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Turfgrass



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MANAGEMENT JOURNAL

The summer of 2016/2017

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Ratho revisited

New holes complete old gem's restoration

Nozzle knowledge
Spraying for success

Cool runnings
Course management
Canadian style

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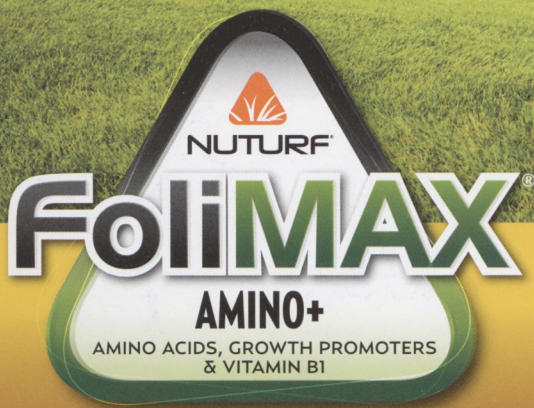
Royal Adelaide stars for Aust Women's Open



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COVER

Royal Adelaide Golf Club: The par four 6th hole at Royal Adelaide Golf Club greets the rising sun ahead of the second round of the 2017 ISPS Handa Women's Australian Open in February. **Photo:** Brett Robinson, AGCSA.



LEAD STORY: #expectbrilliance – Royal Adelaide delivers the 'wow' factor 6
 After the success of the 2016 ISPS Handa Women's Australian Open at The Grange Golf Club, it was the turn of Royal Adelaide Golf Club to host Australia's pre-eminent women's golf tournament in mid-February. Despite some challenging times which extended all the way back to last winter, course superintendent Nathan Bennett and his crew delivered a golf course that captured the imagination of one of the best women's fields ever assembled in Australia. ATM editor Brett Robinson looks back on the event, Bennett's preparations and some of the fantastic plaudits that went the way of the Royal Adelaide crew.

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 Brutal. Relentless. Extreme. Oppressive. Horrendous. Bizarre. Heartbreaking. Those were just some of the words superintendents and turf managers from around the country were using to describe the summer of 2016/2017. From Katherine, NT to the many regional courses along the NSW coast, ATM looks back at what was one of the most challenging seasons in years.

Cool runnings 24
 When Matt Mamone started out as an apprentice at Pambula-Merimbula Golf Club in the mid-2000s, little did he know that the industry would take him all the way to Canada. Here he looks back at his time in one of the more unique regions of the world to ply the greenkeeping trade.

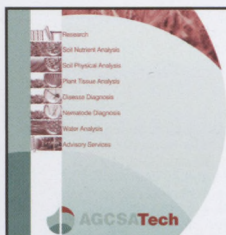


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A shed fit for Royal 54
 Superintendent Richard Forsyth looks back at the project to construct a new state-of-the-art maintenance facility at Royal Melbourne Golf Club.



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Although they may seem trivial, nozzles have a dramatic impact on product distribution and the performance of every spray application write USGA agronomists Steve Kammerer and Brian Whitlark.

GRASS-ROOTS WITH JOHN NEYLAN



Summer stresses

ATM's resident agronomic expert John Neylan looks back at the extreme summer endured by many superintendents and turf managers and discusses the impact such conditions have on cool-season grasses and their management.



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Losses all round

Where do you begin to describe the recent summer that superintendents and turf managers have had to endure? While we had it pretty good down here in Melbourne, in NSW and Queensland records were broken, turf was lost and, most troubling, some superintendents were lost. As someone who has dealt with words and their meaning for much of my career, it's obvious that my understanding of the meaning of the word 'resign' was completely incorrect all these years...

The stresses turf management can present are far greater than most other professions and this past summer certainly tested the professional and mental fortitude of all practitioners around the country. And it wasn't just because of the weather! Having spoken to a number of superintendents, it was again the unrealistic expectations and demands placed upon them and their staff during such extreme times that pushed many to their wits end. It got to such a level that the NSWGCSA felt compelled to issue a missive to Golf Management Australia NSW on behalf of their members requesting the need for support from club general managers and boards during such a difficult period and that every club was in the same boat. Obviously the message got through to some, but not others.

In this edition we canvass superintendents up and down the eastern seaboard and across other parts of the country to see how they fared this summer. All have differing stories but one thing stands out above all – they did their utmost to provide playing surfaces under what were some very trying conditions.

ATM columnist and one of this country's foremost agronomists John Neylan makes a very pertinent point in his column in this edition, one which I encourage all superintendents and turf managers to slip under the noses of their boards and general managers, in regards to the management of turf in the sorts of conditions we saw over the past summer: "Turf management under extreme temperatures is a matter of survival and has little to do with presenting an elite playing surface," writes Neylan. "Once temperatures are well outside of the accepted norm for turfgrasses, it is about minimising the stresses the turf manager can control. That is, lifting cutting heights, reducing shade and increasing air movement, hollow-tine aerification and topdressing in the spring, regular solid-tine aerification prior to and during heat stress and preventative fungicide programmes."

And while we are on the topic of losses, it is with great sadness that the AGCSA will shortly bid farewell to its senior agronomist. Andrew Peart has decided to put the Clegg hammer in the box for the final time and is off to manage the family's newly-acquired farm east of Melbourne (where they will be growing medicinal poppies of all things!) Andrew has been an absolute stalwart of the association over the past 15 years and his departure from the industry, of which he has been a part of for more than 20, is a significant loss.

While his ability to mangle the English language and his misguided loyalty to the Geelong Football Club won't be missed (and don't even get me started on his IT skills...), Andrew's agronomic expertise, unique sense of humour, no-nonsense and selfless manner and his ability to stomach an ouzo and coke will be. All the best Pearty – you have been a fantastic servant for the AGCSA and the industry as a whole and many thanks for your wisdom, friendship and the many (well-edited) contributions to this journal during your time at Clayton HQ. You will be sorely missed. Enjoy the read mate...



Brett Robinson, Editor



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Many Paths,
One Goal

AGCSA partners with Soldier On to assist returning veterans



My column this edition is a little different to what you might usually see in this space. One of the things on my 'to do' list when appointed as AGCSA CEO was to not only ensure that your association aspired to do the right thing for our valuable members and the industry in general, but to lift the profile of the industry and use our good standing in the community to assist other members of society wherever possible.

Most recently, for our members' health and education, the AGCSA has joined forces with the PGA of Australia to conduct a series of seminars on mental health and wellbeing in the workplace and effective modern leadership. These full day workshops, which are being conducted around the country in March and April, are must-attends and I urge all members and turf industry practitioners to visit www.agcsa.com.au to check dates and venues nearest to you.

Mental health awareness for yourself and your colleagues, as well as understanding your responsibilities and obligations in this area, is imperative. In the modern workplace, lack of awareness or ignorance is no longer a defence when dealing with issues that come under the emotional health and wellbeing umbrella.

In a similar vein, unfortunately, even in this 21st Century with our incredible advances in health care, technology, transportation and science, the world is still racked by brutal conflict in many regions. Australia, a nation built on the pillars of freedom, democracy and personal liberties, is often called upon to protect or fight for these rights in far flung parts of the globe. Many courageous young Australian men and women who enlist in our Armed Forces are sent to countries like Iraq, Afghanistan, East Timor and Syria to fight oppression. They are

often involved in things they are unable to talk to friends and family about due to national security and they must deal with experiencing the horrors of war.

When their operational service is done these young men and women must then try to reintegrate into mainstream Australian work and community. Many do so relatively seamlessly, but some struggle. I was shocked to recently read that 41 veterans had taken their life in the first half of 2016 – that was more than one a week! This number is shocking and is unacceptable. Many of these cases are attributed to the difficulties veterans endure trying to integrate back into civilian society.

In response, I believe we as an industry can do and should do whatever we can for these brave Australians who were prepared to make the ultimate sacrifice. After some research, I was directed to an organisation called Soldier On. I sought out **Melissa Russell**, Soldier On's national transitions director, to enquire if our industry and its varied career options could be of service.

She informed me that Soldier On's mission is to achieve the best reintegrated generation of serving and ex-serving men and women in Australia's history. To achieve this, Soldier On supports those who have served by focusing on their physical and mental health, their family, their community and their future. Some 72,000 Australians have served in the Australian Defence Force (ADF) since 1990 and thousands will be affected by their service, be it physically or psychologically. Soldier On provides a suite of services and access to partner organisations to meet the needs of our wounded so that they can start their journey on their road to recovery. Soldier On supports anyone who has served Australia and their families. This includes those who have served as part of the Army, Navy, Air Force, the Department



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of Foreign Affairs and Trade, the Australian Federal Police and the Department of Immigration and Border Protection.

These ex-service people are renowned as hugely talented and skilled in the many fields they train for in the ADF. We tend to associate ADF simplistically with traditional military roles like infantry, transport and hospitality. However, in today's ADF many of these people are leaders in fields as diverse as project management, HR, electronics, mechanics, logistics, communications...the list is huge. All of them are mature, disciplined and often their very lives depended upon teamwork and planning.

Quickly it was obvious to me that our industry could potentially offer a range of opportunities to these talented people both directly in the professional turf or club stream or in positions within companies that service the turf market. It's not hard to imagine an ADF technician who kept state of the art military machinery running in highly adverse conditions making a smooth transition into a talented turf equipment technician, a military logistics expert evaluating and improving a turf supplies distribution business or an electronics specialist maintaining high tech irrigation systems. Those ex-service people with a love of the outdoors might want to undertake a course or mature-age apprenticeship in turf management, while those who were involved in communications or media are surely prime candidates for a great sales career. The list is only limited by our imagination.

So, the AGCSA Board, CEO and staff are absolutely thrilled to announce that we have officially signed on as an industry partner with Soldier On. We will be working closely with the Soldier On team to hopefully place people in roles that suit their existing skills or getting them trained for future roles in our great industry. We will be providing ongoing information to you via the website and this journal, but please visit www.soldieron.org.au to see what this great organisation does to help you understand the importance of this partnership.

We can now advertise that we are an **Industry Veteran Employment Ambassador**. This will not only raise the profile of this initiative, it will reassure veterans that they are dealing with employers who are aware of their circumstances and they are willing to help them succeed. The Federal Government is highly supportive of this initiative and will be introducing ongoing measures to assist the private and public sector to re-engage and gainfully employ these great Australians.

Our industry has often struggled to attract quality people for many roles. Here we have an opportunity to attract highly trained, disciplined professional people that can only improve our industry. So when you employ, consider these men and women. At the very least, we owe them that chance. 🙏



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Royal Adelaide again proved why it is one of this country's most respected layouts after the successful hosting of the 2017 ISPS Handa Women's Australian Open. Pictured is the par four 6th early on the morning of the second round

The world is rife with hashtags these days and in the lead-up to February's 2017 ISPS Handa Women's Australian Open, Golf Australia marketed the tournament heavily on social media with '#expectbrilliance'. While it was more in reference to the stellar field that lined up at Royal Adelaide Golf Club (four of the world's top eight female golfers made the journey), it may as well have also been referring to the course that would be their stage for the week.

Just as Richard James and his crew at The Grange had done 12 months earlier, Royal Adelaide superintendent Nathan Bennett and his crew showcased their course to the world in what was another highly successful event, the second of three Women's Opens that the city is hosting consecutively. Again, the players and tournament organisers were in raptures over the course and its immaculate presentation, while the Adelaide golfing community also voted with their feet. More than 32,000 came through the gates, exceeding last year's excellent attendance figures at The Grange and thus furthering the cause to have the tournament stay in Adelaide beyond 2018.

While Ha Na Jang's stunning final round will stand out for most (she played her final six holes in 5-under to snare the Patricia Bridges Bowl by three shots), from a golfing purist's perspective it was a thrill seeing Royal Adelaide back in the tournament spotlight. Although hosting the World Amateur Team Championships (Eisenhower Trophy and Espirito Santo Trophy) back in 2008, the last time it had hosted the women's Open was 1994 (when Annika Sorenstam won) and men's Open in 1998.

Given such a hiatus between major professional tournaments and the small fact that 2017 is also the club's 125th anniversary, you could imagine that Bennett and his crew may have felt just a little bit of extra pressure to present something special for February's Open. But did they deliver! Despite some challenging conditions in the months leading up to the tournament, Royal Adelaide was simply superlative and drew universal praise from all corners.

Former professional Jane Crafter, one of Adelaide's favourite daughters and whose uncle John Northcott was Royal Adelaide superintendent up until the mid-1990s, paid Bennett and the crew



the ultimate compliment during her final round commentary on ABC television. "I don't think I've seen the fairways here better. Nathan Bennett and his crew have done a superb job this week."

Those sentiments were echoed by Australian great Karrie Webb who, despite missing the cut, joined the ABC commentary team on the Sunday. "I don't think I've seen better fairways anywhere in the world; they're just like carpet!" American drawcard Michelle Wie in her pre-tournament press conference was also clearly enamoured with Royal Adelaide: "I found myself out there looking around thinking, 'Wow, this is a great golf course!'"

However, the feeling among all those that had gathered at Royal Adelaide for the week was perhaps best summed up by tournament director Trevor Herden just a few days out from the opening round. In an article by Martin Blake on the official tournament website, Herden commented that the surfaces prepared by Bennett and his team were some of the best he had seen.

"I'd have to say the quality of turf on the golf course is exceptional, it's unbelievable," Herden was quoted. "They've had a very wet spring then

a lot of heat in the last week, but they've done a remarkable job. It's an awesome tournament course. The players are just saying 'wow'. They love it. These kinds of surfaces, that's all the players ask for week-by-week and they've really got it this week."

Such feedback and comments were extremely gratifying for Bennett and his team who put in a huge amount of effort to present the course not just for the tournament but in a way that was in keeping with the traditions of the club.

"Royal Adelaide is a very traditional club and we strived very hard to present the course as natural as possible for the tournament," says Bennett, who took over as superintendent in November 2011. "It was very much minimalist and we didn't stripe or pattern cut. We wanted the players and spectators to see the golf course for what it was, rather than as a canvas that we could stripe up. Striping looks fantastic on some courses but not here.

"And that's what was great to hear; a lot of the players were talking about how natural and how good the golf course itself was, not just how it was presented. It took a lot of extra work by the guys to



Royal Adelaide superintendent Nathan Bennett (right) shares a light-hearted moment with tournament director Trevor Herden

#expectbrilliance

Despite some challenging times which extended all the way back to last winter, Royal Adelaide Golf Club course superintendent Nathan Bennett and his crew delivered a golf course that captured the imagination of one of the best women's fields ever assembled for the 2017 ISPS Handa Women's Australian Open.



Royal Adelaide's Nathan Greenshields leads Cody Tucker and John Howorth up 14. Fairways, tees, and green surrounds were kept at 8.5mm for the tournament

achieve that in the weeks and months leading up to the tournament and I think we managed to present something that the club was very proud of."

TRIALS AND TRIBULATIONS

Backtrack six to eight months before the tournament, however, and the thought of presenting world class surfaces and putting Royal Adelaide back on the tournament map seemed a world away. In fact, not a lot would go right for Bennett with many elements conspiring to make it a difficult and challenging build-up for what was the sixth major tournament of his turf management career.

It all started with a wetter than average winter of 2016 which flowed into a wetter than average spring. All up by the end of the year, Royal Adelaide had recorded 680mm which was more than 250mm above the norm. The majority of that rainfall fell in August, September and October with some of the flatter holes (the likes of 1, 2, 5, 6, 8, 15 and 17) needing to be closed for periods so as to prevent damage with the tournament only a few months off.

As luck would have it, a three-day stretch of persistent rain in late September coincided with Bennett's fairway and surrounds renovations. When the worst of the rain hit, three fairways were covered in cores which quickly turned to mud. Despite the

weather putting the schedule behind significantly, the crew persevered and managed to get all but six fairways completed. Cool weather post renovations did the common couchgrass fairways few favours in their recovery and just to make matters worse they were ravaged by mites which caused significant thinning in many areas.

By November things had started to improve and with a fair amount of *Poa* in the fairways Bennett's attention turned to cleaning them up. Applying post-emergent herbicides for the first time in a year and a half, Bennett got an excellent strike rate, however, that left a lot of bare areas on fairways. With the common couch taking a lot longer to fire than the newer hybrids (Bennett says it rarely starts moving until December) a lot of plugging and spot fertilising was required to get everything to grow over.

"Like everyone else we have been having our troubles with *Poa* control in fairways," says Bennett. "We had been holding off putting any post-emergents out for about 18 months, but with the tournament coming up we pulled the trigger in mid-November. Whether it was the fact that we hadn't sprayed in a long time or whether there was the right amount of moisture in the ground from all the rain and the *Poa* was very healthy who knows, but we got a great result. By no means were they 100 per cent clean, but we were very happy with the result. *Poa* control is certainly an ongoing issue for everyone at the moment. You think you've cleaned up an area but it just keeps coming back. There's definitely some resistance happening."

With things back on track in the lead up to Christmas, Mother Nature then decided to raise the stakes. The two days leading up to Christmas were in the mid- to high 30s, then on Christmas Day it hit nearly 41, the warmest in Adelaide since 1945. Three days later the rain came – some 80mm – and with it near 100 per cent humidity which is rare for the South Australian capital. That caused a flush of growth which while good for the common couch

CONTINUED ON PAGE 10

Royal Adelaide's par five 2nd. The 2017 tournament was the first Women's Australian Open the club had hosted since 1994



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Above right: Ben Taylor rolls the 11th green following the completion of the second round



CONTINUED FROM PAGE 8

Above: Kooyonga volunteer William Fry is a picture of concentration cutting Royal Adelaide's 7th green

did Bennett few favours with the rough. At that time the rough had started to brown off nicely and provide Royal Adelaide with its trademark links look, but the rain greened up and thickened the couch understory which raised a few playability concerns ahead of the tournament.

January would be typically warm with a monthly mean of nearly 31°C, including a couple of days over 40. The 39°C on Sunday 29 January, just two weeks out from the tournament, had the crew scrambling for the hoses and while they were able to get the greens through unscathed, the same couldn't be said for the rail track that famously dissects the course. A section of track in between the 1st and 2nd holes buckled in the heat which necessitated some hasty repair work that evening by Adelaide Metro (see photo on page 12). Just over a week later on 6 February, 10 days out from the first round, the heavens opened again with another 30mm falling which was followed by five consecutive days of 34, 42, 41, 40 and 34.

Royal Adelaide assistant superintendent Andrew Fraser stimps the 4th green



"The weather was so inconsistent," recalls Bennett. "It was one of the more unusual seasons we've had in a while, but I think it was like that for most across the country this year. Even going back

to spring and our fairway renovations, there were a lot of things that conspired against us. It was wet when it wasn't supposed to be wet and then we had some real high humidity.

"We normally don't have much disease pressure because it's normally hot and dry. But this year we had to be very proactive with our preventative spraying due to the conditions and because we had the tournament looming. But we got through unscathed and the guys were really vigilant and anything we saw we were onto straight away."

DIALLING IN

Knowing the vagaries of Adelaide's climate, Bennett deliberately started preparations a little earlier than normal to make sure the crew wasn't under the pump heading into the week of the tournament. That proved a wise move, especially with those three days in the 40s, and meant that 3-4 days out from the tournament he was able to get his crew to concentrate on some of the finer detail work, like hand-weeding roughs, to help present the course as best as possible.

With a lot of attention paid to presenting the fairways as naturally as possible, by contrast the greens didn't require as much work to get them up to tournament pace. Over the past two years, under the recommendation of Bennett, Royal Adelaide has moved away from traditional renovation practices on its greens. Instead of coring, Bennett dusts little and often, going out every week or second week combined with regular needle-tining (every three weeks).

While the amount of sand applied is still the same (approx. 300 tonnes over the course of the year), Bennett says that moving to such a regime has made a dramatic improvement to the greens in terms of their firmness, their recovery from pitch marks and overall plant health, with the greens getting nowhere near as stressed as they once did. That regime continued throughout the build-up to the Open along with plenty of preventive fungicides

in order to keep on top of any disease that may have flared up due to the heat and humidity.

At the start of the lead-in week Bennett lowered the height of the greens mowers from 3mm to their tournament setting of 2.8mm and double cut every day, one pass with the brushes down and the second without. The weekend before the tournament the rollers came out to firm the surfaces up and then it was a matter of working in with Herden each day to present the desired conditions ahead of each round.

"We were really happy with the turf quality when the tournament arrived," says Bennett. "The only thing we were probably a little disappointed with was the condition of the rough due to the rain and the heat which caused it to thicken up considerably. Having the additional guys coming in made a big difference and it meant we could increase our frequency of cut which is what it's all about with tournaments to get the surfaces really fine-tuned and tightened up.

"What pleased me most was the way the fairways presented. I was really surprised with them given the amount of work we had to do to them. It does take a lot more work to get them up, but the common couch provides an awesome surface. We really wanted that traditional feel and to highlight the common couch and the different variations through



the fairways. We certainly put more preparation into the couchgrass surfaces to present well knowing that our greens would come up relatively quick.

"I was also really pleased with the amount of work we got done in the week prior and the way the guys rallied around. We weren't looking back come the tournament and thinking 'Gee, I wish we had done that' or 'we missed that'. In fact, the last couple of days before the tournament we were looking at

Ian Lawson guides the Reelmaster around the fairway bunkers on 17

2017 ISPS HANDA WOMEN'S AUSTRALIAN OPEN - RAGC

Superintendent: Nathan Bennett (started as superintendent in November 2011)

Assistant superintendents: Andrew Fraser and Mark Everingham.

Irrigation technician: Phil Pleic. **Turf technician:** James Parisella.

Greens: Mix of four bentgrasses – Penn G2, Penncross, Highland and Seaside (HOC 2.8mm).

Fairways, tees, surrounds: Common couch (HOC 8.5mm).

Green speed: 11-11.5.

Tournament crew: 32. RAGC brought in three casuals for four weeks in the lead-up to and during the tournament, including former casual employee **Calum Wood** who is now working as an assistant at Silvertip Resort in Canada. Three of the 15 tournament volunteers came from Melbourne (**John Howorth** – Royal Melbourne, **Holly Waldock** – The National and **Hugh Besley** – Metropolitan). The remaining volunteers came from local clubs Kooyonga, The Grange, Adelaide Shores, Glenelg, Flagstaff Hill, Mt Osmond and Mt Barker, as well as reps from Toro and Nuturf. Toro assisted with additional machinery including fairway units, Workman utilities, three Greensmaster walk-behinds and a triplex mower.

Preparations: The course was closed the Sunday prior to the tournament with a final application of iron and Primo made to fairways, surrounds and tees to retain some colour and tighten up the common couch. Greens were given a single cut both morning and afternoon on Thursday and then a single cut in the morning and roll in the afternoon on Friday and Saturday. With 3mm of rain on Sunday, greens were only rolled ahead of the final round.

Did you know... Royal Adelaide has a large number of pine trees on the property and a fortnight out from the tournament around 40 Royal Adelaide members turned out for a working bee to help staff tidy up the spectator areas. Over a three hour period they collected a total of 30 cubic metres of pine cones!

Englishman Calum Wood, a former casual employee at RAGC who is now based in Canada, returned to assist with tournament preparations



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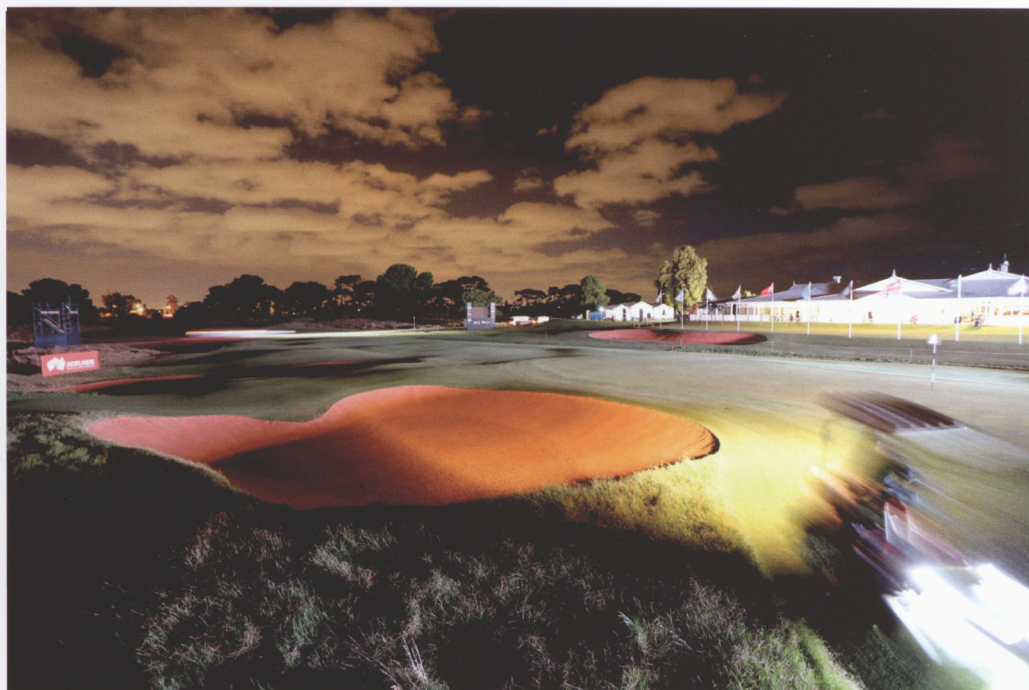


GLOBALTURF

The 18th green and surround gets prepped ahead of the second round



Ryan Reavley cuts the 12th tee



our jobs and scratching our heads and going 'Is that all?' It meant we weren't under pressure going into the tournament and we could concentrate on some of the smaller jobs to finish off the presentation.

"The crew were fantastic and really embraced the tournament. It was a big tournament and there was a lot of excitement surrounding it, especially knowing that it was being beamed into millions of households around the world. All the guys stood up and looked outside their jobs and tasks and were across everything which was really pleasing to see.

"It's been great having this level of tournament back in Adelaide. I think there has been a conscious effort by all three clubs to ensure that we present something different each year. Richard (James) had The Grange in sensational condition last year and hopefully we've presented something a little different again. And I know that Steven (Newell) at Kooyonga will have his course absolutely top notch when it travels there next year. Certainly the feedback from the players is that they are very happy coming to Adelaide, so hopefully we can see the tournament stay here for a few more years to come." 🙌

Far right: It wasn't just the turf that was feeling heat at Royal Adelaide in the lead-up to the Women's Open

Below: Troy Tomlin edges the iconic bunkers around Royal Adelaide's 7th green



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The summer from hell

Brutal. Relentless. Extreme. Oppressive. Heartbreaking.

Those were just some of the words superintendents and turf managers from around the country used to describe the summer of 2016-2017. ATM editor Brett Robinson looks back at a summer some would rather forget.

The summer of 2016-17 will go down as one of the most challenging on record, particularly for those along Australia's eastern seaboard. Superintendents struggled to keep turf alive as extreme heat, humidity and pest and disease pressures reached critical levels

It seems ridiculous to cast the mind back to the past summer when, just as this edition of Australian Turfgrass Management was being finalised, Queensland and northern NSW were mopping up in the wake of Tropical Cyclone Debbie. After one of the hottest, driest and humid summers on record, that all quickly turned into a distant memory as Debbie wreaked havoc, bringing with her massive rainfall that resulted in widespread flooding, affecting many golf clubs and turf facilities (read more in the GCSAQ report on page 79).

The fact remains, however, that the summer of 2016-17 will go down as one of the most challenging on record, particularly along the eastern seaboard. Taking a look at Bureau of Meteorology (BOM) stats from December through to February provides a very real snapshot of the difficult conditions:

- Summer 2016-17 was the warmest on record for Sydney. Records were broken for numbers of hot days and nights across the city, with many BOM stations experiencing their warmest February day on record on the 10th and 11th. (The 47.0°C at Richmond was just 0.8°C below Sydney's all-time record set in January 1939.) Rainfall was close to average, with a dry start to the summer followed by some heavy rain and thunderstorms during February.
- Minimum temperatures in Sydney were persistently warm, with no nights below 15°C at Observatory Hill and 58 nights reaching at least 20°C, the second-most warm nights on record. Five nights reached at least 25°C, the most hot nights on record, with 10 reaching at least 24°C.

- Across NSW as a whole, it was the second-warmest December on record and third warmest for average minimum temperatures. It was the third-warmest January on record for the state with average temperatures 3.34°C above historical averages. Rainfall was 41.6 per cent below average across NSW in January. February was the third-warmest on record for NSW.
- Brisbane had its warmest summer on record in terms of mean temperature. Brisbane's mean maximum temperature was the third-warmest on record, while the mean minimum temperature was the equal-highest on record.
- Brisbane had a record run of 30 consecutive days above 30°C between 28 January and 26 February 2017 (previous record was 19 in 2002).
- All Brisbane BOM locations recorded less than 80 per cent of the average summer rainfall.
- Summer 2016-17 was the second-warmest on record across the whole of Queensland.

Such were the conditions experienced in NSW, and prompted by concerns raised by members, the NSW Golf Course Superintendents Association (NSWGCSA) felt the need to send a letter to Golf Management Australia NSW. Titled *'When the heat is on we need your help'*, the letter highlighted to GMs and boards of management the many things that conspired to cause the loss of turf this past summer.

First and foremost it outlined the challenges created by the extreme weather and the resulting increases in disease and pest pressures, issues with water quality, irrigation infrastructure and budget restrictions. The letter then went on to provide

tips on how to improve the relationship between superintendent and greens committee based on NSWGCSA member feedback (see more page 18).

"From a turf management perspective, last summer will undoubtedly be etched in the memories of many a superintendent, general manager and greens committee chairperson," the letter began. "With the loss of turf being so widespread over the state this year and the stress that superintendents have endured, as well as in many cases the backlash from golf club membership and committees, the NSWGCSA felt an uncontrollable desire to address managers and board members directly in the aim that we can educate golfers on the challenges experienced by their superintendents in 2016-17 and to inform them that they were not alone and that instead of casting blame on maintenance crews, offer support and understanding.

"Unfortunately, many top turf managers are opting to leave the industry due to the lack of support and understanding from club members, committee members and managers. The NSWGCSA believe that the reason for the lack of understanding is down to knowledge."

To get a handle on the challenges faced around the country this past summer, ATM canvassed a number of superintendents and turf managers to see how they fared. Above all, the most important thing that all the respondents stressed was the need for effective communication during such challenging times and doing what's right for the turf. ATM thanks all those who took the time to respond and their willingness to share their trials and tribulations and the lessons learned. We start first in the Top End...

KATHERINE GC, NT

Kirsty Herring certainly won't forget her first summer as a course superintendent in the Northern Territory. Taking over the reins at Katherine Golf Club in the latter half of 2016, it was a short sharp introduction to the vagaries of NT's unique climate.

"It was enlightening," says Herring, a graduate of the 2017 AGCSA Future Turf Managers' Initiative. "As my first wet season in the Top End, I wasn't sure what to expect. It started in November with the 'build up' that gave us week after week of mid- to low 40°C temperatures and very dry ground, with turf (and superintendent) struggling to cope.

"December started the same way but by mid-month the rain had arrived in dribs and drabs and temperatures settled around 38°C. The wet season hit on New Year's Eve with 140mm falling in two days. We received 470mm for the first month and the course suffered minor flooding. Since December we've had just over 1000mm rain in total over 65 rain days. We were closed for several days mid-January but thankfully the course held up well and the board and members were very understanding.

"With the constant wet and humidity levels often at 90 per cent, pythium was rampant and seriously affected many of our greens despite preventative

sprays. We also had an influx of cutworm and armyworm. Every inch of zoysia on the course was infested and quickly spread to the Tif greens. Due to conditions it was difficult to get out and spray, so some areas, particularly tees, were badly damaged.

"Being remote it can be difficult to get products in a hurry. Prior to the next wet season a preventative Acelepryn application will be applied across all zoysia areas. Greens will once again receive preventative fungicide applications but curative products will be kept in stock ready to go. Also, intensive renovations will take place before the wet to ensure good drainage and healthy roots."

ELANORA CC, SYDNEY

Course superintendent **Dan Cook** described the past summer as not only the worst in his time at the northern Sydney course, but his entire career.

"It was oppressive," states Cook. "We had six weeks where the night time temperatures did not drop below 20°C. We had a couple of 43°C days and two nights where temperatures didn't drop below 28°C. The heat then made way for a huge east coast and 400mm of rain in four weeks.

"For me, the toughest part was having the guys working in the oppressive heat. It is tough at best to work outdoors, but when the weather is excessive it is hard on the staff to keep up their efforts to make the place run. To their great credit they pulled together to exceed the members' expectations.

"Our main challenge was keeping the bentgrass alive due to disease pressure and we ran very low on water for all areas. With the bentgrass, smooth rollers were installed on the walk mowers, heights were raised and lots of TLC was applied to baby the greens through easily their toughest summer. Our water shortage was also challenging and eventually town water was purchased to allow all grass to remain irrigated.

"The only project that was affected by the extreme heat was our fairway renovation. I did not core fairways or rough as I did not have the water. This may result in more compaction on fairways than we would like, but it was a great strategy to save a bit of water during the dry spell.



There are so many words that could describe the past summer... different, horrendous or just plain bloody hot and humid! It was basically continual from the first day of summer to the last. I have not experienced one like it in my 24 years at the club.

- John Halter, City GC, Toowoomba

Kirsty Herring won't forget her first summer at Katherine Golf Club, with heavy rains and extreme disease pressures challenging both turf and superintendent





Constant high temperatures and humidity coupled with well below average rainfall caused significant turf loss on the Queensland blue couch fairways at Hervey Bay. Poor water quality also caused significant issues with algae

“One thing to come out of this summer is that the club has asked for a water strategy paper to be written. As we had the least amount of summer rainfall in 25 years and the dam was at its lowest levels in my tenure, it will aid in writing the report as I now know the low levels and trigger points.”

HERVEY BAY G&CC, QLD

It was a “heartbreaking” summer for superintendent **Peter Fraser** with constant high temperatures and humidity coupled with well below average rainfall causing significant loss of blue couch on fairways.

“I have never experienced a summer like it,” says Fraser. “Temperatures were constantly above 32 degrees with high humidity, combined with hot northerly winds and no rain. We haven’t had any decent rain since June 2016 and it has been the driest since records began for the area. Rainfall for summer 2016-2017 was 63.5mm compared to 470mm the previous summer.

“We had a lot of heatwaves this year which gave us a few issues with water quality and the amount of water we were able to put on the course. We had major problems with algae in the lines and blocking

up sprinklers. We had to remove every sprinkler insert, pull it apart and clean them out. We had to do this several times for the same sprinklers.

“When the irrigation was finally operating correctly, I started adding chlorine to the well to help with the issue as well as using Retain Magnum wetting agent pellets. The club has ordered a dosing pump for the irrigation system to help prevent it happening again and I am also looking into other measures to help clean up the irrigation dam as the water supplied is Class B effluent.”

BERMAGUI CC, NSW

The best thing about last summer was that “it ended” according to long-serving Bermagui superintendent **David Thomson**. It was one of the driest he can recall and proved you’re never too experienced to learn a thing or two about turf management.

“It was very parched,” says Thomson. “From 6 December to 8 February we didn’t receive more than 10mm in one rain event. When you’re still operating a semi-automated irrigation system, you rely heavily on a good soaking rain for some moisture depth, but without that we were just tickling the surface.

“We were travelling along okay until the fourth week in January when we were bombarded with stem weevil. We started the yearly programme with a knockdown insecticide, followed by monthly applications of EN’s, including green surrounds. We went out in December with a knockdown/larvacide due to EN’s not turning up in time.

“From October through to the fourth week in January we couldn’t even detect activity of either larvae or adults. Starting to believe in silver bullets, we got a rude awakening with uncontrollable numbers in that fourth week. To regain turf density, extra nutrients were applied, including root strengthening products. Next year we will be narrowing the larvacide window through January/February and will definitely be increasing our monitoring practices.”



FEELING THE HEAT ON NO.1

Timing is of the essence when you are a turf manager, but for **Brian Worboys** at Maitland City Council in NSW there was little he or his crew could do when Mother Nature applied the blow torch early February.

The last roll of 16,000 square metres of turf went down on No.1 Sports Ground on the morning of Friday 10 February, the start of what would be an horrendous three day run of temperatures. That Friday the mercury reached 43 and was backed up by 47 on Saturday and 45 on Sunday.

According to Worboys the irrigation pump only had the capacity to run one line at a time and one 50mm handheld hose. With a water tanker on site, fittings were organised to run an extra handheld hose, with the crew continuing to handwater the newly laid oval from 7am to 7pm across the weekend.

TABLE 1: GRAFTON RAINFALL TOTALS SEPT 2016-MAR 2017

Month	Total
Sep 16	30mm (10mm below average)
Oct 16	11mm (52mm below average)
Nov 16	40mm (42mm below average)
Dec 16	36mm (70mm below average)
Jan 17	100mm (27mm below average)
Feb 17	59mm (70mm below average)
Mar 17 (to 10 Mar)	15mm to 10th (monthly ave 120mm)

GRAFTON GC, NSW

What stands out most about the past summer for Grafton superintendent **John Nelson**, apart from it being so dry, were the extremes of high temperatures. Summers in Grafton are usually hot (average maximum 32°C) with high humidity, and a few days of 36°C plus are not uncommon. But this past summer saw six days in the 40s with a high of 45 on 12 February. Despite the extremes, which saw him turning off water to the fairways, Nelson was still able to present quality surfaces for the members.

"We had a very mild winter last year and for the first time ever we had no significant frosts which saw us hold good colour," recalls Nelson. "Then with good unseasonable rain through August (107mm) things were looking up for a good spring. That's where it ended. Every month from September through to March was well below average. December (39mm) was 70mm below and in February we received only 59mm which was also 70mm below.

"We have a very limited water supply and rely totally on harvested water. We have five interlinked dams with a capacity of 13 megalitres. In an average rainfall season we can expect to refill and double that amount to approximately 26ML available for irrigation. Our harvestable right is 6.8ML

"So with a very limited water supply and an antiquated irrigation system (centre line QC valves)

plus travelling irrigators, I started working really hard to get as much water as possible on our fairways through September and October to promote as much grass cover. Then I became concerned we were going to run out of water, so at the start of November we switched off the fairways and only irrigated greens and tees. We had to top up twice with potable water which was a very expensive exercise. Fortunately on two other occasions, when we were about to top up with potable water, we received enough rain to keep us going."

CITY GC, TOOWOOMBA, QLD

The biggest lesson superintendent **John Halter** and his City GC crew took away from the past summer was not to take anything for granted and that you can never be too vigilant.

"There are so many words that could describe this past summer, I don't know which one to use!" says Halter, who also had to contend with getting the course ready for the 2017 Queensland PGA Championships in mid-March. "Different, horrendous or just plain bloody hot and humid; it was basically continual from the first day of summer to the last! I have not experienced the kind of summer we have just had in the 24 years I have been here.

"When you are growing bentgrass in these sorts of temperatures and have two different climates on your golf course, you really do have to be on your toes. It can be 5-7 degrees different from the bottom to the top of the course. It is much more humid in the lower parts as air does not circulate that well, so much more attention is needed to these holes.

"Temperatures varied throughout summer between the mid-20s (which wasn't very often) to 41. I know it doesn't sound much, but as the temperature dropped the humidity would climb up to as high as 96 per cent, which in Toowoomba is



What was once a dense bentgrass green at Bermagui CC after being smashed by a severe outbreak of Argentine stem weevil in late January

CONTINUED ON PAGE 19

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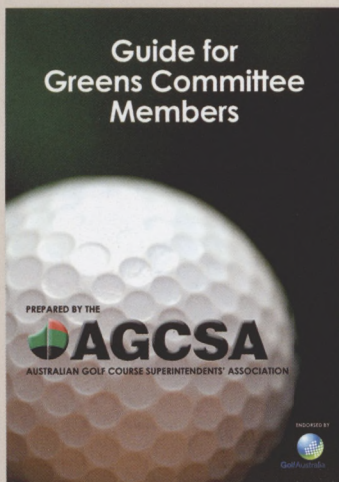
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As badly or disappointed committees or members may feel when things go wrong, it is important to remember that the superintendent and their staff often feel much worse

The AGCSA has a range of member resources to assist superintendents in explaining their role and some of the challenges. Among them is a greens committee guide and a course operations induction manual



SUPPORTING THE COURSE MAINTENANCE TEAM

As part of the NSWGCSA's letter to GMA NSW, the committee included feedback from NSWGCSA members about the ways in which greens committees can (and should) support their course management team. The following are some of the key points NSWGCSA members raised.

COMMITMENT

"The most successful committees are stable. It takes time for committee members to fully understand their role and gain an understanding of the maintenance operation and budget. In reality, the tenure for most committee members is too short and the orientation process for new members is limited at best. This can be very frustrating to superintendents and general managers, who are faced with indoctrinating new committee members while trying to fulfil their own responsibilities. Committee members should be carefully recruited and should be able to devote the time necessary to participate in meetings."

BASIC KNOWLEDGE

"Those who are serious about their role on the committee have a responsibility to learn about the operation, its long-range goals and objectives and the people who are responsible for making it happen. Superintendents and/or general managers should develop an orientation packet for new green committee members if one is not in place. The packet should provide copies of the maintenance standards and objectives, plans and budget information, glossary of terms, staff biographies and other resources that prepare committee members."

BUDGET IMPACTS

"Many respondents expressed frustration over the seeming disconnect between course conditioning and the money required to provide those conditions. Perhaps this is due to the limited exposure that most new committee members have with the maintenance operation. Committee members need to be aware of the costs of conditioning and set realistic expectations."

COMMUNICATION AND TRUST

"Strong two-way communication that fosters confidence and trust between the superintendent and committee is essential. Electronic communication is good, but it does not replace face-to-face meetings and personal interaction. It is difficult to build a trusting relationship with an absentee green chair."

THE WEATHER

"Those of us who work with living systems take this for granted and it is understandable that members overlook the weather's impact, but it does affect a superintendent's ability to maintain high-quality turf and playing conditions. Weather effects are both direct and indirect on the turf and the maintenance

operations. There are also seasonal weather changes to contend with. A good green committee will adhere to and support its superintendent's judgment when it comes to decisions on course closure or cart use, or when maintenance practices must be adjusted due to inclement weather."

PLAYING SKILLS DO NOT RELATE

"Being an accomplished player alone has nothing to do with how to establish good playing conditions or mastering golf course architecture. Understanding what good playing conditions are can be advantageous, but it is also essential to be realistic regarding course conditioning. Course conditions change day-to-day and week-to-week despite the maintenance goals and objectives. The green committee is supposed to represent the entire membership and decisions should always be made in the best interest of the golf course."

AVOID COMPARISONS

"It is easy to compare conditions and maintenance practices with neighbouring golf courses. But an informed committee will discount those comparisons, realising that golf courses vary too widely to make most comparisons meaningful. The committee should remain patient and focused on the programmes that have been developed to produce the playing standards for its golf course."

RESPECT

"Being a superintendent has always been challenging. Superintendents are expected to satisfy a demanding group of golfers while trying to deal with the challenges of the weather. They maintain a valuable piece of property and oversee a significant budget. Demands are placed on their time, both on and off the golf course. They and their core staff are a highly dedicated group who deserve appreciation and respect. And, as badly or disappointed you may feel when things go wrong, the superintendent and his staff often feel much worse."

SUPPORT

"The committee should make it known that the superintendent is a professional and his decisions should be fully supported by the committee. Similarly, good green chairmen do not micromanage. They understand that their role is an advisory one and they let their superintendents do the managing."

NOTHING GOOD IS EVER EASY

"Being on the green committee is a challenging job. However, the experience can be rewarding, knowing that you are helping manage the operation's most important asset — the golf course. Good committee members will understand the importance of their role and invest the time to forge a strong working relationship with the superintendent."

high considering we live 700 metres above sea level and are on the edge of the Great Dividing Range, so you would think air flow would not be a problem.

“Consecutive days of heat above 33 and as high as 41 plus humidity was 16 and 18 days for January and February respectively and of course the hottest days always fell on the weekends. The winds were a major factor as well. They were predominately from the ESE, E and SE which tend to really dry and burn the surface of the greens. It was a very strange season and very hard to predict.

“It was relentless. We knew what we had to do, but it was just day after day, which gave us no time for other maintenance. The challenge was to take care of the greens and to keep the rest of the course in good shape for the PGA in March.

“So what did we learn? The whole summer was an experience and I am sure we are a lot better for it. Careful observation of the course was a must. The most important thing we learned was not taking things for granted. Just because the greens got watered the night before doesn't mean there is enough moisture in the ground to last all day. It can be cool and sunny and the greens will burn and it can be hot and a little humid and they won't. You must learn about your environment and conditions and do not panic (only if you see your bentgrass turning bluish/purple or just plain brown!)”

ROYAL SYDNEY GC, NSW

As was written in ATM Vol 19.1, the Royal Sydney Golf Club crew had their challenges leading up to the 2016 Emirates Australian Open last November. While they succeeded in presenting a world class course, it quickly became a distant memory as they battled through a very tough Sydney summer.

“Collectively, we cannot remember a summer that has been as hot and humid as the one we have just been through,” say Royal Sydney assistants Adam Marchant and Jake Gibbs. “Hot days and hot and humid nights, daytime highs of 38°C and overnight lows of 28°C weren't uncommon, combined with extremely low rainfall. It was brutal.

“There was a significant increase in disease pressure which had an impact on monthly budgets as we made a number of additional fungicide applications. There was a significant amount of hand watering greens – the hoses barely had time to hang back on the wall before going out again!

“It was a funny feeling here for us. We had talked to the crew at length about how post-Australian Open should be a really enjoyable time for us. We felt we would be able to focus on presenting the golf course for the members, knowing that all our renovations had been completed prior to the tournament and for us we could really focus on grooming the golf course and where possible maintain the tournament standard. That plan soon changed and for us the focus became about keeping turf alive.

TABLE 2. ROYAL SYDNEY RAINFALL COMPARISONS

Summer 2016/17	
December 2016:	53.2mm
January 2017:	31.1mm
February 2017:	225.5mm
Summer 2015/16	
December 2015:	180.8mm
January 2016:	238.4mm
February 2016:	34.2mm

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“The main thing that stood out was the resources that we had to use to hand water greens and the constant monitoring for disease even with fungicide coverage. The biggest challenge for us was the balancing act between not making the greens too wet so they still perform well and keeping them moist enough so that there is minimal need to disrupt member play and water them during the day.

“Throughout all of this it was important to be on the front foot with communication around the pressures the weather was placing on us and the turf. The committee were very good at understanding the pressures we were under. We were able to hand water during competition play if required and we also asked for some additional (no play prior) slots in the tee times to allow us to apply added fungicide applications which they were supportive of.

“This summer really confirmed for us the importance of a good reliable crew who were trained around moisture management. The addition of Field Scout moisture meters in recent times has been significant and we feel we would have had a much tougher time had we not had them to assist us.”

PACIFIC HARBOUR G&CC, QLD

Not only did superintendent **Kelvin Nicholson** have to contend with the driest July-December period in over a decade at his course, a direct lightning strike only added to his headaches.

“It was definitely a challenging summer,” says Nicholson. “Above average temperatures coupled with record low rainfalls was the norm. Our normal average rainfall for January and February is 350mm and we only had 80mm which was on top of our lowest rainfall for July to December since 2005 and our lowest previous year since 2000. During December we also received a direct hit from lightning to one of our fairways which subsequently damaged our irrigation system including pumps, electronics, weather station and sprinklers resulting in an insurance claim of about \$30,000.

“The biggest challenge was the lack of rainfall which led to us having to use small pumps to move water around from our on course lakes to our main

irrigation lake. We are pretty lucky here with regards to our turf as even though it dries out it doesn't take much for it to come back. We also putting out more wetting agents than in past seasons.

“Having all of our staff aware of the importance of managing our water has given us all a better understanding of our irrigation practices. With this we have managed to successfully get our course through a very tough summer with minimal impact on our turf and overall quality of the course.”

NUDGENE GC, QLD

It was a long few months for **David Brushfield** at Nudgee in Brisbane's eastern suburbs and it all started back in mid-November when a mini tornado ripped through the 36-hole facility, the likes of which he hasn't seen before in his 25 years at the club. Then it was just relentless heat and humidity...

“It was the warmest, driest period in my years in Queensland and we didn't get any break from the heat and humidity,” says Brushfield. “We would normally see temperatures in the high 20s and high humidity, but this year the norm was 31/32 and high humidity. We had no floods from summer storms which has never happened in all my years here.

“Combined with the warm temperatures and the lack of rain from storms, unirrigated areas of the golf courses were badly affected, and with autumn here and winter just around the corner a lack of turf on some fairways and a near empty dam isn't where we normally are at this time of the year.

“We applied more fungicides as a preventative measure and used more wetting agents on greens, tees and fairways. Our February greens renovation was put back a week because of the heat expected that week, both for the health of staff and the greens.

“Our main dam was very low and we bought town water to continue watering all areas of the courses. The water quality is diminishing and to combat that we were applying gypsum regularly.

“The one positive from the past summer is to see how well the fairways that we have irrigated over the past two years have stood. We received 80-90mm of rain in January/February, well below normal. Compared to the 3-4 fairways that have no fairway watering, the courses have stood up ok, but to imagine what the fairways would look like without the work we put into them would have been terrible.”

MT OSMOND GC, SA

SAGCSA president **Bazz Bryant** has seen a fair bit in his 20 years at Mt Osmond GC in Adelaide but nothing quite like the past summer.

“After an extremely wet winter, the rain just kept coming,” recalls Bryant. “Our average at Mount Osmond is around 690mm per year, but for 2016 we recorded a record yearly rainfall of 1076mm, with a record monthly total of 208mm in September.

“With warm humid weather, not our normal dry heat, constant downpours and high winds, it was just a very unusual, extreme and bizarre summer. On



A direct lightning strike causing \$30,000 damage to the irrigation system only added to the headaches at Pacific Harbour G&CC

11 November 2016 a severe hail storm hit Adelaide, Christmas Day was 42 and then we had an extreme storm that hit on 28 December which was the worst I have seen in my time at Mt Osmond. The 65mm of rain in 12 hours caused washouts in bunkers and paths while the strong winds caused a lot of damage to our heavily tree-lined course.

"The biggest challenge was the clean-up, which was still ongoing even in March. The course was closed that Wednesday, but with help from the Pro, a couple of volunteers and course staff blowing, chain sawing and carting debris, the course was open the next day. The best thing was to see the volunteers come out the following week. The club put an SOS out to the membership to help clean out debris from bunkers with nearly 30 turning out. That was just fantastic and the best thing to come out of the worst of the summer."

AVONDALE GC, NSW

David Warwick isn't the sort of superintendent to mince his words, but the two words he chose to describe this past summer are, well, simply unpublishable. Warwick has grown bentgrass greens in Queensland, but that was seemingly a walk in the park compared to the summer he and his crew have just endured.

"It was without doubt the worst summer I have experienced and that includes growing bentgrass at Arundel Hills in Queensland 20 years ago," states



Warwick. "Temperature highs of 42, minimum night temperatures of 28, 33 at 6.30am one morning and soil temperatures in the mid-30s consistently made it extremely challenging. The crew simply had no rest and neither did the bentgrass which never had a chance to cool down. As a result we had a lot of thin turf especially on the badly enclosed greens. Fungicide applications were spaced closer together, hand watering increased and we reduced mechanical stresses based on forecasts."

TOWNSVILLE GC, QLD

The past summer was just a continuation of the challenging weather conditions that course superintendent **Jason Foster** has had to contend with since arriving in Townsville six years ago.

"I moved to Townsville in 2011 one week after Cyclone Yasi to start construction on a redesigned course and housing development taking the course

After the highs of hosting the 2016 Emirates Australian Open, Royal Sydney staff then had to battle through a relentless summer

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Nice and crispy at Brisbane's Indooroopilly in February

from 27 holes back to 18. With the damage and incredible rainfall that came with Yasi I anticipated lots of rain and cyclones for the future; I couldn't have been more wrong!

"Townsville is now into its seventh year of below average rainfall and is experiencing one of the worst localised droughts on record. To give an example of how dry it has been, the club has a casual employee that has been with us five years now. When he started, I explained to him that during the wet season he wouldn't get many hours due to rain; he has only had two-and-a-half days off in five years..."

"February 2017 really stands out in my mind as the club experienced a lack of rainfall that was worse than the rest of the town. February's average rainfall is 296.6mm. The airport weather station (6km away) recorded 138.8mm whereas the golf club only received 31.5mm in February.

"In mid-January we had 98mm fall over night and over the next few days temperatures hit the high 30's (our thermometer in the shed hit 45 one day), with night time temperatures staying above 30. Golf cart wheel tracks did considerable damage.

"Late summer was particularly difficult. Lack of rainfall over the past years has meant toxins and salts have built up in the greens profiles and with the first dump of rain in January flooding the greens for the first time in a long time it moved a lot of the salts in the rootzone and to the surface. The day after 98mm fell, the ground also decided to move which resulted in three mainline breaks. Coupled with hotter than average temps, this put our greens back a long way. Four days without water and high temperatures cooked some parts of the greens.

"Looking back on this past summer, the one thing that I probably should've done was lift the heights on the old greens and not been so concerned about speed. I think if we kept the greens a little slower and kept the nutrition up, then the bermudagrass decline and dry wilt would not have been as bad."

INDOOROOPILLY GC, QLD

Compared to what previous summers have thrown the way of superintendent **Charlie Giffard** (think back to the Brisbane River floods of 2011), this past one was nowhere near as severe by comparison but it still provided a few challenges.

"It was pretty relentless," says Giffard. "It was the worst we have had in regards to heat and humidity for some time. We had nothing outrageously hot, with 39 degrees recorded one day in mid-February, but it was just the consistency of the humid nights coupled with no dipping below 30 during the day. The few rain storms Brisbane did have seemed to sidestep the golf course on a regular basis.

"The heat and lack of rain meant we had plenty of water issues. At the time of writing (early March) we are currently on zero storage and rely on water piped directly into our irrigation dam from the treatment plant. Luckily, we haven't had many disease issues to deal with and despite watering only with effluent, the turf remained in good health. With little to no flushing of the salts (and a non-working acid dosing pump for a period), it really tested the turf's resilience.

"Effective communication with the CEO and board was paramount, though they often needed reminding. Posting regular updates in the club's newsletter and website certainly assisted. Unfortunately, not everyone reads the website and on occasions it is often a challenge to find the best medium to ensure the right message is heard.

"The take home message this summer is that with 'the new norm' there isn't one! In the past, we tended to plan our programmes and projects working on historical weather averages. Perhaps the time has come to throw out the playbook and start again. Last summer, every month seemed to set a new record for high temperatures and with the spectre of global warming hanging over us, we should expect more of the same." 🙏

SUMMER A WELCOME RELIEF FOR PERTH SUPERINTENDENTS

Recent summers in Perth have been, well, brutal so you could forgive superintendents over in the West for rejoicing after receiving a much deserved break this past summer. As AGCSA Board member **Darren Wilson** quipped, "Can I order another summer like that please?"

"The past summer in Perth was cooler and wetter than normal giving us some much welcome relief than past summers," says Wilson, course superintendent of the 36-hole Wembley Golf Complex. "I would have to say this was our easiest

summer in Perth for many years with many saying we didn't really get a summer. It was certainly the best summer ever for turf maintenance and golf courses in Perth have never looked better.

"At Wembley our water budget was down 40,000m³ than last year over January and February. On February 15 and 16 we recorded 126mm which nearly overflowed our stormwater dam. For seven days in February we didn't have to run the irrigation system which is unheard of; we usually run it every night throughout January and February.

"With the cooler, wetter summer than in the past, there was less pressure on the bentgrass and while we did have a few days in the high 30s there were a lot more cooler days. We constructed a practice chipper during this time and it certainly covered a lot quicker, especially the kikuyu surrounds due to the higher humidity and wetter February."

TABLE 1: WEMBLEY GC WEATHER – JAN-FEB 2015-2017

Year	Rainfall		Mean temperatures	
	January	February	January	February
2017	34mm	155mm	28	27
2016	15mm	2mm	31	31
2015	2mm	17mm	32	33



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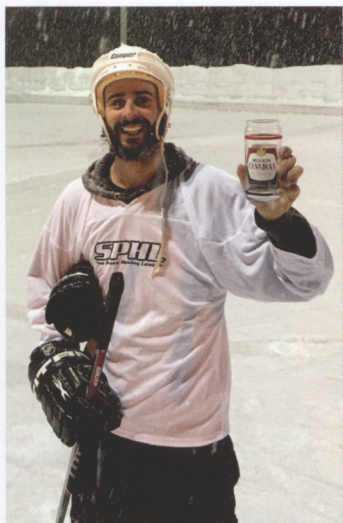
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Matt Mamone upright on ice skates – just one of the many skills he has picked up during his time in Canada

When Matt Mamone started out as an apprentice at Pambula-Merimbula Golf Club in the mid-2000s, little did he know that the industry would take him all the way to Canada. Here he looks back at his time in one of the more unique regions of the world to ply the greenkeeping trade.



Mount Rundle provides a spectacular backdrop at Banff Springs

I have always read with interest the 'Aussie abroad' articles in Australian Turfgrass Management and it fascinates me to read the experiences that fellow turf managers have had both professionally and personally. These articles always make me reflect upon the journey that I have taken, one which is a little different to the norm. I have lived in Canada now for the majority of the past six years during which time I have worked at five separate golf courses, two ski resorts, an ice rink, got married and even built a retirement home in -30°C degrees, but that's another story entirely...

My turf management career began in the far more temperate climes of Merimbula, NSW about a decade ago. I completed the first year of my apprenticeship at CIT in Canberra in 2007 and during my last six months at Pambula-Merimbula Golf Club spent time working alongside Pat Wilson. Pat had just returned from the USA and Europe where he had worked at the likes of Tiburon, TPC Sawgrass and Wimbledon. As an 18-year-old wide-eyed apprentice it quickly opened my mind up to where the industry can take you.

I transferred my apprenticeship to Manly Golf Club in Sydney where I could not have asked for a better group of people to work with. Then superintendent Michael Bradbery and assistant Jason Martin not only trusted myself and the other apprentices with all on course tasks, but also taught me the importance of creating good morale and a team mentality among staff.

I completed my apprenticeship through Kurri Kurri TAFE in 2010 and it was around this time that my sister Kate had moved to London. Every time we spoke it became clearer that I needed to do the same, but I wanted to go my own way. I grew up surfing and thought I should give snowboarding a try which ended up being the basis for my decision to head to Canada.

Little did I think that six years on I would still be here, married to a beautiful Canadian and think it's normal to wear shorts when it's 10°C outside! Nothing in Australia could have prepared me for the experiences I have subsequently had – ice, snow, -40°C, elk, bears, cougars, white Christmases, more ice, more snow and a wedding in Whistler!

BANFF SPRINGS

My first stop in Canada was Banff Springs Golf Club where I was one of three on the 'plant health team'. I arrived in the spring of 2010 and spent my first few weeks snow-blowing tees to help speed up the winter melt. Once we could get on course we vacuumed up the cores from the previous autumn with two John Deere TC125 collectors.

There are a number of different ways to 'winterise' a golf course and it depends on how harsh the winter is. The amount of snow cover you receive, the temperatures and how much sun you get in the spring will affect how you prepare. At Banff, for instance, the cores were left on the surface after

Cool runnings

the autumn renovation of tees, fairways and rough. The cores store heat when the spring temperatures begin to rise and help melt the surrounding snow.

The big event for the year was the 2011 Telus World Skins, a charity event that consisted of five Nike-sponsored golfers Paul Casey, Jhonattan Vegas, Carl Pettersson, Stephen Ames and Lucas Glover. The event was held over two days (nine holes played each day) and it surprised me the amount of set-up that took place just to accommodate five golfers. My first taste of a big tournament was exciting; the build up, the teamwork and the camaraderie were contagious.

The summer was planned so that the course peaked for the Skins event. Six of us fertilised the entire rough of the 27-hole facility with pedestrian spreaders about three weeks out. We were followed by a dump truck loaded with pallets of 25-kilogram bags of fertiliser. When we ran out, we would raise our hand and someone would drive over and refill the hopper and off you went again. Bear in mind the course is at 1383 metres above sea level, the air is thinner and you tire quickly. (In saying that though, you gain about a club and a half and hitting a pitching wedge from 150 yards makes you feel like a pro!)

Ten days prior to the tournament I was tasked to make the final application of Primo and iron before the tournament. "Don't worry Matt," assistant Dan Nolin said to me at the time, "Only a few million people will see if you stuff it up. Is your dad going to watch?" Gee, thanks mate! The tournament itself was a real success with Vegas coming out on top. When the players teed off on the 15th hole,



an elevated par four that plays over a creek and towards the spectacular Mount Rundle, they would have their cameras out. To think of all the places these guys have golfed around the world, it made me realise just how special Banff Springs was.

I left the golf course before it really wrapped up for winter and spent the winter season working at Sunshine Village, a ski resort just outside of Banff. Here the staff received a free pass and two-hour ride breaks which was great for learning.

ISLAND PARADISE

It was during my time in Banff that I met my now wife, Care. We decided to head to the province of Ontario (eastern side of Canada) for the following summer. Her family had a cottage three hours north of Toronto that was opposite a beautiful semi-private 18-hole golf course located on Bigwin Island. The Doug Carrick-designed course consists of bentgrass tees, greens, fairways and ryegrass rough.

As the name suggests the course is on an island and only reachable by boat. Golfers and staff wait at the port and a boat shuttles you to and from the island throughout the day, unless the fog rolls in. The fog was so dense some days that we couldn't

leave the dock. Golfers would arrive and be ready to golf, but the whole greens crew would still be waiting on the boat!

As you can imagine with bent fairways and 35-plus degree days we hand watered... a lot. We had two-person teams on fairways, greens and tees that would go out daily unless it rained. High humidity, high temperatures and heavy dews kept us on our toes with disease pressures extreme at times. If the fairways weren't cut that day, we would remove the dew with two carts and 100 foot of rope. When we did cut fairways, a team of four would head out consisting of three fairway units mowing with catchers and a tractor-trailer to collect clippings. It took about 10 hours to cut 18 holes.

In the middle of one of the hottest summers of the last decade, the course copped a major storm. I received a phone call from the Pro Shop reporting a fire. I was the closest to the course and jumped in the boat at our cottage, once the lightning had eased, and made my way over.

I found what looked like a microwaved toy soldier melted onto a concrete pad where a satellite box once stood. The surge protector failed and blew fuses in nine of the 18 satellite boxes. We

With spectacular winter sunrises like this in Canmore, it's no surprise that Matt Mamone has carved a career as a turf manager in Canada over the past six years



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◀ **Mamone currently works as assistant superintendent at the 36-hole Jack Nicklaus designed Bear Mountain Golf Club on Vancouver Island. Pictured is the Mountain course which last September hosted a PGA Champions Tour event**

quickly discovered that solenoids were failing all over the course from the strike. The 35°C heat made the heads easy to identify and I quickly became a master of changing out solenoids without isolating the area. I was digging up eight heads a day and dancing around them while they ran as I changed out the solenoid. On the last day an employee asked why I didn't just take the gear drive out instead of running in circles...!

BACK IN THE MOUNTAINS

After a small hiatus through Central America and back to Australia for six months, we relocated to Canmore which is 20 minutes east of Banff. Stewart Creek Golf & Country Club was the first course in Canada that I worked a full winter and it proved quite the eye-opener. While the majority of Canadian courses only employ the top two positions year round, at Stewart Creek they offered a few full-time positions outside of superintendent Sean Kjemhus and assistant Duane Epp.

I was heavily involved in 'winterising' Stewart Creek which was a great experience. It began with the all-important irrigation blow-out. The purpose of this is to clear the irrigation lines because if water was to freeze and expand inside the pipe it can lead to spiral fractures that can run a full length of PVC pipe. The province of Alberta can experience long harsh winters, with lows of -40°C for weeks at a time. The ground can freeze solid up to six feet deep so it is therefore crucial to remove as much water as possible from the lines.

A high pressure air compressor is rented every September and usually spends a week at each

course in town. It is important not to blow out too early and be stuck without water if temperatures warm up, but waiting too late is not an option either. You want to be done before the snow flies descend!

Dump valves are located around the course in low areas. Once the pumps are turned off and isolated at the pump house we open the valves and allow the water to drain out for 24 hours. Early morning starts to get ahead of the golfers are important as compressed air at 100PSI squealing out of a head is deafening.

We started on the higher areas of the course and would work/push all the water down to the low areas. It is important to always have heads running. Air compresses and if too much pressure builds the heads break off from the swing arm and need to be repaired ASAP. I found the most effective way was to run a head in a low area of the hole for 20-30 minutes while starting cycles in elevated areas.

A good example would be a tee deck. I would run 2-3 cycles on the tee, advancing the heads once the watering had stopped. On the next cycle you would generally get a light mist from the head; this cycle would run longer – 1-3 minutes per head. You would repeat this until you could not see any mist throughout the tee and then isolate. This was a long process and me and co-worker Mike Mackinnon clocked up over 85 hours that week, starting at 4:30am and working until 11pm.

And it wasn't just the golfers we had to worry about. During this time a grizzly bear was spotted hanging out in the sun on the 16th fairway. He started to become too comfortable around people so we contacted Parks Canada to set up a bear trap to catch it and relocate. The day after the trap was set up, Parks Canada returned to check it only to find that two cougars were inside! They were released and we continued the blow-out until 11pm!

During the winter months, we kept the cart paths clear of all snow using a tractor snow blower and shovelling the hills by hand. There was no shortage of hills on that course! We needed access to all the greens throughout the winter months to monitor ice build-up and elk fences. We would remove the ice from the greens at Stewart Creek if it remained frozen for 90 days. We would monitor known problem greens and essentially when the ice set up the clock would start.

If we got close to 90 days and the forecast did not look promising we would remove the snow

When in Canada... a lazy seven iron off Cascade Mountain in Banff (right) and snowboarding in Revelstoke



with a snow blower, chip by hand and use a Sand Pro with blade to push ice off the tarp. If we were running out of time and the ice was too thick, we would bring out the aerator to break the ice up!

FROM GREENS TO ICE RINKS

In February 2015 I successfully applied for the assistant superintendent position at Sun Peaks Resort, my first senior posting, under superintendent and past Western Conference Turf Association president Keith Lyall. Sun Peaks, which is 1200m above sea level, is a small ski resort town located 4.5 hours northeast of Vancouver. As far as I'm aware, Sun Peaks has the shortest golfing season in North America. The opening date is usually in June and the closing date is late September.

At Sun Peaks we could manage to get the front nine holes open 2-3 weeks before the back nine due to snow cover and elevation difference. Due to the amount of snowfall the course received, waiting for the snow to move and melt naturally was not an option as the golf season was already short enough. Therefore snow groomers (Snow Cats) were used to remove snow from greens and fairways.

Using a large machine intended to move tonnes of snow on top of a green that only has a four-month growing season can be very stressful. We would use a probe to find the depth and try to get the snow coverage down to about one foot. Any lower could be disastrous for obvious reasons and any higher meant a longer melt time.



Clearing the greens took anywhere from 3-4 weeks, depending on the weather. Once the greens were clear we would remove snow from fairways in low areas of the course to expose our catch basins and improve drainage – when six foot of snow melts you have to have somewhere for all the run off! It was a weird sight – the exposed greens would be growing, the temperatures would be 10-15°C but we would still have 3-6 feet of snow around the greens!

To get around the course we would use a quad bike fitted with tracks and pull a trailer with skis instead of wheels with a walk mower on it. I could

Exposing the greens in the spring at Sun Peaks. The golfing season at Sun Peaks only runs from June to September

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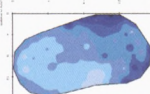
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Ben Tilley, Superintendent at Headland Golf Club, QLD





In the middle of winter when the Sun Peak greens were six feet under snow, Mamone helped set up and maintain the local ice rink



Some of the unique turf management utility vehicles you'll likely come across on Canadian golf courses



get 2-4 greens mown a day depending on their location and how many times I had to dig the quad out of the snow after getting it stuck!

During the winter months Keith and I maintained the town's skating rink which was located on a gravel area in front of our workshop. We flooded the area with hot water which binds the ice together to create a stronger surface that does not chip. For two weeks I was out there in -10°C with a hose building up the ice layer until it was thick enough to bring the re-surfacer out (this was not a Zamboni like you see on TV, but an old re-surfacer on the back of our tractor with turf tyres).

The rink was about 150 feet by 50 feet with plywood for hockey boards. We sharpened skates and sold tickets from our maintenance facility. I absolutely loved my time working on the rink. We took a lot of pride in the quality of ice, just like it was the golf course. I learnt how to skate (and by learn I mean fall over less) and played in the local hockey league that consisted of mostly other Australians – it resembled Bambi on ice! All the Canadians would come and watch, enjoying a cold beer and waiting for the inevitable big wipeouts. Similar to NASCAR racing, they were there for the stacks!

WHERE'S THE 10TH HOLE?

After tying the knot with Care in Whistler last June, in September we moved to Victoria on Vancouver Island. I successfully applied for the assistant superintendent role at Bear Mountain Golf Resort, a 36-hole Jack Nicklaus designed facility which comprises the Mountain and Valley courses.

My first week was not your average first week. I started the Friday before the Mountain course played host to the Pacific Links PGA Champions event. On my first day I met with Bill Quin (co-assistant superintendent), Kyle Kemball and Chris Ainey (co-superintendents) and Dennis Ingram (PGA agronomist) who were all discussing small on-course improvements, greens speeds and local rules. I was in way over my head!

They would be talking about certain holes or hazards and I would be frantically trying to remember which hole was being discussed. I took a brief tour in the morning with Kyle and by the time I figured out the hole, the topic had changed! I managed to catch up to speed as the week went on and thoroughly enjoyed my time during the tournament. The team was very friendly and welcoming which helped with the big transition.

The Mountain course was in immaculate condition for the event and you could see that all the hard work put in by the crew was paying off. The media, golfers and commentators alike had nothing but great things to say about the conditioning of the course and the City of Victoria. I was later told that Chris and Kyle only found out that they were hosting the tournament that May! We are excited to be holding the event again in September this year and I am looking forward to being a part of the build up... and knowing which hole is being discussed!

LIFETIME MEMORIES

I could easily write a 3000-word article on each location that I have worked at to date in Canada. It has been great to take a quick look back at the past six years and think of some of the amazing people I have met and the new skills I have learnt.

I would recommend to anybody within our industry to take his or her trade abroad. You will learn what cannot be taught in a classroom, meet friends that you will stay in contact with for years to come and see sights that you never thought existed. Heck, you may even learn how to snowboard, surf in 6°C water, score a goal in ice hockey, push six foot deep snow off a fairway on a machine you didn't even know existed and even get married!

Editor's Note: Matt Mamone is more than happy to be contacted about his experiences of working in Canada. He can be contacted by email [Matt.Mamone@westinbearmountain.com](mailto:Mamone@westinbearmountain.com) or DM through Twitter @MamoneMatt. Apparently he is on the lookout for some course volunteers come September :) 🙌

Teeing off on the 1st at Stewart Creek where Mamone spent his first full winter season

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Right: The new four holes – 15-18 designed by Crafter & Mogford Golf Strategies – at Ratho Farm Golf Links were officially opened in January. Pictured is the par three 17th

Below: From left Neil Crafter, Peter Thomson and Greg Ramsay at the opening of the restored lost six holes in 2008

Neil Crafter from golf course design company Crafter & Mogford Golf Strategies looks at the project to complete the restoration of Australia's oldest golf course, Ratho Golf Farm Links in Tasmania

Ratho revisited



The Ratho Farm Golf Links is located on the grazing property 'Ratho' just north of the small town of Bothwell in Tasmania's Central Highlands. The Bothwell valley was settled in the 1820's by transplanted Scots all familiar with the pastime of golf. 'Ratho' was settled by Scottish settlers, the Reid family, in 1822, while Bothwell's first doctor and Reverend were educated in St. Andrews and Reid's neighbours came from Elie, Aberdeen and Carnoustie. These settlers left Scotland's oldest golfing communities to begin Australia's first.

As well as the Reids at Ratho, at least four other farmers established golf courses on their new landholdings. When the Bothwell Golf Club was formed in 1902, its competitions would rotate

between the courses and the club still has good accounts of four of the five courses it used. When golf was played at Ratho Farm is not known with certainty, but a date around 1850 appears likely.

UNIQUE LAYOUT

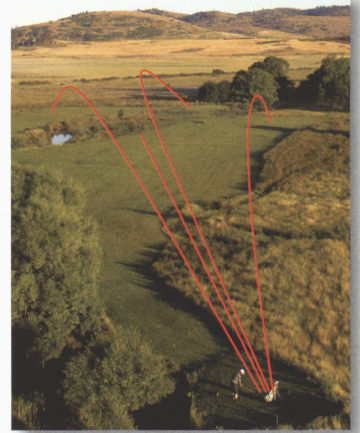
The early course at Ratho was what would have been described as 'sporting' and very typical for courses of the 1800s. Departing and returning from a point close to the main homestead, it went out into an open paddock for four holes before returning to circle the shearing shed and sheep yards.

The layout featured several blind shots, irrigation canals and even the vegetable garden was in play! There were several forced carries over hedges, fences, stonewalls and sheds. The course was described in 1912 as having a 'variety of bunkering', none of which remain today unfortunately, although the outline of some are still visible and the whereabouts of others is known.

The club changed its order of play of the holes occasionally and for at least 10 years during the 1930s the course was expanded to 12 holes, with six holes south of the shearing shed and six holes to the north. This northern loop was played twice to make up the 18 holes. After the club resumed play following World War II, only the original three holes south of the shearing shed were played, the first of these being lengthened to a par five in 1952.



CONTINUED ON PAGE 32



An aerial view of the new short par four 16th showing some of the possible lines of play



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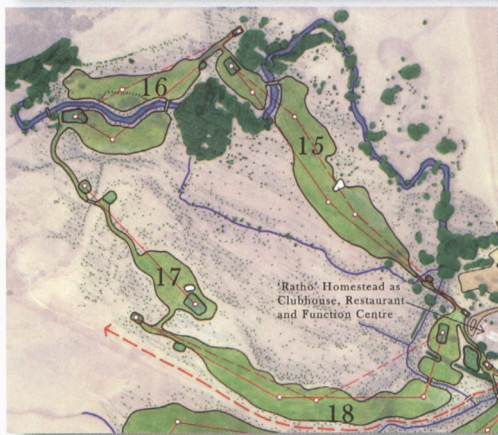
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The addition of the four new holes takes Ratho to a full 18-hole layout. The new four hole loop (pictured underneath the master plan) takes advantage of the Clyde River which comes into play on two holes



The erection of a new bridge into Bothwell realigned the road in the early 1980's and these three holes south of the shearing shed were abandoned and replaced by three new holes north of the remaining six holes.

RESTORATION BEGINS

In the mid-2000s the Ramsay family, who have owned the property since 1936, undertook the first part of a project to revitalise the Ratho layout. Our company Crafter & Mogford Golf Strategies was engaged in 2005 to assist with this restoration and with the help of a Commonwealth grant the six lost holes were resurrected and opened for play in 2008.

CONTINUED FROM PAGE 30

The original spirit of the course was perhaps best epitomised by the original 9th hole which was a long bogey four. The tee shot had to fly a three metre high hedge about 30m from the tee, then carry the implement shed (which housed farming equipment) towards a small, left to right sloping, rectangular green sited some 243 yards (220 metres) from the tee. This hole was almost always played directly into the wind.

To the right of the green was a vegetable garden which was surrounded by a paling fence and over the back of the green was a gravel road and hedge. The green was ringed by wire netting to keep the sheep off it. The strategic values of a hole such as this are very similar to modern penal golf courses, with forced carries, small greens hugged by hazards and significant penalties for missing the defined target. The main difference was that the green still featured an open entry and the firm turf short of the green allowed a shorter hitter to run the ball in (provided the shed had been safely negotiated) as well as a variety of short game styles; along the ground or through the air.

The project to restore the six lost holes was quite involved yet fascinating and required a lot of research to determine their exact nature. As part of that process we studied aerial photographs of the course, going back to the first flight over Bothwell in 1948 in which the majority of the green sites could be seen. We also studied other historical photographs, early scorecards which provided details about hole lengths, as well as discussions with early local community members who recall playing or caddying on the pre-WWII layout.

The official opening in May 2008 featured a distinguished group of Australian golfing legends who played the restored holes watched on by a crowd of a hundred locals and visitors. Among them were Peter Thomson (five-time British Open champion), Lindy Goggin (one of Tasmania's and Australia's best women amateurs) and Peter Toogood (a member of the winning Australian team of the inaugural Eisenhower Trophy in 1958 at the Old Course at St. Andrews and a Tasmanian golfing icon). At the 2009 Australian Turfgrass Conference in Hobart, Greg Ramsay showed delegates on the post conference Turf Tour around these new holes.

Tasmanian Premier Will Hodgman tees off on the 15th hole last November



Shortly after the opening of the lost holes, our focus turned to the addition of a loop of four new holes which proved a slow and gradual process of development. Greg had a clear idea of the area where the four holes would run on land to the north of the homestead along the Clyde River. We explored two alternative loops of holes, one running clockwise from the homestead and the other anti-clockwise, before settling on the anti-clockwise one as likely yielding the best grouping of holes.

For the design of the four new holes – played as holes 15 to 18 – our intent was of course to lay out holes that would complement the existing and restored holes, however, the land available gave us the potential of using the River Clyde that runs through the property as a key hazard, and not just on one hole. The four new holes are:

- **Hole 15:** The first of the new holes is a 445m par five that runs to the north from the homestead, with a short carry over the Clyde to a wide fairway beyond. Golfers must decide whether to lay-up short of the river that crosses the fairway some 50m short of the green or gamble on carrying it with their second.
- **Hole 16:** This is a risk and reward drivable short par four of only 244m that features the river as a diagonal hazard with fairway both sides of the river and a green set immediately on the far bank. A myriad of options as to how to play this hole exist – from a driver to a seven iron



A view over some of the holes that were restored in 2007-8 with the par five 3rd hole at centre

off the tee, with lots of choices for lines to take, from the conservative, to the bold and even to the reckless. Par will require two well thought out and executed shots, while the lure of going straight for the green from the tee will be a temptation that some will not be able to resist. The green is small and judging the approach is at a premium.

- **Hole 17:** A long par three of 178m, the 17th requires a well hit full shot that allows for the right to left slope of the ground short of the green. Left of the green is low, marshy ground and it is advisable to stay on the short grass on this hole.

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Ratho Farm's woolly greenkeepers and some of old hickory shafted clubs available to play the course with



● **Hole 18:** The finishing hole at Ratho Farm is a short par five that can be reached in two by longer hitters but the second shot needs to gamble with marshy ground along the left of the hole. The safer play is to follow the fairway on higher ground that bends around to the left, with a green sited in a clearing beyond a retained hedge. A difficult, small green presents a daunting target for any approach, be it long or short.

The addition of the four new holes means that visitors to Ratho can now enjoy a full 18-hole experience combining original holes, lost restored holes and new holes that complement each other well and give a varied golf experience.

Mown-down natural fairways, fenced-off square greens, natural hazards and the occasional bunker will give today's golfer plenty of enjoyment and challenge, and enable them to see how golf was played in the days before grand constructions. Golfers can play the course with today's equipment or, if they are more adventurous, can hire a set of hickory-shafted clubs with a gutta-percha ball for a true heritage golf experience.

In November 2016 Tasmanian Premier Will Hodgman officially opened the restored accommodation at Ratho Farm. The Premier and his family spent a few hours out practicing their golf before dinner the evening before the opening and received some tutelage from Tasmanian golfing legend Bill Wellington, who, at 72 years of age, still plays to a handicap of two.

Bill, a state and national amateur champion and 10-time winner of the Highland Championships at Ratho Farm, was full of praise for the new golf holes: "It is a nice transition between the old eight holes, the restored six holes and now the new four holes. Hitting back and forth and over and along the Clyde River takes the golf down to some lovely natural scenery, as well as bringing some thrilling

shots into play. I think they (Crafter and Mogford) have done a great job right around the 18 holes in keeping the historic feel, but ensuring it is both fun and challenging for today's golfer."

The Premier's opening address linked Ratho Farm's two main features – its rich history and unforgettably fun golf: "One of the great assets we have in our state are our heritage properties and Ratho Farm offers what our visitors are looking for – a uniquely Tasmanian, authentic experience. With golf becoming increasingly a key part of what we have to offer in Tasmania, Ratho Farm beautifully captures both the rich history and great golf. There is remarkable history attached to this property and I'm sure that wherever Ratho's guests come from, the extraordinary stories here will add another great layer to their Tasmanian experience."

In addition to the restored golf course, the Ratho property is now also complemented by new accommodation with 20 ensuite rooms set within the old farm barns, convict cottages and the grand old homestead, making it the largest accommodation property between Hobart and Launceston. The 20 rooms comprise 10 one-room studio rooms and five two-room apartments, set alongside the renowned fly-fishing waters of the Clyde River.

The official opening of the new holes took place in January 2017 over a two-day festival of golf and the 18-hole course with its four new holes was well received by all who participated in the event. A trip to Ratho Farm is well worthwhile, not only for the golf, but also the food, quality heritage accommodation and good old Tasmanian hospitality.

Editor's Note: For more information on Ratho Farm Golf Links visit www.rathofarm.com.au. ATM Volume 9.3 (May-June 2007) carried an extensive article ('Reviving Ratho: Restoring Australia's oldest golf course' – p14-18) with Greg Ramsay looking at the revival of Ratho just prior to the start of the restoration of the six lost holes. 🍷



The Ratho greens comprise a mix of highland bentgrass and fescues, while the fairways are a mix of native grasses


Delegates at the 2009 Australian Turfgrass Conference visited Ratho to inspect the property and in particular the completed 'lost six holes'. Pictured is the 4th green



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PHOTOS: PETER LONERGAN

Tif takes root

In Volume 18.6, AGCSA Board member Peter Lonergan wrote about the start of the project to covert Coolangatta & Tweed Heads Golf Club's West course greens to TifEagle. Here he looks back at the grow-in and the eventual opening of the new back nine surfaces.

Above: Between October 2016 and February 2016 the back nine greens of the West course were converted from bentgrass to TifEagle hybrid couchgrass. Pictured is the installation of the gravel layer on 12 West which was the last green to be sprigged on 25 November

In the previous article on the TifEagle conversion of the West course greens at Coolangatta & Tweed Heads Golf Club (*ATM Volume 18.6 – The long road to Tif, p30-32*), I noted that the first four weeks of the project had been a whirlwind. Well, the subsequent four week period didn't disappoint either as the weather held (generally) and works continued at near break-neck speed.

The excavation of the old back nine greens continued to provide surprises and with some of the material we found underneath them it was little wonder why it was so difficult to grow bentgrass on them, or any greens grass for that matter. Only one green had not had zeolite added and it was always located in random areas with no incorporation attempted.

Similarly, all but one green had a gravel layer and two greens had no drainage underneath the gravel layer, so to ensure consistency drainage was duly installed and topped with a new gravel layer. This was quite an expensive addition to the works programme but for the future it was the correct decision.

The growing medium of the greens continued to be less than 150mm deep and this had been placed on top of some of the impenetrable material in some cases. On some of the greens, roots from invading couchgrass were found in the gravel layer, but on 10, which was the worst green for couchgrass encroachment, the 'soil' was so hard that no roots had been able to penetrate it!

Coolangatta Tweed is a heavily treed course so the ingress of tree roots was quite severe and a lot were removed as part of the works. Interestingly, there weren't too many evident in the

actual drainage pipes that we found which perhaps further reinforced our thoughts that the water had trouble penetrating some of the profiles.

We had planned to stockpile at least 70 per cent of the sand that came out of the greens in an area close by to use as fairway topdressing material to reduce cartage. This meant that we could just use our own two tonne tippers and a tractor and trailer to cart the waste material away. However, with the very poor quality of the excavated material, this then became another expensive but necessary addition to the project with the need to hire tip trucks to cart virtually all the material to our on course tipping site.

GROW-IN

The last green was planted on 25 November 2016 eight weeks after first turning dirt and the grow-in phase started in earnest. We had originally planned to plant two greens at a time, but having to water the green area anyway to keep the sand in place, it was decided that we may as well be watering stolons than sand, so the greens were planted as soon as possible after final shaping was completed.

While this kept the project rolling along, it became a difficult task to shuffle irrigation, mowers and spraying operations around to suit the varying needs of the eight greens. Then there was also the not so insignificant matter of the other 42 greens and playing areas on the courses that still needed our full attention.

Covering the greens with 820m² of Evergreen turf covers was an art in itself with the wind rarely abating, but they were so instrumental in getting the greens established that it was well worth the expense and effort. The greens were all uncovered

18 to 20 days after planting and all immediately received their first mow at 6mm with the height being dropped down gradually to 4mm. They stayed at this height until all the greens were at that level, with the finished goal of 3mm by the end of February. Unfortunately due to staffing and time constraints, the ride-on mowers were introduced earlier than I would have liked which resulted in some wheel-marking and scalping on some edges.

We certainly adopted the Old Tom Morris adage of 'more sand laddie' as the greens were constantly 'sanded' to begin with and gradually worked back to a dusting which certainly took its toll on the mower bedknives. Again the constant tinkering of sanding levels was an art in itself as were the methods employed to work the material into the surface. Once again due to short resources, a ride on topdresser was used which also left some wheel marks, so the sand was either hand-brushed in or blown in with back pack blowers followed by a heavy water.

A number of greens settled a little more than expected around the edges during the grow-in phase and this, coupled with the prolific growth of the collars grass, left quite a severe edge on the green which wasn't far away from needing a sod cutter to remedy. This was despite quite a bit of attention being paid to compacting the greens profile via heavy watering and rolling with a two tonne vibratory roller to ensure there was no movement once grassed. The collars were heavily scarified after the greens were in play which helped bring them level with the new greens surface.

It was generally all smooth sailing throughout the project and the weather co-operated extremely well for the most part. There was some concern though when a massive electrical storm developed on 10 November and was heading straight for us with five greens already planted and one with the surface ready for planting.

I had been expecting a 'weather event' and was prepared mentally for it, but this was something else. The rain and hail only lasted 20 minutes but we got 38mm in the gauge for that period. I don't recall ever seeing so much water on the course from



Some interesting profiles were discovered when the old greens were ripped up. The bottom 250mm of this green was virtually impenetrable



Above: Just some of the roots removed from the profile of the old 12th green

Below: Compaction was certainly the biggest lesson from the back nine works and particular attention will be paid to this during the front nine works, especially on the edge of the new greens to ensure a more seamless result





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The resurfaced 18th West green gets its first mow at 6mm 19 days after planting



Twenty days after planting and the army worms were certainly enjoying the TifEagle

Foreign couch encroachment from the immediate greens collar is going to be an ongoing battle



The new greens were constantly 'sanded' to begin with and gradually worked back to lighter dustings

a single rainfall event and fully expected the new greens to have washed away, but they somehow all stayed in place. Only about 20 shovels of sand had to be replaced which was utterly remarkable given the volume of water that moved across the surfaces in that short amount of time.

Due to the staggered planting/opening times, the greens were fertilised and sanded on an 'as needed' basis and were generally treated individually until two weeks after they were all back in play when a blanket application programme could start. An insecticide programme for the control of couch mite was instigated very early in the establishment phase of each green to assist in creating the best growing conditions possible. An application to control some of the very healthy army worms we found after first removing the covers was also implemented.

The first green planted took 11.5 weeks to come in to play which was the longest, with the fastest just nine weeks from planting. Due to the very high quality of the temporary greens there was no pressure to open the greens early, but they were all well and truly ready for play when we did.

Foreign couch encroachment from the immediate greens collar is going to be a constant battle that we hope to win, but I am not holding my breath. Throughout the summer both during and following grow-in we were edging the greens weekly in an attempt to hold the invading grass at bay and then hand weeding the runners which will be an ongoing tedious task.

BACK TO FRONT

So I sit here writing this piece in mid-March and upon reflection I am quite satisfied with what was achieved with the greens conversion and the lessons learnt. With the front nine greens scheduled to begin in October this year, preparations have already begun.

Compaction was certainly the biggest lesson from the back nine works and particular attention will be paid to this especially on the edge of the

new greens to ensure a more seamless result in the green/collar interface. Other than that there will be a little bit of tweaking of some of the procedures required and of course a lot of effort will go into the preparation of the temporary greens which helped enormously with player acceptance, although I don't particularly want to be remembered for my great temporaries!

The TifEagle has really settled in well and the 17th green is now two years old and looking and putting superbly. I firmly believe TifEagle has a much wider potential market in Australia, particularly in Sydney and Perth for example. I have seen ultradwarf couch greens in the USA oversown with either bentgrass and/or *Poa trivialis* and they produced as good a putting surface as you could want (these greens were in Texas and in the depth of a very cold, nearly snowing, winter). It will be a courageous club/superintendent who first does it but I really do believe the grass can creep further south into Australia's transition zone.

A project such as this is not possible without the hard work and co-operation of the range of people involved from the sand and turf suppliers to the earthmoving contractors. The support of the club's Board and membership has been outstanding as well. And of course the hard working and dedicated course maintenance staff at Coolangatta Tweed deserve the greatest accolade for the first class finished product. 🌱



18 West green 40 days after planting

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TORO

Toro Turf Tour



Toro provides the total package according to Yarra Yarra Golf Club superintendent Rod Tatt and the decision to sign a five year partnership was “a no-brainer”

year equipment lease deal with Toro, or, as the club prefers to call it, a partnership. Since then Tatt and his crew have welcomed a brand new fleet of red machinery onto the property and the impact they have had on maintenance operations in a short amount of time has been profound.

QUICK AND QUIET

To provide the firm, fast and pristine playing surfaces that Yarra Yarra’s members expect, Tatt and his crew of 15 certainly have their challenges. First and foremost is a very hectic golfing schedule, in excess of 50,000 rounds a year. Multi-tee starts off 3-4 holes are commonplace once or twice a week, member comps run six days a week, while Mondays are taken up with a healthy schedule of corporate days.

Second are the significant boundary issues that Tatt has to deal with. Look at an aerial map of the course and you will see it is hemmed in on all sides by suburbia. Of the approximate 3.5km property perimeter, only a 500 metre stretch along Warrigal Road is free of neighbouring residences, with no less than nine holes affected. As a result, over the years Yarra Yarra has had to make significant adjustments to its mowing routes and starting times due to noise complaints which has greatly impacted productivity. That, however,

The name Yarra Yarra is instantly recognisable in Australian and world golfing circles. One of the principal courses in Melbourne’s revered sandbelt collection, Yarra Yarra Golf Club has a proud history and a reputation for some of the finest playing surfaces going around. The undulating green complexes boast some of the quickest Poa annua turf in the country, while the impressive collection of par threes – holes 1, 4, 11 and 15 – are regarded the world over. Indeed, five times British Open champion and Australian golfing icon Peter Thomson once famously declared Yarra Yarra’s 11th as “a national treasure”.

Growing up in a golfing mad family on the far western outskirts of Melbourne, Rod Tatt certainly knew of the reputation that Yarra Yarra boasted. As an apprentice greenkeeper at Bacchus Marsh West Golf Club, Tatt was also a member of Victoria Golf Club where he was part of the pennant team. Tatt would become familiar with Yarra Yarra’s layout during his playing days but little did he realise that one day he would be the man charged with maintaining its prized playing surfaces.

After stints as superintendent at Cranbourne and Woodlands golf clubs, Tatt joined the Bentleigh East club in November 2014 and since then has made it his focus to improve the presentation of course as well as maintenance efficiencies. Just as Tatt knows

his golf, he also knows the demands the role of superintendent brings and when it comes to choosing the right equipment you need a company that can tick all the right boxes.

Reliability, quality of cut, ease of use, cost-effectiveness and second-to-none service and support were all priorities for Tatt when he sat down in 2016 to map out a way forward for Yarra Yarra’s machinery fleet. Having done a similar exercise a few years prior at Woodlands, he knew there was only one company that could be relied upon to deliver on all counts – Toro.

After 15 years of utilising the services of an external company to manage its machinery, in November 2016 Yarra Yarra signed a five



The Toro Reelmaster 3550-D has effectively halved the time it takes for the Yarra Yarra crew to maintain greens surrounds and tees

Course: Yarra Yarra Golf Club, Vic **Superintendent:** Rod Tatt

Yarra Yarra's fleet of Greensmaster eFlex 2100s mean they can cut greens on boundary holes without the need to worry about noise levels

utilities and three Reelmaster® 5010-H hybrid fairway units. Thanks to those machines, boundary issues are now a distant memory and, as if to back that up, since they've been employed the club has not had a single noise complaint.

"The new electric and hybrid equipment really has made such a difference to the way we schedule our operations," says Tatt. "Having the eFlex's in our fleet has saved us a massive amount of time. In the past with our old petrol walk-behinds we would have to wait until after 7am to cut greens on the boundary holes. Instead of going straight to the 1st green, we would have to go to 5 or 6 then come back and run the risk of potentially getting caught by golfers. With the eFlex we can now go straight to those boundary holes and get the job done. The quality of cut and clip rate on the eFlex is superb and its ability to follow the contours of our undulating greens make it a must-have."

The new Workman GTX electric variant provides similar benefits. Tatt jokes that while the crew have eight Workman® MDX utilities to also choose from, they have fallen in love with the four GTXs and make a beeline for

has pretty much become a thing of the past thanks to Toro's innovative and industry-leading equipment which Tatt and his crew now have the pleasure of operating.

"I guess for us, going with Toro was really all about improving our efficiencies," explains Tatt. "With the boundary issues we do have and the level of play we get, we needed the right machinery that could cover the ground as quickly and as quietly as possible, while at the same time providing the best finish and quality of cut as possible. Those were the priorities and essentially Toro fulfilled all our needs over any of the other companies. Also having them literally down the road and knowing that their service and back up is second to none meant it really was a no-brainer to form a partnership with Toro."

Making the biggest difference to Tatt's operations so far have been the addition of five new Greensmaster® eFlex® 2100 walk-behind greens mowers, four Workman® GTX electric

Yarra Yarra's three Reelmaster 5010-H hybrid fairway units tick all the boxes – superb quality of cut and clip rate, fuel efficient and, most importantly, quiet

YARRA YARRA'S RED SHED

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- 3 x Greensmaster Flex 2100s (petrol)
- 3 x TransPro 80 and 2 x TransPro 100 trailers
- Groundsmaster 4000-D
- Groundsmaster 3500-D w Sidewinder
- Groundsmaster 7210 zero turn
- 4 x Workman GTXs (electric)
- 8 x Workman MDXs
- 3 x Workman HDXs (two prime movers with own spray rigs)
- ProCore 648
- Sand Pro 3040
- Irrigation: Site Pro LTC controller, 800 Series sprinklers (greens) and 700 Series (fairways)

them first each morning. "We've never had an electric utility before and they have been a huge hit," says Tatt. "They are very smooth and comfortable to drive and being so quiet means you can sneak around the course at 5am on a Saturday or Sunday, rake bunkers, change holes and get the course set up for competition without having to worry about noise."



Toro Turf Tour **TORO**

Course: Yarra Yarra Golf Club, Vic **Superintendent:** Rod Tatt



Yarra Yarra's staff have fallen in love with the four new electric Workman GTX utilities

to their mowing routes, further streamlining mowing operations.

FLYING COLOURS

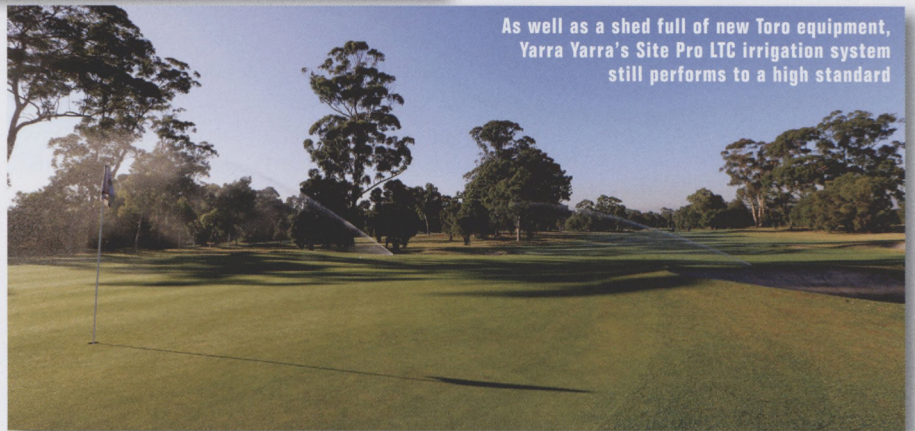
The ultimate test for Yarra Yarra's new Toro fleet came within just a few weeks of it rolling through the gate. Swapping over an entire arsenal of course equipment is always a nervous time for a superintendent, but even more so when you are just six weeks out from hosting a major tournament. For the first time

CUT ABOVE

Also taking pride of place in Yarra Yarra's new fleet are two of Toro's industry-leading Reelmaster units – the 5010-H hybrid drive five-gang fairway unit and the 3550-D three-wheel, five-gang tees and surrounds mower. In his 20-plus years in the industry Tatt says he has never seen a better fairway unit than the 5010-H, while the 3550-D has again helped to realise significantly greater maintenance efficiencies.

"The 5010-Hs provide the best quality of cut I've ever seen from a Toro fairway mower," states Tatt. "That coupled with the quiet operation, which again assists with our boundary issues, and the 20 per cent savings in fuel consumption, makes it one of the best mowers on the market at the moment, hands down.

"They have certainly been put to the test since arriving as we are in a bit of a different position than most other clubs. Over the past two years we have overplanted the existing native couch fairways with Santa Ana, so we are in a phase of trying to promote as much grass growth as possible. We don't use Primo



As well as a shed full of new Toro equipment, Yarra Yarra's Site Pro LTC irrigation system still performs to a high standard

at all so we are cutting fairways at least four times a week which places a huge demand on the units."

Also getting a workout are the 3550-Ds. These lightweight (just over 900kg), highly manoeuvrable units have replaced the old Greensmaster triplexes which were used to maintain Yarra Yarra's tees and green surrounds. Tatt reckons the arrival of the 3550-Ds, which have a 2.1m cutting width, mean his crew can cover the ground in half the amount of time as before and as a result other areas of the course have been added

in Yarra Yarra's history, the club co-hosted the 2017 Australian Amateur Championships in early January, but Tatt need not have worried as the new equipment performed as expected and helped to deliver a course that received rave reviews.

"We had great feedback from the tournament on the presentation of the course," says Tatt. "The big thing for us was that we changed over the fleet in November so we only really had six weeks before the tournament to get the guys trained up and sort out any teething problems. But it went really smoothly and the machinery performed really well and that showed with the level of presentation we achieved. I think it was a big feather in the cap for Toro to be able to roll in a new fleet and have it all go off without a hitch in such a short amount of time and again reassured me and the club that our decision to go with Toro was the right one."

The Groundsmaster 4000-D is one of the real workhorses of the Yarra Yarra fleet



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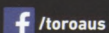
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High-flyers

PHOTO COURTESY OF STUART BOTHE

Drone technology is rapidly evolving and as AGCSATech agronomist Bruce Macphee writes it could only be a matter of time until they form a regular part of a turf manager's equipment arsenal



Above: While some turf managers utilise drones to provide aerial photographs of their facility, their application in other areas such as monitoring plant health and spraying is becoming increasingly commonplace in other industries

Unmanned aerial vehicles (UAVs) – better known as drones – have been around since the early 1980s in the USA. Today, however, the practical applications for drones are expanding faster than ever in a variety of industries.

Basic drones that most of us would be familiar with are often flown by the hobby enthusiast with or without an attached camera, but the ones we are more interested in are a very different beast, capable of carrying up to a 10 kilogram payload and performing a wide range of sophisticated tasks with precision accuracy.

The most relevant advances to the turf manager are coming out of the agriculture and forestry sectors where the surveying of broad acre crops with high resolution sensors to improve crop yield and decrease agricultural water and chemical use is now becoming more prevalent.

CURRENT USES

At the lower end of a drone's data collection capabilities is, of course, photography. I am sure we have all looked at our workplace or own property on the likes of Google Earth or Nearmap and been amazed with what we can see.

Aerial photos can reveal a lot that cannot be easily seen from ground level, such as trench and drainage lines, irrigation leaks, thin or poor performing turf and high traffic areas. And this is just with a basic photograph. At the other end of the spectrum, which is increasingly becoming available to the turf manager, is the highly sophisticated range

of sensors and cameras used to detect the most subtle difference in plant health, often long before symptoms are visible to the naked eye.

Drones are now capable of scanning large areas more accurately and in a fraction of the time. Cameras available are able to photograph your entire facility, taking thousands of high resolution photos which can then be simply uploaded into specialised software and stitched together to provide a detailed image of your turf facility with multiple filter overlays showing never-before-seen detail.

There are various roles drones could play within a turf facility, from daily or weekly collection of data to performing a wide range of tasks. New generation drones are fully programmable via smartphones or tablets, and their ability to acquire GPS signals means they can complete tasks automatically with no need to be controlled by an operator.

Basic drones with a single lens near infrared (NIR) camera start from around \$6000, while a full agricultural type drone, with a five-band multispectral camera, can set you back anywhere up to \$40,000. Some drone applications include:

- **Crop spraying:** Distance measuring equipment, such as those used in light-detection and ranging (or LIDAR), enable a drone to adjust altitude as the topography and geography vary, thus avoiding collisions. Drones can scan the ground and spray the correct amount of liquid, keeping a constant distance from the ground and spraying for even coverage. There are potential savings in increased efficiency with a reduction

in off-target applications. This is certainly an area where advancements in technology could see the methods of spot spraying or chemical applications to greens revolutionised.

- **Turf health monitoring:** Arguably the most exciting area of development with drone technology is the ability to regularly monitor turf health. The ability to check common turf issues such as density, soil compaction, nutritional status, soil moisture levels and irrigation uniformity and pinpointing areas that require treatment reduces time and costs involved in monitoring and maintaining a turf facility.
- **Irrigation:** Drones with hyperspectral, multispectral or thermal sensors can identify parts of a facility which are dry or need improvements in distribution uniformity. Additionally, drones allow the calculation of a vegetation index, which describes the relative density and health of the turf and shows the heat signature or the amount of energy or heat the turf emits due to topographical features or turf density.
- **Health assessment:** It's essential to regularly assess turf or plant health. By scanning both turf and plants within the facility using both visible and NIR light, drone-carried devices can identify which plants or turf areas reflect different amounts of visible light and NIR light. This information can produce multispectral images that track changes in plants and indicate plant or turf health. A speedy response can reduce the effects of a disease or insect outbreak. In addition, the effectiveness of treatments can be monitored more precisely.

CAMERAS AND SENSORS

As humans, we are able to see only a small spectrum from the enormous range of frequencies of electromagnetic radiation. We can see red, blue and green wavelengths (what is termed 'visible light') but there are other types including microwaves, infrared light, ultraviolet light, X-rays and gamma rays.

Many of the sensors available on the market work off the basic principle that plant leaves reflect light across a broad range of spectrums – those we can see (the visible light spectrum) and many of which we are unable to see such as infrared light.

Near infrared light (NIR) is reflected back strongly due to reflection off the spongy layer of mesophyll cells found within a leaf. In some technology, such as NDVI (Normalised Differential Vegetation Index), the level of NIR reflectivity and the visible red light reflected back from the leaf are also measured. Depending on the moisture content of the leaf and the overall health of the plant, the level of reflection is varied. This variation is measured and used to differentiate between vegetation and soil which reflects all visible light equally.

When a plant suffers from drought stress or poor health, the spongy layer collapses and the

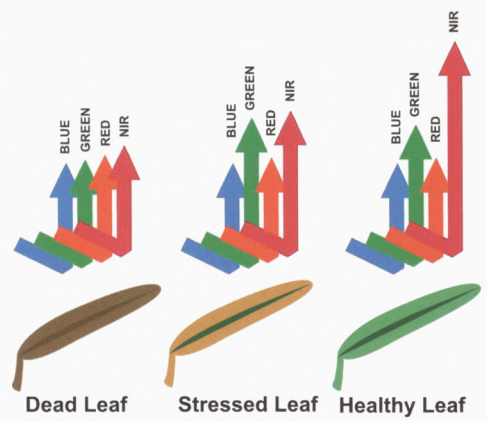


Figure 1. The Normalised Differential Vegetation Index (NDVI) is created by combining the reflectance from visible and near infrared (NIR) light. A healthy leaf will emit different wavelengths of light compared to one that is stressed or dead

plant ceases to reflect as much NIR light. Therefore a calculation of the NIR reflectivity and visible red reflectivity should provide excellent contrast between plant and soil and even healthy plants and unhealthy plants.

FORWARD LOOKING INFRARED (FLIR)

Originally utilised by the military to assist in navigating at night or in fog, FLIR is quite different to night vision. FLIR cameras are thermal imaging cameras that can detect infrared energy (heat) variations in the surface of objects. Sensors within the camera convert the infrared energy into electrical signals, which create a video image that can be seen via a display screen.

This technology can be utilised to detect plant water stress through the measurement of the plant's surface or canopy temperature. The correlation between surface temperature and water stress is based on the assumption that as a plant transpires the evaporated water cools the leaves and reduces the leaf surface temperature. As the plant becomes water stressed, the leaves will start to curl and transpiration will decrease and thus leaf temperature will increase. This technology is being used to assist turf managers to detect hot spots, particularly on golf greens where an entire green can be scanned in a matter of seconds, pinpointing any areas that require extra attention.

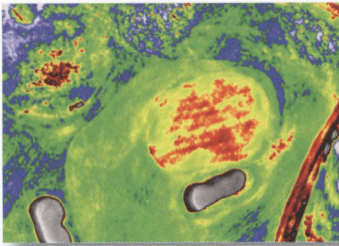
GO PROS, FPV CAMERAS

There is an ever-increasing range of drones and high resolution cameras available (e.g.: GoPros and first person view – FPV – cameras) costing from as little as a few hundred dollars to many thousands for dual control units where one operator controls the drone and another controls the camera separately.

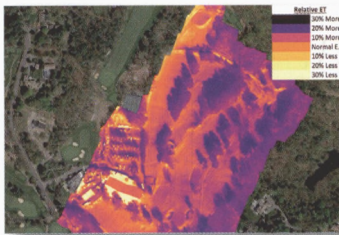
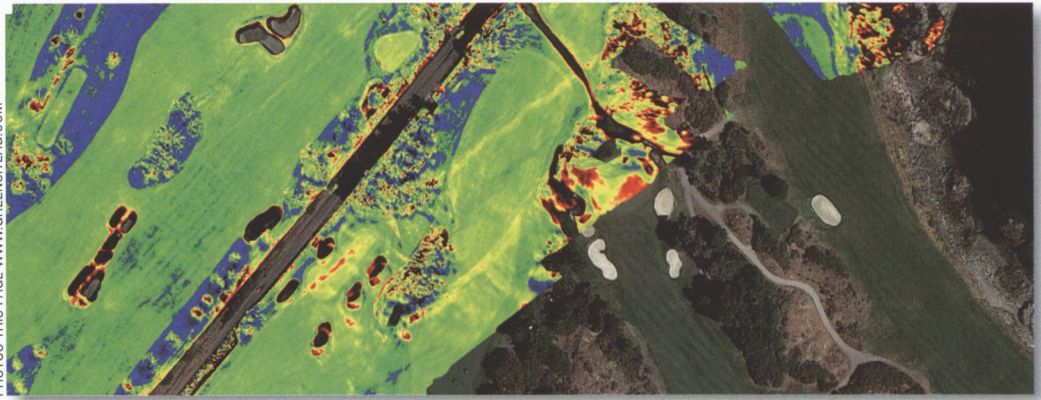
An example of an agricultural drone used to spray crops. Some of these drones can carry loads up to 10kg and are fully programmable and automated



Right and below: An example of an NDVI overlay, where healthy turf appears green or blue, while stressed turf shows up yellow or red

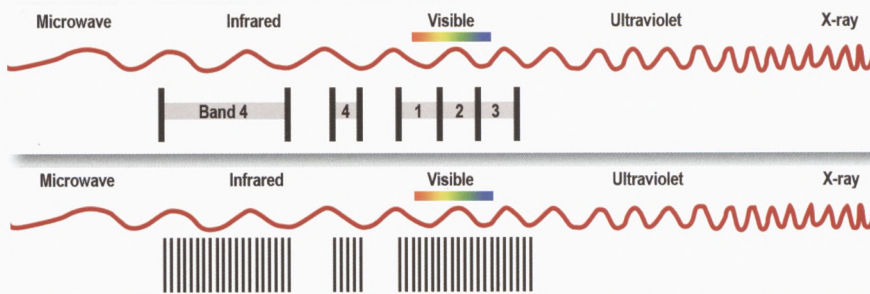


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A thermal overlay image. Lighter areas indicate dryer conditions. Darker parts show areas of high moisture content

Figure 2. Multispectral imagery (top) generally refers to 3-10 bands within the infrared and visible spectrums. Hyperspectral imagery (bottom) consists of hundreds of narrower bands allowing for far greater accuracy



Many turf managers are now engaging the services of an experienced operator to film different aspects of their course or investing in a drone themselves and producing some great footage to use as a communication tool to show a different perspective of the course. This technology also allows GIS data to be collected cheaper and far more easily.

MULTISPECTRAL CAMERAS

Multispectral cameras work by capturing different wavelengths of light. A multispectral camera can have multiple lenses, each with a special optical filter that captures only a precise set of light wavelengths. Once processed, the output is a set of images where the value of each pixel is equal to percent reflectance of light for that particular wavelength.

These sets of images are then stitched together to create geographically accurate mosaics, with multiple layers for each wavelength. Mathematically combining these layers yields vegetation indices. There are many types of indices that measure different plant characteristics (e.g.: chlorophyll content, nitrogen content or levels of water stress).

One popular index is the Normalised Differential Vegetation Index (NDVI). The basic principle of NDVI is that plant leaves reflect both NIR and visible light. This is in contrast to most non-plant objects. When the plant becomes dehydrated or stressed, the leaves reflect less NIR light, but the same amount in the visible range (Figure 1). Mathematically combining these two signals can help differentiate vegetation from soil and healthy plant from unhealthy plant.

LIDAR SENSORS

LIDAR sensors (light imaging, detection and ranging) use ultraviolet, visible, or NIR to scan and image objects. During the scanning process, the

LIDAR system will gather individual distance points within a set area, from which 3D images of the environment can be created. This can then be used to create automatic flight plans.

They are particularly useful for surveying ground topography, where the above ground features (such as tree canopy) can be an obstacle to viewing the ground features. As previously mentioned these are also utilised in crop spraying drones to adjust altitude as the topography varies, allowing the drone to keep a constant height from the crop or surface.

HYPERSPPECTRAL SENSORS

While not yet affordable for the average farmer (costing between \$60,000 and \$200,000), high-tech hyperspectral sensors show the user hundreds of light channels, providing very high-resolution imagery and never-before-seen accuracy.

While multispectral technology can offer a good overview of crops such as overall growth and NDVI, it fails to do so in an integrated scalable way and to tackle more complex problems such as mapping and detection of weeds, pests, diseases and P and K deficiencies. These tools bring a new dimension to analysing and are just a few examples of sensors that are currently being used and what the future holds out in the field.

THE FUTURE

Every crop is different. It goes without saying that the data collected for a vineyard would be completely different to the requirements for a broad acre crop of wheat or turf. Each crop needs to be measured differently to generate meaningful data. There is no universal crop survey solution and it will require specialists in each particular crop type to deliver solutions. Interpretation of data and on ground investigation is being rapidly developed in the agricultural sectors in the US and in Australia.

There is little doubt that the use of drones will become commonplace in the turf industry in the future. Soon turf managers will know what's going on with every surface at their facility, spotting problems before they spread and applying chemicals with precision. The day where drones are autonomously identifying and spot spraying weeds in the rough or applying pesticides to greens while you sleep could be sooner than you think. 🌱



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Summer stresses



ATM's resident agronomic expert John

Neylan looks back at the extreme summer endured by many superintendents and turf managers and writes about a surprising discovery he made while on a recent trip to a golf course in India.

Above: When soil temperatures rise above 18°C, cool-season turfgrass root growth begins to decline and ceases at 25°C. The declining roots are more susceptible to root rotting fungi and other stresses. New roots do not grow in hot weather to replace the old roots

The summer of 2016/17 summer provided a range of weather extremes depending on what part of the country you were in. As you have no doubt already read in the earlier pages of this edition, it was one of the most challenging summer periods in a very long time, with the eastern seaboard from Sydney northwards in particular coping some record-breaking weather.

The state-wide mean temperature in New South Wales was the third-highest on record for January, as was the mean maximum temperature, while the mean minimum temperature was fourth-highest on record for January. The exceptional warmth in New South Wales and southern Queensland persisted from January into February.

Summer 2016-17 saw prolonged and, at times, extreme heat over New South Wales, southern Queensland, South Australia and parts of northern Victoria. In the Sydney region the highest temperatures of the period were recorded during 9-12 February, with Richmond reaching 47°C on 11 February. At a golf course in the same area, a top temperature of 49°C was also recorded.

Under these conditions the discussion comes around to the management of cool-season grasses under such extreme temperatures and in particular the root system of creeping bentgrass (*Agrostis* sp.). Part of the challenge is the demand for firm and fast putting surfaces at a time when the grass should be placed into 'survival mode' by lifting cutting heights, applying fungicides and maintaining adequate moisture levels. It is also a prime time when all manner of products are promoted and used in an attempt to protect the plant and in particular the root system.

When considering the root systems of heat-stressed turf, thought needs to be given to how roots grow and whether it is possible to artificially alter the physiological damage caused by high temperatures. When soil temperatures rise above 18°C, cool-season turfgrass root growth begins to decline (Beard, 1973) and ceases at 25°C (Lucas, 1996). The declining roots are more susceptible to root rotting fungi and other stresses and new roots do not grow in hot weather to replace the old roots.

“Turf management under extreme temperatures is a matter of survival and has little to do with presenting an elite playing surface. Once temperatures are well outside of the accepted norm for turfgrasses, it is about minimising the stresses the turf manager can control.”

Soil sensor data was collected from a golf course in Sydney and during January 2017 showed that the soil temperature was 25°C or greater every day except one and peaked at 35°C on two occasions (see chart on top of following page). The minimum temperature exceeded 23°C on 14 occasions! At a second site closer to the coast, the soil temperature data peaked at 29°C in February 2017. Clearly these

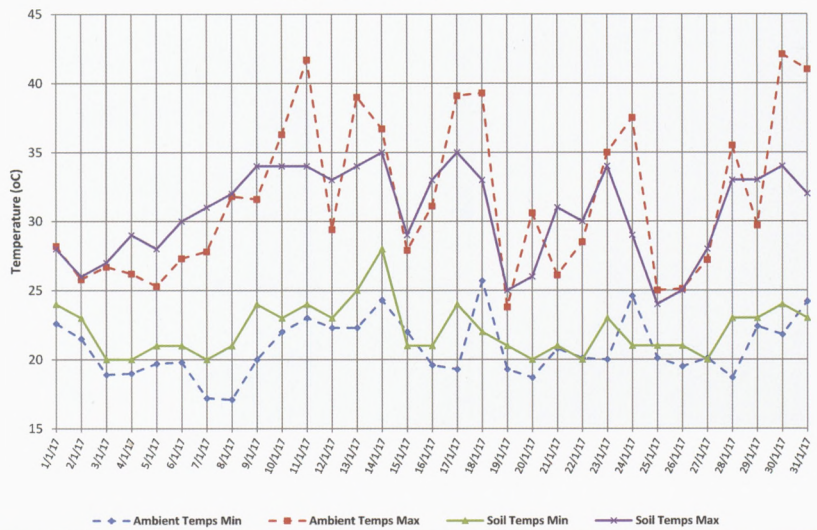
conditions were going to damage roots and present significant challenges for superintendents.

Summer decline is associated with decreased root growth and is thought to be a combination of both abiotic (high temperatures, excessive soil moisture, deficient soil oxygen, drought, shade, etc.) and biotic (diseases, insects, nematodes, etc.) factors (Dernoeden, 2000). The reasons for this summer decline in root growth of cool-season grasses is complicated and not completely understood, but it probably results from high temperature induced inefficiency of photosynthesis caused by elevated rates of leaf photorespiration (Hull 1999).

In short, when soil temperatures rise, turfgrass roots experience their greatest demand for carbohydrates, but heat induced photorespiration in leaves reduces photosynthetic production and less energy is transported to roots. As a result, roots consume most of their carbohydrate reserves and starve (Huang, 2000).

Root decline slows water uptake resulting in less transpirational cooling of leaves and this reduces photosynthetic efficiency even further. This situation is made even worse by heat stimulated soil-borne diseases and root feeding by soil insects and nematodes. As a result, most cool-season turfgrasses will have lost more than 75 per cent of their roots by late summer, necessitating the regeneration of a new root system during the cooler times of the year (Hull 1999).

Weather Data - Sydney January 2017



One of the challenges of maintaining cool-season grasses under heat stress and with a poorly functioning root system is providing adequate water for the plant. Under hot conditions frequent watering is often required which can provide at the very least temporary waterlogging of the upper rootzone. Combined with shaded conditions and poor air circulation, the roots will be deprived of oxygen.

Oxygen is essential for root respiration and root respiration is necessary for water and nutrient uptake and therefore roots do not function unless they respire. If the roots are subjected to saturated

Soil sensor data collected at one golf course in Sydney during January 2017 showed that soil temperatures were 25°C or greater every day bar one and peaked at 35°C on two occasions

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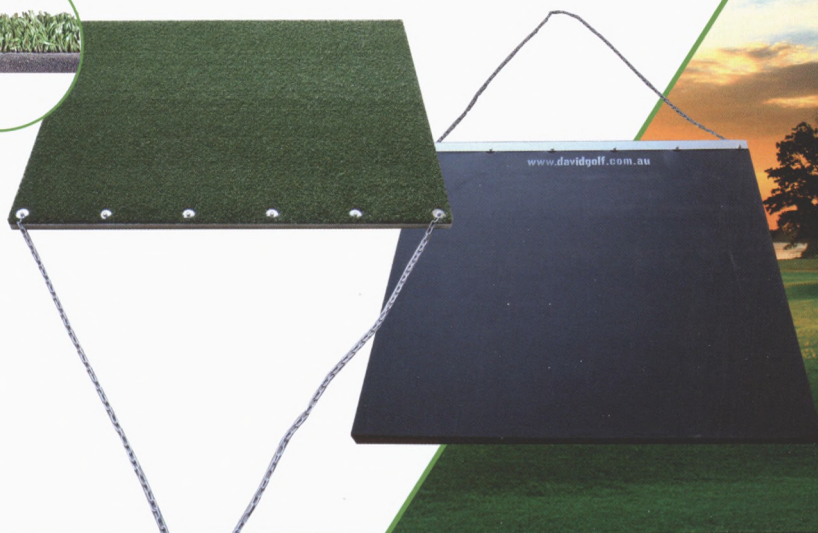
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Heat stress damages roots. Note here that there are no roots even in the core hole



conditions, albeit temporarily, root uptake is shut down (Bell, 2011). In research undertaken by Huang et.al. (1998) it was found that the combination of high temperature and low aeration had more severe effects on root viability than either temperature or aeration alone.

Root and stolon rot diseases (e.g. *pythium*) have been identified as major factors in the summer decline of bentgrass and this is often referred to as summer bentgrass decline syndrome (Carrow, 1996). Summer bentgrass decline is characterised by a thinning turf canopy, leaf senescence and root dieback. Root dieback inhibits the production of cytokinins, a class of plant hormones that are primarily produced in roots, which, in turn, affects shoot growth and senescence.

So, are there any magic elixirs that can combat the adverse effects of high temperature stress and in particular organic compounds and biological stimulants? Many of the biostimulants have some form of plant hormones (in particular auxins and cytokinins) present and the rationale is that they will affect plant growth and function.

Auxins (IAA) are fundamental in the physiology of growth and differentiation and are important for root initiation and elongation. Cytokinins regulate cell division and their role in the plant is

widespread, affecting most aspects of plant growth. Cytokinins are primarily synthesised in root tips and transported via the xylem to the shoots, where they exert regulatory effects on the aerial parts of plants. Cytokinins may also play an important role in photoperiodic improvement of plant growth under environmental stresses.

Huang and Xu (2010) demonstrated that seaweed-based biostimulants significantly improved visual quality of creeping bentgrass in summer by promoting both shoot and root growth. Their research was based on the premise that the biostimulants are applied in the spring and before the summer stress. The products used were seaweed extracts rich in organic and mineral compounds and plant hormones such as cytokinins and auxins. Alternatively, in a research project undertaken with the VGCSA, the application of biostimulants had no significant effect on root depth or root health throughout the summer of 2015/2016.

Turf management under extreme temperatures is a matter of survival and has little to do with presenting an elite playing surface. Once temperatures are well outside of the accepted norm for turfgrasses, it is about minimising the stresses the turf manager can control. That is, lifting cutting heights, reducing shade and increasing air movement, hollow-tine aerification and topdressing in the spring, regular solid-tine aerification prior to and during heat stress and preventative fungicide programmes.

In my experience it is all about having a healthy root system in the spring/early summer and this is achieved almost exclusively through soil aeration. While the root stimulants may have some effect there is no substitute to a well-aerated rootzone.

POA IN PUNE

On a recent trip to India I was inspecting a golf course in the Pune area and was asked by the turf management team 'Do you know what grass that is?' In the past on this golf course we had identified tropical and summer grasses such as *Digitaria sanguinalis* and *Brachiaria plantaginea* but nothing associated with cool-season turf.

Even on a new profile with minimal thatch and good aeration, roots will decline due to high temperatures. Note the poor root density



The greens, tees and fairways on this golf course consist of seashore paspalum which is ideally suited to the hot, semi-arid climate bordering with tropical wet and dry. Yet, there it was – a dense, green patch of grass with a few seedheads sitting in and above the seashore paspalum. The grass species... yes, our old friend/foe *Poa annua*. Having visited this golf course on many occasions I have never come across *Poa annua* on it before. The question was how did it get there and what are the conditions favouring its establishment and persistence.

The climate for Pune has three distinct seasons – summer, monsoon and winter. The summer months are from mid-March to mid-June, with maximum temperatures sometimes reaching 42°C. Even during the hottest months, the nights are usually cool due to Pune's high altitude.

In the month prior to my visit the maximum temperature ranged from 35-39°C with the overnight minimums between 13-17°C. While the day time temperatures are very stressful for a cool-season species, the overnight temperatures seem to be a saviour for a cool-season species such as *Poa annua*. The average rainfall for the first four months of the year is typically only 3-4mm.

There were some other interesting aspects of the *Poa annua* patch. It was in a relatively high traffic area of rough (height of cut 30mm) near the cart path and where many golfers hit their ball. It was also on a slope that receives additional water from



surface runoff. It is a real niche area that suited the *Poa annua* and the cool night time temperatures also seem to have assisted with its survival. In taking a sample and dissecting it, the plant appeared to have perennial type characteristics (i.e.: high tiller density, few seedheads and formed a high density sward). It also had a dense mat (see photo page 52) and strong root system.

So how did it get there? Because it is in a high traffic area the theory is that it has come in with a golfer. In reviewing the literature on seed dispersal there are some interesting aspects that are relevant for any golf course that is attempting to minimise the presence of this weed species.

***Poa annua* in seashore paspalum.**
This patch was found on a golf course in India where the climate is hot, semi-arid bordering with tropical wet and dry

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◀ In taking a sample of the *Poa* and dissecting it, the plant appeared to have perennial type characteristics and had a dense and strong root system

Poa annua is a cosmopolitan grass included in the Global Compendium of Weeds (Randall, 2012) and listed as one of the most aggressive weeds invading areas from sea level up to 1200m in elevation. It can be found from the Arctic to Antarctic regions in practically all terrestrial ecosystems (Holm et al., 1997; USDA-ARS, 2014). It is listed as a weed in 38 crops in more than 80 countries within and outside its native distribution range.

It grows in a wide variety of soils, tolerates trampling, mowing and frozen conditions and is a frequent weed in heavily trafficked areas. The characteristics of rapid flowering and profuse seeding enable the plant to survive adverse conditions by exploiting a short-lived niche. These are characteristics we are very familiar with in the turf industry.

Research into the methods of seed dispersal by humans and machinery go back decades and in work undertaken by Clifford (1956) annual bluegrass seeds were the most abundant of all species found in mud on foot wear. Researchers Pickering and Mount (2010) noted that human-mediated seed dispersal is recognised as an important, but under-researched issue.

To assess the potential for tourists to act as unintentional seed dispersal agents, Pickering and Mount (2010) reviewed published and unpublished data on seed dispersal via clothing, vehicles (cars) and in/on horses and donkeys, all of which can be used by tourists. Seeds from 754 species of terrestrial plants have been collected from these vectors, 15 per cent of which are internationally recognised environmental weeds.

Seeds were collected from personal clothing and equipment (228 species) and vehicles (505 species). Most were herbs (429 species) or graminoids (237 species) and native to Europe. Annual *Poa*, white clover, Kentucky bluegrass and Yorkshire fog were the most frequent species. There have been eight studies specifically on tourists, which identified 12 species on clothing, 26 on vehicles and 133

from horse dung. Methods that minimise the risk of tourists as human-mediated dispersal agents may therefore be appropriate for some tourism activities/destinations. This principle definitely has merit where a 'Poa-free' environment is desirable.

Ware et. al. (2010) sampled the footwear of 259 travellers into the Arctic region and recorded 1019 seeds – a mean of 3.9 (± 0.8) seeds per traveller. Assuming the seed influx is representative for the whole year, it was estimated a yearly seed load of around 270,000 by this vector alone. Seeds of 53 species were identified from 17 families, with Poaceae having the highest diversity and number of seeds. Overall, 40 per cent of the 259 footwear samples examined contained seeds with *Poa annua* among them.

In a case closer to home, the New Zealand B3 – Better Border Biosecurity Research group has raised the potential issue of invasive weeds and pests being transplanted onto previously unaffected courses by golfers' shoes and accessories (Bewsell et. al. 2011). A study was undertaken to determine whether golfers were aware of the biosecurity risks associated with their footwear, specifically focusing on overseas players.

It was noted that not only were a large proportion of the organisms on soiled footwear viable (including bacteria, fungi, seeds and nematodes), but some of the specimens identified were categorised as unwanted organisms under New Zealand's biosecurity regulations. The research concluded that while some golfers who responded to this survey were aware that golf shoes posed a biosecurity risk, over one third were not.

So back to Pune, India and the presence of *Poa annua*. The location of the *Poa annua* patch provided an ideal niche for its presence and persistence. How it got there would seem to be associated with a visiting golfer. The movement of golfers around most countries that play golf is extensive and the transference of *Poa annua* seeds through footwear, equipment and clothing is a strong possibility. 🌱



Right: Its presence in such an environment again proves what an adaptable and opportunistic species *Poa annua* is

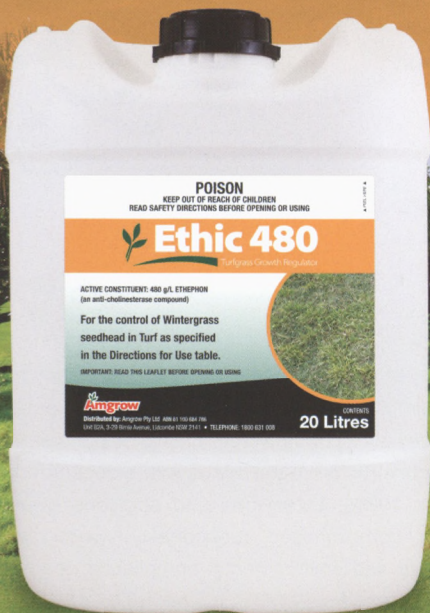
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Between April and December 2016 Royal Melbourne Golf Club constructed a new \$5 million maintenance facility

Course superintendent Richard Forsyth looks back at the project to construct a state-of-the-art maintenance facility at Royal Melbourne Golf Club.

Royal Melbourne had outgrown its previous facility which comprised two separate buildings that were constructed in the 1970s and 1980s

A shed fit for Royal



In 2016, Royal Melbourne Golf Club undertook the construction of a new \$5 million maintenance facility to help improve maintenance operations and efficiencies across the 36-hole facility. The project involved two stages – the construction of a new equipment storage building and upgrading one of the existing buildings.

Plans to upgrade the maintenance facility started when the club initiated a master planning process in 2010 to determine the best use of available land space, including the existing maintenance facility site. From this point the inadequacies of the maintenance facility were on the agenda and a few concept plans were formulated and considered including relocating the facility.

Simply put, the club had outgrown the previous facilities which comprised of two main buildings, one constructed in the 1970s with a second added in the 1980s. Extensions and additions over the years compromised functionality, while safety, security and environmental compliance needed to be addressed.

Up to 50 per cent of equipment was stored outside, while the size of the existing buildings compromised efficiency as equipment had to be moved constantly to access other equipment. Staff facilities were also inadequate, access for trucks and vehicle movements was poor and workshop space and separation of tasks needed improvement.

THE PROCESS

In 2012, then Royal Melbourne chief executive officer Paul Rak and I toured some maintenance facilities at leading clubs in the US. Recently constructed facilities at Pine Valley and Merion were good examples of the style of building we were proposing. We also visited Shinnecock and Augusta National. Following these visits we were able to better establish a conceptual layout. The clear message in all of our visits and discussions was to make sure the facility was adequate in size and that there was room for future expansion.

By 2014 the maintenance facility issues were again on the agenda. Some initial work was done with Lynton Reid from Hawthorn Consulting Engineers. Lynton was advised to formally plan a layout into the land space available, utilising existing buildings where possible. The size of the building





PHOTO: JAMES LAURITZ PHOTOGRAPHY

NEW RMGC MAINTENANCE FACILITY – QUICK FACTS

- Project started April 2016, completed December 2016.
- 4200m² under roof; workshop facilities 850m².
- Accommodates up to 40 staff. Three courses operating from the one facility (RMGC East and West and Sandringham). Sandringham operations moved across to assist with equipment management and facility inadequacies.
- **Budget:** Under \$5 million.
- **Building contractor:** CMW Design and Construct.
- **Project manager:** Robert Luxmoore.
- Tilt slab and colourbond construction.
- Construction in two stages to maintain operations. Part of one of the existing buildings was retained and renovated.

was based on the current equipment list and the goal of being able to take each item of equipment out of the building without needing to move others. Expansion space of 10 per cent was incorporated to allow for future additions to the equipment fleet.

The drawing of all equipment to scale and planning how it would all fit into the floor space required was very important in establishing the size of the building. Questions about size and cost were inevitable but were easily answered by the scaled plan of equipment and the original goals of a place for everything without the need to move other things. Anything less would be a compromise.

Early in the design phase we established work flows to optimise the best order in the layout to maximise efficiency. The positioning of various things from the arrival of staff into the car park through to the positioning of hand tools, machinery wash areas and fuelling was set out to achieve the most obvious order of work flow.

The club established a subcommittee of members with building and project management expertise which duly appointed project managers Robert Luxmoore P/L. Luxmoore had previous experience in golf club maintenance facility construction and were well placed to advise and assist the club with this significant project.

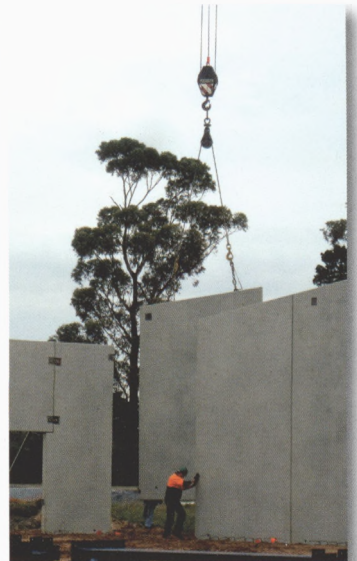
Using the preliminary plans and layout, we then put together a detailed specification and list of inclusions, itemising all of the various spaces, fittings, finishes and functionality of the facility. From there we were able to go to tender with design and construct builders.

Once an accurate cost was obtained an EGM was planned seeking member approval for the expenditure. There was significant communication to members during this phase with several opportunities to highlight the deficiencies and noncompliance of the existing facilities. Planning approvals were lodged with Bayside Council involving tree removal, landscape plans and proposed new buildings.

Following the tender process, interviews and inspections of previous work were undertaken, with CMW Design and Construct selected and appointed in December 2015. Member endorsement was obtained in February 2016 with construction to start on site in April 2016. CMW set an aggressive timeline to complete before Christmas 2016 which was important given we were operating under compromised conditions and most of the equipment was parked outside during the construction period.

PRE-CONSTRUCTION

Prior to construction we needed to establish temporary facilities including car parking for staff, fuel storage and secure parking areas for equipment. We levelled and prepared an area at the southern end of the site and installed crushed rock. We ordered a 12,000 litre Convault fuel tank, which would become the permanent storage, early and temporarily installed it away from the building site. Temporary lighting was provided to the outdoor machine storage, car park and fuel areas. The new facility encroached onto the existing turf nursery area, so a new site was found to relocate 4000 square metres of both fine fescue and bentgrass.



Stage one of the project included the main equipment storage building (112m x 30m with 16 roller doors), staff facilities, administration, washdown, fertiliser store and pesticide store

The size of the new facility was based on RMGC's current equipment list and the goal of being able to take each item of equipment out of the building without needing to move others. Expansion space of 10 per cent was incorporated to allow for future additions to the fleet



PHOTOS THIS PAGE: JAMES LAURITZ PHOTOGRAPHY

Access to the existing building changed from the western side to the eastern requiring temporary road and changed access to all areas. Water and electricity supply required a significant upgrade so authorities were contacted well in advance to have services available as the building programme required. A new fibre connection also was installed to connect the clubhouse with the new facility.

CONSTRUCTION

A two-stage construction timeline was set to enable all staff, administration, workshop, washdown, pesticide storage and limited machine storage facilities to be retained, unchanged within the existing facilities. All other buildings were cleared out and alternative places found for various materials and equipment. This was a big task in itself and required significant labour resources to relocate and sort many years of accumulation. The two-stage programme was very important for our operation to continue functioning, but an added complication and expense for the builder.

Demolition of existing buildings included some potential environmental hazards including removal of three redundant underground fuel storages. This was strictly managed by environmental consultants with extensive soil testing before and during removal. The civil works and site preparation involved excavation into the slope at the southern end of the site. This generated some 4000 cubic metres of good quality sand which was retained on site for use on the golf courses. Demolition started in mid-May 2016, followed by civil works to prepare the site for the main stage one building.

Stage one included the main equipment storage, staff facilities, administration, washdown, fertiliser store and pesticide store. The building size is 112m x 30m with 16 roller doors. Equipment is parked back to back with access through lanes to doors opening on both sides with one way traffic flow. Line marking of all parking bays with machine numbers on the floor has been an important part of achieving best use of the space. Cable trays were installed in appropriate locations to allow for charging of electric mowers and rollers with expansion allowed for future electric equipment.

The amenities area has a staff room to accommodate 40 but can easily handle 60 during a tournament or special event. The room has been well set up with technology to allow training for staff.

Stage one was completed at the end of September 2016 and we made the transition over to it in October. This also required a lot of resources to relocate the workshop to a temporary facility and move all of the staff facilities and administration.

Stage two involved renovation and modification of the existing building, additional workshop space and additional machine storage. This building is 98m long x 12m wide. A fuel store canopy and soil bays, two with retractable tarps, was also part of the schedule. Modified work spaces included the workshop with two hoists, service bay, pull down bay, grinding and machining bay and welding bay. These spaces are connected with an overhead gantry crane to move heavy items between areas. Other work spaces include parts store, paint room, carpentry room, horticulture room and irrigation store. Stage two was completed by Christmas 2016.

A NEW ERA

It was very exciting to move everything into the new facility and start to see the benefits of all of the planning and preparation work materialise into much improved functionality, efficiency and compliance.

Many people have contributed to the successful outcome, particularly the RMGC Council, management, subcommittee and members, who supported the project to lift the standard of the often-overlooked facility to be more in keeping with the club's overall facilities and standards.

Our staff have been fantastic in coping and adapting to compromised facilities during the project and inadequate facilities prior, but are now thoroughly enjoying the new facility. CMW, their subcontractors and Luxmoores delivered the project on time and on budget, an outstanding achievement given the ambitious timeline.

This winter we have some work to complete including landscaping, final set up of workspaces and organisation of areas. We look forward to many years of efficient operation from our new home and thank all involved for delivering a first class result. 🌱

The amenities area has a staff room to accommodate 40 on a regular basis but can comfortably handle 60 in a tournament or special event situation





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JOHN DEERE



Using the appropriate nozzles will improve the effectiveness of spray applications, reduce the risk of environmental impacts and save money by reducing labour and chemical inputs

Following on from last edition's AGCSATech Update on spraying basics, USGA agronomists Steve Kammerer and Brian Whitlark take an in-depth look at spraying for success and the importance of choosing the right nozzle for the right job.

There are many nozzle choices available. Golf course managers that think about course priorities, the products utilised and the objectives for each spray application will be able to choose the right nozzle for the job



Although they may seem trivial, nozzles have a dramatic impact on product distribution and the performance of every spray application. As such, there are many styles of nozzles available to choose from, each offering specific traits for specific applications. Diligent course managers use different nozzles depending upon the goal of each application and the product being used. If only one nozzle type is used for all spray applications, reduced performance can be expected with certain products.

Not all products are the same, nor is the intended target of every spray application. Turfgrass leaf blades are the intended target for some applications (e.g.: applications of foliar-active products like trinexapac-ethyl). In other situations, such as the application of products to control fairy ring, turfgrass leaf blades are an obstacle because the products must reach the thatch and soil to be effective.

Using a nozzle type that is appropriate for the product and its intended target is essential to maximise the performance of every application. Course managers are encouraged to calibrate sprayers with a minimum of three different nozzles designed to deliver products to:

- Turf leaves for foliar or contact products;
- The crown or leaf sheath for systemic products; and

- The soil for products that target soil-borne pests or must be absorbed by roots.

This article provides valuable information about nozzles and spray volumes that can improve the effectiveness of spray applications, help avoid negative environmental impacts and potentially save money by reducing labour and product inputs.

NOZZLE BASICS

The nozzles on a sprayer deliver products by uniformly breaking a pressurised, water-based spray solution (i.e.: a product(s) dissolved or suspended in water) into a range of droplet sizes and directing the droplets toward a target. Usually, either turfgrass or soil is the target of product applications to golf courses. However, there are other targets such as waste areas or banks adjacent to water hazards that require special considerations.

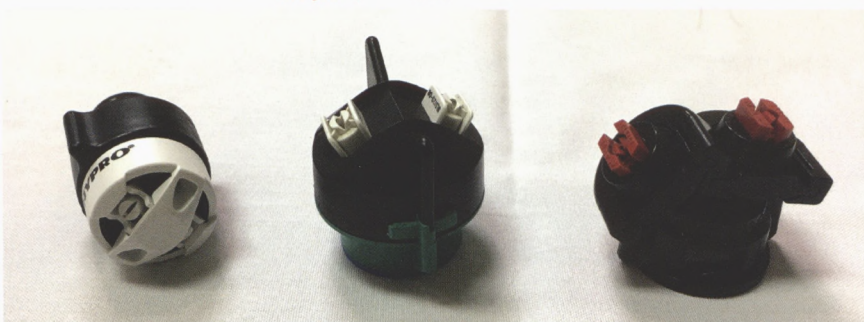
Before spraying, it is important to read and follow relevant product and equipment guidelines regarding sprayer set-up, spray volumes, nozzle characteristics, sprayer calibration and product application directions and restrictions.

KEY COMPONENTS OF SUCCESSFUL SPRAYING

When planning a spray programme for optimal performance it is important to consider spray volume, drift potential, topography, phytotoxicity concerns, potential for nozzle clogging and, most importantly, the intended target of each application. Let's look at each of these in more detail.

SPRAY VOLUME

Before deciding on a nozzle, it is important to read product labels to discern the recommended spray volume for each application. Labels often specify different spray volumes based on the target or





better control of dollar spot when dew was not present. Making spray applications to a dry turf canopy can improve product performance and extend the interval between applications.

DRIFT CONSIDERATIONS

For most foliar spray applications, small spray droplets lead to better coverage and product performance. However, small spray droplets are also vulnerable to drift which can reduce application uniformity and decrease product performance by reducing the concentration of spray solution at the intended target. Drift can also cause offsite movement of spray solution, potentially posing health and environmental concerns. Nozzles that produce large droplets can help minimise drift; unfortunately, large droplets may reduce the performance of foliar applications or products with contact activity.

Drift potential can be reduced by positioning sprayer booms closer to the ground and switching to nozzles with a wider spray angle (e.g.: using nozzles with a 110-degree spray angle rather than 80-degree). As spray angle increases, nozzles can be mounted closer to the ground without changing nozzle spacing.

Drift can also be minimised by reducing spray pressure, but adjusting spray pressure may decrease product performance. Dramatically reducing spray pressure should be avoided because there is a minimum pressure required to maintain the correct spray angle and overlap of nozzles. Likewise, excessively raising spray pressure should be avoided because it can increase drift potential. In general, pressure modifications have to be major to significantly affect volume output (e.g.: spray pressure must be increased fourfold to double spray volume).

Another way to minimise drift is to equip sprayers with lightweight, drift-reduction boom shrouds that shield nozzles and their spray pattern from wind. However, care must be taken to ensure that a boom

location of the pest. Most products recommend a spray volume between 0.5 and 2 gallons per 1000 square feet (approx. 2L-8L/100m²). Low spray volumes may require a nozzle that delivers fine droplets to achieve thorough coverage of turf foliage without running off into the thatch or soil.

However, when the intended target of an application is the soil, recommended spray volumes may reach 4 to 8 gallons per 1000 square feet (approx. 16L-32L/100m²). Choosing the correct nozzles can help improve coverage when trying to achieve high spray volumes, but there are limitations. Ultimately, modifying spray volume and nozzle selection at a fixed sprayer speed and pump pressure can ensure precise delivery and maximum efficacy of any product.

Applying irrigation after an application that uses a low spray volume can help move a product further into the turfgrass canopy, thatch layer or soil. However, irrigating following a spray application cannot match the uniformity and deep coverage achieved by using the appropriate spray volume and nozzles to make the application. Furthermore, irrigation may not effectively move a product to the target location if the product dries after application and does not readily resolubilise. Irrigation may also cause undesirable product movement if the irrigation system has uniformity issues, if too much water is applied or steep slopes and impermeable soil conditions cause runoff.

Course managers must also consider dew and external leaf moisture before spraying, especially if the target is turf foliage. Data obtained from a study conducted at the University of Maryland (McDonald et al, 2006) found that dew can contribute 100 to 272 gallons of water per acre (approx 935L-2500L/ha). The same study found that applications of chlorothalonil, a common turfgrass fungicide, provided significantly

When planning a spray programme it is important to consider spray volume, drift potential, topography, phytotoxicity concerns, potential for nozzle clogging and, most importantly, the intended target





Ultimately, modifying spray volume and nozzle selection at a fixed sprayer speed and pump pressure can ensure precise delivery and maximum efficacy of any product

shroud does not contact the spray pattern or allow spray solution to gather on and run off its edges; either condition reduces application uniformity and could result in over applications.

TOPOGRAPHY

Another factor that influences the effectiveness of spray applications is topography. The height of spray nozzles in relation to the intended target must be consistent to achieve proper coverage; but keeping nozzle height consistent across a three-dimensional landscape is much more challenging than it is when spraying a flat surface. It can be difficult to maintain a consistent boom height over irregular terrain such as undulating fairways or green and tee surrounds.

To solve this problem, spray booms can be outfitted with an automated system that uses ultrasonic sensors to continually monitor and adjust boom height. The ultrasonic boom-leveling systems can maintain a consistent boom height even as

applications are made to irregular, undulating surfaces. Furthermore, the ultrasonic sensors are extremely robust and reliable under most conditions.

PHYTOTOXICITY AND NOZZLE CLOGGING

When making spray applications, caution should always be exercised to minimise the risk of phytotoxicity and turf damage. Increasing the spray volume of an application can decrease the potential for phytotoxicity, but it may also decrease product performance. This can be the case with some post-emergent herbicides like MSMA and soil wetting agents. Choosing the appropriate nozzle can be an option, independent of adjusting spray volume, to reduce the potential for phytotoxicity while minimising the loss of product performance.

Clogged nozzles can also negatively affect spray applications. Some organic-based products, fertilisers, colorants and chemicals are prone to clogging nozzles when applied at high rates. Mixing several products in the spray tank can also result in nozzle clogging. The risk of clogged nozzles increases if the materials being applied are thick, viscous, incompatible with each other or do not completely mix into solution or suspension.

Nozzles that deliver fine droplets are more vulnerable to clogging because they often have small orifices. In general, large nozzle orifices are less likely than small nozzle orifices to become clogged. For example, many commercial sprayers come equipped with flood-type nozzles that have large orifices and low clogging risks. Flood-type nozzles can be ideal for pre-emergent herbicides and liquid fertilisers but provide poor foliar coverage for contact products.

TARGET DESTINATION CONSIDERATIONS

Turfgrass leaves: Materials intended for leaf coverage (foliar application) often are contact products that have little to no soil activity. Many of these products depend on direct contact with a pest or uptake and movement in foliage to be effective. Examples of products within this group include:

- Contact fungicides for foliar diseases like dollar spot or leaf spot (e.g.: chlorothalonil, iprodione and mancozeb);
- Biostimulants or hormones such as gibberellic acid and cytokinins;
- Foliar fertilisers (e.g.: chelated micronutrients) that are specifically formulated for foliar uptake;
- Insecticides for foliage feeders such as caterpillars, mites and aphids (e.g.: chlorpyrifos and pyrethroids);
- Plant growth regulators with little to no root uptake (e.g.: trinexapac-ethyl);
- Turfgrass pigments and colourants; and
- Post-emergent and non-selective herbicides such as 2,4-D, glyphosate and sulfonylurea herbicides.

TABLE 1. THREE-NOZZLE SET-UP ON A ROTATING NOZZLE BODY

This set-up can easily achieve a range of spraying objectives without removing any nozzles. The appropriate nozzle can be selected by rotating the nozzle body until the desired nozzle is in the correct position. Fixed variables are:

- **Boom height:** 20 inches (50cm)
- **Nozzle spacing:** 20 inches (50cm)
- **Sprayer speed:** 4 miles per hour (approx 6.5kph)

Nozzle 1: Flat-fan, fine-to-medium droplet, low-volume nozzle

- **Target:** Foliage
- **Spray volume:** 0.5 to 1 gallon per 1000 square feet (approx. 2L-4L/100m²)
- **Applications:** Contact products, systemic products designed for foliar uptake, post-emergent herbicides and colourants.

Nozzle 2: Flat-fan, coarse-droplet, medium-volume nozzle

- **Target:** Crown or thatch layer
- **Spray volume:** 2 gallons per 1000 square feet (approx. 8L/100m²)
- **Applications:** Products for controlling crown diseases and thatch-dwelling pests

Nozzle 3: Single or dual flat-fan, very coarse droplet, high-volume nozzle

- **Target:** Soil
- **Spray volume:** Up to 4 gallons per 1000 square feet (approx 16L/100m²)
- **Applications:** Soil-borne pest control products, pre-emergent herbicides, fairy ring control products, soil wetting agents, non-systemic nematicides

In general, products intended for foliar coverage are most effective when applied using a spray volume of 0.5 to 1 gallon per 1000 square feet (approx 2L-4L/100m²). While a spray volume of 1 gallon per 1000 square feet (approx 4L/100m²) may provide better foliar coverage than a volume of 0.5 gallon per 1000 square feet (approx. 2L/100m²), the concentration of the product on the leaf surface is reduced by 50 per cent. The higher spray volume also increases the risk of product running off the leaves and into the thatch or soil, decreasing efficacy or residual control and wasting product.

For foliar applications, course managers are encouraged to use a nozzle with a fine spray pattern rather than an all-purpose nozzle and increased water volume. Flat-fan nozzles with medium to fine spray droplets are recommended for foliar applications.

In a fungicide trial at the University of Maryland (McDonald et al, 2006) where contact fungicides were applied to control dollar spot, high spray volumes resulted in reduced disease control when using the same spray nozzles. In a 2006 University of Georgia study of foliar-applied growth regulators on TifSport bermudagrass, researchers Bill Nutt and Tim Murphy observed greater clipping reduction when applying the same product with nozzles that delivered the finest spray particles.

The performance of turf colourants is also dictated by application accuracy. Turf colourants

are commonly used in the US as an alternative to overseeding in locations where bermudagrass enters winter dormancy, conserving resources, saving money and enhancing the playing quality. However, the spray pattern when applying turf colourants must be consistent to achieve a uniform, visually pleasing colour. For the best results when applying turf colourants, use fine to very fine spray nozzles with close nozzle spacing and low boom heights. Also, try to apply turf colorants when there is little or no wind.


Soil or turf roots: The effectiveness of products that target the soil or turf roots is influenced by soil activity, soil texture, absorption or adsorption by leaves, thatch and organic matter, sensitivity to UV degradation, root uptake and high temperatures coupled with high humidity, which can translate to potential phytotoxicity if certain products remain on the foliage for an extended period of time. Examples of products in this group are:

- Algae or cyanobacteria products;
- Fairy ring control products;
- Non-systemic nematicides;
- Pre-emergent herbicides;
- Products that control root-borne diseases such as summer patch, spring dead spot and take-all patch;
- Insecticides that control soil-inhabiting insects such as grubs and mole crickets; and
- Soil wetting agents.



This rotating nozzle body allows course managers to quickly choose between three nozzles, making it easier to use the best nozzle for a specific application

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Most products that need to reach the soil to be effective should be applied with a minimum spray volume of 2 gallons per 1000 square feet (approx 8L/100m²). High spray volumes are especially necessary if the ability of a product to reach the soil – even following subsequent rainfall or irrigation – is diminished after it dries on turfgrass leaves or thatch.

Products designed to target fairy ring may even specify spray volumes as high as 4 gallons per 1000 square feet (16L/100m²) along with subsequent irrigation. While there are nozzles capable of applying upwards of that, achieving high spray volumes is difficult. Reduced nozzle spacing and significantly slower operating speeds may be required to reach ultrahigh spray volumes.

To help ensure products reach the soil, use nozzles that produce very coarse to extremely coarse spray droplets. Coarse spray droplets are more capable of penetrating the turf canopy than fine spray droplets. Also, nozzles that produce coarse spray droplets have low potential for drift and nozzle clogging, so the likelihood of the spray reaching the soil is greatly increased.

Turf crown or thatch: Turf crowns and thatch layers are the most challenging targets to effectively reach because they are below most of the foliage but above the soil surface. Examples of products that target these areas include both systemic and contact products, such as:

- Biologicals for soil or crown diseases;
- Insecticides for thatch-dwelling insects;
- Materials sensitive to UV degradation; and

To better understand your specific nozzle requirements, compile a list of all sprayer-applied products utilised at your facility and categorise them by target area – leaf, soil and crown or thatch layer



- Pesticides for pathogens that cause crown diseases such as anthracnose, pythium blight and brown patch.

A spray volume from 1 to 2 gallons per 1000 square feet (approx. 4L-8L/100m²) is best-suited when targeting crowns or thatch layers. When using a 1 gallon per 1000 square feet spray volume (approx. 4L/100m²), select a nozzle that produces a medium to coarse spray droplet and set the spray pressure on the high side of the manufacturer-specified range for the nozzle being used. When using a 2 gallons per 1000 square feet spray volume (approx. 8L/100m²), spray droplets can be coarse to very coarse with lower spray pressures.

Ultimately, spray volume should be dictated by turfgrass density. Greater turf density requires higher spray volumes to effectively reach the turf crown or thatch layer. Typically, drift potential for the nozzles used to reach the turf crown or thatch layer is low.

PUTTING IT ALL TOGETHER

As an exercise, ask yourself what three nozzle types could address the majority of your spraying needs. The answer will depend on your priorities, performance goals, the type of products you use, drift potential, spray tank capacity and the time available for applications.

To better understand your specific nozzle requirements, compile a list of all sprayer-applied products utilised at your facility and categorise them by target area – leaf, soil and crown or thatch layer. Next, equip your sprayer with nozzles that can effectively deliver products to each of these target destinations (see Table 1). Work with nozzle and spray system manufacturers and distributors to find the equipment that meets your needs.

Calibrate your spray systems for each type of nozzle you will use, making sure to recalibrate your sprayer and replace nozzles every year. Regularly check nozzles during the season to ensure that they are not damaged or worn and that all filters and screens are clean.

Golf course managers that think about course priorities, the products utilised and the objectives for each application will be able to choose the right nozzle for the job. Using the appropriate nozzles will improve the effectiveness of spray applications, reduce environmental impacts and save money by reducing labour and chemical inputs.

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South West Rocks CC, NSW

The NSW north coast boasts some fantastic golf courses and among those is South West Rocks Country Club which is home to AGCSA superintendent member David Hobday.

Superintendent: David Hobday (42).
Family: Wife Mandy, two daughters Ella (7) and Zoey (5).
Period as a superintendent: Five years.
Association involvement: AGCSA member 10 years, NSWGCSA five years.
Turf management career: Warialda Golf & Bowling Club (apprenticeship 1991-95); Royal Pines Resort (greenkeeper 1995-2001); Murwillumbah Golf Club (assistant superintendent 2001-07); Royal Pines Resort (assistant superintendent 2007-2012); South West Rocks Country Club (superintendent 2012-present).
Qualifications: Cert III Turf Management and Diploma of Management.

Where in Australia is South West Rocks Country Club? South West Rocks is located on the mid-north coast of NSW near the mouth of the Macleay River, about 120 kilometres south of Coffs Harbour. The township's population of 4800 increases markedly during the holiday season, with local attractions including the Trail Bay Gaol, Smoky Cape Lighthouse and many beaches.

Tell us a bit about your background and how you came to be in the industry? I grew up in Warialda, NSW (about one hour east of Moree) and I loved playing sport, mainly cricket and golf. As kids we were always mowing a cricket pitch or a golf green in the backyard with a pineapple tin for a hole. Two of my neighbours were greenkeepers, one of whom was a close friend and he used to talk to me about his job. That prompted me to get into turf management.

Who were some of your early turf mentors and what did they instil in you? At Warialda Golf Club, Murray O'Brian taught me not to be dodgy – if you are going to do a job, do it right the first time; that has helped me throughout my career so far to set high standards for myself and the work we carry out on course. Later in my career Paul McLean (superintendent, Sanctuary Cove) taught me a lot about being a superintendent. He explained everything from his reasoning for the programmes

The South West Rocks crew comprises (from left) Brett Thurgood, Steve Branson, Nathan Moore, Brian Mugridge, Daniel Tinlin (on mower), course superintendent David Hobday and John Meehan



he implemented and taught me how to write reports for management and the board, which has helped me especially when putting my case forward to get new machinery.

How did the job at South West Rocks come about and what do you like most about being the superintendent there? My career goal was always to become a golf course superintendent. I had been applying for jobs on the Gold Coast for about a year without success so I decided to move south to try and get some bentgrass management experience. Luckily enough I landed the job here at South West Rocks. The thing I like the most about working here is the positive feedback I receive from members and visitors.

Give us an overview of South West Rocks CC and some of its unique characteristics? We have very narrow fairways that are mainly lined with pine and gum trees. There are some driveable par fours but if you miss the green you can be punished. The par threes are quite tough, but it's our undulating greens that are the biggest challenge and give us a slope rating of 140.

What are some of the unique features about South West Rocks CC from a turf management perspective? When I started here in 2012 the club had just converted three greens (1, 6 and 7)

to Tifdwarf hybrid couchgrass. This was one of the main reasons why I moved to South West Rocks so I could experience this sort of major project. However, the members wanted to keep the bentgrass greens (they weren't particularly impressed with the three month dormancy period) so I put together some costings of the two grasses and the decision was made to stick with the bentgrass.

Also, I had been involved with oversowing *Poa trivialis* on the 328 greens at Murwillumbah Golf Club and also had conversations with Darryl Edwards at Burleigh Golf Club who had successfully oversown one of his greens with bent. So we now oversow our three Tifdwarf greens with bentgrass and to be honest they are probably some of the best greens we have. They don't look any different compared to the bent greens and the biggest advantage is that we don't have any plug marks!

Is it an easy/hard facility to manage? What's the most challenging aspect? It was quite hard at the beginning as there were a lot of weeds in the greens and a lack of root length which I have rectified with an ongoing programme. The biggest challenge at South West Rocks Country Club is the greens irrigation; the sprinklers aren't evenly placed around the greens and we get a lot of windy nights (mainly southerly or northerly winds) which cause a few dry patches. Also our kangaroo population is very high and they do a bit of damage in bunkers.

Opposite page: Since arriving at South West Rocks Country Club in 2012, David Hobday has focused a lot of resources on improving course presentation. Pictured is the 10th hole which along with the 7th boasts the unique feature of a tree right in the middle of the fairway

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Recent course improvements works have included the rebuilding of select bunkers (like the greenside bunker on 13 pictured here) and new cart paths to keep golfers on the course during wet weather

Take us through your turf management operations there. What changes have you implemented in recent times? The main changes have been to the cutting heights and presenting the course better (e.g.: striping tees, fairways and introducing step cuts). All the machinery was past its use by date and over the past five years I have managed to change over 90 per cent of our course equipment which has made a big difference to presentation levels.

What other maintenance changes are you hoping to introduce? This year I have just started a programme using Primo Maxx on a 200 growing degree days theory. I'm pretty happy with our results so far and we have saved on irrigation run times and I feel I am more in control of my clip rate.

Any special environmental considerations that you have to incorporate into the management of the course? We haven't got any special considerations, but you always have to consider the environment. I am always careful when spraying around the fresh water creek running through the course. We are just going through the process of changing our bins so we can recycle everything we can.

What are some of the major challenges facing South West Rocks CC both from a turf and club management perspective? With an elderly population of members, the biggest challenge is when we get wet weather and we call carts off. Doing so can see a loss of 75 per cent of golfers. We are currently building paths and we use a lot of ropes to direct carts away from wet areas.

Outline any major course improvement works recently completed or currently ongoing? As mentioned, one of our main ongoing works projects at the moment is the building of buggy paths and drainage to keep golf carts on the course during wet weather. We have received \$30,000 in donations from some of our social clubs to put towards these paths. We have currently constructed about 300m of concrete paths and 2km of road base paths, all of which have been done in-house.

Two years ago we built 12 new tee tops so we could have four teeing options and slope ratings. We have also levelled four sets of tees and planted them with Wintergreen couch. Last year we rebuilt

AT A GLANCE – SOUTH WEST ROCKS COUNTRY CLUB, NSW

Course specs: Course length is 5953m (blue markers), 5697m (white), 5180m (red) and 4908m (yellow). We have 0.9 hectares of greens (16 are bentgrass/*Poa annua* and three are Tifdwarf oversown with bentgrass). Tees total 1ha, with half of them a mix of kikuyu/Queensland blue couch and the other half Wintergreen couch which were rebuilt over the last couple of years. Eight hectares of fairways which are predominantly kikuyu/Queensland blue and 30ha of rough. The club also has three bowling greens and four synthetic tennis courts.

Members/rounds: 790 members in total but only 370 of whom live in the South West Rocks 2431 postcode. With membership only being \$260 annually we have a lot of holiday members. Annual rounds total 37,000.

Major tournaments/events: South West Rocks Country Club Pro-Am held in September each year.

Staff structure: David Hobday (course superintendent), Brian Mugridge (assistant superintendent), Brett Thurgood and Daniel Tinlin (groundsmen), John Meehan (20-hour causal), Steve Branson (8-hour causal) and Nathan Moore (8-hour bowls greenkeeper).

Climate/annual rainfall: Warm, wet, humid subtropical climate with an annual rainfall of 1400mm.

Soil types: Our 1st green was rebuilt to USGA spec, two greens are push-ups without drainage and the remaining 16 were built using local river sand. Tees and fairways are push-up silty loam.

Water sources/irrigation system: We have two – effluent water which

is used to irrigate the tees and fairways and a fresh water creek which is used for the greens. Greens are watered by two Hunter ICC control boxes. We manually turn on the sprinklers on tees, while the fairways are watered by three Trailco travelling irrigators.

Cutting heights/regimes: Greens are cut at 3mm most of the year and lifted during high pressure times. They are cut five times a week and rolled the other two. Tees and aprons are cut at 6mm twice a week and fairways are kept at 10mm twice a week. Fairway step cuts and tee step are cut at 25mm once a week. Rough is mowed at 50mm once a fortnight and spot mowed the other week.

Renovations: Last year I did three minor renovations because our Pro-Am was moved to when I normally carry out my major renovation. This year my renovation involved a verti-cut using thatchaway units on a Toro 3400 at -2mm in two directions followed by an 8mm mini-tine at 50mm spacings. Topdressing and soil amendments were then applied to raise my organic matter and then followed by a foliar feed because my soil tests were pretty good.

Major disease pressures: Disease pressures are relatively low here because we get good sea breezes. The main diseases we do experience are pythium and brown patch, but these are kept in check through a good fungicide programme.

Nutrition management: I spoon feed fortnightly and put out a soil application every other week with organics. Gypsum is applied monthly and depending on the results of our quarterly soil tests I will put out what is needed.

the bunkers on 13 and 4 to my design to limit the amount of washouts without using bunker mat or spraycrete. I am very happy with the result and so far we haven't experienced any washouts. We have just started rebuilding two bunkers on the 12th along with improving drainage in the area. I am also in the middle of getting quotes together to add to our shed (we want to move the workshop and add a lunchroom).

Water is obviously a critical issue for any golf course. How is South West Rocks CC faring in the water management stakes? We don't have a problem with water because we are next door to the sewage station and we also have a fresh water creek which runs through the course. It has only stopped running once in the five years I have been here.

The weather and climate is always a great leveller for a course superintendent. How has Mother Nature treated the course in recent times? I have been lucky that in my time here the weather hasn't been too bad, although in saying that we are going through a very dry spell at the moment. In my first couple of years we had very high rainfall but we have only had a couple of minor storms that caused some tree damage.

The one product I couldn't manage my course without is... Wetting agent tablets. I'd struggle



without them – they are a massive help with managing dry patch on the greens.

What have you got in your shed? Toro 3400 TriFlex fitted with groomer for greens, Toro 3400 TriFlex for tees, Tru-Turf roller, Toro 7000 fairway mower, Toro Sidewinder (fairway step cuts), Toro 4000D and Lastec rough mowers, John Deere 1200A bunker rake, Toro HDX spray rig/topdresser, Terex PT52 positrack, Toro Pro-core. The next major item on the wish list is a Toro Multi Pro 757 sprayer because I want a dedicated sprayer that we don't use for transport.

Looking down the 9th and 10th fairways from the practice putter. The fairways are a mix of kikuyu and Queensland blue couch

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◀ The South West Rocks fairways are watered using three Trailco travelling irrigators. Pictured is the 17th

What's your favourite piece of machinery and why? The Terex PT52 positrack and its attachments because I enjoy constructing new areas.

What are some pros and cons of being a regional-based superintendent? The biggest pro would be my trusty 'South West Rocks Country Club Cavalry' volunteers who are only a phone call away if we need a hand. They come in every week to empty bins and fill sand and save me time to do the major jobs out on course. The worst thing is members expecting the course to look like the bigger courses with limited staff and budget and the access to service departments in the case of machinery breakdowns.

Are expectations of course presentation and conditioning any less than that placed on your metropolitan counterparts? No I don't think so. They watch golf on TV and play golf at some of the bigger courses and expect the same standard.

Do you have to be more resourceful as a regional-based superintendent? The biggest thing I realised when I got this role was the need for good spare part stocks and tools because it's a minimum three-day turn around for a breakdown to receive parts.

How important are the relationships you have with other course supers/trade reps? Very important

South West Rocks boasts 15 greens that are a bentgrass/*Poa annua* mix and three that are Tifdwarf couchgrass oversown with bentgrass



because we are in the middle of nowhere and if you have problems they are only a phone call away.

Do you think regional/country superintendents have a better work-life balance than their metro counterparts? No not really. I think we both have the same pressures from diseases, pests, weather and members to deliver a good course. I think what you put into your job is what job satisfaction you get out. If you only want to work 38 hours your course will suffer. And when you've only got small staff numbers you are superintendent/irrigation tech/mechanic. I spend a lot of time with my girls on course and do all paperwork at home. The best thing is I only live a couple minutes from work!

Favourite spot on your course? It would be on a Friday afternoon at the pro shop looking at our diamond cut on the 9th and 10th fairways.

Best advice you have received about being a course superintendent/greenkeeper and who gave it to you? I better not say who said it to me, but one time I thought I deserved a pay rise so was called into the office. This gentleman told me I was not irreplaceable and that if I left there was always somebody looking for a job and while they might not do the job as good, the job would still get done. I stormed out of the office not happy, got on a mower and thought about what he said and realised that he was right.

What do you think is the most challenging aspect of a superintendent's role today? What have you worked on personally in recent times to improve your skills as a superintendent? I think communication, especially relaying information to the golf committee and board of directors.

What gives you the most job satisfaction? When my staff take photos after doing a job to show me how good it looks and the feedback from members and visitors.

Most pleasing/rewarding moment during your time as South West Rocks GC superintendent? The article in the May edition of Golf Australia magazine last year when one of my peers had read it and sent me a text saying 'good work'. 🙏



The approach to the 6th green at South West Rocks

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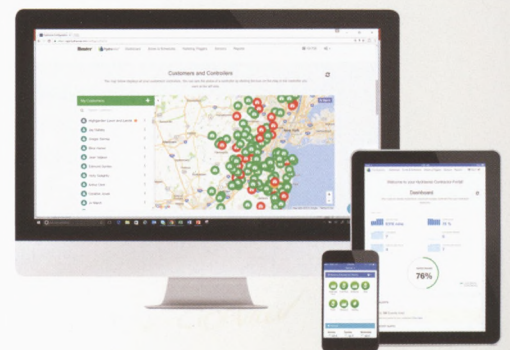
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DINT GOLF SOLUTIONS GROOMS A PERFECT PARTNER



Dint Golf Solutions is now the exclusive supplier in Australia and New Zealand of the GreensGroomer

A GCSA Bronze Partner Dint Golf Solutions has announced that it is now the exclusive supplier in Australia and New Zealand of the US-manufactured GreensGroomer. Fabricated and assembled in Indianapolis, the GreensGroomer aids in the incorporation of topdressing medium on golf course surfaces and has proven a hit with superintendents and turf managers the world over according to Dint managing director Adam Dinte.

"We spoke with a few Australian superintendents that have imported the GreensGroomer unit themselves from the USA," says Dinte. "We couldn't believe the comments we were hearing about it! Each one these supers literally told us that it's one

of the best units they own and wouldn't know what they would do without it! We are very excited to be partnering with GreensGroomer and to have the opportunity to bring such a high quality product to the Australian golf market."

The GreensGroomer can be used all year round and aims to improve turf health. According to its manufacturer, it won't scuff, bruise or damage turf on greens, fairways or tees and effectively moves both wet and dry topdressing and brushes off heavy dew and grass clumps. It also assists in controlling grain, promotes leaf healthiness and grass density and can reduce the frequency of verticutting.

The GreensGroomer's patent-pending brush quickly and easily moves topdressing evenly with no windrowing, allowing turf managers to schedule topdressing with confidence, knowing that the brushing can be performed in a true one-pass effort.

The GreensGroomer is currently into its second generation and the latest model has been tweaked slightly to improve performance. An important aspect of the design change is an increased brush area which translates into a greater distribution of the unit's weight and a reduction of weight per square inch. The weight reduction keeps the brushes in a straighter, upright position and improves the moving force of the brush head.

For more information on the GreensGroomer visit www.dint.com.au.



ADAMA'S EVOLUTIONARY FUNGICIDE HITS THE AUSTRALIAN MARKET

Agro-chemical company Adama has launched the first turf-registered option in Australia for fairy ring control – Evolution fungicide.

Evolution is a premium, differentiated fungicide mixture containing 120g/L of the active ingredient azoxystrobin and 200g/L tebuconazole. This unique combination provides systemic control of a broad range of turf diseases including fairy ring, dollar spot, helminthosporium, anthracnose, winter fusarium and brown patch.

Evolution provides powerful control of fairy ring in turf, as both actives have excellent known activity on many of the causal organisms that produce fairy ring symptoms. The combination of

two modes of action in Evolution provides protection against several stages in the lifecycle of fungi. The dual combination of a strobilurin and DMI ensures infections are targeted from the time of spore germination on the leaf surface through to mycelial development within leaves. Therefore, applying Evolution as a preventative treatment prior to spore germination will achieve the maximum benefit from both the strobilurin and DMI components.

Preventive fairy ring control can be much more effective and consistent over curative measures. For effective fairy ring prevention, multiple fungicide applications need to be applied prior to soil temperatures reaching 21°C in spring. Ideal application timing for the initial application is between 15-18°C.

Applications of Evolution fungicide for curative fairy ring control should be applied soon after symptom development. To achieve effective curative control, apply Evolution at the high rate of 4L/ha at 30-day intervals. Soil surfactants should be applied 1-2 weeks prior to or after the Evolution application to achieve maximum performance. Symptoms take 2-3 weeks to disappear following treatment.

For more information on Evolution fungicide, visit www.adama.com.au or the Nuturf website www.nuturf.com.au or call 1800 631 008.

Evolution fungicide provides systemic control of a broad range of turf diseases including fairy ring

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TURFKEEPER, LIVING TURF ALIGN

Living Turf and TurfKeeper Australia announced in February 2017 a joint venture agreement for the future development and distribution of TurfKeeper's online turf business management software.

Australian turf managers can now subscribe to TurfKeeper software via either business and get the same specialised activation and after sales support. TurfKeeper and Living Turf's Turf Forensics will coordinate future development to ensure that

improvements to the respective products are aligned and optimised to enhance the experience for customers of both software products.

In addition to the announcement, Daryl Sellar has also joined Living Turf as a consulting agronomist, product manager for TurfKeeper and custodian of Living Turf's relationship with the South Australian market. Sellar will work closely with Living Turf's technical and marketing director Dr Henk Smith who joined the company in the latter half of 2016.

INDUSTRY APPOINTMENTS



BINGHAM TAKES ON TORO AUSTRALIA NATIONAL SALES, MARKETING ROLE

AGCSA Platinum Partner Toro Australia has promoted **Laurence Bingham** (pictured) to the role of national director of sales and marketing. Toro Australia's managing director, **Richard Walne**, says Bingham was the perfect candidate for the newly created position and will help drive a consistent approach across all sales and marketing functions. In his new role, Bingham will be responsible for overseeing all sales, service and marketing functions across Australia's Toro and Pope brands. He is also a member of the executive management team in Australia.

"Laurence's passion and personable approach have made him a successful leader and influencer at Toro Australia for the past 17 years," says Walne. "He has played an integral role across the business as consumer equipment business manager, managing the Pope garden business and holding various managerial positions within our irrigation division."

Upon the announcement, Bingham said he was excited to take on such an integral position within the company: "Having been at Toro Australia for nearly two decades, I have witnessed the changing landscape and know the importance of forging strong client relationships. We are proud of the reputation we have established in the area of innovation and will continue to strive to maintain the lead within the industry. But most importantly, I'm proud to work for a company that genuinely cares for people and that has achieved a uniquely successful balance between people values and performance values."



Elsewhere within the company, former course superintendent **Luke Crawford** (pictured) has recently joined Toro Australia as area sales manager – golf equipment for the NSW North region. He takes over from **Matt Coles** who has moved north to take over the area sales manager – golf role for Queensland following the recent retirement of **Ross Sarow**.

Crawford has a long association with the golf course industry in multiple capacities, varying from superintendent through to equipment technician. Has worked at Bermagui Golf Club, Leeton Golf Club, Nambucca Heads Golf Club, Bonville International and most recently was superintendent at Horizons Golf Resort. Crawford can be contacted on 0427 266 050.



FREWIN REJOINS GLOBE

Amgrow announced in early March the appointment of **Peter Frewin** (pictured) to the role of business manager of its Globe Growing Solutions business. Frewin's appointment comes at a time of significant restructure, with the appointment also of **Paul Barber** to the role of chief executive of Australian Agribusiness (Holdings) Pty Ltd, the holding company for

both the Amgrow and Accensi businesses in Australia.

"We are thrilled to have Peter as part of our senior management team," says Barber. "Peter's strong management experience and pragmatic approach to business development will be key in elevating Globe Growing Solutions as well as the broader Amgrow business in 2017 and beyond."

Frewin's impressive career in the Australian turf sector, spanning more than 35 years, has seen him hold several high profile positions including superintendent at Barwon Heads Golf Club, chief executive of the AGCSA and most recently as national sales and marketing manager for golf products with Rain Bird. He also worked briefly with Globe prior to his five year stint at the AGCSA.

Frewin started his new role on 14 March and is based at Globe's Tullamarine office in Melbourne. He can be contacted on 0418 593 072 or by email at peter.frewin@globeaus.com.au.

SUTHERLAND JOINS TURFCARE WA

Former WACA curator **Cameron Sutherland** has been appointed general manager of Perth-based Turfcare WA. Director **Michael Maartenz** announced the appointment in early March with Sutherland set to play a key role in the company's plans to expand its operations further afield. Turfcare WA specialises in large scale sporting field turf renovation, facility management and design and construction of turf sporting surfaces.

"Adding Cam Sutherland to the team is a genuine victory for us," says Maartenz. "From Perth Racing to the WACA, he understands quality turf management requirements and our own expansion strategies." Adds Sutherland: "The growth Turfcare WA has achieved is impressive, as is the strategic thinking at the heart of the expansion. Michael's vision for the business is exciting and I am happy to be joining the business at this stage in their evolution."

Sutherland joins Turfcare WA from his position as racecourse and facilities general manager with Perth Racing. Previously, he was consultant to the Department of Sports and Recreation on the new Perth Stadium and the proposals for managing the stadium's playing surface. From 2005 to 2013 Sutherland was also arena manager at the WACA.



Michael Maartenz (left) with Cameron Sutherland

GCSAWA Superintendent of the Year recipient Jonathan Leach (left) from Busselton Golf Club with Michael Healy



Busselton Golf Club course superintendent **Jonathan Leach** was named the GCSAWA Superintendent of the Year at the Western Australian Golf Industry Awards which was held in March. Jonathan was one of three GCSAWA members honoured on the night for their efforts over the past 12 months. The awards night saw more than 460 people pack Perth's Crown Casino in what has become one of the highlights of the annual WA golf calendar.

Jonathan beat home the impressive challenges of fellow finalists **Jon Carter** (Wanneroo GC), **Bruce Coleman** (The Links Kennedy Bay), **Britney Goldsworthy** (Seaview GC), **Nick Kinley** (Hartfield CC) and **Ashley Watson** (Joondalup Resort) to collect the McIntosh & Son and Jacobsen-sponsored award. Jonathan was rewarded for the considerable improvement he has made to the Busselton course over a short period of time. He has reduced fungicide applications considerably by implementing a liquid seaweed programme which is showing very positive results on the greens.

The Toro Apprentice of the Year Award was won by **Daniel Breadmore** from Mosman Park Golf Club. Daniel has been at Mosman Park since August 2016 after starting his apprenticeship at Hillview

Golf Course in 2012. Originally from Tasmania, he started his career at Barnboughle Dunes before moving to Perth and working as a casual at courses such as Joondalup and Gosnells before starting his apprenticeship. In 2015 he volunteered at the Emirates Australian Open. He beat home fellow finalists **Mark Dickinson** (Cottesloe GC) and **Ben Suckling** (Capel GC).

The final GCSAWA award of the evening – the Globe Environmental Award – was taken out by Cottesloe Golf Club superintendent **Simon Bourne**. Cottesloe has carried out major revegetation works in recent years by removing turf from tee to fairway and planting over 20,000 native grasses and plants. This has reduced the irrigated area of the course by five hectares and these areas are now incorporated into the club's remnant management plan.

Other awards handed out on the night included Regional Golf Course of the Year which was won by Margaret River GC (superintendent **Mark Lewis**), while Metropolitan Golf Club of the Year went to Wanneroo Golf Club (superintendent **Jon Carter**).

NEIL GRAHAM
PRESIDENT, GCSAWA

Far right: Globe Environmental Award winner Simon Bourne with Danny Hambleton



Right: GCSAWA Toro Graduate of the Year Daniel Breadmore with Toro's Geoff Stephens



Royal Adelaide's iconic par three 7th being prepped during February's 2017 Women's Australian Open

We have finally farewelled summer and are now right into autumn. We have also said goodbye to a couple of good blokes lately.

Rowan Daymond left The Grange Golf Club, where he was senior assistant, for the superintendent role at Murray Downs Golf and Country Club (NSW), while **Patrick Casey** departed Adelaide Shores to take over as superintendent at Kalgoorlie Golf Club in WA. We wish both all the best in their new roles.

February saw Royal Adelaide Golf Club host the 2017 ISPS Handa Women's Australian Open. Superintendent **Nathan Bennett** and his crew, with some help from local and interstate greenkeeper volunteers, hosted another very successful Open. The RA layout looked an absolute treat and

received rave reviews from players, officials and commentators alike. The weather was a bit up and down, but the tournament went off extremely well and congratulations must go to Nathan and the team. Next February it will be the turn of **Steven Newell** and his crew at Kooyonga Golf Club.

The next SAGCSA meeting will be held at Thaxted Park Golf Club where they are well into a course reconstruction programme. Superintendent **James Hyde**, course architect **Neil Crafter**, shaper **Malcolm Williams** and irrigation installer **Darryl Cahill** will give us an insight into all the works.

BAZZ BRYANT
PRESIDENT, SAGCSA

STA AUSTRALIA



As the year is quickly passing us by, we have already said farewell to cricket and now prepare for a busy season of winter sports. It is also time for STA Australia to be preparing for presentations for the Sportsturf Stream at the Australian Turfgrass Conference in June.

STA is proud to be associated with this event and we look forward to assisting in presenting a strong programme for the sports turf managers. This year's event will be held in sunny Queensland at Twin Waters Resort and we encourage all turf managers to start planning your trip, as it is always a very worthwhile experience.

At this time of year we are also preparing for the STA Australia Sports Turf Graduate of the Year Award and again look forward to welcoming a new group of graduates through the process. This is such a great opportunity for newly graduated turf managers to expand their knowledge and further develop their skills and most importantly network with others in the industry. STA Australia is once again fortunate to have Toro Australia's support in partnering with this initiative.



While on the subject of graduates, last year's winner **Kurt Dillon** has recently had more success to add to his story. Kurt had two main passions in his working life, as a sports turf manager preparing a quality playing surface every week for the Cronulla Sharks rugby league club at Shark Park, as well as his dream to play first grade footy.

Well, Kurt will get to live that dream as he has been signed with the Sharks in the first grade squad for 2017. While we are very happy for Kurt, we are also sad to lose him from the industry but he has assured us that he will return to greenkeeping at the end of his playing career. We wish him lots of success and look forward to seeing him run out on to the field for the Sharks.

In the coming weeks we hope finalise plans for the Toro Regional Sports Fields and Grounds Forums that will be held around the country. Keep an eye on the website and news from your local STA. Good luck with the winter sports season.

CHRIS CHAPMAN
PRESIDENT, STA AUSTRALIA

2016 STA Sportsturf Graduate of the Year Award Kurt Dillon has had more success after signing with the Cronulla Sharks first grade side for 2017



The STA WA switched its traditional end-of-year gathering to the start of the year with a day at Ascot Raceway in mid-February

What better way to start the New Year than with a couple of social events. Following a popular suggestion from the floor at our past AGM, the STA WA executive committee agreed to move the association's annual end-of-year celebration to the beginning of the year. A good turnout of about 50 members gave testament to that decision to meet at the Ascot Raceway for its Wednesday midweek race event on 17 February.

It was a thoroughly relaxing way to spend an afternoon, however, I must say that the only down side was with regard to actually picking any winners as it seemed to some of us that a number of the horses must have also decided to have a relaxing afternoon. Never mind, it's all fun having a punt and a laugh.

A few weeks after that many of us then met again down at the turf shed of the South Metropolitan TAFE campus in Murdoch for the annual BBQ breakfast. This event came about a few years ago as a means to help bridge the communication gap between the various sectors in turf management, the students and TAFE lecturers.

South Metropolitan TAFE campus in Murdoch held the annual STA WA BBQ breakfast



I have often said that this is one of the best trades and industry communities to work in, but one of the messages not told enough is the recognition of the positive impact that our TAFE lecturers have upon the whole industry. These trainers are predominantly sourced from people who were quite recently workers within the same industry and have, I believe, not only a full understanding of current work practices but also share a keen admiration for innovation and experimentation.

They unashamedly congratulate self-education which as they know lends itself towards self-empowerment and the quest for success over those many challenges we encounter day to day in turf management. In short, the BBQ gives us a chance to shout out about the brilliant South Metro TAFE team who continue to be the wind beneath our wings, as well as a chance to introduce the students to industry and vice versa.

As I write this we are about to host a Cricket Wicket and Sports Turf Renovation workshop to be held on 29 March. This is the practical element following on from the successful Cricket Wicket Seminar held last September. Returning to the sports ground at Murdoch University, attendees will get the opportunity to participate in hands-on demonstrations of pitch renovation while under the careful tutelage of some of our most experienced curators.

In the outfield, State Wide Turf Services will be demonstrating and discussing a variety of sports field renovation equipment in operation and their desired results. During the day we are also very proud to have **Matt Holmes** and **Dan Docherty** from Syngenta come over to WA and present to the group, helping make what we hope to be another fantastic STA WA education event. Our thanks also go to Nuturf and Mowmaster who are instrumental in helping bring the day to fruition.

The next major event we are full swing into organising for will be the biennial WA Turf Seminar & Trade Expo hosted in conjunction with the Turf Growers Association of WA. This year it will be held on Wednesday 31 May once again at the Tompkins Park Function Centre and will feature a full day of seminars from local and interstate speakers as well as a variety of trade product and equipment displays. For more information about these events and more please visit www.sportsturfwa.asn.au.

TONY GUY
PRESIDENT, STA WA



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Some 90 members attended the first VGCSA meeting for 2017 at Commonwealth and Woodlands golf clubs



Assistant Chris Adames outlines some of the recent works undertaken at Commonwealth during the recent VGCSA meeting

Far right: Commonwealth superintendent Mark Prosser

Below: Woodlands superintendent John Mann discusses the recent works to the club's reconstructed second hole



The association's first foray for 2017 was our annual dual club education meeting conducted at Commonwealth and Woodlands golf clubs. A great turn out of members (over 90) had the pleasure of walking both courses and seeing firsthand the results of extensive works that both clubs have undertaken over the last few years.

First stop was Commonwealth where course superintendent **Mark Prosser** spoke to the group about the development of the golf course and vegetation areas during his time at the club. Due to the amount of work to be seen, the group was split into three with Mark's assistants **Steve Bolt**, **Chris Adames** and **Tim Bickerdike** showing members around.

Extensive works to convert fairways and green surrounds to Legend couch and tee complexes to Grand Prix couch have been undertaken over a seven-year period with numerous bunkers also either remodelled, added or removed. Most recently, between January 2014 and October 2016, Commonwealth undertook a major course improvement programme which saw the clearing of a significant number of trees and introduction of more than four hectares of native vegetation around the course. The vegetation programmes

are showing great results and horticulture manager **Kate Torgersen** was on hand to explain the amount of work that has been undertaken. She indicated that spraying and works programmes in these areas are constantly modified to achieve limited labour hours when it comes to maintaining them.

Following the walk around Commonwealth, the group headed across to Woodlands Golf Club where superintendent **John Mann** hosted the second part of the day. Woodlands is currently undergoing a greens replacement programme with the existing Penncross/Poa surfaces being converted to Mackenzie creeping bentgrass and surrounds to fine fescue. Attendees got to view the recently completed 2nd green as well as the 4th green complex which is currently growing in.

Mann also showed off the recent works undertaken to realign the par five 2nd hole by Renaissance Golf Design (**Tom Doak**) to remedy boundary issues with White Street. This work saw the addition of three new fairway bunkers and narrowing the fairway from 65 to 35 metres along with the installation of extensive new fairway drainage lines. Members were also shown the practice tee extension which was done thanks to left over turf from the works to the 2nd hole.

The VGCSA's Annual General Meeting is the next major date for the association on Monday 8 May. Metropolitan Golf Club will be our host and I am sure course superintendent **Dave Mason** will provide excellent golfing conditions for our major golfing trophies to be decided.

MAT POULTNEY
PRESIDENT, VGCSA



The summer of 2016/17 will surely go down as one of the most difficult seasons experienced by any NSW superintendent and their greenkeeping crew. Weevil, disease, extreme heat, lack of water, water quality issues and now flooding! We have had it all and many have lost turf through no fault of their own.

The pressures of this industry have taken its toll this year, to the point where the NSWGCSA felt the need to address Golf Management Australia NSW (GMA NSW) to voice our concerns in the way course superintendents are being treated by golf club committees and their membership. A brief and to the point information sheet has been sent, on behalf of the NSWGCSA Board and NSWGCSA members, to GMA NSW outlining the need for support from general managers and committee members during such a difficult period.

The information sheet outlines what difficulties many courses have experienced as well as points out that many people are in the same position and not to blame their superintendents, rather to work alongside them and support them through their issues. The general managers have been requested to pass this information sheet onto their boards and committees as well as their membership. A copy of this information sheet has also been emailed to all NSWGCSA members.

In more positive news, the association is pleased to be able to announce an amalgamation between GMA NSW, PGA, GolfNSW, Jack Newton Golf and the NSWGCSA for an industry awards evening. The format will be in the style of the Oscars where each industry award will be presented on the night with nominees for each award invited to attend with their families and guests. The event will be open to all our members and will be held at an exclusive venue which is yet to be confirmed. We



are looking to hold the event in early November as the marquee event that kicks off the NSW golfing calendar. This is a great initiative which will give more exposure to the nominees, winners and the award sponsors over different areas of the industry.

On that point, I would like to remind everyone that we are now accepting nominations for our annual awards, so if you have anyone in mind please fill out the nomination form that has been emailed to our membership. May I also remind you that we are also looking for nominations to join the NSWGCSA Board of Directors. **Shane George** stood down in November and more recently **Justin Bradbury** from Bonnie Doon Golf Club.

Justin was at Bonnie Doon for four years as superintendent, after dropping everything in the US to make a commitment to the Doon and steer them through Stage 2 and 3 of their course redevelopment. Justin excelled in both his positions of maintenance superintendent and grow-in superintendent and should be highly commended on a job well done.

Another mover in the industry this past month has been **Michael Bradbury's** shock resignation from Manly Golf Club on Sydney's northern beaches after 19 years as course superintendent. Michael led the redevelopment of the course between 2009 and 2012 and oversaw the grow-in of the new course layout. Michael advised the club that "After surviving another extremely challenging summer I realised that the demands of the job over recent years was becoming more difficult and not something I want to continue doing for the remainder of my work life."

We wish both Justin and Michael all the best for the future and hope they stick around the traps as this industry needs quality guys like them.

STUART GILL
PRESIDENT, NSWGCSA

The resignations of both Justin Bradbury (top) and Michael Bradbury shocked the industry this past summer

ON THE MOVE

MICHAEL BRADBURY:

Resigned as superintendent Manly Golf Club, NSW.

JUSTIN BRADBURY: Resigned as superintendent Bonnie Doon Golf Club, NSW.

LUCAS BROWN: From superintendent Mildura Golf Resort, Vic to superintendent Adelaide Shores, SA

BRAD DUSCHER: From assistant superintendent to superintendent Mildura Golf Resort, Vic.

GLENN MCCORMICK: Appointed superintendent Kilmore Golf Club, Vic



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STA VIC



As this edition of Australian Turfgrass Management was going to print, STA Victoria was gearing up to host an informative Safety and Education Forum sponsored by Bayer Environmental Science at Holmesglen TAFE.

In addition to hearing about Bayer's safety advancements, attendees were to hear about the handling and disposal of hazardous chemicals, chemical application documentation and the correct placement of chemicals. An insight into the STA Vic's 2017 research project was also part of the schedule, while the latest Toro MultiPro 5800 spray unit was also due to be demoed.

The next major event on the STA Vic calendar will be the AGM Sports Turf Seminar at AAMI Park on Wednesday 19 July. We are proudly partnering with major sponsor Jacobsen again and look forward to hearing from AFL legend **Brent Harvey** who will be our guest speaker. As North Melbourne's games record holder, Harvey is undoubtedly one of the AFL's stars of the 21st Century. Stay tuned for news on other exciting speakers and presentations as they are announced.

As always, we are happy to receive any feedback so please get in touch. If you have a great topic you would like presented at the July seminar or any of our events, please send us an email and we can work together to firm up the programmes.

STA Vic is currently calling for applications for its student sponsorship initiative. In November last year STA Vic announced that it had agreed to offer and partially fund a student sponsorship designed to encourage students to move from Certificate III in Sports Turf Management into a Diploma.

The sponsorship offered will comprise 50 per cent of the total fee of the course up to \$3000.

Successful candidates must enrol for their first year of Diploma study within two years of completing their apprenticeship. The award payment will be provided to self-funded students on successful completion of their first year, once a statement of results is received.

The STA (Vic) sponsorship application form is available on the website vicsportsturf.asn.au and will be published via Facebook and industry magazines. Please direct enquiries to **Jan Fenton** on 0439 089 005 or complete the application form on the STA website and email to vic@sportsturf.asn.au

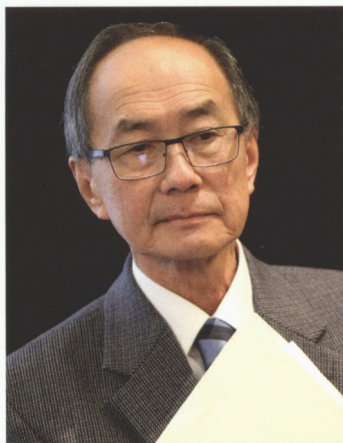
Finally, STA Vic wishes to announce that it has appointed Turfgrass Consulting and Research (**John Neylan**) for the association's 2017 research project. Results from a research project questionnaire following the Sports Field and Wicket seminar held in 2016, showed members were interested in comparing possible hours of use for different sports field construction types and maintenance inputs.

A project brief was designed and expressions of interest were called for in December 2016. The committee shortlisted three high quality and detailed submissions from research providers and after consideration and a detailed evaluation of all three Turfgrass Consulting and Research was awarded the project.

The project started on 1 March 2017 and STA Vic looks forward to bringing you articles and milestone reports on the progress of this project over the 18 month period of the study. The complete project brief can be viewed at www.vicsportsturf.asn.au

GARRY WOOLARD
COMMITTEE, STA VICTORIA

STA NSW



Dr Percy Wong

It's been a tough start to the year for sports turf managers across NSW with the extreme weather we have experienced. It seems to be the year of breaking records with summer hitting incredibly hot days in the high 30s and on many occasions well into the 40s week after week followed by storms and damaging winds the next week. Autumn has now arrived and we are looking at the wettest autumn on record only after a few weeks.

We were lucky to have a great day for our first event of the year when we headed north to Newcastle for a Wicket 101 Accreditation course. This event would not have been possible without the commitment of **Greg Askew** at No. 1 Sportsground. To Greg and his staff, Mitch and Drew, a big thank you for not only presenting a fabulous surface and allowing the delegates to work on the wicket, but for all your efforts in setting up for the event.

We continue to get great feedback from this course and look forward to being able to offer it to turf wicket managers all over NSW. Next location is planned for the Wollongong area at the start of the next cricket season.

April sees two events for STA NSW – the Annual Golf Day which will be held at Riverside Oaks (4 April) and the Turf Disease Identification workshop with **Dr Percy Wong** (11 April). This is a hands-on workshop, being held at Ryde TAFE and will include how to use a microscope to help better identify diseases such as pythium, black helmo (helminthosporium complex), brown patch (rhizoctonia) and ERI disease complex (including soil borne diseases and information on BF1).

CHRIS CHAPMAN
PRESIDENT, STA NSW

The past few months have been very challenging with droughts and flooding rains. Cyclone Debbie wreaked havoc from the north to the south of the state and then into northern NSW leaving carnage wherever she went. Many courses have been inundated, leaving superintendents with major works ahead of them to clear silt and debris.

At time of going to print, the crew at Windaroo Lakes Golf Club were in the process of de-silting 14 greens with a posi-track skid steer and loads of volunteer help, while **Glenn Beauclerc** at Logan City Golf Club has 15m of water across his course with 25 of 27 greens fully under. Further south across the border at Murwillumbah Golf Club, superintendent **Brian Cox** is taking the worst flood he has ever seen in his stride. He anticipates the course will not be open for a month and what were previously one hour jobs to de-silt greens are four hours with this one. They received 470mm in a week leading up to the cyclone then two days later close to 600mm drenched the course with minor showers still continuing even a week later.

A month ago we were all talking about the drought, but that seems a long way away now and insignificant compared to the clean-up that is ahead of many of our peers. Good luck to all of you in repairing the damage.

On a much more positive note, I would like to congratulate all our Queensland Golf Industry Award winners. **Phil Soegaard** (Lakelands Golf Club) received the Superintendents Achievement Award sponsored by Living Turf, while **Garry Kunz** (Byron Bay Golf Club) collected the Assistant's Recognition Award sponsored by Globe Growing Solutions and Ogilvy, Clayton, Cocking, Mead. **Christopher Zeal** was awarded the Toro Apprentice of the Year.

Phil's nomination was forwarded by Lakelands and stated that he is well respected by the members and all the staff at his facility. Phil is known for his loyalty, enthusiasm, hard work, love of the golf course and the turf industry. He has an extensive list of credentials including training two GCSAQ Apprentices of the Year along with three further finalists, extensive major refurbishment of the golf course with a significant reduction in his budget, an improvement of 12 positions in the Australian Golf Digest course rankings between 2014 and 2016 and plays an extensive role in ongoing trial work for the likes of the AGCSA and major industry companies. He has received a Climate Smart Business Award for water reduction and also hosted the 2016 Australian PGA qualifier.

This year's Assistant Recognition Award was very difficult to judge given the quality of the three finalists, but in the end it went the way of Garry Kunz. Garry is very highly regarded in his role at Byron Bay Golf Club which during the last eight years has seen him involved in the planning and



Above: Brisbane Golf Club had six greens go under after copping 285mm in a 24 hour period in the aftermath of Tropical Cyclone Debbie

implementation of major construction and irrigation projects, as well as the annual preparation for the Australian Legends PGA Tour Championship. Garry's exemplary commitment to this tournament sees him sleeping in the maintenance facility over the three nights of the tournament and managing an additional 16 volunteers for the event.

The apprentice award went to Christopher Zeal who completed his apprenticeship with the Brisbane City Council at both Victoria Park Golf Complex and St Lucia Golf Links under the tutelage of course superintendent **Kirk Heald**. During this time he received the Apprentice of the Year Award from the Brisbane City Council for his mentoring of other apprentices and management of landscape construction projects. Christopher is currently furthering his career working at Silvertip Golf Resort in Alberta, Canada. Kirk accepted the award on Christopher's behalf.

Congratulations again to all GCSAQ winners and I would also like to thank our award sponsors for their continued support of our association. I hope my next report sees some brighter news with repairs to damaged courses and some fine weather for us to catch our breath.

Below: Twenty-five of 27 greens went under at Logan City Golf Club



BEN TILLEY
PRESIDENT, GCSAQ



Left: GCSAQ Superintendents Achievement Award recipient Phil Soegaard (Lakelands GC)

Below: Byron Bay GC's Garry Kunz (right) received the Assistant Superintendent Recognition Award



In January, Simon Bourne played his first round of golf at Cottesloe Golf Club since his accident seven years ago, thanks to the ParaGolfer all-terrain wheelchair



Bourne back in the swing

After a freak holiday accident left him a paraplegic in 2010, Cottesloe Golf Club course superintendent Simon Bourne is finally back playing the game he loves.

It's been just over seven years now since an accident while on holiday in Bali left me confined to a wheelchair. Obviously the adjustments I have had to make to every facet of my life as a result of the accident have been all encompassing, but the one thing that I have really missed has been able to get out on the golf course and have a hit.

I was a very keen golfer prior to the accident, down to single figures, and I enjoyed nothing more than going out and playing nine holes on a Friday afternoon with mates for a six pack and enjoying the 'healthy' banter that went along with it. I also enjoyed getting out on course with the guys from work so they could play the course and see it from a golfer's perspective. As we all know, you see your

course totally differently when you play it rather than just work on it.

The thought of never being able to play golf again was just one of those things I had to come to terms with, but that has all changed in recent times thanks to a fantastic piece of kit called the ParaGolfer. I first came across the ParaGolfer at a demonstration day conducted by Empower Golf at Perth's Wembley Golf Complex and with the assistance of a government grant I purchased one (they retail for around \$36,000).

The ParaGolfer is an all-terrain wheelchair that raises the user into a standing position to allow for a more conventional golf swing. It can go anywhere on the course including greens and bunkers, although it's not easy to rake the bunker after a shot (but that's what the apprentice is for). The machine doesn't leave any tyre marks on the green if you're careful and drive onto the green as close to square as you can to the putting line. You can still adjust yourself if you're not lined up right; it's just a matter of not turning too tight.


I took delivery of my ParaGolfer last September and had my first game at a par three course in Perth in early October. Since then I have slowly been getting used to it – how to set up for each shot, figuring out how upright to stand and how far away from the ball I need to be. The pressure on my knees from the brace that is used to lock them into place so I can stand up took a little while to get used to, as did the chest strap which holds my top half upright once the chair is raised to standing position. It's the strangest feeling that something so natural like standing can feel so unnatural at times!

Due to not having the use of my stomach muscles (I have no feeling from my mid-chest region down), I can't turn my trunk around to hit the ball with two hands like I used to, so I play most shots one-handed. This took a little bit of time to get used to, not just the act of striking the ball but also having to swallow my pride and forget how I used to play or how far I used to hit. Once I hit a one-handed shot for the first time and hit it well, all those wonderful feelings I had years ago of enjoying the game came flooding back in an instant!

When I'm playing I use one hand for all shots that are more than about 30 meters out from the green and then two hands when it's more about touch than power. I hit my driver around 125 metres now and reasonably straight and then most of the time from the fairways I use a 3-wood or rescue.

The highlight to date came in late January this year when I ventured out on to Cottesloe for the first time in seven years and had a round with my workmates Damon Arthur and Richie May. To finally be back playing the game I love on a course which has been a second home for me since my days as an apprentice was truly special. 🌱

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- Settlers Run
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- Shell Harbour
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