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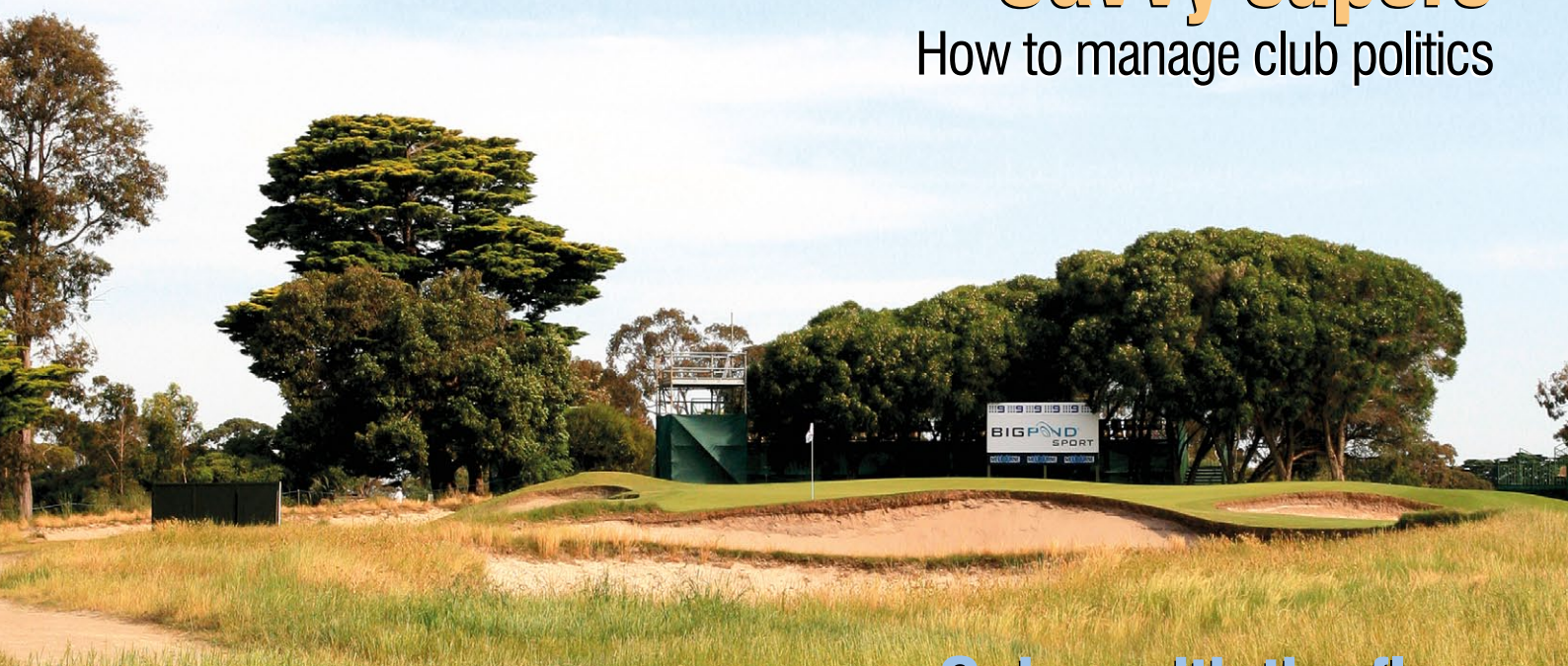

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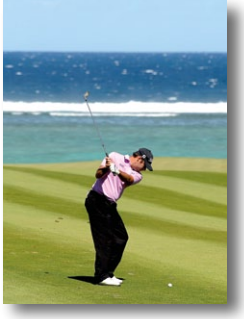
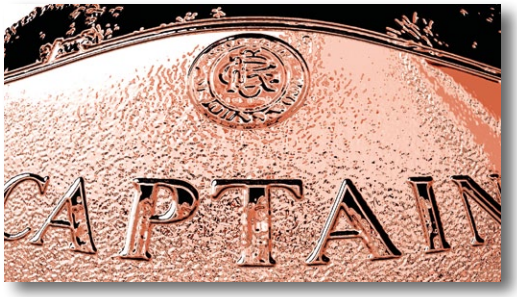
COVER

Victoria Golf Club: The par 3 4th at Victoria Golf Club, Melbourne. Victoria was one of 13 golf clubs to take part in the recently completed three-year AGCSA/University of Melbourne biodiversity project.

Photo: Brett Robinson





Contributors to Australian Turfgrass Management Journal Volume 16.5 (September-October 2014)

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Reality check

I'm popping hay fever tablets like peanut M&Ms at the moment so that can only mean one thing – spring is here and summer is just around the corner. This time of year sees a flurry of activity throughout the turf management community as air and soil temperatures start to rise, ushering in a new growing season. For turf managers it signals the start of one of their busiest periods and foremost on their minds is ensuring that all the checks and balances are in place to give their turf surfaces the best environment in which to flourish.

For one Queensland turf manager, however, this new season will have more significance than most. On the Wednesday of the 30th Australian Turfgrass Conference, while his colleagues were enjoying themselves down on the Gold Coast, Suncorp Stadium curator and STA Queensland president Mal Caddies was facing the devastating reality of having just been told he had cancer. Having discovered a lump under his left arm, purely by chance while he was watching television just weeks earlier, a biopsy had confirmed the worst – stage three malignant melanoma. A few weeks later, on 16 July, Mal was in Brisbane's Princess Alexandra Hospital undergoing an operation to have a 3cm x 5cm tumour and all the lymph nodes under his arm removed.

Despite the physical and emotional rollercoaster that Mal and his family have been through, ATM can gladly report that he is now on the road to recovery and since the operation has received only positive news. Not surprisingly, the whole episode has put a lot of things into perspective for the father of three and one of the things he is determined to do is make his experience a learning one for his fellow turf industry colleagues, in particular the importance of getting regularly checked.

The scary thing for Mal is that for many years he had done just that. Having had a number of basal cell carcinomas removed from his skin, Mal knew he was at risk and would religiously check his body and undergo yearly skin scans. On this occasion, however, the melanoma was a rare form that didn't physically manifest itself on the skin and Mal experienced no pain or sickness. As Cancer Council Australia repeatedly reminds us, skin cancer is a 'silent killer' and it was only through some very good fortune that Mal discovered the lump in time and was able to take immediate action.

In an upcoming edition of Australian Turfgrass Management we will relay Mal's story in full, but for now, given that the new season is upon us and the weather is starting to warm up, make the decision to be proactive not only about your turf's health but your own health as well. As Mal says, if he can prevent one turf manager from having to go through what he has been through, then his experience will have been worthwhile.

So, if you're not in the habit of doing so, start checking your body regularly. Go to the Cancer Council Australia website and download the informative 'Skin cancer and outdoor work' guide. Know the warning signs. Cover up when you head out onto the course, even when it's an overcast day. And, most importantly, if you do find something untoward don't do the typical bloke thing and ignore it or put off seeing your doctor.

On to this edition and our lead story focuses on the significant results to come out of the AGCSA/University of Melbourne biodiversity project which has wrapped up after three years. As delegates to the recent Australian Turfgrass Conference will be aware, this project has shown the huge environmental benefits golf courses provide to the urban landscape. It is a ground-breaking study and really lends weight to the need to preserve these green oases and how important a role golf course superintendents can play in enhancing the environment through best management practices. Enjoy the read...

Brett Robinson, Editor

PETER FREWIN, GENERAL MANAGER, AGCSA

AGCSA enters formal training discussions with PGA-IGI

It is nice to see the end of winter and as I write this the sun is shining for the first time in what seems an eternity and the smell of spring is in the air; let's hope the coming seasons are kind to all.

August has seen me keeping a very low profile as, like many within the turf industry, I succumbed to a dodgy hip and underwent a full hip replacement earlier in the month. I am pleased to report that the recovery is on track and thanks to all that have sent their best wishes.

This was my first venture to hospital for an extended stay and I must say it quickly puts your problems into perspective. Walking the halls of St. Vincent's Private Hospital, my minor health issue was at worst an inconvenience when you see so many others dealing with major surgery or terminal illness.

Regular readers of this column will be aware that the AGCSA has been investigating what options are available regarding the association entering the training sector to provide quality education for our members and the wider turf industry. I am pleased to report that the AGCSA Board at its last meeting gave the approval to start formal discussions with the PGA's International Golf Institute (PGA-IGI) to facilitate training on our behalf.

The PGA-IGI currently provides education to the golf industry and the Board were of the opinion that this experience and the understanding they have of the industry would provide the best outcome both nationally and internationally. The PGA-IGI has campuses located on the Gold Coast and Sydney with additional locations coming online shortly. Also at their disposal is an excellent online learning tool which will enable participants, regardless of their location, the opportunity to undertake high quality formal training.

The PGA-IGI currently offers a Diploma of Golf Management and an Advanced Diploma of Management which is endorsed by Golf Management Australia and it is hoped that in the near future they will also offer a similar course with a focus on turf management which will be endorsed by the AGCSA.

The proposed course will also include management components which will include HR, dealing with committees, basic accounting and other relevant components to enable participants to manage their respective facilities. While in the short-term the focus will be on the higher levels of training, it is possible that a pilot programme aimed at the lower levels of training may be started in some areas; further investigation and discussion will be required before this initiative is launched.

HUNTER VALLEY 2015

As recently advised via The Cut e-newsletter, the venue for the 31st Australian Turfgrass Conference and Trade Exhibition will be Crowne Plaza Hunter Valley from 21-26 June 2015. The area will provide a great destination with plenty on offer for all who attend and the dates coincide with the start of Queensland, NSW and Victorian school holidays. The venue will have a similar feel as Twin Waters in 2013, albeit a lot cooler!

The serious planning now begins and we are already in discussions with a couple of excellent international speakers and we look forward to announcing these in due course. The Toro AGCSA Golf Championships and state teams' event will again be played on the Sunday leading into the conference week (21 June), a move which has proved popular over the past two years. Negotiations are currently underway to secure a suitable venue that will showcase the quality field that this event


Crowne Plaza Hunter Valley

always attracts and we are hopeful of making an announcement shortly (stay tuned to The Cut and AGCSA website).

In closing, as reported in the previous instalment of Foreword Thinking I advised that we had to farewell **Robin Doodson** as an AGCSA Director after his recent appointment as superintendent of Doha Golf Club in the Middle East.

I am pleased to report that **Stephen Lewis** from Royal Hobart Golf Club has been co-opted onto the AGCSA Board. Stephen has been a great supporter of the local and national bodies for many years and has a great deal of experience at many levels of committee. In line with the AGCSA Constitution, Stephen, who received the TGCSA Distinguished Service Award at their recent AGM, will hold the position until the 2015 AGCSA AGM where he has the option to stand for the normal two-year term.

Please feel free to contact me at any time if you have an issue or suggestion; any feedback is greatly appreciated. I look forward to catching up when our paths next cross.

LETTER TO THE EDITOR

DESERVED ACCOLADE

Dear Editor,

Re: your article on John Neylan and his AGCSA Distinguished Service Award (**ATM Volume 16.4 – A verdant career**), which I considered long overdue.

When I wrote to John congratulating him on his award I made the observation that apparently there had been some mention at the presentation of elevation to the ranks of the greats. I pointed out that this was not a matter of elevation, but one of recognition of greatness that was well overdue.

John is as fine a scientist in this field as you could ever wish to find – thorough, meticulous and considered. He is also a thorough gentleman and a pleasure to know and work with. Anyone who has had as much impact as John has had and continues to have deserves every bit of the accolades he receives.

PETER MCMAUGH
TURFGRASS SCIENTIFIC SERVICES

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Green havens

In an increasingly urbanised environment, the University of Melbourne/Griffith University three-year study has demonstrated that golf courses play a significant role in improving biodiversity in urban areas. Pictured is Spring Valley Golf Club, one of 13 courses that were involved in the study

After three years of collecting data at 13 golf courses in Melbourne's south east, University of Melbourne and Griffith University researchers have wrapped up their project which has examined the biodiversity benefits of urban golf courses. This significant project, co-funded by the AGCSA and Australian Research Council, has provided some excellent data which clearly demonstrates the very positive role golf courses play in improving the biodiversity value of urban landscapes.

Royal Botanic Gardens Melbourne
Australian Research Centre for Urban Ecology
The University of Melbourne
Melbourne School of Land & Environment

Large urban green spaces, such as golf courses, support a large proportion of the vegetation within cities and subsequently can make a big difference to the retention of urban biodiversity.

These large green spaces are important to people for a range of social and ecological reasons including recreation, social networking, biodiversity conservation, carbon sequestration and improved urban hydrology. Specifically, golf courses can provide habitat for birds, mammals, insects, reptiles and amphibians to inhabit and forage within.

In Melbourne, golf courses currently contain nine per cent of the urban green space in the greater Melbourne area. However, continued infill development and increasing urban sprawl is putting pressure on these managed large green spaces, with golf courses in Melbourne, and other Australian cities, being increasingly sold off and replaced by residential and commercial developments.

To better value, manage and protect these large urban green spaces, research is required that specifically demonstrates and quantifies their environmental benefits in comparison to the surrounding urban residential, commercial or light industrial matrix.

In 2011 the Australian Golf Course Superintendents' Association (AGCSA), in conjunction with the University of Melbourne and Griffith University, announced that it had been successful in establishing a joint research project with the objective of improving the understanding of biodiversity conservation and carbon sequestration provided by urban green spaces, in particular golf courses.

Jointly funded by the Australian Research Council (ARC), the Australian Research Centre for Urban Ecology (ARC) and the AGCSA, the three-year project, which has now been completed, had three specific aims:

- To quantify the carbon stored and sequestered in the vegetation biomass and soils of urban golf courses according to management and age;
- To quantify the biodiversity benefit of urban golf courses in comparison to the adjacent residential urban areas; and
- To develop, or apply, spatially-explicit models to predict the carbon and biodiversity benefit of urban golf courses, parks and gardens, and to validate their predictive capacity.

To investigate the ecological value of Melbourne's urban golf courses, we measured various forms of animal and plant biodiversity in 13 urban golf courses and compared this to biodiversity in the adjacent residential areas and in nearby smaller urban parks in south-east Melbourne. The golf courses involved in the study were:

- Brighton GC (mgr. Kingsley Ferguson)
- Victoria GC (supt. Ian Todd)
- Woodlands GC (supt. Rod Tatt)
- Rossdale GC (supt. Paul Kortholt)
- Spring Valley GC (supt. David Phillips)
- Kingswood GC (supt. Terry Ford)
- Peninsula GC (supt. Martin Greenwood)
- Frankston GC (supt. Dean Hadfield)
- Centenary Park (supt. Chris Bardsley)
- Sandhurst (supt. Cory Budden)
- Ranfurlie Golf Club (supt. Luke Harris)
- Settlers Run Golf Club (supt. Stuart Graham)
- Amstel Golf Club (supt. Rhys Whitling)

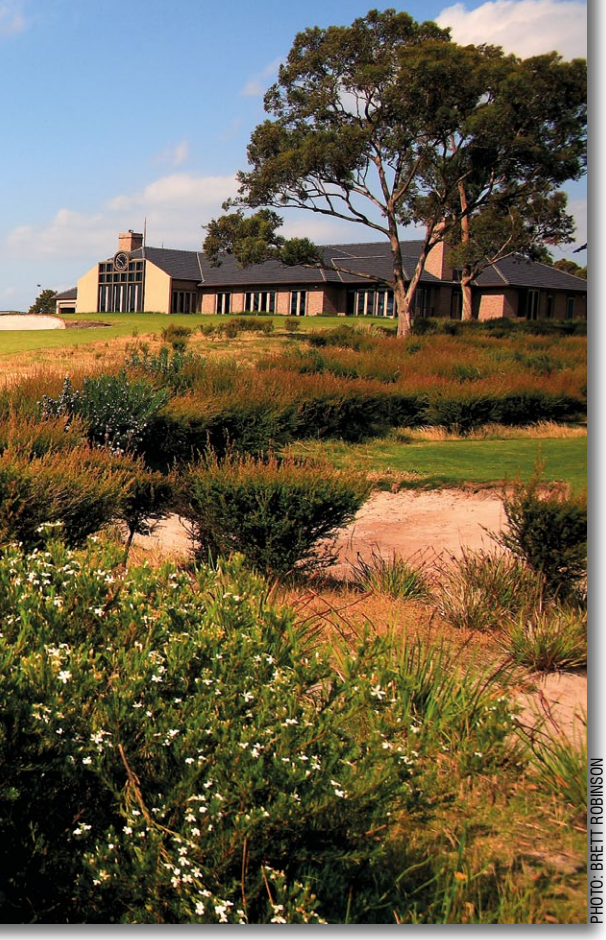


PHOTO: BRETT ROBINSON

The complexity of vegetation in the 'out-of-play' areas of the golf courses varied considerably. We included golf courses that contain large patches of complex remnant vegetation, courses that had planted complex and dense vegetation in between fairways, as well as courses that are more open and park like.

There was also a range of golf course ages, or time since establishment, the youngest being less than 10 years old and the oldest more than 100 years old. After a golf course is landscaped, it takes several decades for the vegetation to establish and surface litter to accumulate, providing a more natural ecosystem for faunal biodiversity to find refuge. As such, there may be greater biodiversity benefit in older, more established golf courses, as well as in courses that contain more complex vegetation structure.

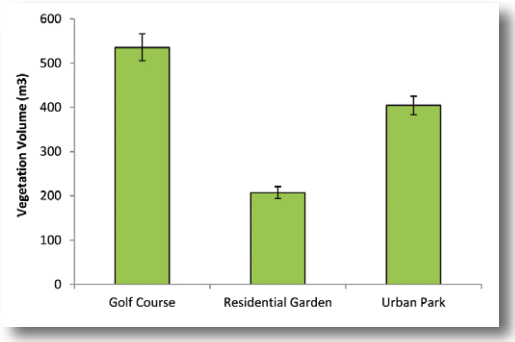
The biodiversity value of each golf course was assessed during the spring and summer of 2012-13. First, vegetation surveys were carried out at multiple plots throughout each golf course, so as to identify plant species present, the variety of plant functional and the three-dimensional structure of that vegetation habitat.

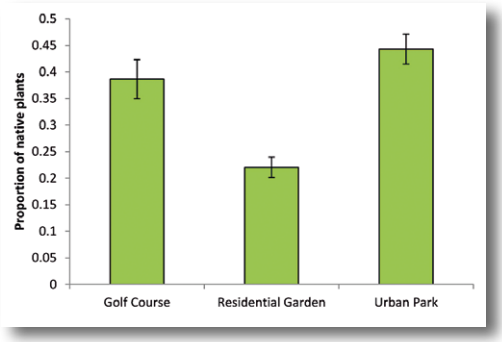
Then we surveyed various types of fauna, including ground and vegetation insects, birds and insect-eating bats. Various methods were used to measure the number of insect, bird and bat species in each golf course and the abundance for each species. For certain faunal species we investigated them in more detail because of their sensitivity to environmental change or habitat quality, such as native bees, predatory bugs, beetles and the lesser common birds and bat species.

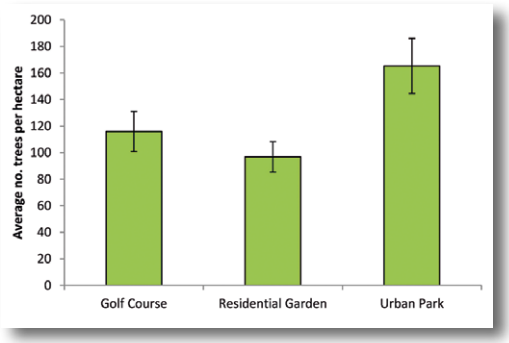
GOLF COURSE VEGETATION

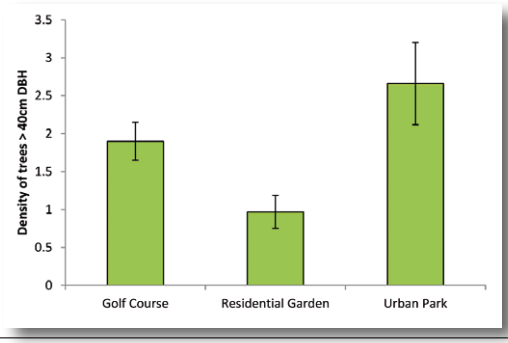
The study found that Melbourne's sandbelt golf courses provide a huge biodiversity benefit in comparison to nearby urban parks and urban residential areas. We found that on average golf courses contain a greater volume or amount of vegetation within each sample plot (Figure 1). When compared to the same area of a surrounding residential suburb, golf courses contain more than double the amount of vegetation.

We also found that golf courses and urban parks contain a greater proportion of Australian native plants than residential areas (Figure 2) and more trees per hectare (Figure 3). Golf courses and urban parks also contain a greater density of native trees and trees with a greater diameter (larger than 40cm at breast height) in comparison to residential areas (Figure 4).

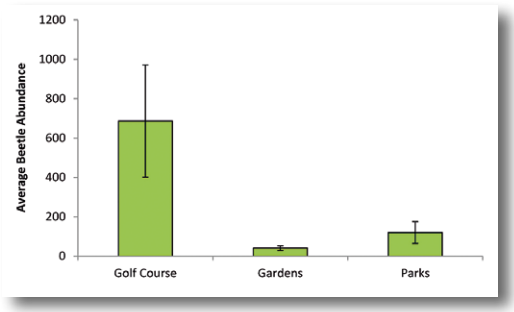


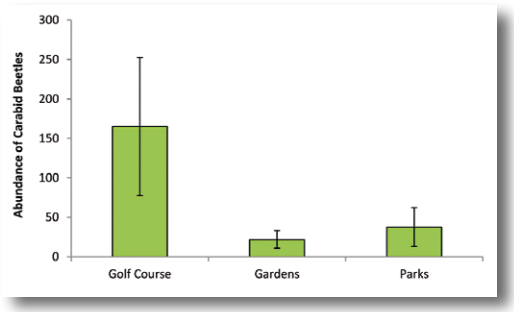




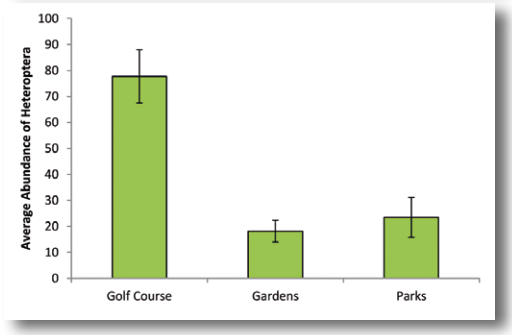


Figures 1-4 (top to bottom). Figure 1. Vegetation volume (m^3) across land uses; Figure 2. Proportion of native plants across land uses; Figure 3. Tree density/ha across land uses; Figure 4: Density of trees 40cm in diameter or greater. All charts show averages ± standard error





Figures 5a (right) and 5b (far right). Average abundance of beetle individuals caught per plot, using light traps. Figure 5a shows data for abundance of all beetles and 5b abundance of Carabid ground beetles. Average ± standard error



Figures 6a (right) and 6b (far right). Average abundance of bug individuals caught per plot, using sweep nets. Figure 6a shows data are for abundance of all bugs (*Heteroptera*) and abundance of predatory bugs (*Heteroptera*) within tall grassland rough and woodland out-of-play habitats

BEETLES AND BUGS

We found that golf courses supported, on average, a greater abundance and species richness of many invertebrate groups, including beetles (*Coleoptera*), bugs (*Heteroptera*) and native bees (*Apoidea*) – see Figures 5-7.

Using light traps we caught over 40,000 individual beetles and identified at least 197 beetle 'morpho-species'. Using sweep nets we caught over 9000 individual bugs and identified 119 bug species.

We also found that golf courses supported a greater abundance of key beetle and bug groups, including Carabid beetles (Figure 5b) which are used globally as indicators of ecosystem health, and predatory bugs (Figure 6b) that play a key role in insect pest control. One interesting feature was that these predatory bugs were far more abundant in areas of tall grass or herb-rich 'rough' compared to wooded 'out-of-play' areas (Figure 6b).

THE IMPORTANCE OF GOLF COURSES FOR NATIVE BEES

Using a combination of sweep nets and coloured pan traps, we caught over 1000 individual bees and identified at least 30 different species of native bee. When compared to nearby residential areas and nearby nature reserves, golf courses on average supported a greater number of different bee species (Figure 7).

We sampled these nature reserves to see if more intact remnant habitats supported a greater number of bee species, but instead we found that golf courses provided the most important refuge habitat for native bees in the urban landscape. This is probably due to the wide variety of nectar-bearing plants found within golf courses and because of their greater levels of maintenance (e.g. irrigation) which may increase food resource availability for these native bees.

GOLF COURSES SUPPORT A GREAT DIVERSITY OF BIRDS AND BATS

We surveyed for birds within golf courses, residential suburbs and small urban parks on three occasions and at different times of the day. We did this work with the assistance of local bird experts from Birds Australia. We recorded 106 bird species in total, with up to 60 bird species being recorded in one golf course alone!

Each golf course consistently supported a greater diversity of bird species than nearby residential areas or urban parks (Figure 8a). Importantly, unusual and rare bird species were recorded in golf courses, including Latham's Snipe, Painted Button-quail, Horsefield's Bronze-Cuckoo and Rufous Whistler.

We also recorded evidence of breeding activity and found that golf courses supported almost twice

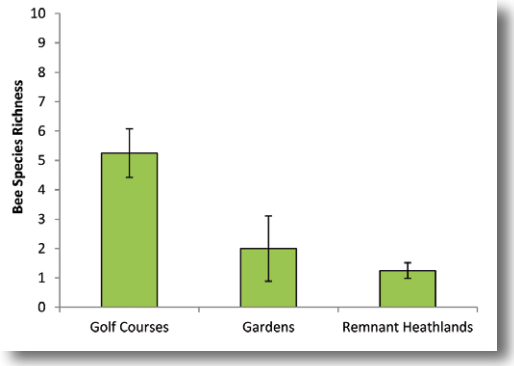
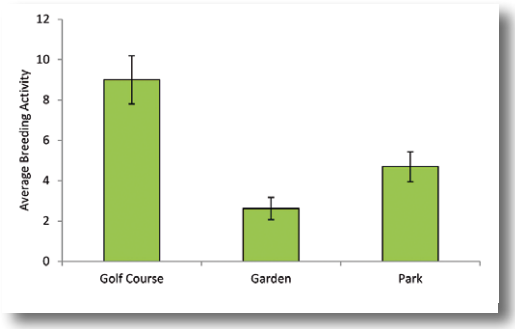
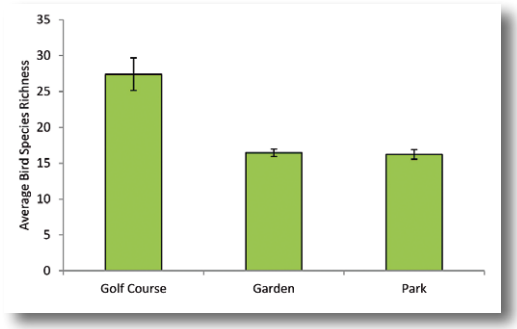


Figure 7. Number of bee species (species richness) caught per plot, across land uses. Average ± standard error

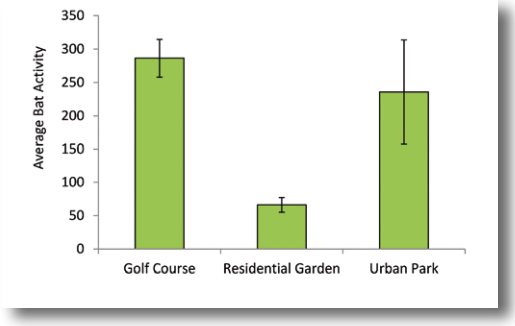
PHOTO BY TRACEY LEE

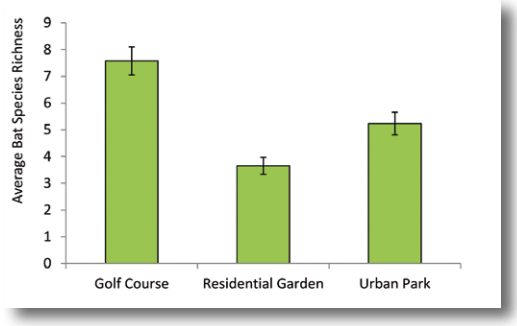
Far right: All 12 bat species known to occur in the Melbourne south east area were recorded at golf courses during the study. Pictured is *Chalinolobus gouldii*





Figures 8a (left) and 8b (far left). Average number of bird species and breeding recorded across three visits to each land use. Figure 8a shows data for bird species richness and 8b bird breeding activity. Average ± standard error





Figures 9a (left) and 9b (far left). Average number of bat species and activity recorded across each land use. Figure 9a shows average bat species richness per site and 9b total activity (average no. bat passes per night). Average ± standard error

the bird breeding activity of residential and small park areas (Figure 8b). Bird breeding activity was indicated by flying in and out of hollows, building nests in trees and interaction with dependent young.

We also surveyed for bats in golf courses, residential suburbs and small urban parks using ultrasonic sound recorders to record the unique acoustic sound that each bat makes. We recorded the presence of all 12 bat species known to occur in the area. The number of ultrasonic bat sounds recorded each night was used to assess overall bat 'activity' in each area.

There was far greater bat activity in golf courses as compared to residential areas or urban parks (Figures 9a and 9b). We also recorded the activity of a rare bat species in one golf course, the Eastern false pipistrelle (*Falsistrellus tasmaniensis*) a species considered very uncommon in urban areas.

BIG BIODIVERSITY BENEFIT

Data from the three years of field collection suggests that across all the fauna groups investigated there are huge biodiversity benefits from retaining golf

Each golf course consistently supported a greater diversity of bird species and supported almost twice the bird breeding activity of residential and small park areas ▶

PHOTOMAP COURTESY OF NEARMAP

An aerial photo of Frankston Golf Club, one of the 13 golf courses that took part in the three year project, showing its heavily urbanised surrounds

courses in the urban landscape. The diversity of fauna in nearby residential areas and smaller urban parks is much lower than that in the average golf course.

We did find several species of fauna in residential areas and small parks, but to retain the full suite of fauna species currently in these urban region, keeping large green spaces, such as golf courses, with structurally complex vegetation is critical.

Our data suggests that both the vegetation characteristics of the golf course, as well as the location of that golf course in the urban landscape determine the fauna biodiversity values it can provide. Older courses provide suitable habitat for a wide array of animals, however younger courses that have been landscaped specifically to provide

CONTINUED ON PAGE 12

Golf courses supported a greater abundance of key beetle and bug groups, including predatory bugs such as Assassin bugs that play a major role in insect pest control

PHOTO BY LUIS MATA

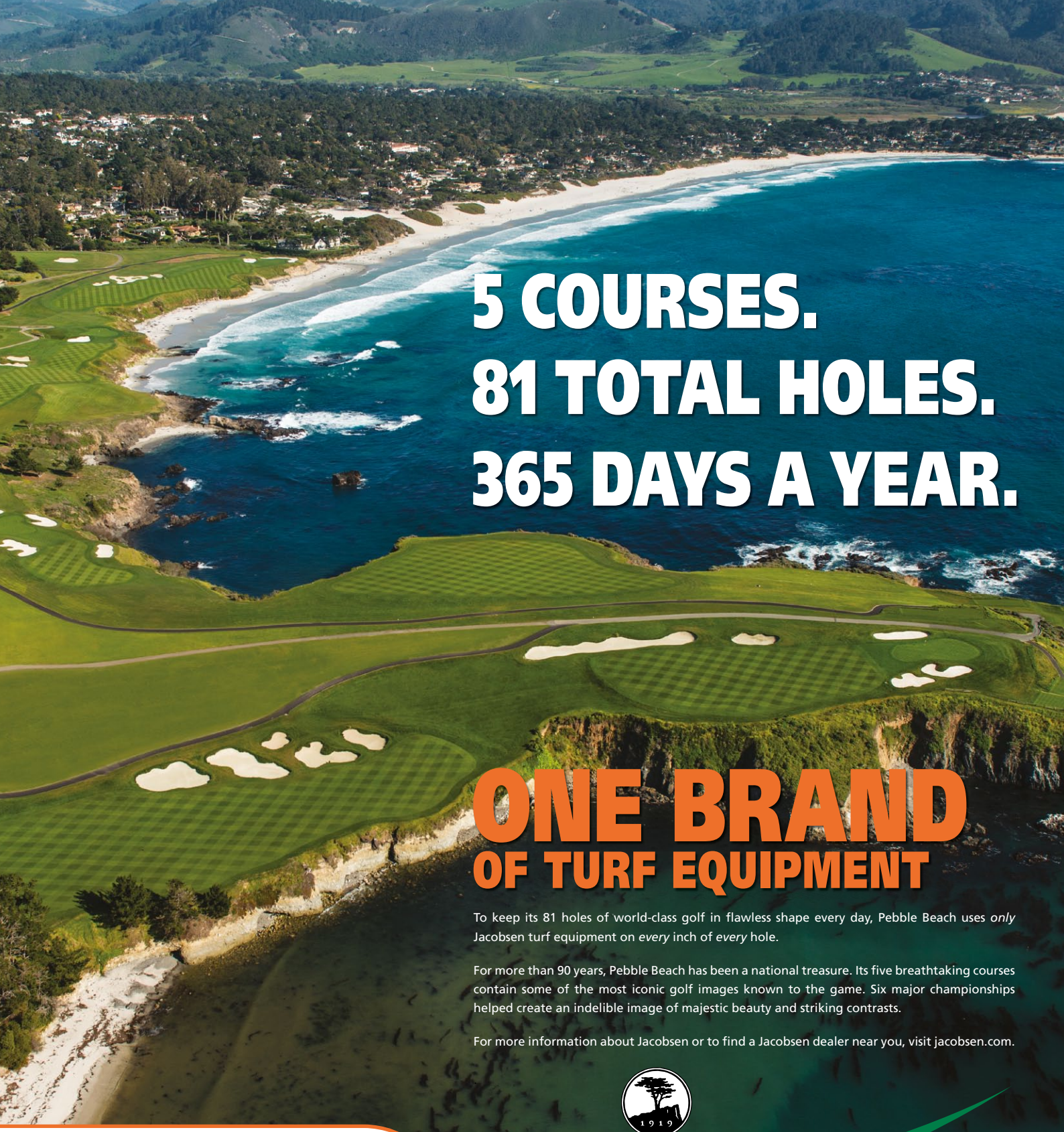
FREE BIODIVERSITY TRAINING FOR SYDNEY GOLF CLUB GROUPS

Since July 2012, the Greater Sydney Local Land Services' Teeing Off Carbon Connections programme has worked with Sydney golf clubs to help preserve existing native vegetation and foster regeneration and revegetation projects. In addition to this, the programme is now offering free biodiversity training for club volunteer and member groups.

If your club has a volunteer group involved in bush regeneration or helping to establish native vegetation and manage weeds on your golf course, the Greater Sydney Local Land Services, in partnership with Golf NSW, is looking for up to three golf club groups to participate in free training. As part of the programme a trainer will come to your club and give a practical half-day training session, assisting with a site work plan and providing follow up advice.

A free superintendent and greenkeeper training day with individual site visits and professional consultation for selected Sydney golf clubs is also being planned later in 2014.

To enquire about the training day or sign up your group for this opportunity, contact Judy Christie on (02) 9895 7753 or email judy.christie@lls.nsw.gov.au.



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ATM/Pebble Beach/09/2014

PHOTO BY LINDA ROGAN

When compared to nearby residential areas and nature reserves, golf courses on average supported a greater number of different bee species such as *Euryglossinae*

Dr Caragh Threlfall uses a sweep net to sample insects in out of play areas

CONTINUED FROM PAGE 10

fauna habitat also contain a wide diversity of fauna species. This suggests that the diversity of species in golf courses likely improves over time, especially if patches of unmanaged long grass, remnant vegetation and large old trees are retained.

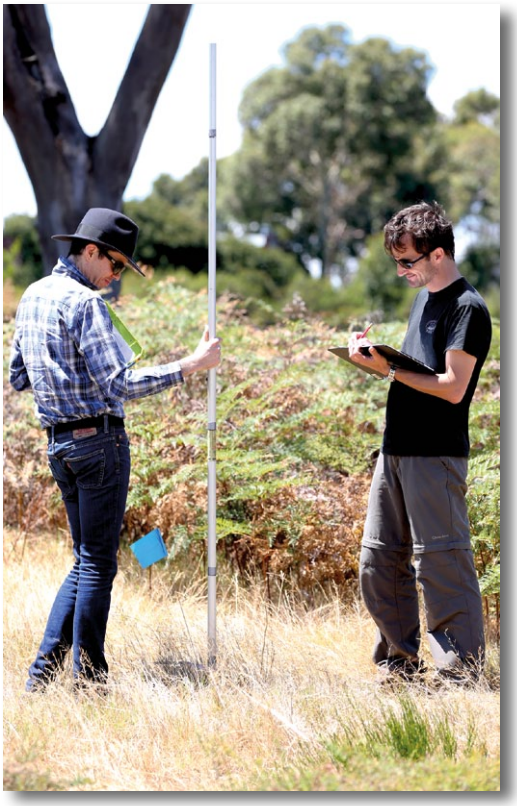
IMPROVING THE BIODIVERSITY VALUE OF YOUR COURSE

Golf course managers and superintendents that want to maintain or improve the diversity of native fauna on their courses should focus on restoring a range of vegetation conditions. These include:

- Increasing the proportion of native vegetation planted;
- Retaining native trees >40 cm in diameter as a priority, using ecological arboricultural practices to ensure public safety and structural integrity are also delivered;
- Allowing understorey vegetation structure to develop or be planted; and
- Allowing ecological features to develop at ground level, such as leaf litter accumulation, decomposing logs and exposed rocks and bare soil.

Upon reflection, this study demonstrates the great biodiversity benefits that large urban golf courses are providing to all of us. The retention of these important large urban green spaces and the management of these spaces with greater consideration for the biodiversity they support can only increase the playing experience and the overall liveability of Australia's towns and cities.

Right: Project team members Lee Wilson (left) and Alessandro Ossola undertake vegetation surveys to determine structural complexity



Using sweep nets, researchers caught over 9000 individual bugs and identified 119 bug species as part of the project. Pictured is the herbivorous *Mustaca* species

PHOTO BY LUIS MATA

ACKNOWLEDGEMENTS

This article has been compiled by Dr Caragh Threlfall, Dr Nicholas S.G. Williams, Dr Amy K. Hahs, Dr Nigel Stork, Jess Baumann, Jess Mackie, Luis Mata, Alessandro Ossola and Dr Stephen J. Livesley. For more information about this project and its findings, contact Caragh at caragh.threlfall@unimelb.edu.au or Stephen at sjlive@unimelb.edu.au

Editor's Note: At the 30th Australian Turfgrass Conference, Drs Threlfall, Williams and Stork gave a plenary address about the biodiversity study. Shortly after the conference, delegates were sent an email containing a link to the suite of webcasts which included the biodiversity presentation. This will be made available for general viewing in the lead-up to the 2015 conference. Drs Threlfall and Livesley also gave a presentation on the project at the 29th Australian Turfgrass Conference on the Sunshine Coast in 2013. This webcast can be viewed through the 'Webcasts' tab on the AGCSA website.

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Valhalla Golf Club in Louisville, Kentucky hosted its third PGA Championship from 7-10 August

PHOTOS: MARK HARKNESS

Major taste

Melbourne-based qualified greenkeeper Mark Harkness has been a regular volunteer at Australia's major tournaments throughout his career. In early August, off his own bat, he journeyed to Louisville, Kentucky to be part of the tournament crew at Valhalla Golf Club for the 2014 PGA Championship.

The wonderful thing about being a greenkeeper is the opportunity to volunteer at major tournaments. Since 2008, when I was completing my apprenticeship at Kingston Heath Golf Club, I have always sought to broaden my turf management experiences by seeking volunteer opportunities at tournaments. Whether it's raking bunkers, divotting or having the responsibility of cutting greens, being involved provides a tremendous insight into tournament preparation techniques as well as helping to foster many lifelong friendships.

The excitement and pressure that comes with tournaments started for me when Kingston Heath hosted the 2008 Australian Women's Open. Since then I have gone to volunteer at the 2010 and 2014 Women's Opens (Commonwealth and Victoria), 2011 Australian Masters (Victoria) and the Emirates Australian Open at Royal Sydney in 2013. I will be returning to Sydney this November to be part of Phil Beal's crew for the 2014 Open which heads back to The Australian Golf Club for the 18th time in its history.

With a number of local tournaments on the CV, last year I decided it was time to experience something on a bigger scale and started making enquiries about working at one of the US-based 'majors'. That led me to contacting Roger Meier, course superintendent of Valhalla Golf Club in Louisville, Kentucky which was hosting the 2014 PGA Championship from 7-10 August.

Mark Harkness (centre) with Valhalla superintendent Roger Meier (left) and lead assistant Chris Habich

After a number of emails back and forth I managed to secure a position as one of 70 volunteers working both 'advance week' and tournament week. The airfares were off my own back and I was fortunate that my employer at the time, Patterson River Golf Club where I was assistant superintendent, allowed me to take annual leave so that I could head across.

After two days of travelling from Melbourne, I finally arrived in Louisville late afternoon on the Thursday (24 July) before advance week. Starting work the very next day, there was very little time to adjust and get over any jet lag. It's well known that advance week is perhaps the most intense period in the lead-up to a tournament, so I was expecting that I would be in for some long days ahead.

Arriving at the course for the first time, your initial view is that of Valhalla's most recognisable hole, the stunning par five 18th with spiral-topped clubhouse in the background. Sponsor marquees ran down the entire left hand side of the hole, while the hole's famed water hazard dominated the right. The 18th looked like a picture – nothing was out of place – and set the scene for what would be a fascinating fortnight ahead.

Arriving at the maintenance facility I was introduced to Roger and his staff. Roger's management team at Valhalla consists of Chris Habich (lead assistant superintendent), Jason Sperring (front nine assistant), Joey Downard (back

nine assistant), Josh Bonifield (front nine assistant in training) and Bryce Yates (back nine assistant in training).

Valhalla is a private members facility designed by Jack Nicklaus which opened in 1986. In 1992, Valhalla was announced as the site for the 1996 PGA Championship and in 1993 an agreement was negotiated whereby the PGA of America purchased 25 per cent of the club. After the successful conclusion of the 1996 PGA Championship, the PGA assumed 50 per cent ownership in the club and announced it would return to Valhalla in 2000 to play the 82nd PGA Championship. At the conclusion of that, the PGA exercised the right to purchase the remaining interest in Valhalla.

Valhalla was purpose-built to host big tournaments, with lots of open spaces for marquees and room for huge galleries, with each green having a stadium feel which makes for great viewing. Since 2000 Valhalla has hosted three US PGA Championships (1996, 2000 and this year), two Senior PGA Championships (2004 and 2011) and the 2008 Ryder Cup where the US team notably ended the Europeans' streak of three successive victories.

MAJOR OVERHAUL

Shortly after the 2011 Senior PGA Championship, Valhalla underwent major reconstruction in preparation for the 2014 PGA Championship. The greens, which had been re-grassed from Penncross to an A1/A4 blend in 2006, were still struggling, especially in the heat and humidity of summer, while a number of underlying issues were also making their management difficult.

After seeking the help and advice from soil experts and undertaking some in-depth research of his own to determine the best grass variety for the greens, Roger, who at that time had only been at Valhalla for a year, recommended that the greens be fully reconstructed. Key to the project was converting the greens to T1 creeping bentgrass on account of the variety's greater tolerance to extreme heat and drought as well as its higher resistance to *Poa annua* invasion.

Initially the greens conversion was the main focus but with the course taken out of play for 12

Looking back down Valhalla's iconic par five 18th hole. The course, designed by Jack Nicklaus, was tailor-made to host major tournaments with its wide open spaces and stadium-like greens complexes

Mark Harkness was on greens mowing detail during tournament week

months Roger took the opportunity to address a number of other issues and literally gave the whole course a makeover. Bunkers were rebuilt, roughs were stripped and re-seeded, intensive fairway drainage was installed (the course resides on a flood plain) and the practice area was completely rebuilt.

A brand new Toro Lynx irrigation system was also installed which saw the number of heads go from 800 to just under 3000. Roger explained that some might think this an overkill, but water efficiency has greatly improved, they can irrigate the course quicker and water usage has reduced as they can now micro-manage areas.

Once the reconstruction work was completed, Roger then embarked on a fairway topdressing programme, going out at 12 tonnes/acre every week. This added upward of 75mm to the profile which proved invaluable come the tournament as after the rain the course received the fairways remained firm and playable with no plugging.

ADVANCE WEEK

The plan for advance week was pretty simple – fine tune the turf, dry the greens down and make sure all bunkers had a uniform depth of sand with firm faces and level bases. True to form, on the Sunday a storm rolled over Valhalla and dumped 43mm of rain which left nearly every bunker needing attention with washaways and contamination. Once the storm had passed, work started immediately to reinstate the bunkers with any dirty sand placed in piles and removed and fresh sand added. Within a couple of days they were back to tournament condition.

My jobs during advance week included bunker work, divotting, mowing greens, repairing pitch marks, blowing and fluffing rough and checking moisture levels. The most invaluable lesson I got during this time was watching Roger's 40 staff go about their work. No job was too big or too small, no blade of grass was out of place and everyone worked with the sole purpose of making the course look its very best.

Each day during advance week would start at 6am with Roger's full-time staff often working through until 10pm and even later on a couple of nights. With most pulling upwards of 12-15 hour days, their commitment couldn't be questioned.

TOURNAMENT WEEK

On the Sunday before the tournament, 70 volunteers arrived for a meet and greet and pre-tournament briefing. All were handed a goodie bag which included our uniform for the week (five shirts – three blue, one white and one red), a hat, wet weather gear, a cigar (nice!), shot of whisky (nicer still!) and a mini baseball bat.

Once the meeting concluded we were all put straight to work with orientation of the course and job training for your allotted task. I was very fortunate to be given the task of handmowing greens 10, 11, 13, 15 and 17 which included Valhalla's signature hole, the island green on 13. From there the countdown began to the players arriving for their practice rounds and the opening round.

I was one of two Aussies volunteering for the tournament, with Living Turf technical sales representative and 2012 AGCSA Golf Championship winner Scott Fogg also on the crew (Scott cut fairways in the mornings and divotted in the afternoons).

All volunteers were accommodated at a local hotel (paid for by Valhalla Golf Club) about 10 minutes away from the course. We were shuttled each day to and from the course in a convoy of four buses. As I arrived earlier than the other volunteers, I was lucky to be able to get lifts in with Roger and

CONTINUED ON PAGE 18

Harkness got to mow back nine greens, including Valhalla's signature island green on 13

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Valhalla's fairways, tees and approaches are Penncross creeping bentgrass, primary rough Kentucky bluegrass and bunker faces zoysiagrass

CONTINUED FROM PAGE 16

his office assistant Scarlett Shumate during those first few days.

Each morning started with a quick chat from Roger about the day ahead and any changes to the morning jobs list. A job checklist and roll call from Chris followed to make sure everyone was on board and ready to work.

With the 70 volunteers complementing the Valhalla crew of 40, every job possible was achievable to make sure the course looked its very best. Some of these included hand-blowing all fairways and roughs with back pack blowers to prevent tyre marks showing and making sure all the water hazards were clean of floating algae and debris.

We cut greens in pairs and I was teamed up with Cog Hill Golf & Country Club intern Isaac Farley. Height of cut on the T1 started at 2.7mm at the start of tournament week and by Saturday was down to 2mm. What follows is a breakdown of our greens mowing regime from the Monday through to Sunday.

- Single cut morning and afternoon Sunday, Monday and Tuesday;
- Wednesday and Thursday single cut or backmowed (coming back down on the same line);
- Friday morning single cut and afternoon backmow;
- Saturday backmow morning and afternoons (green cut four times);
- Sunday all greens double backmowed as well as rolled. With rain forecast during the day, the aim was to have all the greens around 14 feet on the stimpmeter.

Once a green was mown, a stimpmeter reading was taken and then the decision made to either hand roll or cut again. After this the green was stimped again and firmness readings taken. Greens

AT A GLANCE – 2014 PGA CHAMPIONSHIP, VALHALLA GOLF CLUB

THE COURSE AND CREW

- **Opened:** 1986.
- **Designed by:** Jack Nicklaus.
- **Yardage:** 7540 yards, par 72 (Slope Rating 148).
- **Annual rounds:** 17,000.
- **Area:** Total property 180 hectares – greens 1.2ha, tees 1.2ha, fairways 10.5ha, primary rough 20-22ha, maintained native areas 90ha.
- **Bunkers:** 65.
- **Soils:** Clay. Greens profile – USGA (85% sand/15% peat).
- **Superintendent:** Roger Meier (36).
- **Valhalla maintenance crew:** Full-time staff numbers are 40 during summer which include up to eight interns. During the tournament the interns would set up all machinery morning and night. Staff levels reduce to 15-20 over winter.
- **Tournament volunteers:** 70 (from 28 US states and four overseas countries).

THE TURF

- **Greens:** T1 creeping bentgrass (Jacklin Seed) – reconstructed in 2011 and converted from Penn A1/A4 blend.
- **Tees, fairways and approaches:** Penncross creeping bentgrass.
- **Roughs:** 90 per cent turf fescue mix, 10 per cent Kentucky bluegrass.
- **Intermediate rough:** Kentucky bluegrass.
- **Bunker faces:** Zoysiagrass.

THE EQUIPMENT AND HOC

- **Greens:** 10 x Jacobsen Eclipse 18". Height started at 2.7mm at the start of tournament week and by Saturday was down to 2mm.
- **Tees and approaches:** 10 x Jacobsen Eclipse2 23". HOC 8mm.
- **Fairways:** 12 x John Deere 8000 E-Cut three-wheel. HOC 10mm.
- **Roughs:** 3 x Toro 3500-D cut at 80mm. Cut on the Sunday and then left for the remainder of tournament week. Intermediate rough cut at 30mm.
- **Other equipment:** 50 transport vehicles (5 x John Deere Gators and 45 Club Car utilities); 40 Stihl backpack blowers.

were rolled with water-filled hand rollers twice daily. This enabled Roger to vary rolling weight as required (when full the rollers weighed 320kg).

In the afternoons we were required back on course by 4pm. The afternoons started with Roger once again saying some words of inspiration and to help motivate the crew he also organised a series of guest speakers. Among the speakers were Major Dan Rooney (a US Air Force F16 pilot, creator of Patriot Golf Day and owner of The Patriots Golf Club), Greg Fischer (Louisville mayor), Ted Bishop (PGA president), Walt Gahm (son of Valhalla GC founder Dwight Gahm), Kerry Haigh (Championship director) and Keith Reese (Valhalla general manager).

All these speakers spoke to us about the opportunity we had been given, to keep working hard and that our efforts were being noticed. A magnificent buffet dinner then awaited us and each night had a different theme – pasta, BBQ, Mexican, roast; needless to say the food was amazing.

Chris would then go through the afternoon job sheet and once the all clear was given we were back out on the course. Afternoon jobs included mowing and rolling greens, mowing non-championship tees, divotting the course, fly-mowing bunker faces, cleaning out bunkers and smoothing out the bases.

In addition to the main cultural practices, Valhalla's spray units were out in force nearly every day. Being situated in the US 'transition zone' where heat and humidity are constant factors, Valhalla has a very proactive and well-managed fungicide and fertiliser programme in place and this was very evident during tournament preparations with all surfaces receiving multiple applications.

The T1 creeping bentgrass greens were cut at 2.7mm at the start of tournament week and by the third round were down to 2mm

Moisture management was also a big priority with TDR300 Fieldscout moisture probes used to monitor moisture levels in the greens. Greens, tees, fairways and roughs were handwatered only throughout the tournament, but with the rain later

The fairways were maintained by a fleet of 12 John Deere 8000 E-Cut mowers

in the week this wasn't an issue. On the Friday and Saturday nights once play had stopped for the day, two Precision Air units were used to draw as much water from the greens profiles as possible. These were manned by Roger's full-time staff with some of these guys pulling 30+ hours on the clock.

As it had done just ahead of advance week, the weather would play a significant role during the final three rounds of the tournament. Some 25mm rain fell on the Friday followed by a further 5mm on Saturday. However, it was the 20mm that fell in just 25 minutes on the Sunday that really caused chaos with organisers suspending play for more than two hours.

During times of forecast rain the tournament crew was on standby to squeegee surfaces if required. On the Sunday half of the volunteers had left to go back to their own courses following the morning preparations, and at around midday we were a little short on numbers when the warning came through that another intense rain cell was approaching the course.

That downpour left the course flooded, but with some hard work over the next hour and half all water was squeegeed off greens and fairways and bunker washaways hastily repaired. When play resumed the course didn't look at all like it had just been hit with 20mm of rain. Conditions were perfect and the greens remained firm and there were no complaints from the golfers.

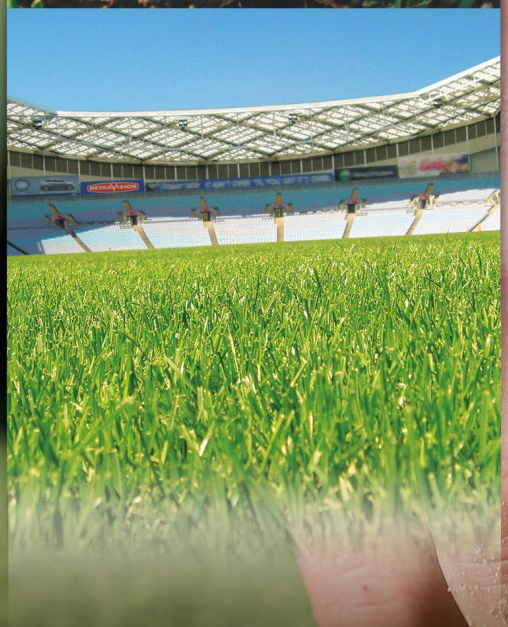
Due to the rain delay, by the time tournament leader Rory McIlroy stepped on to the 18th tee, it was already near dark. Not wanting to come back the following day, tournament officials allowed McIlroy to hit up on Phil Mickelson and Ricky Fowler in the group ahead with both his tee shot and second shot. In what proved to be an historic end to the tournament, McIlroy prevailed by a shot to clinch his second consecutive major and become just the fourth player in history to win four majors at the age of 25 or younger (the others being Tiger Woods, Jack Nicklaus and Bobby Jones).

During my time at Valhalla I formed some lifelong friendships and I would like to thank Roger and all his team for making my time there such a great experience. Every aspect of the tournament was huge – the crowds were enormous every day from the Monday through to Sunday – and it gave me a superb insight and appreciation of how the American's prepare their courses for such prestigious events.

One of the personal highlights came on the Wednesday of tournament week when the GCSAA's director of communications and media relations Craig Smith took me up to the clubhouse and into the players' dining area and then out to the practice area. While there I was able to have a chat with Australian hopes Marc Leishman and Adam Scott one-on-one which was a tremendous opportunity and one that I will never forget.

Below: Valhalla's greens were ripped up following the 2011 Senior PGA Championship and converted from Penncross to T1

Right: 20mm of rain in 25 minutes forced the suspension of play for two hours during the final round



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Natadola Bay Golf Course more than held its own for the 2014 Fiji International, its wall-to-wall seashore paspalum surfaces presenting beautifully for the inaugural tournament

International exposure

Following on from last edition's preview of the PGA of Australasia's inaugural Fiji International, Natadola Bay course superintendent Steve Lalor looks back at the successful staging of the country's first internationally televised golf tournament.

The 2014 Fiji International was played from 14-17 August at Natadola Bay Golf Course and was considered to be a great success by all involved, including eventual winner Steven Jeffress. Hitting the very first tee shot of the tournament, Jeffress went on to sink the last putt of the tournament as he birdied the 72nd hole to claim the title by four shots from fellow Aussie Jake Higginbottom, finishing with a four-round total of 10-under.

As outlined in the previous edition of Australian Turfgrass Management Journal **(Natadola's international debut – ATM Vol. 16.4 p6-12)**, since the announcement that the Fiji International was coming to Natadola last September, a raft of course improvement works had been undertaken to get the course up to tournament standard. Although the course has held a number of significant tournaments in the past, this was the country's first internationally televised tournament which placed an increased emphasis on ensuring all the behind-the-scenes elements came together.

To get the course up to such a standard took a lot of hard work from Natadola's all-Fijian maintenance crew along with a few compromises here and there with event organisers to achieve the dream. We were all aiming for the same goal, so to carry out tasks that changed the golf course slightly were not an issue. To facilitate this, the course maintenance team did around 100 hours a week of overtime in the six week period leading up to the tournament, focusing on the smaller jobs to improve the playability and appearance of the course as directed by event organisers.

HELPING HANDS

In the weeks leading up to the tournament we gratefully received some new Jacobsen equipment and put it to work straight away. There were some hiccups with the new machinery but Jacobsen were great and helped us out accordingly.

Our mowing schedule increased from mowing tees, fairways and aprons twice a week to three times a week six weeks out from the tournament. Our cutting heights did change slightly due to green speeds and firmness of fairways. Greens were set at 2.75mm two weeks out from tournament and fairways were dropped to 8mm six weeks out. Greens were rolled three times a week for the month before the tournament.

Initially we applied Primo to the seashore paspalum greens at a rate of 800ml/ha and then weekly at 500ml/ha for four weeks prior to tournament. We also applied a fungicide to the greens two weeks out.

The rough wasn't mown for two weeks as soil temperatures were considerably lower which didn't allow the turf to grow to the desired height. We tidied up the roughs the week prior to the tournament and that was enough to see them through.

PHOTO: PAUL LAKATOS/ONEASIA

With the extra pressure and scrutiny that comes with hosting a televised tournament, we were very fortunate to have a several Australian superintendents and greenkeepers make the journey across to volunteer (mostly southerners to get away from the cold winter!).

Along with ex-pat Australian superintendent Dave Brennan who travelled down from Denarau Golf and Racquet Club near Nadi, Steve Harris (The Vintage), Ryan Markwell (Magenta Shores), Tom Smith (Waterford Valley), Dan Brien (St Andrews Beach), Brett Nay (Clarence Valley Council), Craig Easton (Simplot Partners) and Shane Summerhayes (Turfcare NSW) joined the crew. Their experience and hard work proved valuable during the week.

My initial thoughts were not to work these guys too hard as they had come over at their own expense, so I planned for them to only work the morning shift so they could see some of the country after we finished set-up. I wanted them to feel a part of the team so I paired them up with some of the local crew members mowing fairways, changing holes and ensuring the detail on each hole was consistent and directing the local crew on tournament preparation.

They started at 3am on the Monday of tournament week and there were some bleary eyes. The international volunteers had to drive for an hour to get to Natadola from Nadi each day, so a nap on the way was standard for the week.

PHOTO: PAUL LAKATOS/ONEASIA

Steven Jeffress prevailed by four shots at Natadola to collect the $US180,000 winner's cheque

Natadola superintendent Steve Lalor (second from right) was able to call upon the expertise of a number of volunteers who came across for the tournament, among them (from left) Shane Summerhayes, Tom Smith and Dave Brennan

Below: Just 10 days after the tournament had finished, Natadola's 8th hole was hit by bushfire

Below right: Lalor praised the efforts of his all-Fijian crew for the manner in which they supported one another and worked in with the volunteers during the Fiji International

Everyone was out working by 3.30am and at 3.45am that Monday I got a call saying that no one could see their lines. We decided to turn a syringe cycle on the greens only to find that the pumps had gone down. Upon inspection, the suction line on the irrigation system had lost all pressure – a great start to the week! What else was in store for us?

Luckily that was the worst thing that happened for the whole week. The greens were running at the desired speed and the feedback from the players during the practice rounds was all positive. There were five greens (4, 5, 8, 9 and 11) that did require some extra water due to them being too firm given their undulations. This was rectified on Tuesday and they improved considerably for the Pro-Am (Wednesday) and tournament proper.

We topped up the greens with water every night during the tournament and added extra water on the five firm greens every morning before play to ensure consistent speeds throughout. The greens were single cut only each morning and we only ended up rolling them once as we were instructed to keep the rollers in the shed.

Put simply, my local team outdid themselves, especially considering the magnitude of this event which most had not experienced before. The teamwork and support that they showed towards each other, as well as the international volunteers, was fantastic and I could not have asked for anything more from them.

Prior to the final day's play, tournament directors Andrew Langford-Jones (PGA of Australia) and David Parkin (OneAsia) addressed the crew to show their appreciation of the way in which the course was presented and the work the crew had achieved to get it to tournament standard in such a short amount of time. It was very well received by the guys and a great motivator for future tournaments.

I must give special thanks also to the international volunteers. Without these guys the tournament would have been more demanding on myself and the crew. Special mention must go to Ryan Markwell who stayed with me for a week and a half to help out. I have known Ryan for 16 years and have worked with him on several jobs, including the construction of Natadola Bay. It was great to have a person like Ryan by my side for this event and I look forward to seeing him and this year's international crew again next year.

ROLL ON 2015

This year was in many respects a trial for all parties and the 2015 event will see a number of changes, the main one being the shifting of the tournament to an October timeslot. There will be a few changes to the course as well but these will be confirmed once the PGA of Australia and course owner Fiji National Provident Fund have had a chance to discuss these items and look back over the 2014 event.

As mentioned in the last edition of ATM, there was a three-year plan that was implemented for course works when the tournament was announced, so we will continually action those items. As part of that we have started to clear some of the landscape weeds which will give a whole new look to the golf course and change the way it plays also.

During the tournament I got the chance to discuss a few things with Natadola's original course designer and tournament drawcard Vijay Singh. It was great to hear what his vision of the golf course was to ensure the future success of the tournament.

Finally, as an interesting postscript to the tournament, just 10 days after the players and spectators had left, Natadola was hit by bushfires. Although not uncommon at this time of year, the bushfires razed all the vegetation down the left hand side of the 8th hole – luckily for us it happened then and not when the tournament was on!

Stop Argentine stem weevils.

Ask turf managers which pests are their main concern in golf courses or sports fields and the Argentine stem weevil *(Listronotus bonariensis)* is likely to be named. This is particularly the case in the cooler regions of New South Wales, Australian Capital Territory, Victoria, South Australia and Tasmania.

When dry patch or dried off areas are seen in turf over summer, soil compaction or fungal diseases may be mistakenly taken as the cause, but Argentine stem weevils may well be the real problem.

According to Craig Burleigh, Sales Manager, BASF Turf Solutions, "One of the key indications of an adult Argentine stem weevil infestation in turf is evidence of their movement in lawn catcher clippings."

"Treating Argentine stem weevils in spring is critical as they lay their eggs during September and October before emerging three to four weeks later to feed on turf grass before pupating. As the lavae feed on the plant, they breakdown the xylem cells disrupting the movement of water and nutrients to the leaves. Yellow leaves and wilting are the result giving the impression of drought stress often assumed as dry patch," says Craig

"This explains why the worst periods of damage appear in early November, early January and late February each year," added Craig.

"**Impede**® when applied in spring and as per the label directions, is highly effective in controlling Argentine stem weevil. It spreads through the thatch and targets the weevils directly, preventing the damage which presents in summer months."

"It is the only insecticide currently registered for turf featuring the unique chemistry, fipronil, as its active ingredient," highlights Craig. BASF's innovative chemistry acts as a non-repellent to insect pests, so they cannot detect the product and continue to forage through the soil and thatch layer, picking up a lethal dose.

This unique mode of action not only ensures the control of target pests is highly effective and provides longer term residual control reducing the need for repeated applications.

Adult stem weevils can feed at night, year round on the foliage of cool season grasses. They can also survive for several weeks without food, making **Impede's** residual activity ideal.

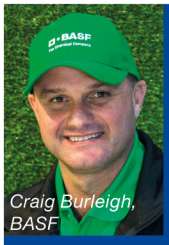
Impede granules are free flowing, uniform in size and produce no dust, so they are easy to apply to the turf with a granule applicator.

The granular formulation also maximises ease of application, bringing peace of mind to turf managers and their staff.

Impede also provides highly effective and long-lasting control of other key pests that damage turf, including Funnel ants and Mole crickets.

Turf managers can now confidently prevent key pest turf damage in summer with a preventative application of **Impede** insecticide from BASF in spring. For more advice about Impede and Argentine stem weevil control this summer, contact your BASF distributor.

Impede®
Insecticide



Craig Burleigh, BASF

If dry patch or dried off areas were a problem in your golf course or sports field last summer, Argentine stem weevils may well have been to blame. Craig Burleigh, Sales Manager with BASF Turf Solutions, describes how taking action with **Impede®** insecticide in spring can prevent damage to golf courses and sports fields in summer.


Argentine stem weevils are one of the most serious pests in cool season turf.

ALWAYS READ AND FOLLOW LABEL DIRECTIONS.

For more advice about Impede and Argentine stem weevil control this summer, contact your BASF distributor.

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The Kingston Heath solution

In the latter half of 2013, Kingston Heath Golf Club undertook a multi-million dollar upgrade of its irrigation infrastructure. Course superintendent and AGCSA member Hayden Mead looks back over what was a unique project and the lengths that one of this country's elite clubs has taken to maximise the efficient use of its most precious asset.

Above: Some 10 years in the making, the recent upgrade of the irrigation system and associated infrastructure at Kingston Heath has set the course up for years to come

More than 10 years in the making, in early 2012 Kingston Heath Golf Club on Melbourne's sandbelt finalised its 'Water Solution' for the ongoing management of the course. This report was wide reaching and investigated a number of components including the irrigation system (pipework and management system), various water sources available to the club, both present and future, and storage options.

Kingston Heath's existing irrigation system was installed in 1989 and over the years had been extended and added to with various improvements. The central control system and controller boxes were Hunter with the majority of sprinklers Toro.

As each year passed by, the reliability of the system became of increasing concern. One staff member was spending about 30 hours a week repairing pipework and sprinklers, while the system overall was considered undersized and needed a major overhaul. The primary issues were twofold:

- The pipework was too small, limiting the amount of water that could be distributed around the course which resulted in only half the fairways being irrigated each night; and
- Single row sprinklers down the middle of most fairways resulted in inefficiencies with the roughs being watered by the overthrow. Consisting predominately of couchgrass, the excess water was causing an undesirable thick/spongy rough. Parramatta grass was also a major concern in the roughs and was only being encouraged to grow due to the amount of water being thrown into the roughs.

Kingston Heath derives its irrigation water from two bores that are tapped into the Moorabbin Aquifer which yield a combined total of 18 litres per second in summer and up to 25l/s in winter. The club has a licence to extract 174 megalitres per year from these bores.

Numerous reports had been presented on the subject of water sources for Kingston Heath over a 10-year period. After years of searching for an alternative source to bore water, including sewer mining and stormwater harvesting, it was realised that the only viable alternative in the future, should bore water not be available, would be potable water.

The yield from the club's bores has been very consistent over a 50-year period, but while this satisfied the club's needs the quality of the water had not. The bicarbonates in the water averaged approximately 220ppm (ideally this would be below 100ppm) and the pH was consistently around 8. Acid injection had been used previously to reduce the bicarbonate levels with good results but at high cost and with the associated WH&S challenges.

New treatment methods investigated included sulphur burning which ticked all the main boxes, in particular the lowering of the pH level, reduced cost and safer operation. By lowering the pH to between 6.0-6.5 from the existing 8.0, the bicarbonates present would drop to around the desired 100ppm.

The other challenge facing Kingston Heath was the lack of above ground storage due to its compact site. Prior to the upgrade, the course relied

BY THE NUMBERS...KHGC IRRIGATION PROJECT

- Upgrade approved in early March 2013. Installation started May 2013 and completed December 2013. Sulphur burner commissioned in February 2014;
- Costs: Irrigation system $1.6 million; tanks $450,000; tank management system $70,000;
- 45 kilometres of pipes;
- 1205 sprinkler heads.

on five old concrete storage tanks adjacent to the maintenance facility which combined have a storage capacity of 480,000 litres. The maximum amount of water which could be used each night in a 10 hour irrigation window was 1ML. This meant that that only half the fairways could ever be irrigated during any one night.

Over the last five years three water storage options were investigated including aquifer storage and recharge, dam construction and the installation of more tanks. After lengthy investigations, tanks were the chosen option. With the sulphur-treated water only to be used on the greens, a separate storage facility was required and to mitigate some of the risk it was agreed that at least two weeks' worth of water needed to be stored to irrigate greens in the event of bore failure.

So, the principal requirements of the system upgrade were:

- Adequate town water mains;
- Treatment of water for greens (sulphur burning system) and separate pipe system for greens (allowing for the distribution of sulphur-treated water);
- New storage facility with a minimum capacity of 3ML;
- A new pump station and associated pipes should have the capacity to irrigate the course in minimal time; and
- Minimal irrigation to roughs.

With the club hosting the Talisker Masters in November 2012, it was decided the project would break ground in 2013. The course was GPS'd in mid-2012 with the upgrade approved by the club in early March 2013. Contracts were signed late March 2013 and installation started May 2013.

DESIGN

Due to the complex nature of the required infrastructure, irrigation consultants Paul F. Jones and Associates were engaged to design the new system. Key components of the brief were:

- Irrigating the course in as minimal time as possible;
- Hard edge sprinklers on all fine cut surfaces, including bunkers, to reduce size of the area under irrigation;
- Coupler points on every third lateral on fairways;
- A separate system to irrigate greens and any sprinkler heads that throw close to the greens.
- New town water system to all drinking fountains, toilets and taps to areas for marquees and public toilets for tournaments.
- New town water supply to all greens for hand watering in the event of no bore water or no power. In total, four mainlines.
- Designing a new pump station to irrigate greens and integrating a sulphur burner with the new tanks.
- Once installed, all pipes, sprinklers, valve boxes to be GPS'd for future reference.

Kingston Heath's old irrigation infrastructure had become increasingly unreliable, as evidenced by this blowout in the middle of the 8th fairway in March 2013 prior to the new system being installed

STORAGE TANKS

Rhino Tanks was employed to construct three new 1ML storage tanks. The tanks chosen were low profile so they weren't obvious to the surrounding area and are housed on a property adjacent to the course that the club owns. The tanks are 24 metres in diameter and 2.9 metres high constructed with concrete ring beams and colourbond steel.

CONTROL SYSTEM AND PUMP STATION

Toro's Lynx Control System was chosen to drive the new infrastructure with electric valve-in-head sprinklers and satellite boxes. It was decided to go with satellite boxes on course for added insurance, so in the event of the central control system ever going down the course could still be irrigated. The majority of the heads chosen were Toro 830, 850, T5 and T7 series sprinklers.

The existing pump shed and five concrete tanks were retained and have been reconfigured for irrigating fairways, tees and any other couchgrass areas. The new pump shed and storage tanks are for the sulphur-treated system, watering greens and any other heads throwing towards the greens.

Two Grundfos Hydro pumps were purchased which relay pump data back to the Lynx central control system. A circulation pump was also installed to circulate water between the tanks and the sulphur burner. An interconnecting valve allows us to connect the untreated and treated bore systems if required in case of pump failure in one of the pump sheds.

WATER TREATMENT AND TANK MANAGEMENT SYSTEM

To treat the bore water, a SS-10 sulphur burner was purchased from Agua Dulce in Salt Lake City, USA. It was oversized for the job just in case irrigation water for the fairways needed treatment in the future.

The sulphur burner burns elemental sulphur (which is in pastille form, 98 per cent pure, that comes in 25kg bags) to create SO_2 gas. The

An aerial shot of Kingston Heath's 17th during installation. Much of the trenching was confined to the rough areas

PHOTOMAP COURTESY OF NEARMAP

Kingston Heath's greens are now irrigated through a separate system which utilises sulphur-treated water

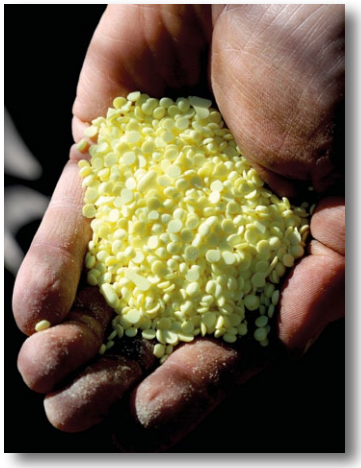
oxidised sulphur blends with irrigation water to create sulphurous acid (H_2SO_3) for the purpose of improving water and soil conditions. Since the sulphurous acid produced in the burner is diluted by water during production, the solution is very mild and has the acidity of lemon juice. The maintenance of the burner is very minimal and we estimate that we will use about one tonne of sulphur per year.

As mentioned above, a circulation pump pushes water through the burner and then into one of the three new storage tanks. The burner continues to treat the water until the desired pH is achieved. Once this has occurred, the tank management system then transfers over to the next tank and treats this water.

The tank management system forms an integral component of the new set up and a Motorola Irrinet system was chosen to handle this. Once it was decided to install a sulphur burner, we realised a control system was required to monitor the pH prior to the water going out on course. When the Irrinet system was shown to us, the capabilities of the product were far greater than we first thought and it was apparent that it could manage everything prior to water going onto the turf surfaces.

Right: Despite good yields from the club's two bores, high levels of bicarbonates in the water led Kingston Heath to install a sulphur burner to bring pH levels down from 8.0 to 6.0-6.5

Below: The sulphur burner burns elemental sulphur to create SO_2 gas. The oxidised sulphur blends with irrigation water to create sulphurous acid for the purpose of improving water and soil conditions



The final system we now have in place was designed by Toro's Richard Howe who did a great job bringing together what is a highly complex system behind the scenes to enable it to do everything we needed it to. The system controls and monitors all the workings of the irrigation system including tank levels, valves, bores (fills, depths and flows), pH levels in the tanks, the circulation pump for the sulphur burner and controls water going onto the course at the desired pH.

The process to integrate the sulphur burner with the tank management system was complex, however, once installed it has been very simple to operate and control with all inputs hard-wired back to a computer in the maintenance office.

It has been very handy to be able to monitor bore flows and depths of water above the bore pump. We now know exactly how much water is in any tank at any one time and the pH of each tank. It eliminates any guess work and manually monitoring the pH and water levels of the tanks. We are able to change what tanks we water out of each night simply with the click of a mouse button.

INSTALLATION

The installation of the system and tanks went very smoothly. The hardest and most drawn out part of the process was having the permits approved for the tanks as they were situated in a green wedge zone. Once this was finally approved the tank construction was very quick.

The installation of the pipework, sprinklers, pump shed and sulphur burner was carried out by Superior Green. Luke Marsh and his staff did a fantastic job of installing what was a complex system with minimal disruption to members.

In mid-May 2013 the old system was completely shut down and the trenching began with an estimated

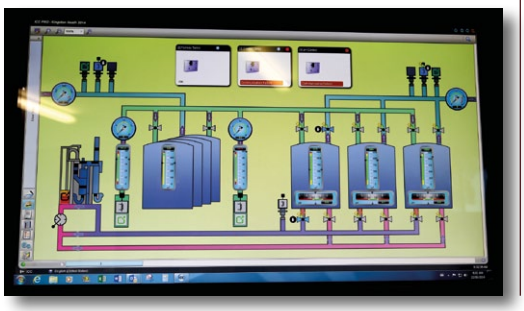
timeframe of seven months to complete the project. The only pipes in the ground the contractors needed to work around were the existing drainage pipes.

We were fortunate that we could turn on the new system as it was being installed, however, despite the first section being completed it was a couple of months before water became available. Unfortunately during this time we had some major issues with nematodes in the greens. Without having water and needing to apply a chemical to control the pest, it was very difficult washing in chemicals with 2000 litre tanks. Prior to the old system being shut down, a pre-emergent fungicide and herbicide were applied over the entire course to reduce the chances of any outbreaks occurring.

The four mainlines that were installed were dug with an excavator to fit all the pipe work in one trench. We are very fortunate at Kingston Heath that there is a lot of sand in the roughs so the majority of these trenches were placed in these areas and then backfilled with minimal visible impact. The contractor compacted and backfilled all mainline trenches ready for turfing where required. Once the laterals were all ploughed in, the course staff then compacted all the trenches and turfed around the sprinkler heads.

It was very easy to stage the install as Kingston Heath has 19 holes. One hole was taken out at a time and the members were able to play nearly the full course during the entire installation, with only a

To remedy a lack of water storage capacity, three 1ML tanks were constructed on a property the club owns adjacent to the course. The low profile tanks store the sulphur-treated water used for greens irrigation



A complex tank management system enables Kingston Heath staff to fully control and monitor all the workings of the system, from tanks and bores to pumps and water treatment infrastructure, from the office

The new pump shed (installed as part of the sulphur-treated system) comprises two Grundfos Hydro pumps as well as circulation pump (right) to circulate water between the tanks and the sulphur burner

handful of occasions when tees had to be brought forward. The only inconvenience was that during the install there was no water to drinking fountains and limited water to toilets.

One of the main challenges for the installers was a 'barrel drain' which runs virtually diagonally through the course. This concrete drain is approximately 400mm in diameter and only 200mm below the surface, which was right in the line of the pipe work.

There were many modifications done on the run mainly around limiting water into the roughs and locations of hand watering taps. Each green has two sulphur-treated taps, one town water tap and all tees have one untreated bore water tap.

As the greens and collars are A1 creeping bentgrass, we decided as we marked out the first green to change all positions of our greenside sprinklers to go on the outer edge of the 1.6m collar. This has enabled us to now manage the collar and green as one, as all other fine cut turf is couchgrass. Another added benefit of this is we don't have any sprinkler heads on the putting green edges and, where possible, taps and valves are located in the roughs and not on the fine cut turf.

Being on sand, we were fortunate that we lost very few days due to wet weather and by late September 2013 all greens had water to them. The installation was completed in late December and in January the contractors went around and lifted or lowered sprinklers as required. The final component was the commissioning of the sulphur burner which occurred in February 2014.

SIGNIFICANT IMPROVEMENTS

Since the new system has been live, we have seen a reduction in water usage and marked improvements in efficiency and ease of management. In the peak of summer we previously used up to 1ML to water the entire course, but with the new system we can now water the entire course with about 940KL. We have also seen a great reduction in the thickness of the couchgrass rough and also the severity of the Parramatta grass.

Eighteen turf sensors have been installed in various areas around the course and the data we are receiving from them has been very helpful with irrigation management. They have taken a lot of the guess work out of when and when not to irrigate. We can also operate all manual irrigation from iPads or iPhones and not radios.

Having gone through such a major project as this, one recommendation for others looking to embark on something similar is to make sure you run plenty of spare wires to valve boxes etc for future use; we are always adding sprinklers.

Our course staff did a fantastic job installing the turf and reinstating the trenches once all the pipework had been laid. They also removed every sprinkler from the old system, capped the old pipe work and plugged it with turf. Not surprisingly by the end of it the team were extremely happy to see the last sod laid!

With four separate mainlines to install, an excavator was required to create trenches wide enough to accommodate some 45km of pipe

Below right: An aerial photo showing the location of the new tanks in relation to the Kingston Heath maintenance facility. Towards the bottom left of the photo are the five existing concrete tanks (480KL total capacity) which are now used for irrigating fairways and tees

One of the main challenges for the installers was a 400mm diameter 'barrel drain' which runs diagonally through the course

PHOTOMAP COURTESY OF NEARMAP

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Find out from colleagues, members and trusted friends who are the people who have power in your club and develop excuses to connect with them

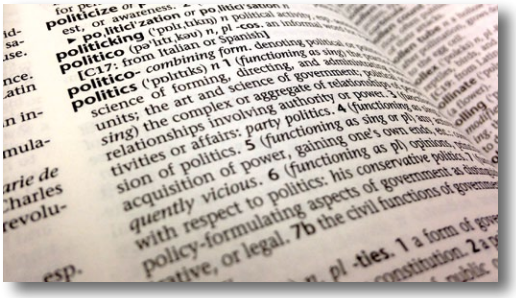
Being super savvy

At the recent 30th Australian Turfgrass Conference, popular keynote presenter David Bancroft-Turner espoused to delegates the importance of developing an understanding of and engaging in the political landscape at your golf club or organisation. Easier said than done! Here he follows up with some pointers on how to take that all important first step.

Golf club politics... surely there aren't any? Members who come together with the purpose of enjoying and sharing this wonderful game we call golf, hosting old and new friends, eating and drinking at the 19th, generally getting along and telling tales of the various shots that were great or not so great. Sounds idyllic doesn't it?

Let's go behind the scenes for a moment... a captain that nobody likes, a professional that the members would like to get rid of but can't, committees that are populated with the same (retired?) people year after year, groups formed around various personalities, the member from hell that complains about everything, greenkeeping staff that seem to delight in making it as difficult for members as possible. Ah, the joys of working at a golf club – the frustration, angst, time-wasting... aaarrrgghhhhh!

Golf clubs are like any other formalised groups of human beings. Where there are three or more gathered together, thou shalt have politics. But actually it's worse than that as golf clubs have an added dimension that companies and the like don't have – people who have time on their hands, a group, generally retired from working life, who have agendas only known to themselves interacting with the paid service providers within the club who don't have this time luxury, in fact the opposite.


politicize ... politicking ... politico ... politics

So let's take a step back and get some clarity on what we are talking about here – club politics. Note the small 'p'. So we are talking about the behaviour of all people associated with the club, but what actually is 'politics'? One definition would be 'the informal, as opposed to formal, way of getting things done'.

For example, when I was a committee member of my local golf club and keen to propose a new way of doing things, I chose to approach all of the other committee members for their views and asking for their support. When I had that support I attended the committee meeting to put forward my idea. But I already knew the outcome. The question to you is this; in your opinion was I skilful or manipulative? Let's look at both views...

- **You're skilful:** Getting others people's views first, tweaking your idea as a result of their input, asking for support is all about getting clarity of direction before you get the official rubber stamp of approval at the meeting.
- **You're manipulative:** Why didn't you present your ideas in the open at the meeting where everyone could discuss the relative merits, all could have a say and then vote on it?

I don't subscribe to the idea that one is good and the other is bad (or vice versa), they are just different ways of getting to the same end point. I don't find it helpful to argue which one is right and which one is wrong – we will just end up arguing! The key question is – do you know which one is happening at your club?

The first lesson about politics is do not rely on what the club tells you are the processes for making decisions; the real way your organisation works is via the informal processes

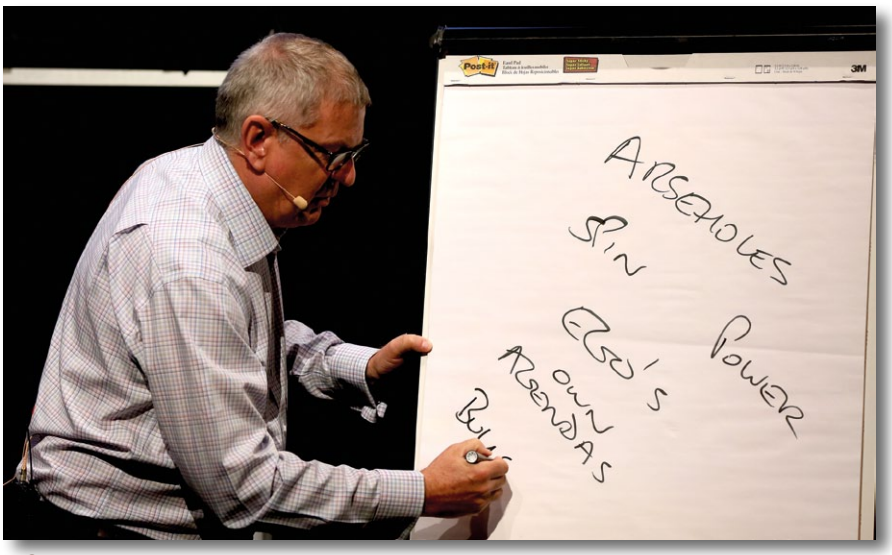
In fact, are you aware of how your club really works? Not how it says it works, but how it really works. This is the art, science and process of managing club politics. If you don't manage the club politics, they will manage you. And what does that mean? You will be sidelined, bypassed, left out of decisions and ignored, have your ability to influence reduced and your power to bring about change deflated. In essence your voice will be but a quiet whisper in the vocal morass that is your club.

What this means in practice, depending on how other people go about their business, is that you will need to use different skills and behaviours to make sure you are not a victim of however they go about their decision making.

So, are you convinced yet that you need to be on top of your club politics? I wasn't until something happened to me when I was working my first job in a bank. My good friend Neil and I had joined the bank on the same day, on the same grade, on the same employment scheme.

After a promising start I thought I was doing quite well and seven months into my new job Neil was promoted, walking into the office with his letter, proudly showing it to anybody who would listen and talking about what he was going to do with his pay rise. 'Congratulations, well done, fantastic news' I said, but inside I was in turmoil. 'How did he manage that? I'm better than him, aren't I? Where's my letter?'

Two days later I found myself at the coffee machine with the admin manager and raised the subject. 'Well,' he said, 'If you had spoken up about the good work you have been doing, like Neil, perhaps the big boss would have recommended you as well for that promotion'. 'What do you mean?' I thought, 'Doesn't my work speak for itself?'. Obviously not!



Club politics carries many negative connotations, but it is important that superintendents become more aware of the political landscape that operates at their club

The next day I accidentally bumped into the big boss (actually I had waited outside the staff restaurant for 55 minutes waiting for him to turn up). He asked me to join him for lunch which gave me the opportunity to tell him how brilliant I was. Skilful or manipulative? Your choice!

The point being is that I was relying on the 'formal' processes within the organisation to 'look after' me when actually it is the 'informal' processes that I needed to learn and to make sure I am tapped into them. That was my first lesson about politics – do not rely on what they tell you are the processes for making decisions; the real way your organisation works is via the informal processes.

So, less of the banking sector and me, let's get back to you and your club. Ask yourself these questions...

- Are you clear on how decisions really get made in your club?
- Do you know how information flows through and in and out of the club?
- Are you connected with the people who have access to the power in the club?
- Are you aware of the key people in your club and what their real agendas are?
- Are you able to flex your approach depending on who you are dealing with?
- Do you know when to shut up?
- Are you able to make a bad situation look as if it can be improved, or do you see the downside in everything?
- Do you take time out to be really interested in what is important for other people?
- Do you make the agenda of your boss your agenda?
- Do you really believe that the politics need to be managed?

If you answered 'No' to any of the above, then this gives you a plan of action. An answer of 'No' to the last question means you have no hope. If you don't believe that politics needs to be managed, there is nothing I can do for you, apart from giving you my respect for making a decision that is going to be really tough for you and your career in the future. But hey, good luck!

OUTFOXING THE FOX!

At the 30th Australian Turfgrass Conference and Trade Exhibition on the Gold Coast, keynote speaker David Bancroft-Turner introduced delegates to the four archetypal 'political animals' that generally exist within organisations – the fox, the owl, the mule and the sheep – and their particular attributes.

The 'fox' is an individual who exhibits guile, cunning, is ruthless, has a high level of political intelligence but whose agenda is primarily self-oriented. No doubt superintendents and turf managers would have come across such individuals within their clubs and if you are interacting with somebody you believe may be a 'fox' or is acting 'fox-like', Bancroft-Turner suggests asking yourself the following questions:

WHAT IS THE ISSUE/SITUATION?

- In the overall scheme of things, how important is this to me?
- What is really going on and how long has it been going on for?
- Why am I really concerned and what is the worst that could happen?

WHO IS INVOLVED?

- Who will the activity/outcome affect apart from me?
- Do I fully understand all the people ramifications?
- What might others reactions be if I do something/nothing?
- Has anyone else had this problem in the past?
- Who else do I need to involve and whose support do I need to get?

WHAT DO I KNOW ABOUT THE OTHER PARTY?

- Is it me, my position or my boss they are working against?
- What are they really motivated by and what might be driving their behaviour?
- What real evidence do I have?
- How can I obtain confirmation of my suspicions?
- Is there a hidden agenda? Are they working to their own or the organisation's objectives?
- How much support do they have; a lot or only a little? And who?
- Have they done this to someone before?
- Do I like them?

AM I PART OF THE PROBLEM?

- Am I seen as a soft touch or too nice?
- Is it because I am difficult to deal with?
- Could it be that my motives or behaviour has been misunderstood?
- Could it be revenge for something I did?
- Have I been associated with someone else who is the real target?
- Do we communicate effectively?
- How effective am I at influencing?

WHAT SHOULD MY STRATEGY BE GOING FORWARD?

- Am I really sure there is a need to do something? If so how will I go about it?
- Is there a sequence to be followed and how soon do I need to start?
- Should I approach them directly or work with/through others?
- Who do I need to alert/get onside/build alliances with?
- Are there alternative approaches that are less risky?

If you're smart and decided that you do need to become more involved in club politics then the question becomes what do I do next? Here are some ideas for you to think about:

- Find out from colleagues, members and trusted friends who are the people who have power in your club and develop excuses to connect with them ('connect' is 'trainer speak' for talk to them, listen to them, have a chat, pass the time of day, find out what is on their mind etc...)
- Ask your boss about his or her agenda and what they really want out of working at the club.
- Network (meet, talk, bump into, have a chat, whatever you want to call it) with people that you don't know. Introduce yourself and be interested in what they think about the club.
- Learn the four different personality preferences that exist within organisations (the fox, the owl, the mule and the sheep – see more in ATM Volume 16.4) and practice saying the same thing in four different ways.
- Think back on times that have gone well and not so well – what can you learn from them?
- Ask people that you trust at the club about how decisions really get made.
- Take time with the 'little people' at the club (bar staff, receptionist, secretaries – with a small 's') and develop the relationship with them so you can obtain information and knowledge when you need it (forewarned is forearmed!).
- Practice managing the key political skill of 'Time and Place'. Know when to raise an issue and learn when to keep quiet.
- Focus on outcomes, possibilities, solutions and not problems, difficulties and worries. Develop a reputation for positivity and action – you're a superintendent after all.
- Stop avoiding people you don't like – the best politicians interact with everybody, otherwise they are not going to have the vital information that they need.
- Start to use the informal processes that exist – identify them, where do they happen, when, who and what is covered?
- Accept that it is not only 'what' you do that is being watched by others but also 'how' you do it.
- Learn to talk about yourself and your colleagues in the positive. If you don't, then no one will.

If all else fails, go back to the top of the list and start again. Or, alternatively, you could go home, back to the most political human group of all – the family!

Editor's Note: David Bancroft-Turner certainly made an impression upon delegates at the recent 30th Australian Turfgrass Conference. More than 50 per cent rated Bancroft-Turner as their favourite presenter according to the post-conference survey conducted by the AGCSA.

> "If you don't manage club politics, it will manage you. You will be sidelined, bypassed, left out of decisions and ignored, have your ability to influence reduced and your power to bring about change deflated."
>
> **- David Bancroft-Turner**

AFL talks turf

The demands and scrutiny placed on AFL playing surfaces has never been more intense. In August the AFL brought together curators from all the major Premiership venues along with AFL representatives and stakeholders to discuss a variety of ground management issues. AGCSATech senior agronomist Andrew Peart was among the attendees.

Above: The 2014 AFL season saw the Melbourne Cricket Ground host a total of 45 home and away Premiership matches

On 14-15 August 2014, the AFL held its first ever AFL Turf Managers Conference which brought together curators and turf managers from 16 AFL venues across the country. The current season has seen a total of 17 venues host at least one AFL Premiership match, with TIO Traeger Park in Alice Springs debuting as a venue in 2014.

AFL venues, like the vast majority of sporting ovals across Australia, are not solely dedicated to AFL football. Nearly all venues host cricket during the summer (most notably the MCG, SCG, Adelaide Oval and The Gabba), with the exception of Metricon Stadium (Gold Coast) and Patersons Stadium (Perth), although these latter two venues do host other events over the summer months.

This past year also saw the dramatic conversion of the SCG into a baseball field to host Major League Baseball prior to the start of the 2014 AFL season, while each year Spotless Stadium in Sydney (home to GWS Giants) is annually renovated and converted back into an AFL venue following Sydney's Royal Easter Show.

The concept of having such a conference was instigated by the AFL's ground operations manager Jennie Loughnan. The idea was to workshop a number of issues around the use of grounds not only for AFL Premiership matches but other associated requirements such as hosting Auskick games, team warm-ups, umpire practice, curtain-raisers and 'kick and catch' sessions following matches.

As well as turf managers, the conference also included representatives from a number of different AFL departments – umpires, research, risk management, broadcasting and scheduling and fan development – as well as club representatives (high performance coaches, physiotherapists, doctors and football operation managers) and the AFL Players Association.

AGCSATech, which undertakes monitoring of all AFL grounds prior to the start of each season (both Premiership and pre-season venues), was also represented. The insight from these different sectors provided better knowledge of each other's requirements and how best these could be accommodated with hopefully less impact on the playing surface.

UMPIRES

One of the first discussions on the table centred around umpires and the centre bounce and their need to practice it. Michael Vozzo, former course superintendent at Eastwood Golf Club in Melbourne and a 281-game AFL umpire who is now assistant umpires coach with the AFL, talked about the importance of umpires being able to correctly bounce the ball.

As AFL fans know, the ball is now only bounced in the middle of the ground to start each quarter and restart the game after a goal is scored. Vozzo noted that umpires now work very closely with sports psychologists on the importance of routine in terms of perfecting their bounce technique.

While this is understandable, it does place excess stress on the middle of the ground where umpires are instructed to practice their bouncing. There may be the possibility at some venues to

undertake this on an alternative circle, however, it is not a desirable feature from an AFL markings standpoint as well as the umpires themselves.

Interestingly, it was also suggested by some turf managers that the vast majority of wear on the playing surface over the course of the season was actually caused by umpires, especially immediately behind the goal line, centre circle and corners of the centre square.

PLAYER SAFETY AND PERFORMANCE

The AFL invests a significant amount to ensure that the game continues to be one of this country's most prominent sports and one of the areas in which it leads other codes is the importance it places on player health, safety and welfare, particularly minimising injuries.

Since 1992 there has been an annual AFL injury report. The Australian Sports Commission funded this initial report with the AFL making the decision to continue funding it from 1993 onwards. In 1996, the AFL publically released its 5th annual injury report which is believed to be the first occasion worldwide that a professional sport has openly tabled data on player injuries. While many professional sports these days collate injury data, the AFL remains a leader in the transparency of its results.

As well as funding the annual injury report, the AFL's Research Board also directs money towards sports science and medicine, game evolution, community football, coaching and player welfare. In previous years it has also provided funding to gather information on surface performance in relation to probable causes of injury.

One of the areas of constant risk for the AFL is players practicing kicks for goal prior to the start of games. This has led to the erection of poles and netting structures behind all goals which creates another challenge for groundstaff to remove them prior to the start of play (at present they have just three minutes to do so).

Club representatives also provided a very good insight into the requirements of players, in particular the choice of footwear and how it related to ground conditions. The player's boot ideally needs to be able to provide them with suitable comfort, traction and cushioning to allow them to perform at their optimum with no detrimental impact on recovery. The boot is seen as a crucial element in terms of how the player interacts with the surface and whether his choice of footwear ultimately influences his ability to handle certain ground conditions.

It was suggested by one turf manager that all players wear the same footwear, a little like how F1 drivers must use the same tyres, and the skill is in how they adapt to that environment. However, that idea was quickly squashed based on players' needs for cushioning. The one requirement from the clubs was that ideally ground conditions should be as consistent as possible so that the choice of footwear is far clearer.

Pitchcraft's Richard Winter hosts AFL Turf Managers Conference delegates at Essendon's new training facility at Tullamarine

Another interesting area from an AFL point of view was its desire to have a much closer relationship with fans in terms of their game day experience. At present AFL is the world's fourth highest in terms of spectators attending matches. The AFL is keen to maintain this level of attendance, especially in light of falling levels in Melbourne this season.

Access onto the arena following the game is seen as a possible incentive to attract more spectators to games, especially in Melbourne, as it is a common practice at other venues such as Simonds Stadium, Patersons Stadium, The 'Gabba and Adelaide Oval on eight occasions throughout the season. This, however, comes with huge concerns for the turf manager in relation to turfgrass recovery.

If more fan involvement was to be allowed, greater input by the turf managers would need to be sought and access onto the grounds should only occur when the turf has an opportunity to recover prior to the next AFL fixture. Erroneous objects being discarded, unintentionally or intentionally dropped, is also a huge risk factor that needs to be investigated.

GROUND ASSESSMENT

The assessment criteria currently adopted was also an area of great discussion between all turf managers present. All turf managers submit Clegg hammer readings to the AFL prior to every Premiership game at their venue.

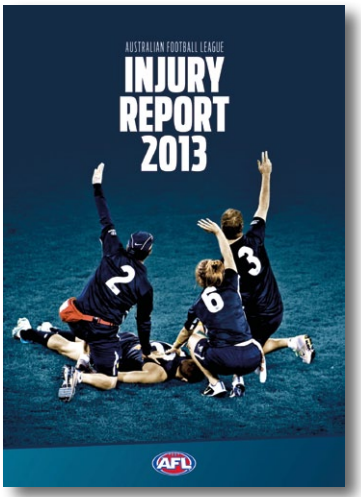
For many years turf managers have undertaken three readings (three drops) at 20 locations over the ground. Over the last couple of years, AGCSATech has recorded only the first drop of the Clegg but at 45 locations over the ground. This was following thoughts by many within the industry that understanding the consistency across the surface was just as important as knowing its surface hardness, with less emphasis being placed on multiple drops.

It would appear that following the conference, as of next year all turf managers will report pre-match Clegg readings to the AFL from 45 locations and with just a single drop.

2014 AFL PREMIERSHIP VENUES AND FIXTURES

VIC: Etihad Stadium (48*), MCG (45) and Simonds Stadium (Geelong, 7)
NSW: SCG (8), Spotless Stadium (Sydney, 8) and ANZ Stadium (Sydney, 3)
QLD: The Gabba (11), Metricon Stadium (Gold Coast, 11) and Cazaly's Stadium (Cairns, 1)
SA: Adelaide Oval (22)
WA: Patersons Stadium (22)
TAS: Aurora Stadium (Launceston, 4) and Blundstone Arena (Hobart, 2)
ACT: StarTrack Oval (Canberra, 3)
NT: TIO Stadium (Darwin, 1) and TIO Traeger Park (Alice Springs, 1)
NZ: Westpac Stadium (Wellington, NZ, 1)

*Total home and away fixtures for 2014 (*does not include 2014 Finals Series*)



Since 1996 the AFL has publically tabled data on player injuries

The AFL is also working closely with a software provider to make the process of entering this weekly data easier for the turf manager as well as far more accessible by competing clubs. It is hoped that the finished product may allow the turf manager to simply upload that information from a hand held tablet directly to the AFL.

As well as the number of locations that the Clegg is dropped, it was also discussed about the possibility of altering the preferred range for surface hardness as well as categorising the suitability of the grounds based on their standard deviation for hardness. This, however, will require some more detailed investigation. There was also discussion surrounding the need of some further research work to further clarify the use of a traction type device to best understand the intricacies of turfgrass coverage, species composition, soil type and footwear.

TRAINING FACILITIES

The turf managers conference concluded with a visit to a number of new AFL training facilities. The condition of the training grounds at AFL clubs has improved dramatically over the last five years or so as was witnessed with visits to Essendon's impressive new training facility at Tullamarine and North Melbourne's upgraded ground at Arden Street.

Essendon's training facility includes two AFL-sized training grounds, one replicating the dimensions of the MCG and the other Etihad Stadium, as well as a 1km running track. The complex also includes a large indoor area with a synthetic turf surface that the players can practice skills during inclement weather. Other facilities include a 25m lap pool and fully equipped gymnasium with an anti-gravity treadmill.

As well as substantial upgrades to these venues, other clubs to have gone down a similar path in recent years include Collingwood (old Olympic Park), Richmond (Punt Road), GWS (Tom Wills Oval), Geelong (Simonds Stadium) and St. Kilda (Seaford).

Above all, the most pleasing aspect expressed by all non-turf manager participants at the conference was the excellent condition of all grounds currently being presented for AFL Premiership matches. It is certainly the intention that the quality of the surfaces remains high and that all stakeholders have an appreciation for the requirements of the turf not just during the football season but year round.

MCG TO OVERHAUL SURFACE AHEAD OF BUMPER CRICKET SEASON

Shortly after the AFL held its inaugural Turf Managers Conference in mid-August, the Melbourne Cricket Ground announced that it would be replacing the entire arena surface immediately following this year's AFL Grand Final.

Almost 20,000m^2 of turf will be replaced as the venue readies itself for a significant events schedule in the coming 12 months, in particular the 2015 ICC Cricket World Cup where it will host five matches including the final on 29 March.

Starting on Monday 29 September, immediately following the Grand Final and MCG Open Day, the $1.7 million turf resurfacing programme will be the most extensive conducted by the Melbourne Cricket Club (MCC) since it reconstructed the field and converted the stadium to host the 2006 Commonwealth Games (pictured).

The MCC has spent several years consulting with other venues around the world to develop a surface renewal strategy that ensures the quality of the turf is world-class and can accommodate the variety and volume of events played at the MCG.

"Since the ground was redeveloped for the Commonwealth Games in 2006, turf replacements have been conducted when required to prolong the life of the turf surface," says MCC arenas operations manager Tony Gordon. "The life span of any natural turf sports surface is not infinite and while our artificial lighting system has significantly reduced the need for turf replacement, the MCG is a high-use venue. Strategic turf replacement is crucial to ensuring our playing surface is among the best in the world. Both cricket and AFL players will enjoy the benefits of this programme."

The entire turf surface will be stripped and re-levelled, amounting to 3000m^3 of material or around 150 truck and trailer loads. At the same time, 10 portable pitches will be installed in the centre before new turf is laid in time for the Sheffield Shield season opener between the Victoria Bushrangers and NSW Blues on 31 October. In November, the MCG will host Twenty20 and 50-over internationals between Australia and South Africa.

The last major reconstruction of the MCG surface occured in the lead-up to the 2006 Commonwealth Games

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Hard and fast

Over the years John Neylan has developed a reputation as being one of the Australian turf industry's leading researchers. In his latest ATM column he looks at a self-funded project he has instigated which is examining the role that sands play in achieving hard and fast putting surfaces.

Above: The issue of surface firmness has become an increasingly common discussion point among superintendents

The requirement of putting surfaces has always been about being firm and reasonably fast. In the 2012 AGCSA golf course benchmarking study it was determined that the elite level clubs provided greens that were firmer, drier and smoother and were considered to be superior putting surfaces. Windows and Bechelet (2010) stated after their extensive study of putting greens in the UK that "If you want your greens to provide an optimum test of golf and perform well throughout the year, then set your sights on firmness first".

The issue of surface firmness has become a common discussion point, particularly during the winter months when there is a greater chance of rainfall and lower evaporation that can keep moisture within the surface. When putting surfaces have a high moisture content, pitch marks are more severe and there is more foot printing and general surface inconsistencies. Having firm, smooth and consistent putting surfaces year round is the aim.

Over the past five years or so there has been questioning of the USGA or perched water table greens profile concept and whether this style of profile is holding too much moisture and contributing to softer surfaces. These concerns have also coincided with a reduction in the traditional spring and autumn greens renovations so as to minimise the disruption to the golfing programme. As a consequence of fewer renovations, thatch accumulation has become a major factor resulting in softer surfaces. Immediately we have conflicting or possibly multiple factors influence the firmness of putting surfaces.

The evolution of greens construction in Australia took its first major steps in the late 1970s and early 1980s as golf clubs moved away from the traditional 'push up' greens to a more formularised method of construction. The 'push up' green is a relatively non-descript means of building a golf green but generally implies that local 'sandy' soils were used with no subsoil drainage. Unless the golf course was actually on coastal sands, the 'sandy' soils are better described as being loamy sands and sandy loams.

These soil types have a higher proportion of fine soil particles, they packed down into very hard profiles during dry weather but had poor water infiltration in the winter months. The move away from 'push up' greens was principally due to the lack of drainage and poor winter performance.

The USGA Greens Section Guidelines provided the template for building greens. The selection of appropriate sands has been an ongoing challenge for the past 30 years. With many of the sands available consisting of rounded particles, stability and firmness has always been a point of discussion and frustration. In Australia there has been a move away from the strict USGA specification for sands because it allows for a relatively high proportion of coarse sand particles which contributes to a lack of stability and surface hardness.

With the recent focus on surface hardness there has been questioning of how greens are being constructed and whether there should be a return to the finer sands and loamy sands. The AGCSA study (2012) demonstrated that a green constructed

using a fine loamy sand soil with a profile depth of several metres consistently provided firmer surfaces throughout the year.

Several researchers (Blake et. al., 1980, Crum et.al, 2003 and Mancino et. al. 1997) have studied the key factors of particle size distribution, proportion of fine soil particles and particle shape on the influence on sand packing and surface stability. These researchers have demonstrated that a higher proportion of fine particles and well-graded sands exhibit greater particle interpacking, greater stability and therefore a firmer surface. Sand particles that are more angular pack into a more stable surface when compared to rounded particles.

Particle shape is a factor that we have no control of with most of the sands used in Australia typically being more rounded and therefore tend to be less stable. However, there is possibly scope to look at sands with a broader spread of particles and a higher fines content.

Based on my observations over many years it was apparent that there was much that was not known regarding sand type, moisture retention and its relationship to stability and hardness. For this reason I decided to undertake a research project to look at the influence of proportion of silt and clay, moisture retention, moisture release, particle shape and particle size distribution and their effects on surface hardness.

RESEARCH METHOD

The research involved selecting eight different sands that represented manufactured sands commonly used in greens construction, coastal sands used for greens construction and a loamy sand that is typical of the Melbourne sand belt. The sands varied in particle size distribution and the proportion of fines (see Table 1 for particle size characteristics of each sand). The fineness modulus and the uniformity coefficient were calculated as a means of determining the fineness of the sands and how widely the particles are distributed.

Uniformity coefficient: The uniformity coefficient (Cu) is defined as the ratio of the sieve size that will permit passage of 60 per cent of the sand by weight to the sieve size that will permit passage of 10 per cent of the sand material by weight. D10 represents a particle diameter for which 10 per cent of the sample will be finer than it. The larger the Cu means the size distribution of particles is widely spread and vice versa. A Cu of 1 means that the sand is uniform with all particles being the same size. Dune sands are often very uniform with a narrow particle size grading. Sands with a narrow grading do not have the internal frictional forces required to make them strong. Sands that are well graded (a broad spread of particles) have frictional forces produced by smaller particles fitting within the voids of larger particles.

Fineness modulus: The fineness modulus is defined as the sum of the cumulative percentages retained on US standard sieve numbers 4, 8, 16, 30, 50 and 100 divided by 100. Sieve openings are 4.76, 2.38, 1.19, 0.595, 0.297 and 0.149mm respectively. A small number indicates a fine grading whereas a large number indicates a coarser material.

To test the characteristics of the sands, mini-profiles were constructed in 50 litre buckets with a 0.4 meter diameter. All buckets had a drainage outlet. For all of the sands, except the very fine loamy sand, the profile consisted of a 10cm gravel layer and 30cm depth of sand. The sand was compacted in 10cm layers using a 2kg weight dropped from a height of 30cm. The weight was dropped 20 times to ensure that the sand was well consolidated. With the sandbelt sand, a 40cm profile was constructed.

Following consolidation all buckets were placed in a large tub filled with water and the profile was allowed to reach saturation by capillary rise. Once the profiles drained a final level of compaction was applied. There were three replicates for each sand type.

The testing regime involved saturating each of the sands and then once drainage had ceased a series of measurements was made for;

- Volumetric water content using a FieldScout 300 TDR moisture probe. Both the 3.8cm and 7.6cm probes were used;
- Surface hardness using the 0.5kg Clegg Impact Soil Tester (CIST);

John Neylan's research project is looking at the influence of proportion of silt and clay, moisture retention, moisture release, particle shape and particle size distribution and their effects on surface hardness

TABLE 1: PARTICLE SIZE CHARACTERISTICS

Sieve size (mm)	% Particles retained*							
	MBS	PGS	PDS	FS1	MS1	FS2	MS2	VFS
2	0	0.3	0.2	0.3	0.1	0	0.6	0.2
1	0.7	0.6	0.2	2.9	1.3	0.4	3.7	0.6
0.5	3.5	11	7.3	21.9	15.8	4.9	26.3	5.1
0.25	40.9	47.6	39.6	46.8	50.0	35.1	48.4	45.0
0.15	49.2	36.2	40.2	21.8	28.3	46.4	18.3	38.3
0.053	4.9	3.8	6.6	3.4	3.7	10.8	2.3	3.8
<0.053	0.8	0.5	5.8	2.8	0.7	2.2	0.5	7.0
Fineness modulus	0.94	0.91	0.84	0.94	0.96	0.87	0.97	0.89
Cu = D60/D10	1.53	1.88	1.93	2.35	2.06	1.62	2.2	2.0
Description**	U/F	MU/F	WG/F	WG/F	WG/F	MU/F	WG/F	WG/F

*Sand gradings done by wet sieve analysis

**U = uniform, MU = moderately uniform, F = fine, WG = well graded

- Infiltration rate using a single ring infiltrometer;
- Intact core samples were taken to determine dry bulk density; and
- Sampling the profile at 5cm increments and measuring the moisture content.

The hardness readings were taken at increments that related to the reduction in soil moisture. When the temperatures were high 2-3 readings were taken over a 12 hour period, whereas during cooler weather readings were taken daily. The tests were run on multiple occasions and the sands were taken to a point where the soil moisture content was no longer decreasing.

RESULTS

A large amount of data was collected and analysed and only a select portion has been included in this report. The association between surface hardness and volumetric water were determined and it generally follows a curvilinear relationship (Figures 1- 4).

The relationship between soil moisture content and surface hardness is peculiar to each particular sand type. The relationship is strong (i.e.: R^2 value greater than 0.9) for most sands, however, some sands did not behave in this particular manner.

The PDS sand is an example of one that had a very weak relationship where the hardness remained reasonably consistent irrespective of the soil moisture content (Figure 2). The PDS sand had a high proportion of fine soil particles but also a high organic matter content. When this soil was wetted up it became very soft ('spongy') and took a long time to drain and even when it was dry the surface was 'fluffy' and soft.

The VFS sand which comes from the Melbourne sandbelt had a very strong relationship between moisture content and surface hardness and typically became harder as it became drier (Figure 1). The fines content appears to lock the particles together and forms a firm surface crust. Even when this sand was at its highest moisture content it still had a high level of hardness. This characteristic has also been observed in the field.

The MS1 sand had a very low fines content and maximum hardness was achieved at about field capacity and tended to became less firm as the soil moisture content declined (Figure 1). This relationship was typical of the manufactured or washed sands. Having maximum hardness at or near field capacity is somewhat counterintuitive to the belief that dry soils relate to the firmest surfaces. These particular sands reach a certain point where they are at a low soil moisture content and there is no binding between particles and consequently under impact there is greater particle displacement.

The maximum and minimum hardness and the percentage change were plotted for each sand (Figure 4). The most obvious result is that the finer sands had the harder surfaces (with the exception of PDS) and the medium sands the least. Most sands had a reduction of about 40 per cent with the VFS having the lowest change in hardness.

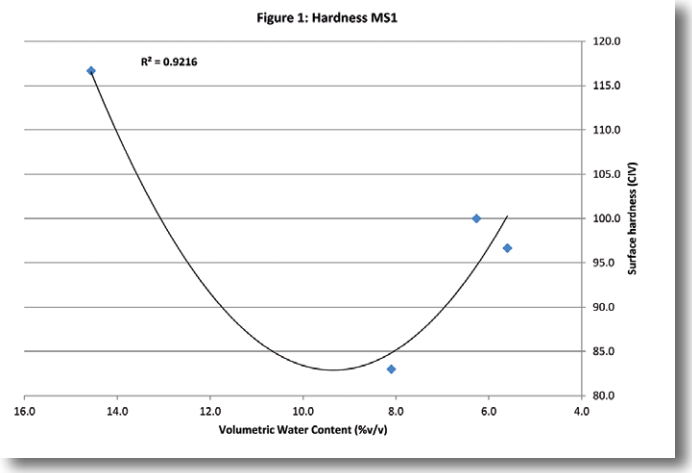
The other important aspect of selecting sand for greens construction is the drainage rate and the ability to remove surface water quickly and

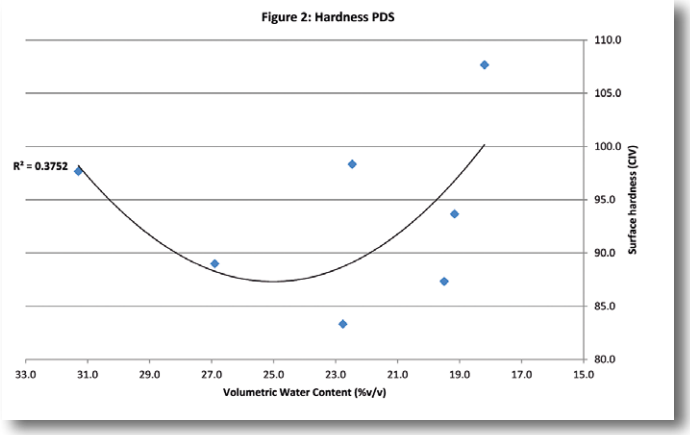
Figure 1. Hardness MS1

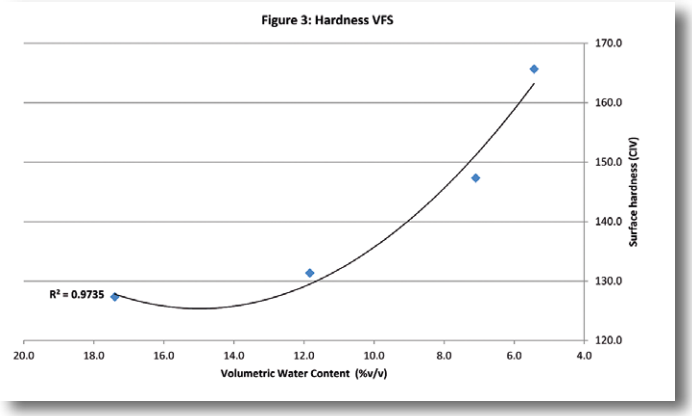
Figure 2. Hardness PDS

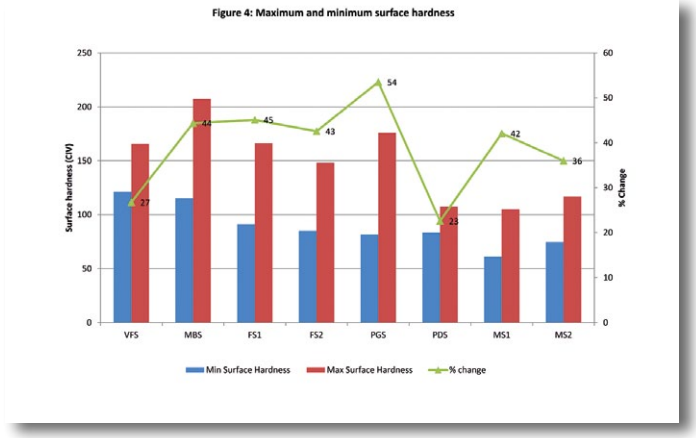
Figure 3. Hardness VFS

Figure 4. Maximum and minimum surface hardness









The research project involved selecting eight different sands which varied in particle size distribution and the proportion of fines

effectively. The infiltration rate tests are detailed in Table 2 and as would be expected the sands that had the least amount of fines and had a narrow particle size distribution had the highest infiltration rate. Bulk density was also measured by taking intact cores and the results were within the expected range (Table 2). The PDS sand had a low bulk density and this reflects the organic matter content and the corresponding resistance to compaction.

CONCLUSIONS

This project has looked at the influence of sand type and moisture relations on surface hardness. Obviously in a putting green situation the firmness of the surface is influenced by the grass cover and the thatch layer. Thatch depth and density in particular can have an overriding influence on the firmness of the putting surface.

Sands that have some fine soil particles tend to produce a harder surface and even as the sand dries the firmness is maintained at higher levels than the sand with very few fines. With the finer sands it is the frictional forces produced by the smaller particles fitting within the voids of the larger particles that maintains the harder surface.

The sands with no fines have maximum surface hardness when the moisture content is near field capacity and this firmness diminishes relatively quickly as the sand dries out. The finer sands generally get firmer as they get drier, however, the firmness is still at the higher end of the scale even when the sand is near field capacity.

The influence of moisture on the sands with a low fines content most probably assists in 'holding' the particles together or more accurately when the voids are filled with water there is less opportunity for particle displacement. As the finer sands get drier they become harder and this is likely due to a slight 'cementing' of particles and that the voids are not as large. Consequently on the finer sands there is less opportunity for particle displacement.

Calculating the coefficient of uniformity and fineness modulus provides some indication of whether a sand is likely to be hard, however, the range of the values are quite narrow and at this time do not appear to provide a particularly clear guide. The proportion of fines is probably the best indicator with about 3 per cent by weight being the point where the firmest surface can be achieved. However, the spatial variability is such that more investigation is required to sort out this relationship.

Some statistical analysis of the data has been undertaken and while there is a significant difference in hardness between the VFS sand (i.e.: firmer) and the MS1 sand, the most interesting factor is the variability in the data between the replicates. As is often discussed with sands and putting surfaces there is always a considerable spatial variability to deal with. Even in such a controlled set of circumstances as this there still exists this variability.

While the data points towards firmer surfaces using finer sands, there still remains the issue of low infiltration rates and excessive moisture retention. With the VFS sand the infiltration rate is very low and well below that prescribed in the USGA guidelines. The key to overcoming this lack of water infiltration is compensated in part by having a considerable depth

TABLE 2: INFILTRATION RATE AND DRY BULK DENSITY

Sand Type	Average Infiltration Rate (mm/hr)	Dry bulk density (g/cm^3)
MBS	450 (68 – 825)	1.51
PGS	223 (150 – 330)	1.52
PDS	68 (53 – 78)	1.34
FS1	256 (217 – 266)	1.59
MS2	1041 (963 – 1147)	1.45
MS1	869 (750 – 1061)	1.53
FS2	296 (206 – 397)	1.48
VFS	35 (26 – 52)	1.45

Fine sand less displacement (top) and medium sand (no fines) greater displacement (bottom)

of sand and good surface fall. The depth of sand is important in providing sufficient hydraulic head to 'draw' the moisture through the upper rootzone. As noted on 'push up' golf greens designed by Alistair McKenzie, there is considerable attention to having multiple surface drainage points.

With the sands with a low fines content, the general principle of maintaining maximum surface hardness is going to be achieved by keeping the moisture content near field capacity. Easier said than done! Interestingly, in summer the sand in golf greens is often kept very dry as a means of creating firm surfaces. Providing that the thatch levels are well controlled through renovations and sand dustings, there is probably a case to be made for keeping the underlying sand at a higher moisture content.

As a general premise I believe that during the summer the profile of these sands should be periodically wetted up and then to allow the profile to dry from the surface down. With a well developed root system the turf should be able to support a dry surface with minimal stress on the turf. Regular light irrigations only keep the surface damp and potentially soft with a very dry and potentially less stable sand beneath.

In field observations of perched water table greens over summer, the perched water table is almost non-existent and there is no moisture rising into the lower rootzone. The perched water table is only going to work if the profile is recharged from time to time and may in fact be beneficial in providing improved firmness.

If we accept the premise that the 'ideal' sand for producing a firm surface will have some fines present, it is important that all of the other physical characteristics are considered such as capillary porosity, aeration porosity and hydraulic conductivity. The other aspect of selecting sands with some fines raises the question of whether a consistent sand can be procured both in the short- and long-term.

Natural loamy sand soils are rare and inconsistent and any sand with a fines content is likely to be a blended product. There is still a bit to be learnt regarding sand/soil mixtures and to what degree particle separation occurs.

This project has only scratched the surface and the second phase has now started where two different sand types are being tested with a bentgrass cover and the influence that thatch accumulation has on surface hardness. The results will be discussed in a later edition of Australian Turfgrass Management.

ACKNOWLEDGEMENTS

This is a self-funded project and I am grateful for the support from several people and organisations for the loan of equipment and the provision of materials. Thanks to Andrew Peart and the AGCSA for the Clegg Hammer, Grant Greenway for the use of the TDR probe and Chisholm TAFE at Rosebud for the use of the soils lab.

The sands were kindly supplied by Rocla, Burdetts, Rod Tatt (Woodlands GC), Glenn Stuart (Metropolitan GC) and Leigh Yanner (The National GC). Special thanks for technical support provided by Michael and Cassandra Neylan.

Each sand was measured for volumetric water content, surface hardness, bulk density and infiltration rate

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Don't get collared

Putting green collars receive constant abuse that often goes unnoticed until their appearance and playability decline. USGA agronomist Darin Bevard looks at the problems that can occur and some possible solutions.

There are many factors that can lead to the deterioration of collars, including mechanical stress from mowers and rollers, sand abrasion and overspray from applications of growth regulators

Putting green collar (or apron) management has been challenging for many golf courses in recent years. Most golfers do not realise the constant abuse imposed on the narrow strip of turf that separates the putting green from its surrounds which can lead to turfgrass decline that is unsightly and detrimental to playability. More important, golfers often perceive collar problems as a shortcoming of maintenance practices or neglect. In some instances this may be true, but in most cases it is not.

Understanding the factors that affect collar performance offers the opportunity to allocate additional resources to reduce turfgrass problems on collars. It may also help golfers and course officials realise the challenges facing collars throughout the growing season.

COMMON PROBLEMS

The primary causes of collar decline must be identified and understood before they can be prevented. Keep in mind that the factors discussed below are often found in combination with each other and that awareness of them allows preventative strategies to be developed.

MECHANICAL STRESS – MOWING

As our ability to maintain healthy grass on putting greens has improved in conjunction with faster green speeds, collar problems have become worse. Greens are mowed more frequently and putting green mowers and rollers often turn or change direction on the collars.

Often, areas most difficult to manage are located between the edge of a green and another close obstacle such as a bunker, water hazard or steep drop-off because there is limited area to turn mowers. Sharp turns are made to avoid the obstacle to the detriment of the grass on the collar. If strategies are not used to disperse traffic or protect the grass, thinning or even outright decline of the collars can occur over the course of the growing season.

Problems can also develop where warm-season grasses are adjacent to creeping bentgrass greens. Many superintendents have decided to maintain a warm-season grass collar to maximise available putting green area for hole locations. When you assume an average collar width of 30 inches over 18 average-sized greens, this translates to roughly the same area as two to three additional greens.

However, problems from the stress of mower and roller traffic occur when warm-season grasses are dormant or growing slowly but the creeping bentgrass putting surface is actively growing and still requires regular maintenance. Furthermore, couchgrass or zoysiagrass adjacent to a green may be thin and slow to green up in the spring, if it greens up at all.

SAND ABRASION

The worst collar damage often occurs because of sand abrasion from bunker splash, topdressing overlap or sand accumulation during core aeration. Often, sand abrasion acts as a 'double whammy' and adds to collar stress where space to turn equipment is already limited.

Sand blasted from bunkers can settle into collars creating an abrasive environment that effectively emulates sandpaper on grass as traffic traverses the

affected area. Sand topdressing applied to a green that overlaps into the collar or sand that is deposited on a collar during the aeration process can also cause problems, especially during hot, humid weather when cool-season grass is susceptible to decline from sand abrasion.

GROWTH REGULATOR OVERSPRAY

The expanded use of growth regulators has also been problematic on couchgrass and zoysiagrass collars adjacent to creeping bentgrass greens. Repeated applications of growth regulators containing paclobutrazol or flurprimidol (registered in the US) at rates and intervals used on greens to suppress *Poa annua* and reduce clipping yields can stunt and thin zoysiagrass and bermudagrass collars.

Growth regulator applications seem to cause the most problems when warm-season grasses are entering or exiting dormancy and when recovery during the growing season is slow. If warm-season collars are continually exposed to certain growth regulators, the grass will be caught in an annual cycle of damage and recovery.

Just as warm-season collars recover by the end of summer, their growth naturally begins to slow during autumn. Applications of growth regulators to maintain cool-season putting surfaces during autumn – in addition to the mechanical stress imposed by rolling and mowing greens – can damage warm-season collars as they begin to enter dormancy and their ability to recover from injury is diminished. Therefore, warm-season collars may get weaker each growing season until their quality becomes unacceptable.

POSSIBLE SOLUTIONS

Each situation is unique, but one or all of the circumstances discussed in this article could impact the quality of collars over the course of a growing season. However, knowing some of the primary stresses that lead to collar decline will help develop preventative strategies.

SELECT THE BEST MOWING HEIGHT

Height of cut and growth habit have a major impact on the ability of creeping bentgrass collars to withstand mechanical stress. While it may seem counterintuitive, reducing the height of cut generally improves wear tolerance on collars. Collars are commonly mowed at 6mm-7.5mm to encourage upright growth and increased plant density.

GROOMING FOR BETTER WEAR TOLERANCE

Light brushing and grooming can also promote upright growth. Why is upright growth important? Excessive leaf tissue is often confused with good plant density. If creeping bentgrass is allowed to maintain a strong lateral growth habit, the horizontal orientation of the leaves makes them more susceptible to abrasion and mechanical injury. With more upright growth, traffic impacts the tips of the leaves rather than the entire leaf surface.

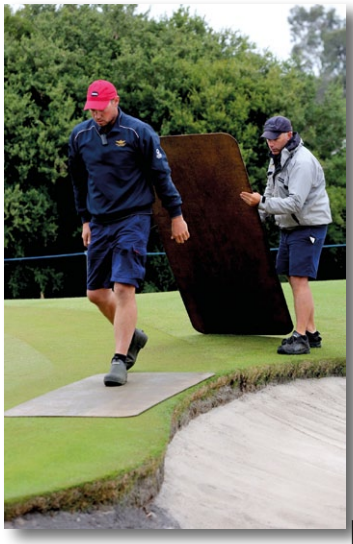
MINIMISE MECHANICAL STRESS

More golf courses are investing in plastic mats or wooden boards to protect collars from turning mowers. However, the use of protective barriers on collars during mowing is more labour-intensive and increases the time required to mow greens by as much as 20 percent because of the need to constantly move the mats as the green is cut. There is also a learning curve for turning a mower on plastic mats, but mats and boards offer considerable protection to the grass on the collars.

Some superintendents only use protective mats during the peak summer period when ongoing environmental stress on cool-season grasses is highest. Another preventative strategy is to encourage employees to make wider turns into the green surrounds or, when possible, vary the location of turns rather than always turning on the collar. This strategy can help, but it has limitations when the available turning area is limited by bunkers or other obstacles. Also, this strategy may relocate problems to a different area by creating wear patterns in the surrounding rough.

Traffic from rollers and mowers needed to prepare actively growing creeping bentgrass greens can lead to the decline of warm-season collars at times of the year when these grasses are dormant or growing slowly

Often, areas most difficult to manage are located between the edge of a green and another close obstacle such as a bunker because there is limited area to turn mowers



Making wide turns and varying the area where turns are made can prevent wear patterns from developing on collars

For warm-season collars, it is necessary to limit traffic during the 'shoulder seasons' (i.e.: when warm-season grasses are dormant or slow growing). The use of mats or boards is one option. Some courses with warm-season collars use triplex mowers to cut greens during the shoulder seasons because triplex mowers can distribute traffic from turning over a larger area of the green surrounds. Regardless of the strategy employed, the goal is to limit concentrated traffic on warm-season collars when they are not actively growing.

REDUCE SAND ABRASION

Limiting sand applications on creeping bentgrass collars during summer heat will reduce abrasive stress on the turfgrass plants. One way this is accomplished is by suspending light topdressing applications under stressful environmental conditions. However, this eliminates the potential agronomic and playing condition benefits associated with light topdressing.

Some superintendents actually choose to apply one or two passes of light topdressing with a drop spreader just inside of the collars. Broadcast spreaders are then used to apply topdressing to the rest of the green. The use of drop spreaders adds labour to the process, but it also limits the potential for sand abrasion to impact on creeping bentgrass collars.

The use of protective mats or boards on cool-season collars to absorb the punishment of turning mowers can help reduce collar stress

REDUCE PGR EXPOSURE

Growth regulator overspray is primarily a problem on warm-season collars and can create problems throughout the growing season. There are three options to address this;

- Stop using the growth regulators;
- Use carpets or other materials to cover collars when growth regulator products are sprayed; or
- Spray growth regulators in such a way that minimises overspray onto warm-season collars.

The first option of stopping growth regulator applications has been employed often, but this eliminates a valuable tool for reducing clipping yield and suppressing *Poa annua* in creeping bentgrass. The second option, protecting collars from overspray by using covers, is labour-intensive but effective. The final option of spraying a 'clean-up pass' of growth regulator around a green (before completing the application in the middle of the green) has been utilised successfully, but requires careful sprayer set-up. In short, there is no easy answer to the problems caused by growth regulators applied to bentgrass greens with warm-season collars.

CONCLUSIONS

Collars receive far more traffic than people realise and they play a vital role in the playability and appearance of a golf course. In addition to ordinary collar maintenance, collars are affected by golfer traffic and the management of greens, surrounding rough and bunkers.

The use of protective mats on creeping bentgrass collars to absorb the punishment of turning mowers, in conjunction with limiting exposure to topdressing sand during the heat of the summer, can help dramatically reduce collar stress. Protective mats can also be used on warm-season collars adjacent to creeping bentgrass greens during times when warm-season turf is not actively growing. However, using mats to protect warm-season collars from traffic does not solve the issues associated with growth regulator overspray, which can be a more substantial challenge.

With expectations for unblemished turf, especially around putting greens, it may be necessary to increase collar management inputs to prevent collar decline. First, however, identify the factors contributing to collar problems in your situation. Understanding these will help to formulate an effective management plan. If you have problem areas on collars and maintain the status quo, expect challenges to continue.

ACKNOWLEDGEMENTS

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Darin S. Bevard is director of the USGA's Mid-Atlantic region.

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A numbers game

A vigilant monitoring programme is critical to help keep on top of Argentine stem weevil outbreaks

PICTURES COURTESY OF GARETH HAMMOND (AVONDALE GOLF CLUB, NSW)

They measure just a few millimetres in length, but Argentine stem weevils can strike fear into any seasoned turf manager. Syngenta technical manager Dr Mark Walker looks at recent research into this devastating pest and how early control and vigilant monitoring are keys to its management on cool-season turf.

Argentine stem weevil is one of the most difficult insect pests to control in cool-season turf

PHOTO: PADIL

Argentine Stem Weevil (ASW) is perhaps the most difficult insect pest to control in cool-season turf. Part of the reason for this is that historically, detailed knowledge of the lifecycle of this pest in Australia has not been readily available. It has, therefore, been difficult to separate fact from fiction and plan a genuine control programme based on established biology.

Syngenta now has solid data on this pest generated from various development programmes undertaken over the last 10 years. This data allows turf managers to better understand how many generations per year are 'normal' or 'typical', what the generation intervals look like, how these change from beginning to end of seasons and what the cumulative result can be of allowing consecutive uncontrolled generations to occur.

Combining previous understandings with new information, the following points must be considered by turf managers when planning an ASW control programme:

- Adult stem weevils possibly only 'overwinter' (i.e.: remain in the thatch in sheltered areas) in the colder parts of Australia. In the warmer parts of Australia (such as coastal NSW), adults may remain active throughout the winter.
- Although adults may remain active throughout the winter, it is likely that they do not lay eggs between the months of March and July.
- In the warmer parts of Australia such as NSW, it is likely that the first ASW eggs are laid in July. In cooler parts such as Melbourne it may be as late as early September. The timing will depend on the climatic conditions.
- The lifecycle of ASW is dependent on the temperature and can be completed in as little as four weeks during the hotter parts of summer. Generation intervals shorten as temperatures rise from early spring to mid/late summer. Four generations per year appears quite normal, with more not out of the question in the warmer climes. Lifecycle overlaps appear equally normal, meaning finding active grubs alongside adults is not uncommon.
- Eggs are laid in the top layer of the leaf sheath, young instars feed down the tiller towards the crown. Older instars live in the thatch and feed on roots, meaning proactive and reactive control programmes may need chemistries applied differently and placed differentially – or different chemistries altogether. Ideally a programme is developed that matches the pest biology to optimise control and minimise total applications.

EARLY CONTROL

The key to preventing ASW problems is to control the first generation by employing a two-pronged approach against the adults that produce this first generation and the grubs that are this first generation. If the first generation is not controlled, numbers build up in subsequent generations causing significant damage. If turf managers get this right, pest pressure thereafter is far reduced.

Often damage does not become visible until the grass becomes water stressed when the temperature heats up in late spring/summer. Control at this late stage becomes very difficult with high pest numbers and multiple life stages present. Damage is already underway and even if you get 90 per cent control, 10 per cent of a large number is still a significant number and can continue to cause damage. It's a numbers game and turf managers need to use all the tools available to keep the ASW populations down below threshold levels.

THE ASW CHALLENGE

One of the reasons that ASW is so difficult to manage is the variability associated with the timing, intensity and duration of its attack on cool-season grasses (mainly bentgrass and *Poa annua*). This variation is a function of the widely different environmental conditions that occur during the spring. Because no two springs are exactly alike, ASW behaviour one year may differ greatly from the next.

In ideal circumstances, the emergence of adult weevils occurs over a relatively short period of time, which results in a narrow period of intense egg laying. When this occurs (and if good monitoring

is in place to detect their arrival) one or two insecticide applications can successfully maintain ASW populations below damaging levels for most or all of the summer.

However, spring weather is notoriously variable both in temperature and rainfall. These varying conditions greatly impact the behaviour of overwintered adults and result in wide extremes in the intensity and duration of egg laying and subsequent larval development. So instead of a narrow peak of egg laying, there may be a prolonged period when eggs are deposited and larvae subsequently damage turf.

This prolonged egg laying period makes ASW management most difficult because adult activity may be rather cryptic and the need for multiple insecticide applications often goes unnoticed until the grass begins to quickly fade during the first hot or dry spell in November.

ASW management is further complicated by the fact that differing microclimates on an individual course can result in up to a 10-day difference in ASW development. For example, an open green with a northern exposure will experience earlier egg hatch than a nearby green that has a southern exposure and is lined with trees. It is unusual that a single insecticide application could be made at the proper timing for both of these locations.

Successful spring management of ASW does not always mean that turf will be free of damage through the summer months. Even the most successful spring control programmes don't totally eliminate the ASW population, and in years when high populations are present, sufficient numbers of ASW survive into the summer months causing damage from second, third or even fourth generation larvae.

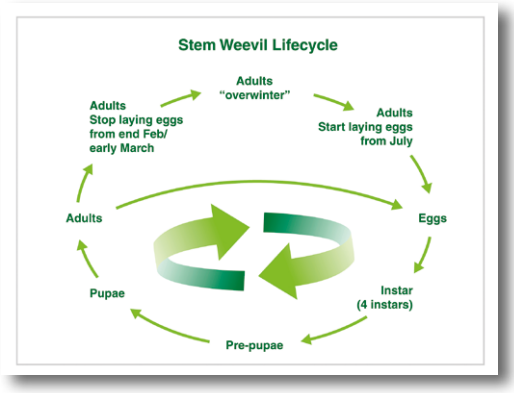
This is especially true considering that summer conditions place grass under tremendous stress so that a minimal amount of ASW feeding (that wouldn't be noticed when the plants are vigorously growing in spring) causes unacceptable damage in the heat of December and January.

OPTIMAL CONTROL PROGRAMME

Based on all information now available, it is clear the best control programmes include both adulticides (such as synthetic pyrethroids of chlorpyriphos) and larvicides (such as cyantraniliprole/thiamethoxam and fipronil). An adulticide application early in the season, with additional targeted applications when numbers become apparent, should reduce the number of adults laying eggs.

The exact timing of the first application depends on your local environmental conditions as this will influence the timing of the first appearance of adults. This may not be until August/September in the south, but in coastal areas of NSW stem weevil adults are regularly seen on greens during winter.

Monitor for the appearance of adult stem weevils from July onwards and spray greens and surrounding areas to prevent migration into the critical green and collar areas. However, turf managers shouldn't put all their eggs in one basket, as adulticides are not long lasting (up to two weeks) and may not kill all the adults.



The Argentine stem weevil lifecycle is dependent on temperature and can be completed in as little as four weeks during the hotter parts of summer

With each female laying up to 300 eggs over a number of weeks, it does not take many adults to survive to generate a large number of larvae and cause subsequent damage. It is, therefore, important to protect your turf directly from the damaging larval stage as well. Applications of a systemic larvicide provide protection from the larval stages for several weeks or longer and are particularly effective at targeting the young larval instars feeding in the stem. As with many insects, the first instars are more susceptible to insecticides, than the later instars and adults and are therefore an ideal target to break the lifecycle.

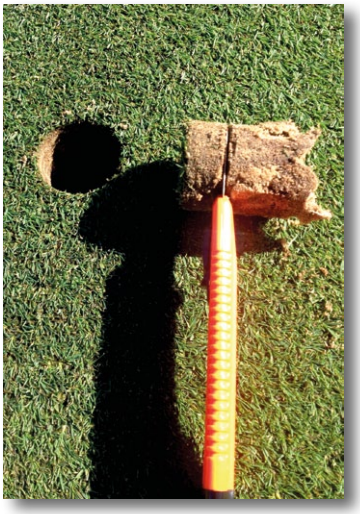
If unchecked, the first generation of ASW populations may reach more than 500 larvae per square metre of turfgrass. Under such high population pressure, even programmes that provide exceptionally high levels of control will allow a certain number of individuals to survive and produce subsequent generations throughout the summer.

By the middle of November, ASW populations have usually become asynchronous – meaning that all life stages are present at the same time and there is not a single dominant stage. To get or maintain control later in the season a combination of adulticide and larvicide is recommended to keep the stem weevil population below threshold level.

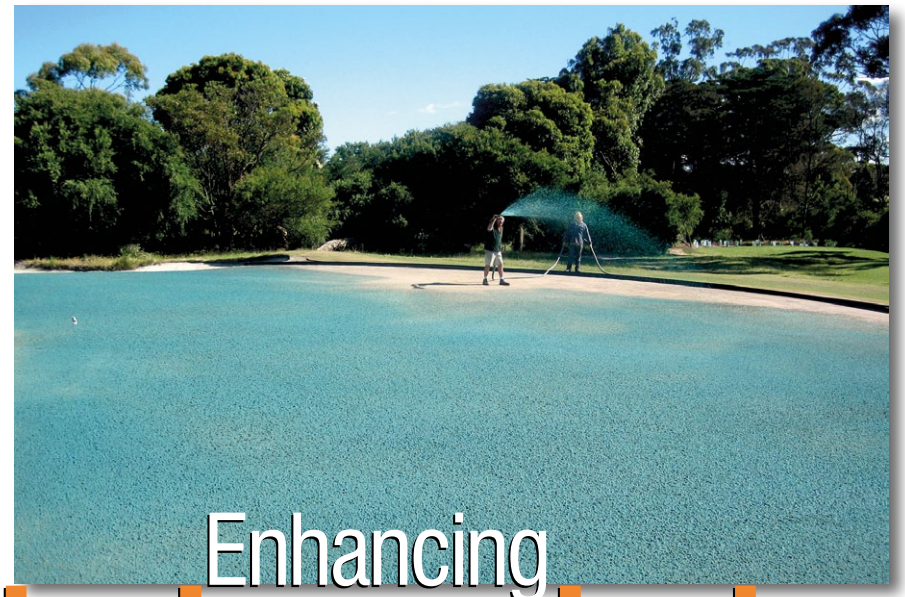
ROTATING CHEMISTRIES

As mentioned, the presence of stem weevils can vary by year, in terms of timing and level of pest pressure and their occurrence may vary between different parts of the same golf course. Management is best provided by a preventative control programme. However, like disease management, even with a control programme there is the need to have an active monitoring programme.

The similarities with disease management also continue with the need to rotate chemistries. With four or more generations of ASW per year, this pest is an ideal candidate to develop resistance if poor insecticide management practices are followed. Resistance to pyrethroids has been documented in the US and although not proven yet in Australia there should be no room for complacency.



Monitor for stem weevil appearance from July onwards and spray greens and surrounding areas to prevent migration into the critical green and collar areas



Enhancing hydro-sprigging

University of Queensland and CSIRO Brisbane researchers have recently embarked on a project to develop a state-of-the-art hydro-sprigging methodology to help benefit the Australian turf industry.

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Above: Research has begun to determine how the process of hydro-sprigging can be enhanced to assist the Australian turf industry in providing solutions to land stabilisation issues

Soil erosion and stabilisation are huge problems facing Australian land users including those working in agriculture, mining, road construction and urban sports and community landscapes. While there are no published reports of soil losses from mining sites, road works, sportsfields and community parks, they are likely to be significant as they are particularly susceptible to de-vegetation.

There is a large opportunity for the Australian turfgrass industry to play a role in providing solutions to Australia's land stabilisation issues. If 10 per cent of these denuded landscapes can be vegetated by turfgrasses, the turfgrass industry as a whole can benefit greatly. Collectively, the areas to be stabilised are enormous but to date the methods used to revegetate these land masses are limited.

THE SOLUTION

Hydro-sprigging (HS) is an inexpensive, automated method of delivering grass sprigs (stolons) with a hydraulic pump to large areas of bare soil. Sprigs are usually applied as a slurry of water, mulch (e.g. wood fibre, bagasse, paper pulp), fertiliser and tackifier. The operator has full control of where the sprigs are applied which makes this approach highly efficient particularly in cases where the landscape is steep, uneven and has major obstacles e.g. large rocks and sticks or contains electricity poles, drains, communication towers and perennial vegetation. HS is the method of choice particularly where the target areas are too large to plant to sod.

THE LIMITATIONS

HS and hydro-seeding have grown in popularity particularly for mine site rehab and roadside vegetation projects where hostile soil types including sodic/saline soil profiles are common. However, the success rate of HS and hydro-seeding in terms of establishing a grass sward is relatively low. The reasons for the low establishment success are not clear although poorly applied and inadequate or poor quality planting/follow-up irrigation, hostile soil profiles and poor quality grass feedstock are likely to be major contributors.

The available plant materials for vegetating landscapes where abiotic stresses are multiple and severe are limited. For example, the mining industry has a requirement to vegetate sodic and sometime saline batters in environments where rainfall is low. A further requirement of vegetation for these situations is short growth habit to improve visibility over engineered landscapes and reduce the fire hazard during dry conditions. Currently there are no successful ways for vegetating these profiles.

Hydro-seeding has often failed because seed germination is poor due to the elevated levels of salt in the upper layers of the soil profile; consequently, traditional revegetation options using seed blends of C_4 grasses have been unsuccessful. Rhodes grasses had potential but these grow over one metre tall during wet seasons reducing visibility and increasing the fire hazard during dry seasons, both highly undesirable for mine-site landscapes. In addition bunch grasses such as these leave sections of the soil surface exposed allowing for tunnel erosion to proliferate.

ENHANCING HS

Currently in Australia commercial HS involves the use of bermudagrasses as a feedstock although there are no reported differences between cultivars in terms of their suitability for this purpose. Clearly, identifying varieties that are suited to HS would be of great value.

A replicated experiment with 12 bermudagrasses grown in a field trial under optimal water and fertiliser conditions in SE QLD suggests that there are differences between varieties when harvested and tested for stolon sprouting ability under laboratory conditions (see Figure 1).

The germination percentage was affected by temperature and it dropped consistently across all grasses when the temperature of the germination tests was reduced from 30°C to 20°C (Figure 1). Furthermore, there was as much as a 30 per cent difference in germination of stolon nodes between the best and worst varieties (Figure 1). It was unclear whether the variation was due to differences in bud dormancy, stolon size etc., or if levels of nonstructural carbohydrate (NSC) in stolons was low. All these factors are being investigated.

UNDERSTANDING PTQ

Photo-thermal quotient (PTQ) describes a mathematical relationship between incident solar radiation and temperature during a growing period. In the absence of disease and water/nutrient stress, PTQ gives a relative measure of how favourable

conditions are for plant growth and if NSC may be stored in stolons through a growing season.

The concept was originally adapted for wheat growth by CSIRO scientist Henry Nix in 1976 and has been used to predict the yield of wheat crops in a range of different environments in Australia and internationally. Here's how it may work for turfgrasses:

$$PTQ = Solar\ Radiation/Temperature$$
$$= (MJ/m^2/day)/(T_a - T_b)$$

Where T_a = daily mean temperature and T_b = base temperature above which growth and development occurs. Base temperature for growth and development is lower for C_3 compared to C_4 grasses. For bermudagrass a base temperature around 8°C is often reported.

Solar radiation drives photosynthesis where CO_2 is fixed from the air and combined with water taken up by the roots to produce simple sugars which are used for a whole host of downstream purposes including stem, leaf and root growth and development.

When plants are growing actively (during warmer months for C_4 grasses) a large portion of the sugars is used to make structural carbohydrate (for new leaves, stolons, roots etc) and the pool of sugars stored as NSC may be diminished. The converse applies as well; if temperatures are low and growth is retarded, the sugars may be diverted to give a greater proportion of NSC (usually stored in stolons and rhizomes). So by studying the PTQ through the year a turf grower may be able to determine when the NSC pool of their grass is large or small.

Based on research in other areas of plant science, we hypothesise that having a large pool of NSC within the plant will improve the germination of stolons used for hydro-sprigging. Figure 2 shows the mean monthly PTQ for a location in SE QLD in 2012 and 2013. In terms of NSC, these data suggest that this pool may be large in early spring and lowest in late summer.

The concept of PTQ will set the theoretical basis of optimising hydro-sprigging technologies and guide our research activities as the project matures. We will test our hypothesis by harvesting stolons throughout the year and try and correlate sprouting with concentration of NSC in the stolons. The data presented in Figure 1 is the first of many sets that will be collected.

PTQ is only one aspect of the research. This project will also study a range of amendments that may help with rapid turf establishment on hostile soil profiles. These results will be reported at a later date.

ACKNOWLEDGEMENTS

Authors Christopher Lambrides, Thinh Van Tran, Shu Fukai (University of Queensland) and Anthony van Herwaarden (CSIRO Brisbane) wish to acknowledge funding for this research by Horticulture Australia Limited (TU13026) and Origin Energy.

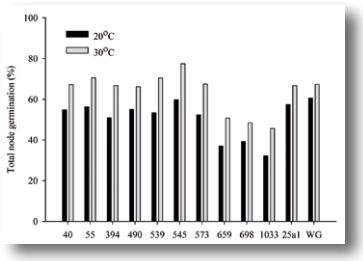

Figure 1.Total node germination of 12 bermudagrass genotypes. Stolons were field grown at a turf production farm in SE Queensland. Germination was tested at 20°C and 30°C

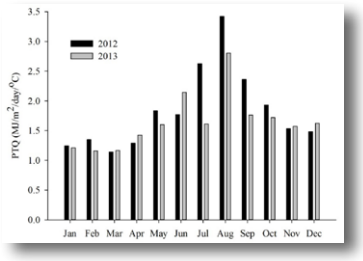

Figure 2. Monthly mean Photo-thermal Quotient (PTQ) for a location in SE Queensland

Tanunda Pines Golf Club, SA

Located in the heart of South Australia's famed Barossa Valley wine growing region, Tanunda Pines Golf Club is certainly an attractive golfing destination. Course superintendent Damien Mangelsdorf provides an inside look at his course which boasts both couchgrass and bentgrass greens.

Above: Originally a nine hole sand scrapes course started by local winemakers, Tanunda Pines was extensively redeveloped in the 1970s and wends its way through a stunning landscape. Pictured is the 1st looking back up the fairway towards the clubhouse

Superintendent: Damien Mangelsdorf.
Nickname: Damo, Mangas.
Age: 34.
Family: Wife Lyn, Indie (3) and Emme (20 months).
Period as a superintendent: Three years.
Association involvement: AGCSA and SAGCSA (three years).
Turf management career: Loxton Golf Club (eight years, including three-year apprenticeship); Mt Barker-Hahndorf Golf Club (assistant superintendent/ mechanic, five years); Tanunda Pines Golf Club (superintendent, three years).
Qualifications: Diploma in Turf Management (Torrens Valley Institute of Tafe).

Where in Australia is Tanunda Pines Golf Club and what is the region famous/known for? Tanunda Pines Golf Club is located in the heart of the famed Barossa Valley wine growing region about an hour from Adelaide.

Give us a bit about your background and background in turf management. How did you start out in the industry and how did you end up at Tanunda Pines? My career in turf management started when I lived not far from Loxton Golf Club in South Australia's Riverland region and asked them if I could do some volunteer work around the course during the school holidays. From this I was offered an apprenticeship.

From there I moved to Adelaide and was lucky enough to secure a position at the Mt Barker-Hahndorf Golf Club under then superintendent Sam Sherriff, who I learnt a great deal from and who encouraged me to further my education. The Tanunda Pines superintendent job then became available. It's what you work towards your whole career and I was fortunate enough to win this position.

Give us an overview of Tanunda Pines GC and some of its unique characteristics? Established in 1938, the Tanunda Pines course was initially developed among scrub land, with the fairways 'mowed' by a flock of sheep. Founding members consisted of winemakers who would bring along wines, butchers who supplied the meat and bakers who brought bread for a feast after their round of golf.

Over the decades, the club has grown from a nine hole sand scrapes course to an 18-hole, par 72 championship course with fairways that weave their way through100-year-old trees and magnificent views of the surrounding regional native flora and fauna, including a resident family of kangaroos and a thriving population of birdlife.

Named to commemorate the native pines that frame the valley, an ongoing revegetation of native grasses and trees connects Tanunda Pines to its idyllic regional environment.

The course was extensively redesigned by Murray Crafter in the 1970s and has excellent fairways and fast greens making it a must play. Members and visitors enjoy the challenging course and the warm, inviting, friendly atmosphere of the 19th hole.

What are some of the unique features about Tanunda Pines GC from a turf management perspective? The most unique feature of the course is that we have two types of greens turf. We have seven new greens which are G2 bentgrass and built on Tailem Bend sand, whereas the old greens have a Santa Ana couchgrass base which is oversown with Penncross. It's definitely a challenge during summer keeping growth under control and making sure both greens types are playing the same. We are hoping to convert the remaining greens over to G2 in the next few years.

Is it an easy/hard facility to manage? I wouldn't say it is hard, but it has its challenges. I believe you make your own luck, so now we try and prepare as much as possible, but there are always times when a spanner is thrown into the works!

Take us through your turf management operations there and what changes have you brought about in terms of managing the course during your time as superintendent. Greens are cut six times a week in the growing season and 2-3 times a week in winter and rolled with the greensmower the other days to remove dew. The fairways and tees are cut twice a week in summer and as needed in winter. Since being here we have purchased a Toro ProPass sander to dust greens which has brought about some great results.

Any special environmental considerations that you have to incorporate into the management of the course? We have the 300-room Novotel Barossa Valley Resort on one side, vineyards another and a farm the other. So when it comes to spraying of chemicals we have to be extremely mindful of what time of year it is and what we are spraying.

Water is obviously a critical issue for any golf course. How is Tanunda Pines faring in the water management stakes? We are faring pretty well. Before last season we struck a deal with the nearby

Tanunda's 2nd hole with the new Tiger tee in the foreground. A number of new tee blocks have been built in recent times to remedy safety issues and increase length

Orlando Winery that now sees us receive 125 megalitres of its waste water. This is pumped into our dam and shandied with our bore water. We also have a large groundwater allocation and are in the process of refurbishing the best quality bore.

What are some of the major challenges facing Tanunda Pines both from a turf management perspective and general club management perspective? Securing our water deal was a significant step for the club and to know we have the sustainability into the future is fantastic. With that box ticked, we have now been working hard setting up unique stay and play packages for groups where the club will pick golfers up from the airport, arrange accommodation and wine tasting for them and play golf a couple of times. This has been successful and continues to grow in popularity.

Outline any major course improvement works recently completed and/or highlight any ongoing or future works that the club is undertaking.

The Tanunda Pines course management team (from left) Carl Schubert, superintendent Damien Mangelsdorf, Steven Draper and assistant superintendent Byron Myatt

The most unique feature of Tanunda Pines is the two types of greens turf. Seven new greens are G2 bentgrass built on Tailem Bend sand, with the old greens Santa Ana couchgrass oversown with Penncross. Pictured is the 15th green

Since I have been here we have removed a number of trees that an arborist deemed dangerous and diseased. We have also built and are in the process of building new tee blocks. This was done to realign holes for safety reasons to stop wayward drives flying onto adjacent fairways.

It's an ongoing job of basically peeling the top off the tee and saving the turf, using the soil to build the new one along with installing new irrigation infrastructure. We are lucky we have the space to do this as in many cases we will be adding distance on the holes with Tiger tees.

The weather and climate is always a great leveller for a course superintendent. How has Mother Nature treated Tanunda Pines in recent seasons? Last summer was a testing time with long periods of 40°C-plus temperatures putting the turf surfaces (and staff) under stress. We also had a few dramas with our new waste water supply that saw sprinklers/valves blocking continuously. This meant one staff member (assistant superintendent Byron Myatt) spent three full months going around the course and cleaning out all sprinklers. At one stage we couldn't even get a rotation out the sprinklers before they blocked up again!

Last season Tanunda Pines struck a deal with nearby Orlando Winery to receive 125 megalitres of waste water which is shandied with the club's bore allocation for irrigation

The one product I couldn't manage my course without is... Trinexapac-ethyl. This keeps my couchgrass greens under control during summer – love it! It is closely followed by, or on a par with, wetting agent.

What are some pros and cons of being a regional-based superintendent? Freight and the speed that we get parts and chemicals can be so slow and costly at times. I have some great chemical reps that will deliver personally if they can.

Are expectations of course presentation and conditioning any less than that placed on your metropolitan counterparts? No, the expectations are similar. We do our best to present the course in a way that makes them proud of being a member here; can't do much more than that!

Do you have to be more resourceful as a regional-based superintendent? I guess you get resourceful out of need. We needed a drag mat that could not only rub in after a dusting but also tease the couchgrass greens up during summer before cutting, so we zip-tied some fake turf to the bottom of our existing chain drag mat. We have also made up a frame of broom heads that we tow across the greens at renovation time.

If you could change one thing about your job as a regional superintendent what would it be and why? I see it as the best job in the world, so I wouldn't want to change much. We work with Mother Nature and sometimes I do wonder what she is thinking!

How important are the relationships you have with other course supers/trade reps? Very important. The more knowledge you can gain from a variety of sources the better and if you can help another super out you will as you never know when you might need that favour returned.

What are some of the more unusual requests/ things you have had to do as a superintendent of a regional course (not necessarily turf management related)? When the boy band 'One Direction' came to Australia their first stop was Adelaide and they happened to be staying at the Novotel Resort adjacent to our course. This meant we had throngs of media and busloads of teenage girls being dropped at our perimeter fence from 7am all wanting a glimpse of them playing golf etc…

It was two full days of chasing groups off the course, which my apprentice thought was Christmas and loved the attention! On the upside, we did have a large increase of young female golfers playing that week for some unknown reason!

What have you got in your shed?

- 6700D Toro fairway mower
- 2 x 3250D Toro greens and tees mower
- 1445 John Deere rough mower
- 2653A John Deere surrounds mower
- 3000 Toro Greensmaster (set up as a verticutter)
- 1200A John Deere bunker rake
- Toro ProPass 200 sander
- Weidenmann Terra Spike
- Toro 3pl blower
- New Holland 75hp tractor with bucket and forks and John Deere 1070 tractor
- Tru-Turf roller
- Toro Workman and John Deere Gator

What's your favourite piece of course machinery and why?

I would have to say the New Holland tractor. This has built greens, paths and sprays the course – definitely the most valuable and versatile anyway.

We have just purchased the John Deere 1445 rough mower to replace an old 1145. The next major purchase will probably be a greens mower. A sprayer and Pro Gator is on the wish list as we currently spray greens with a hand gun, so having this would more than halve spray time.

Do you have any interesting pieces of machinery which have been manufactured out of necessity or any old pieces of equipment that you keep alive through necessity? We have an old Toro 3000 Greensmaster which is now only used as a

Tanunda's greens are renovated once a year at the start of November. Greens are cored with large window tines and topdressed heavily with Mt Compass grey sand. Pictured is the 10th looking back from the green

Surrounded by some of the best wineries in Australia, Tanunda Pines is becoming an increasingly popular stay and play destination for golfers

verticutter. She's clocked up an impressive 6000 hours and every time we roll her out we tell her "Just one more time, just one more time".

Favourite spot on your course? I would have to say the 11th tee, the highest point on the course. Gives you great views of the course with the Barossa ranges in the background – a great spot for a beer (or wine)!

Best advice you have received about being a course superintendent/greenkeeper and who gave it to you. I think it was my first day as an apprentice and the course chairman told me that "You are going to get a lot of members telling you how to do your job and making requests. Just smile and nod your head, you only answer to Graham (the superintendent)'.

Most pleasing/rewarding moment during your time as Tanunda Pines superintendent? That moment just before the golfers tee off in a tournament where you can stand back with the crew and look at the course and realise that all those long hours was worth it.

Tanunda Pines boasts Santa Ana fairways and tees

AT A GLANCE – TANUNDA PINES GOLF CLUB

Course specs: 6127m par 72. Total area 51 hectares, irrigated turf area 21ha. Santa Ana couchgrass fairways (10ha), Santa Ana tees (0.5ha), Santa Ana/bentgrass surrounds (1ha) and bentgrass/couchgrass greens oversown with bentgrass (1ha).

Members: 325 and growing.

Annual number of rounds: 12,000.

Major tournaments/events held during the year: Senior Legends Tour Pro-Am, Black Magnum, Robert Hill Smith Cup, Holden Scramble, Australian Amateur PGA Tournament, Australian Senior Open, PGA Senior Open and Australian Senior Ladies Championship. Tanunda Pines also hosts several charity golf days annually.

Course management budget: $450,000.

Staff structure: Damien Mangelsdorf (course superintendent), Byron Myatt (assistant superintendent), Steven Draper and Carl Schubert (greenkeepers).

Climate/annual rainfall: Hot dry summers, cool winters with frost. Average rainfall 480mm.

Soil types: Fairways/couch greens/tees comprise of a native grey sand. The new greens have been constructed with Tailem Bend sand.

Water sources:

- 125 megalitres from Orlando Winery. This is a combination of storm water, water off the bottling line and washdown;
- 10ML effluent water from Novotel; and
- 220ML groundwater and creek license (we have four bores scattered throughout the property).

Irrigation system: Toro Site Pro 3-wire decoder system.

Cutting heights: Greens 3mm, tees 7mm, surrounds 9mm, fairways 12mm, rough (1st cut 1.5", 2nd cut 2.5", tee and green surrounds 3.5").

Renovations: One major renovation a year at the start of November. Large window tine core, heavy topdress with Mt Compass grey sand. Two or three mini tines depending on weather and greens conditions. Verticut and dust couchgrass greens every three weeks during the growing season.

Major disease pressures and how you combat them: Winter fusarium would be our biggest pressure on the greens. I have a great winter fusarium programme that I stick to which keeps it under control, along with a few cultural practices.

Contact details: Call (08) 8563 1200 or visit www.tanundapines.com.au

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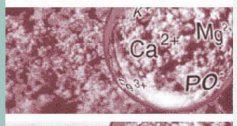
Research



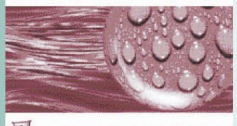
Soil Nutrient Analysis

Soil Physical Analysis

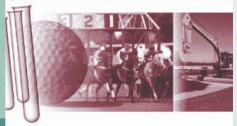
Plant Tissue Analysis

Disease Diagnosis

Nematode Diagnosis



Water Analysis



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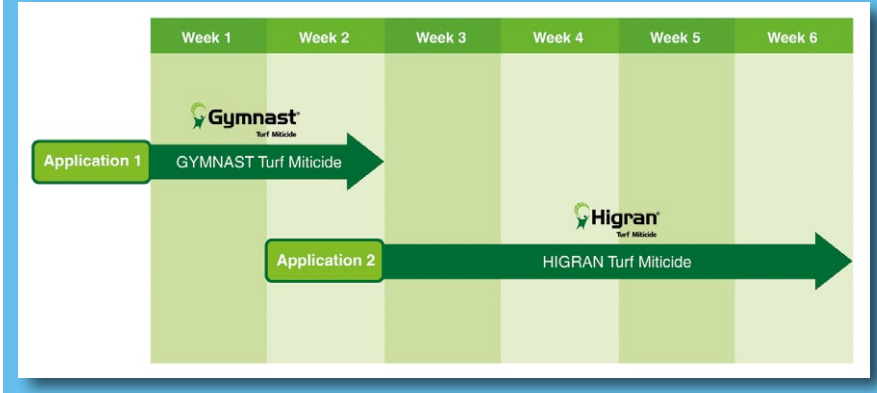
SYNGENTA LAUNCHES TWO-PRONGED ASSAULT ON COUCHGRASS MITES

Together, Syngenta's new miticide registrations Gymnast and Higran offer a new solution to control couchgrass mite. The programme is initiated by the application of Gymnast (a.i.: 18g/l abamectin) and followed up with Higran (a.i.: 500g diafenthiuron) 10-12 days later

At the recent 2014 Australian Turfgrass Conference on the Gold Coast, AGCSA Gold Partner Syngenta launched two new additions to its turf portfolio – Gymnast and Higran turf miticides. After extensive testing of various approaches, Syngenta has settled on a two-pronged approach to mite management focusing on complementary adulticide chemistries with the end result being the two new registrations which are now available to Australian turf managers.



"Following an extensive trial programme it became quite obvious that the greatest efficacy was achieved when the inherent characteristics of two very good chemistries were combined in a sequential approach," says Syngenta technical manager Dr Mark Walker.

"The programmed solution is initiated by the application of Gymnast (a.i.: 18g/l abamectin) utilising its excellent knockdown qualities and delivering solid short-term control of couchgrass mite. However, it is the follow up application of Higran (a.i.: 500g diafenthiuron) 10-12 days later that sets this programme apart.

"The qualities of Higran, demonstrated in a number of cropping situations, transfer directly into the turf management situation and allow a greater duration of control and better overall control. The possibility now exists to achieve improved levels of control with potentially less sprays."

"We are excited to introduce Gymnast and Higran to the Australian turf market," adds Syngenta business manager Dr Henk Smith. "Higran represents a new mode-of-action for turf management in Australia and with mites not previously being exposed it becomes an excellent resistance management tool.

"The registration of two options simultaneously has made continual rotation between turf registered chemistries a genuine option. This recognises and addresses the needs of turf managers while supporting some fundamental principles of chemical use aimed at maximising the usable life of these important tools."

For more information about Gymnast and Higran turf miticides, contact your local Syngenta agent or visit www.greencast.com.au

Sprinkler upgrades and maintenance are now easier with Toro's new Infinity Series sprinklers

INFINITE POSSIBILITIES WITH TORO

AGCSA Platinum Partner Toro Australia has launched its Infinity Series golf sprinklers onto the local market that include significant new features and benefits to help extend its popular 800S and DT Series sprinklers. The key benefit of the Infinity Series is the Smart Access feature that allows crews quick and easy access to internal components, including solenoids, pilot valves, two-wire control modules and wire splices, all without digging to provide significant labour savings.

With an eye to the future, the Smart Access compartment is designed for future upgrades as new technologies become available. The compartment also provides system protection by isolating all electrical components, such as wire splices, from soil and moisture to prevent ground shorts and keep the system operating smoothly. Allowing easy access to facilitate troubleshooting and repairs, the Infinity Series sprinkler incorporates a patented Check Flow feature that allows pilot valve removal without turning the water off.

"Our new Infinity Series sprinklers allow courses to add new technology inside these golf sprinklers for decades to come," says Patrick O'Shannessy, Toro Australia's national sales manager, turf. "They enable crews to trade their shovels for screwdrivers when it comes to sprinkler upgrades and maintenance. Most important, play won't be interrupted by sprinkler repairs, replacements, piles of dirt, closure signs or scarred turf."

All models of the Infinity Series provide trajectory adjustment of the main nozzle. INF34/54 and INF35/55 models provide dual trajectory adjustment selections of 15 or 25 degrees. The INF35-6/55-6 is available with the patented TruJectory feature that allows users to adjust the main nozzle trajectory from the top of the sprinkler, and fine-tune radius and spray heights from 7 to 30 degrees in one degree increments. Users can select the trajectory

type and angle they need to maximise distribution uniformity to eliminate wet and dry spots, improve turf quality and playing conditions and reduce water use. All Infinity Series models feature different activation types including a DC latching solenoid and an integrated GDC module.

For more information about the Toro Infinity Series sprinklers visit toroinfinity.com, call Toro Australia on 1300 130 898 or visit the Toro Australia website www.toro.com.au

JACOBSEN APPOINTS NEW TASMANIA DISTRIBUTOR

Gaffney Machinery, with branches in Somerset and Longford, has been appointed the Tasmania distributor for AGCSA Gold Partner Jacobsen. Established in 1961, Gaffney employs over 20 people at its two branches located in the north and northwest of Tasmania.

Commenting at the Jacobsen stand at the recent Australian Turfgrass Conference Trade Exhibition, Gaffney representative Greg Cahill said the company was delighted to be joining the Jacobsen distributor network in Australia. "This is our first venture into the groundscare sector, which we will operate out of our Longford branch," says Cahill. "Our reputation has been forged by our commitment to our customers and we will bring this ethos to our groundscare operation. We see the addition of the Jacobsen brand as a positive opportunity to expand our product base and bring our expertise to a broader range of customers."

Jacobsen's regional sales manager for Australia Mike Foskett adds: "Appointments such as Gaffney demonstrate our drive and determination to be the major turf equipment supplier in the region. They have the dedicated staff and infrastructure that we demand of our distributors and we welcome them into the Jacobsen network." **To contact Gaffney Machinery call (03) 6345 1104.**

Left: Chuck Greif, Managing Director Jacobsen APAC welcomes Greg Cahill of new Tasmanian distributor Gaffney Machinery, watched on by Jacobsen's Mike Foskett (left) and Ray Grech (right)

BAYER ANNOUNCES AGENCY AGREEMENTS

AGCSA Silver Partner Bayer Environmental Science recently announced a change to the way in which it markets its portfolio of turf and ornamental products via a network of approved agents.

Bayer's new turf market manager Peter Kirby says the change will facilitate a greater focus on training and service to ensure that users of Bayer products will be assured comprehensive support when using the range.

"Fundamental to this new focus is new learning and development and product forecasting portals," says Kirby. "These will work to ensure that seasonal demand is met as effectively as possible and that the sales teams of our agents receive up-to-date training on new products and the results of ongoing research and development with the existing portfolio.

"We are confident that this change will ensure increased levels of technical expertise and service in the field, ensuring that users of the Bayer range get the best possible results."

Full details of the Bayer portfolio and its pricing are available either from the Bayer Environmental Science website www.environmentalscience.bayer.com.au or from the following Bayer approved agents – Globe Growing Solutions, Living Turf, Nuturf, Oasis Turf and Simplot Partners.

INDUSTRY APPOINTMENTS

KIRBY BAYER'S NEW TURF MARKET MANAGER

AGCSA Silver Partner Bayer has announced it has appointed **Peter Kirby** (pictured) to its turf management team as Market Manager Turf ANZ/EAP. Kirby will develop the commercial and marketing strategy for the Bayer Environmental Science Turf portfolio within the East Asia Pacific region, with specific operational responsibility for the Australian market.

Kirby joins Bayer from Amgrow P/L where he was business development and marketing manager. Prior to that, he has worked with NuFarm, Sydney Environmental and Soil Laboratory and Nuturf Australia P/L. Kirby can be contacted direct on 0437 869 159 or by email at peter.kirby@bayer.com

JORDAN JOINS PGG

AGCSA Bronze Partner PGG Wrightson Turf (Australia) has appointed **Troy Jordan** as turf territory manager for Victoria, Tasmania, South Australia and Western Australia. Jordan's main role will be to liaise with turf retail clients and provide technical support to them and their clients in sportsgrounds, golf, racing and other amenity turf areas.

Jordan began his career in turf management in 2003 preparing wickets and sportsgrounds at private schools and local grounds around Melbourne's inner east suburbs. In 2008 he moved to Etihad Stadium, under Gavin Darby, at the same time completing his Diploma in Sports Turf Management at NMIT.

In July 2011 he was appointed head turf manager at Dunedin's newly-completed, state-of-the-art, fully-roofed arena Forsyth Barr Stadium. The pitch was the first in the Southern Hemisphere to use the Desso Grassmaster system and the first stadium in the world to grow natural grass under a fully enclosed roof.

Jordan left Forsyth Barr earlier in 2014 to move to the PGG Wrightson position back in Australia, but in between was contracted by the STRI to provide turf consultancy at the 2014 FIFA World Cup in Brazil. He was based on the perennial ryegrass Corinthians Arena in Sao Paulo for two months, overseeing the local turf management team for six World Cup matches, including the opening ceremony, the opening game (Brazil v Croatia) and the semi-final between Argentina and the Netherlands. Wrightson Turf. Jordan can be contacted on 0447 744 748 or email tjordan@pggwrightsonturf.com.au.

The new Long Paddock Organic Solutions website

NEW ONLINE PRESENCE FOR TORO, LONG PADDOCK

AGCSA Platinum Partner Toro Australia has launched a new website at www.toro.com.au. The new site is user friendly and easy to navigate with a contemporary look and feel. Turf managers can navigate to product information via a number of ways – by customer category (e.g.: golf, sports fields and municipalities, professional contractor, construction, tree care and underground equipment, agriculture and homeowner), through the product menu and by using the search function. The website contains handy header and footer menus on every page to make it easy to access information within other categories. Links to the Toro YouTube channel and Twitter accounts are also included.

Guyra, NSW based Long Paddock Organic Solutions also recently launched its new website – http://longpaddock.net. The new website contains information about the various products the company offers, including its Sportsturf range which has been released onto the market over the past 12 months. MSDS sheets are also available as are testimonials, contact details and some background information about the company. For more information visit the website or contact director Phil Knight on 0408 533 090 or pknight@longpaddock.net

SIX OF THE BEST FROM HONDA

Honda Power Equipment is adding not one, not two, but six new models to its lawn mower fleet this season with models to suit both commercial and residential users. From the two HRR216 models designed with the homeowner in mind to the two HRX217 mulch and catch models (RRP $1299) which have been tailored for the professional contractor, Honda has a mowing solution for all users.

With an 88-litre catcher bag – the biggest Honda has ever offered – and tough NeXite cutting deck, the HRX217 Recoil Start (RRP $1299) and Electric Start (RRP $1449) models are lightweight but tough.

Honda Power Equipment has added six new models to its lawn mower fleet this season

Included within the new model range is the HRC216 (RRP $1099). Powered by Honda's GSV160 commercial engine, the HRC216 is equipped with Honda's MicroCut twin-blade system which produces grass clippings so fine that professional contractors can fit up to 30 per cent more clippings in every bag. The HRC216 also features mulching capability, a steel deck and an 88-litre catching bag to improve productivity.

The range is completed by the HRS216 Side Chute lawnmower (RRP $599) which comes with a convenient side chute or mulching option that enables users to return clippings back into the soil. All new models feature 21" cutting decks, come with a standard two-year domestic warranty and are backed by Honda's network of 450 dealers Australia-wide.

For more information, or to find your closest authorised Honda dealer, visit powerequipment.honda.com.au.

COME IN SPINNER!

Along with its assault on couchgrass mites, AGCSA Gold Partner Syngenta has also unveiled another insecticide to its turf portfolio – Spinner. A specialist larvicide, Spinner combines two highly systemic chemistries for the rapid control of insect larvae including Argentine stem weevil (ASW).

When targeting ASW, Spinner moves systemically up into the stems to control the early instar larvae and also into the soil for the later instars. Spinner can be applied at multiple times throughout the spring/summer period to coincide with the generational activity of young larvae.

In addition, Spinner provides rapid curative caterpillar control and can be applied when pest/damage is observed. It can also be applied from spring onwards to control African black beetle and Argentinean scarab larvae.

Spinner contains 200g/kg cyantraniliprole, a member of the anthranilic diamide insecticides and 200g/kg thiamethoxam, a member of the neonicotinoid insecticide group. Cyantraniliprole is a Group 28 insecticide and thiamethoxam is a Group 4A insecticide. Syngenta business manager Dr Henk Smith says that Spinner can be used with Acelepryn and Meridian turf insecticides for season long control.

For more information about Spinner turf insecticide, contact your local Syngenta agent or visit www.greencast.com.au

WORKMAN HDX GOES AUTO

AGCSA Platinum Partner Toro has released the new Workman HDX Auto into the Australian turf market, the industry's first heavy-duty utility vehicle with automatic transmission.

The Toro Workman HDX Auto

Toro's proprietary SpeedContr'l ensures precise ground speed to engine speed, which is critical during spraying and topdressing. Operators simply select the correct position on the SpeedContr'l to maintain consistent speed over undulating fairways and hills.

The Workman HDX Auto is powered by a 28hp Kohler® LH775 twin-cylinder, liquid-cooled, electronic fuel injection engine. It boasts travel speeds of 17.7km/h in low range and 32.2km/h in high range. Additionally, the HDX Auto provides a total payload capacity of 1498kg and a towing capacity of 1587kg.

The Workman® HDX Auto also features a four-wheel hydraulic disc brake system for added control, an easy-to-use operator panel that includes an electronic switch to engage rear differential lock and the true on-demand four-wheel drive option.

"This unit is unique in that it delivers peak power at any speed," explains Toro's Mark Johnson. "You can climb the most difficult terrain with a load of sand and not even know the bed is full. The torque delivery system is smooth and gradual, which minimises wheel spin-outs to minimise turf damage.

SET SAIL WITH COLUMBUS

Turf Culture has launched Columbus Insecticide (active constituent: 250 g/L thiamethoxam) for the control of African black beetle, Argentinean scarab and billbug in turf into the Australian market. Columbus Insecticide is a liquid formulation (suspension concentrate) and comes in a one litre pack size. For more information and to download the Columbus Insecticide product label, visit www.turfculture.com.au

INDUSTRY APPOINTMENTS

LIVING TURF, NUTURF SWOOP ON COURSE SUPERS

Living Turf and Nuturf have both been busy on the recruitment front in recent months with a number of former superintendents joining both companies as territory managers and technical sales representatives.

Former Windaroo Lakes Golf Club course superintendent and GCSAQ treasurer **Dave Morrison** joined the company as a technical sales representative. With nearly 30 years in the turf industry, Morrison began his career at Oxley Golf Club and went on to be superintendent at three south east Queensland clubs including Jindalee, Hills International and most recently Windaroo Lakes. Morrison can be contacted on 0407 500 101 or dmorrison@livingturf.com

Joining Morrison in making the move to Living Turf's Queensland operations is **Angus Mahoney**. Mahoney completed his apprenticeship in Queensland before participating in The Ohio Program which saw him work at various courses across America including Oaklands Hills Country Club in Michigan where he prepared and worked the 2004 Ryder Cup. After his stint in America, Mahoney returned to Australia where he worked at Pelican Waters Golf Course on the Sunshine Coast before taking up a position as assistant superintendent and progressing to superintendent at Royal Westmoreland Resort in Barbados.

Mahoney worked with the David Mclay Kidd golf design company on the construction of the 18-hole Laucala Island Resort golf course in Fiji in the capacity of assistant construction manager/design associate for three years and most recently he completed a two year contract in the Middle East at The Royal Golf Club, Bahrain. Mahoney joins Living Turf as a technical sales representative and can be contacted on 0409 500 800 or amahoney@livingturf.com.

Nuturf has also bolstered its ranks with the appointments of no less than three experienced course superintendents in recent times. **Dean Henderson, Scott Harris** and **Andrew Smith** have joined as territory managers bringing a combined 70 years' worth of turf industry experience to the company.

Henderson started his new role on 18 August after a small hiatus from the industry following his departure as superintendent at Palmer Coolum on the Sunshine Coast earlier in the year. Henderson, who will service the southeast Queensland market, has been a mainstay in the Queensland turf industry for around 20 years.

Between 1996 and 2009, Henderson worked his way up from a greenkeeping position at Sanctuary Cove Golf & Country Club into the assistant superintendent role at nearby Hope Island Resort, before ultimately returning as superintendent at Sanctuary Cove. In 2009 he headed to the Sunshine Coast to take on the superintendent position at the then Hyatt Coolum Resort, hosting multiple Australian PGA Championships and also overseeing the construction of six new holes. Henderson's success at Coolum saw him awarded one of the GCSAQ's highest honours – the Superintendent Achievement Award – in 2012.


Morrison


Mahoney


Harris


Smith

AGCSA Accredited Superintendent and two-time AGCSA Golf Championship winner Scott Harris also announced his switch to Nuturf in August. Harris finished up Canberra's Gold Creek Country Club after 10 years as superintendent to take on the new role. Harris, recently elected to the newly formed STA Australia association, will remain on the national committee as well as continue on as president of STA ACT.

Andrew Smith completed the new-line up when he recently departed Yamba Golf Club on the NSW North Coast after 26 years at the helm. Smith won the AGCSA's coveted Claude Crockford Environmental Award at the 2009 Australian Turfgrass Conference in Hobart.

Jo, Charlie and Anthony Muscat (Turf Australia chairman) at the Turf Australia Field Day held at Greener Lawn Supplies

In the green

Australian turf producers gathered in Penrith at the end of August for the annual Turf Australia Conference and Field Day. Turf Australia's industry and business development manager Richard Stephens reviews the event.

Turf Australia
Grow Green
www.turfaustralia.com.au

Great conference, congratulations! Good people doing good work! This was just one of the many positive pieces of feedback received from the 2014 Turf Australia Conference and Field Day (In the Green) that was held in the last week of August in Penrith, NSW. Despite some wet weather, very positive feedback was received from the 198 delegates who attended about the conference programme, speakers, workshops and field day.

Steven Bowman, managing director of Conscious Governance, kicked off the conference with a very inspirational presentation on ways to change business thinking from negative to positive. "Don't let the points of view of others control you," Mr Bowman espoused. "If people tell you, or if you tell yourself, that something is difficult and you believe that, guess what, it will feel difficult.

The annual conference and field day attracted nearly 200 delegates and 30 exhibitors

"Don't define anything. Don't put boundaries or limitations in place. Instead, ask questions like 'What are the top two strategic issues for your business over the next 10 years?' And ask this question of yourself and every staff member at least twice per year and brainstorm wild, even slightly plausible answers.

"To be aware in business, you need to be willing to ask questions, lots of questions. A good question opens up possibilities, such as:

- 'What is the one thing we do well as a business but don't value and therefore assume others don't value?'
- 'What is not working here and what do we need to do about it?'
- You can even ask your advisors, accountants, bank managers etc... 'What question should I ask?'

"A fixed point of view is not helpful as it narrows your vision and therefore means you are blind to many possibilities. You know when you have a fixed point of view because you feel 'pissed off'.

Rather than closing off possibilities and feeling 'pissed off', change your response to 'That's an interesting point of view and/or situation' and start asking insightful, strategic questions. We really need to get over ourselves, start asking thought-provoking questions and create points of view that work for us and our businesses".

John Squires from Rural Directions then facilitated a panel session of growers on their experience with the 'Staying in the Green' programme. Robert Welke, director of Tallemenco, prompted many delegates to commit to doing an irrigation efficiency check, while University of Western Australia associate professor Louise Barton provided an interesting, informative and fact finding summary of managing water allocations on turfgrass, including the role of wetting agents. Anna Bertram and Andrea Brydges from Bite Communications also explained how turf businesses can link into and leverage more sales from the new national turf marketing campaign.

The final two presentations focused on learning from our international counterparts. Dave Raison convened a panel of Turf Producers International Study Tour participants and reported on the 2014 USA Midwinter Study Tour. Erin Wilder, director of marketing and industry relations at Sod Solutions, USA, delivered a wide ranging presentation that covered many innovations in the turf industry.

Wilder highlighted what is likely to be in store for Australian growers and said the best thing they can do is to educate the end user. Erin was a very polished speaker and the huge amount of information in her presentations was well received by all delegates in attendance.

Following the gala conference dinner and trivia night, which raised over $5000 from the member benefit auction, the next day saw delegates head out to the field day which was held at Greener Lawn Supplies & Greenway Turf in Freemans Reach.

With over 150 participants and 30 exhibitors the day proved to be very popular with workshops held on herbicide trials, conducted by Ben Baudinette (Eurofins Agrisearch), and the process of cleaning or 'pigging' irrigation pipelines, demonstrated by David McKechnie.

TURF AUSTRALIA AGM

Just prior to the field day, Turf Australia (TA) held its Annual General Meeting. TA chairman Anthony Muscat explained how the organisation had worked hard over the past 12 months to lead and develop the industry as well as promoting turf to the market place. He thanked the TA Board for their valuable contributions, including:

- Ross Boyle (vice-president, Rosemount Turf)
- Adrian Pitsikas (outgoing treasurer, Greenacres)
- Anthony Heilig (incoming treasurer, GoTurf)
- Paul Saad (Southern Cross Turf)
- Tony Cornwell (Mardi Park Turf)
- Bec Selleck (The Lawn Doctor)

The TA Board give up their valuable time voluntarily for the long-term benefit of the whole turf industry. Muscat also indicated support for the Future Leader programme and announced that both Josh Stephenson (Dad & Dave's Turf) and Sarah Mason (Coastal Turf) will be asked to attend future TA Board meetings as observers.

Turf Australia staff were also thanked for their hard work to help develop the industry. Christine Hughes, based in Brisbane, along with Jasmine Norman and Richard Stephens, based in Richmond NSW, have been able to improve the communication services provided to industry, deliver more benefits to individual businesses and expand the annual conference and field day to attract almost 200 delegates.

As a not-for-profit, Turf Australia relies on the support of its partners and sponsors and Muscat personally thanked Platinum Partners Nuturf, Sammut Agricultural Machinery (in conjunction with Trebro), Evergreen Turf (in conjunction with Kesmac & Brouwer), TurfCraft and Agrifood Skills Australia. Gold Partners were also acknowledged including Sustainable Turf, Globe, Total Eden, ProLube and Local Land Services. TA asks members to please show their support to these companies by using their products and services where ever possible.

The Field Day provided an opportunity for delegates to network with many of the Turf Australia partners, sponsors and exhibitors

VGCSA

It has been very pleasing to see the great support and attendance at recent VGCSA education meetings. Our association is all about getting together with our colleagues and learning from them and the best way to do this is to come to meetings and talk to people.

The combined Superintendent/2IC meeting held at Corowa Golf Club was a fantastic meeting with nearly 100 members making the trek up to the Murray. The meeting was supported by our sponsors that all provided some interesting demonstrations.

The keynote speaker for the meeting was **Oscar Yildiz**. This is the second time Oscar has presented at the country meeting and with the amount of positive feedback I have received since I don't think it will be the last time we use Oscar. If you didn't go to Corowa you missed a great educational opportunity, so make sure you come along next year.

Special thanks to course superintendent **Darren Harvey** for playing a major role in making the meeting such a success and presenting the golf course in such pristine condition. From all reports Darren and his team have turned the course around and this was reinforced by the feedback from all who played golf on the Monday.

I would like to take this opportunity to recognise **Ray Keane** for his outstanding contribution to the VGCSA and the industry. Ray, recipient of the AGCSA's Distinguished Service Award winner in 2004, was the first superintendent of Gisborne Golf Club and has worked there up until his very recent retirement. Ray served on the VGCSA committee for many years, including nine as president through an era that set the foundation for the VGCSA to be in the strong position it is today.

At the other end of the scale, I would like to congratulate **Ethan Bell** on receiving not only the VGCSA Graduate of the Year Award but also the AGCSA Graduate of the Year Award. It is turning out to be a stella year for Ethan as he has also just been appointed superintendent at Wangaratta Golf Club.

The next VGCSA meeting will be held in mid-September at Spring Valley Golf Club (host superintendent **David Phillips**) with a focus on vegetation management. We haven't had a meeting at Spring Valley for some time so it will be great to see you all there to support the day.

JEREMY CUTAJAR
PRESIDENT, VGCSA

A KEANE SUPER

At the 20th Australian Turfgrass Conference in 2004, former Gisborne Golf Club superintendent Ray Keane was bestowed the AGCSA's Distinguished Service Award. What follows is an excerpt from Australian Turfgrass Management Volume 6.4 (August-September 2004) in which Keane was profiled. Keane recently retired from Gisborne after more than 45 years.

"Being in the right place at the right time could possibly sum up 2004 Distinguished Service Award recipient Ray Keane's experiences in the superintendent trade.

It began some 35 years ago when the club he was a member of decided to make some big changes. Gisborne Golf Club was then a small country club with a Vern Morcom-designed layout with sand scrapes and 400 sheep. Keane was employed as superintendent in charge of construction, of upgrading to grass greens and removing the sheep every Friday and bringing them back on Mondays.

The only training in those days was a part-time course at Burnley College in Melbourne, and it was while Keane was there that a fellow student suggested that if he really wanted to broaden his knowledge he should join the Victorian superintendents (then curators) association.

The first meeting Keane attended was at the prestigious Victoria Golf Club. Upon arriving, Keane parked his car only to be met with verbal abuse and a loud blast of a car horn. Unbeknownst to Keane, he had parked in the Secretary Manager's car park who soon let it be known what he thought of those who "cut grass".

Keane entered the Victorian association at a time of change and with his desire to learn and be involved quickly became part of the association executive.

"To be part of new initiatives was exciting and rewarding and together with learning from people of the ilk of Claude Crockford from Royal Melbourne it proved to be a great time," recalls Keane.

Keane also played a role in the early development of the national association which despite being a challenging and frustrating time saw him form many friendships with the likes of George Rub and Rube Walkerden who were honoured posthumously at the 2004 conference.

Throughout Keane's career there have been many highlights, almost all coming about because he happened to be in the right place at the right time and had a desire to be involved.

Keane, a life member of the VGCSA, was president of the Victorian association between 1975 and 1985, and was national association president for a time. In 2000, he was among a number of superintendents to be awarded the Australian Sports medal for services to the industry, while his most treasured honour was a life membership at his home away from home, the Gisborne Golf Club.

"A very important thanks goes to the Gisborne Golf Club for their support and encouragement over the years," says Keane. "To have been a part of the club's development over the years and to be involved in the improvement of the course, which is ongoing, is the most rewarding thing of all."

Above: Ray Keane pictured after receiving the AGCSA Distinguished Service Award in 2004

STA QLD

Around 100 STA Qld members attended the association's recent Cricket Wicket Seminar at Allan Border Field

With an attendance of around 100 STA Qld members, many of them new to the association, our annual Cricket Wicket Seminar just continues to grow bigger. In conjunction with Queensland Cricket we held our biggest STA event yet at the Allan Border Field in July. In fact, the late flurry of registrations forced the relocation of the event from Queensland Cricket to the National Centre of Excellence.

After some early networking, the day started off with a presentation on the construction and maintenance of cricket wickets by Queensland Cricket's club wicket consultant **Wayne Heinemann.** Lunch was provided in the courtyard of the Ian Healy Room and after taking in the view of this fantastic venue from the Matt Hayden Stand it was time for some practical demonstrations.

AB Field grounds manager **Jarrod Bird** and his staff showed us plenty of aspects of wicket preparation from scarifying to sealing a wicket with many helpful tips in between. During these demonstrations we were lucky enough to see the Queensland Bulls train.

As always, the day was a great mix of both theory and practical demonstrations and STA Qld would like to thank Jarrod and Wayne for their hospitality and for sharing their in-depth knowledge of all things wickets.

The next STA Qld next event will be slightly different to our usual annual partner's day. We have decided to hold an 'Open day' which will be open for everyone involved in the turf industry to attend. Our partners will be displaying their products, services and machinery with the additional benefit of attendees being able to actually try them out. It will also showcase what our association is all about and how it can assist, educate and benefit our members.

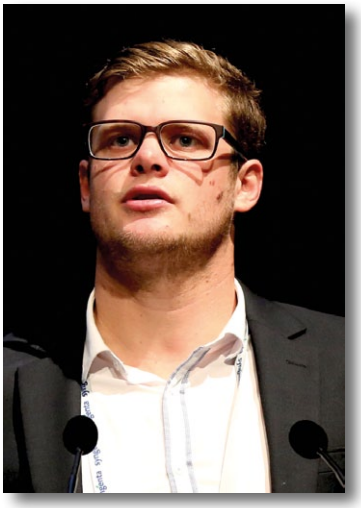
Planning of our annual bus trip in October is well underway. At the moment it's looking like we will be visiting the new National Cricket Centre, Eagle Farm racecourse and Golf Central driving range.

And lastly, it's great to see STA Qld president **Mal Caddies** (Suncorp Stadium) on the road to recovery and back on the tools. It's also been a good wake up call to all of us to be much more sun safe in the future.

MARTYN HEDLEY
VICE-PRESIDENT, STA QLD

STA ACT REGION

Simon Snedden has recently taken over as superintendent at Gold Creek Country Club



2013 AGCSA Graduate of the Year winner Luke Jorgensen spoke about his trip to attend the University of Massachusetts' Winter School for Turf Managers at the recent STA ACT Turf Seminar

We managed to avoid the frosty mornings for much of the winter but it seems we are making up for it of late. We've just come through a week of -4°C to -8°C temperatures that sure make it tough just getting out of bed in the mornings let alone fronting up for outside work.

The frosty mornings have made sure the couch surfaces are well and truly still asleep. This is not necessarily a bad thing this time of the year as the couch tends to break dormancy more evenly if it's later in the season. It shouldn't be too much longer before we see some green tips emerging.

Our annual Turf Seminar was recently conducted at the new venue of the Tuggeranong Town Sports Centre (Vikings Club). The new venue was an overwhelming success as it is more intimate and guarantees sponsors a better chance to interact with delegates. Numbers were up on previous years and we hope this trend will continue in years to come.

We went back to a more traditional programme of local greenkeepers speaking on local topics mostly covering this year's theme of reconstruction and rejuvenation. Golf courses, sports fields and bowling greens were all represented and we hope to continue this again next year.

Luke Jorgensen (Royal Canberra Golf Club), last year's AGCSA Graduate of the Year Award winner, spoke about his eight week trip to the US as part of his award. It was particularly interesting to hear how much study and work is involved in the trip. Luke was grateful for the chance to learn from so many high profile teachers at the University of Massachusetts and encouraged other apprentices to strive for a similar opportunity.

We must pay special thanks to both **Peter Frewin** (AGCSA) and **Richard Forsyth** (Royal Melbourne GC) for taking the time to come and speak at our seminar. Richard spoke about reconstruction and tournament preparation at Royal Melbourne and certainly raised some eyebrows with the amount of work and planning for these events. Peter gave an insight into the ground inspections carried out for AFL games to take place. The behind the scenes work carried out at these venues was a good topic of conversation for many delegates over lunch.

Andrew Boyle (Royal Canberra Golf Club) outlined their plans for course redesign and reconstruction. Their decision to go wall-to-wall bentgrass was another talking point and certainly worthy of a feature article in ATM in the future.

At this year's seminar **Keith McIntyre** was bestowed the honour of STA ACT life membership. Association president **Scott Harris** presented Keith with a plaque as thanks for his tireless work for the association over the past 20 years or so.

Keith has been instrumental in not only establishing the association in the ACT region but for organising so many events and seminars during his time on the committee. Keith's passion for our industry is unrivalled and it was a long overdue recognition of these efforts.

We must also give a huge thank you to the sponsors of this year's event. It goes without saying that these seminars could not take place without their assistance. We hope sponsors got something out of the day and any teething problems with the new venue can hopefully be ironed out for next year.

At the conclusion of the seminar we held our Annual General Meeting. There are some new faces on the committee that we hope can add something through the year. The full committee is as follows:

- **President:** Scott Harris (Nuturf)
- **Treasurer:** Karen Higgs (Royal Canberra GC)
- **Committee:** Mark Thompson (Federal GC), Bill Franklin (Nuturf), Danny Hull (Queanbeyan BC), Mark Dagwell (Tuggeranong BC), John Tait (Marist College), Andrew Boyle (Royal Canberra GC), Brad Van Dam (Manuka Oval).

And finally, congratulations to **Simon Snedden** who has recently been elevated to course superintendent at Gold Creek Country Club. Simon, the STA ACT's representative at the 2014 AGCSA Graduate of the Year Award, has taken over from Scott Harris who left the club in August after 10 years as superintendent to take on a territory manager role with Nuturf. We wish both Scott and Simon all the best with their new roles.

DANNY HULL
COMMITTEE, STA ACT

ON THE MOVE

Simon Brown: From assistant superintendent Long Reef Golf Club, NSW to superintendent Mona Vale Golf Club, NSW replacing Andy Hugill who has stepped up to GM.

Brian Wilson: From assistant superintendent to superintendent Peregian Springs Golf Club, Qld.

GCSAQ

As the newly elected Queensland president, it gives me much pleasure to present my first state report to you, the valued reader of ATM. I'll start with the tried and trusted opener on the subject of Queensland's fickle weather and after a very dry and cool winter the recent rain has brought some welcome relief to many superintendents across the state.

Although certainly not drought breaking for our farmer friends (the Queensland Government recently declared almost 80 per cent of the state officially in drought) it has replenished a good number of our storage dams and given the landscape a tinge of green, putting us in a better place going into the warmer months ahead.

A successful staging of our Annual General Meeting was recently held at Horton Park Golf Club at Maroochydore (host superintendent **Pat Pauli**) with some 35 in attendance and 24 players taking part in the annual golf championships.

One of the main happenings for the day was the election of the new GCSAQ committee for 2014/15 and with the likes of **Peter Lonergan** (Coolangatta & Tweed Heads GC, president), **Dave Morrison** (ex-Windaroo Lakes GC, treasurer) and **Robin Doodson** (ex-Sanctuary Cove G&CC) stepping down, there were a number of changes.

Headland Golf Club superintendent **Ben Tilley** makes the move from the general committee to take on the role of treasurer, while **Phil Soegaard** (Lakelands GC) and 2014 AGCSA Excellence in Golf Course Management Award winner **Shaun Cross** (Byron Bay GC) join the general committee for the first time. The full GCSAQ committee for the coming 12 months is.

- **President:** Charlie Giffard (Indooroopilly GC)
- **Vice-president:** Brendan Clark (Cairns GC)
- **Secretary:** Mark Hauff (Palmer Gold Coast)
- **Treasurer:** Ben Tilley (Headland GC)
- **Committee:** Phil Soegaard (Lakelands GC) and Shaun Cross (Byron Bay GC)

Many thanks to our outgoing committee members – Peter, Dave and Robin – for their outstanding contribution to the association and industry as a whole over these past few years. They leave a great legacy for us to grow the association from.

Many thanks must of course go to our major sponsor on the day Toro and their representative Ross Sarrow for again supporting the GCSAQ by providing prizes and catering for the day. Newly elected committee member Phil Soegaard celebrated his appointment by winning the golf with 39 points, a fine achievement given he doesn't play a lot these days. Runner up was perennial front-runner **Paul McLean** who has re-entered the superintendent ranks once more after his appointment as Robin's replacement at Sanctuary Cove.

PHOTOMAP COURTESY OF NEARMAP

The new Horton Park course at Bli Bli is due to open May 2015. Aerial photo taken mid-June 2014

In the trade section, **Paul Bevan** (Simplot Partners) saluted the judge (after some serious practice the previous day in the pouring rain!) with Dave Morrison, moving the other way and now representing Living Turf, coming a close second.

It was a first time visit for some (myself included) to Horton Park, with Pat and his crew presenting the course in great condition, particularly after receiving 115mm of rain over the weekend.

As of May next year Horton Park will move to its new course – Maroochy River – currently under construction at Bli Bli. It was therefore fitting that host superintendent Pat Pauli was bestowed life membership of the association at what was potentially the last GCSAQ meeting at the course.

Pat's life membership was bestowed upon him by another doyen of the industry and fellow life member **Doug Robinson** who presented him with a framed picture and certificate.

After lunch, we travelled out to the new site to take a look at the new course. It has certainly progressed well since our last visit some months earlier, with construction company McMahons working on shaping and course construction while the clubhouse building has recently started with the target for completion being May 2015. Given the open nature of the new course and with plenty of water to negotiate, it will certainly present an interesting challenge to play.

Finally, it is around this time of year where many are thinking ahead to spring renovations and with the weather warming up, let's hope we continue to get some much needed rainfall to ensure even and steady growth.

CHARLIE GIFFARD
PRESIDENT, GCSAQ

ON THE MOVE

Greg Burgess: From assistant superintendent New South Wales Golf Club, NSW to superintendent Portsea Golf Club, Vic.

Callum Hitching: From superintendent Busselton Golf Club, WA to construction superintendent Karratha Golf Club, WA.

Horton Park's Pat Pauli (left) was presented life membership of the GCSAQ by Doug Robinson (right) at the recent AGM

TGCSA

Bicheno Golf Club on Tasmania's east coast was the venue for the TGCSA's two day conference and AGM in August

While we are enjoying some mild late winter/early spring weather, quite a few Tasmanian members have been busy repairing damage to their courses after some violent storms during the first week of August.

A common theme has been broken and uprooted trees, sand blown or washed out and localised flooding. At Launceston Golf Club, superintendent **Tony Smith** arrived home from holidays to find 120 trees blown over and what looked like a bomb site rather than a golf course. Some mainland newspapers featured photographs depicting a flooded Aurora Stadium, but as usual for the Hawthorn home game a few days later **Bryan Dunn** and his staff had produced an impeccable surface which the players often describe as the best they play on.

The Jacobsen-sponsored TGCSA two-day conference and trade show was staged from 19-20 August at Bicheno Golf Club on the state's east coast. Brilliant conditions greeted delegates for the early morning Toro golf competition with **Nic Bauld** (Aurora Stadium) taking the honours from **Dan Docherty** (Syngenta). **Mark Bainbridge** (Graden) and **Shane Knott** (Mowbray Golf Club) took home the nearest the pin prizes.

The conference sessions kicked off in a packed Bicheno clubhouse with **Mike Foskett** announcing that Jacobsen had established Gaffney Machinery as their agent in Tasmania. This was followed by an enlightening presentation by golf course architect **Ross Watson** entitled 'Site drives design'.

Brad Van Dam gave a comprehensive presentation on the redevelopment of Manuka Oval before **David Warwick** from Avondale Golf Club challenged delegates with presentations on his experiences with *Poa annua* control, microclimate management and bunker management.

AGCSA agronomist **Andrew Peart** presented a piece on his own thoughts and experiences on putting green maintenance derived from previous AGCSATech research projects and also gave a presentation on the ground monitoring work he undertakes for the AFL each season to ensure the grounds conform to the very high standards necessary at that level. The conference also included a range of machinery demonstrations from the likes of Jacobsen, Toro, John Deere, Graden and Equipment Solutions.

After happy hour in the sponsor's pavilion, the Tas Turf Solutions dinner was highlighted by some presentations sponsored by Bactivate Waratah and taste-testing of single malt whiskeys by Hellyer's Road Distillery.

The first award was the TGCSA Academic Achievement Award which was presented to **Mark Goodyer** from Launceston Golf Club for his exceptional results in completing the Diploma of Sports Turf Management through TAS Tafe.

The second award was the TGCSA Distinguished Service Award and went to newly anointed AGCSA Board member **Stephen Lewis**. Stephen continues to have a long and distinguished rein as Royal Hobart Golf Club superintendent and over many years has held all positions on the TGCSA Board more than once.

That commitment has continued on to the national association and recently Stephen was co-opted to the AGCSA Board following the recent departure of former Sanctuary Cove superintendent **Robin Doodson** to the Middle East. It's great to have a Tasmanian represented on the national board and all of us wish Stephen well in his new role.

At the TGCSA Annual General Meeting held during the two-day conference there were a few changes to the general committee with **Danny Gilligan** (Tasmania Golf Club), co-opted to the committee late last year following **Ricky Barr's** departure, confirmed as the association's secretary/treasurer. The full TGCSA committee is:

- **President:** Mark Johnson (Ulverstone GC)
- **Vice-president:** Phil Hill (Barnbougle)
- **Secretary/Treasurer:** Danny Gilligan (Tasmania GC)
- **Committee:** Tony Smith (Launceston GC), Adrian Box (Kingston Beach GC), Mark Selby (St Pats College), Bryan Dunn (Aurora Stadium) and David McLean (Tas Turf Solutions)

MARK JOHNSON
PRESIDENT, TGCSA

Royal Hobart's Stephen Lewis was presented the TGCSA Distinguished Service Award for his many years of service with the TGCSA

STA WA

About 40 members attended the STA WA Annual General Meeting held on 13 August at the Wembley Golf Complex Swing View driving range facility.

A lot of information was covered at the meeting, including changes to our membership and sponsorship fee structure and minor alterations to the constitution. One of these changes included the need to acknowledge the newly formed national STA Australia entity within the document. Of equal importance was a very constructive discussion regarding future social events and educational event attendance price scheduling.

The existing committee was voted back into office and the full line-up is:

- **President:** Tony Guy (All Saint's College)
- **Vice-president/Treasurer:** Hugh Gardner (Swan City Council)
- **Secretary:** Clint Betts (Baileys Fertilisers)

The meeting provided a wonderful opportunity for **Luke Cooney** of Hale School to be publically congratulated for his win as the National Sports Turf Graduate of the Year. Luke was in Brazil for the recent 2014 FIFA World Cup so missed out on being presented his award at the Syngenta President's Dinner held during the 30th Australian Turfgrass Conference on the Gold Coast.

Cricket pitch preparation is a craft that takes years to master and one in which Luke is quickly forging a name for himself. He completed his apprenticeship during a five-year stint at UWA and now prepares pitches alongside Hale's director of cricket, former Australian captain Kim Hughes.

To close off the meeting we were very fortunate to have special guests **Dr Henk Smith** and **Daniel Doherty** of Syngenta attend the meeting and provide an informative presentation on Gymnast and Higran, two new chemical registrations developed against couch and kikuyu grass mites.

Upcoming events include a Chemical Refresher Course in mid-September followed by our major seminar 'Turf Alive 2014' on Wednesday 12 November. The focus or theme of this year's seminar will be on the mental and physical stress challenges that face frontline and middle management staff.

We have on hand some magnificent speakers and presenters including guest speaker, former Eagles Premiership player and coach **John Worsfold**. This event will be held at the impressive WA Basketball Centre in Floreat. Further information and registration brochures will be sent out shortly.

TONY GUY
PRESIDENT, STA WA

PHOTO COURTESY OF CHALLENGER TAFE

National Sports Turf Graduate of the Year winner Luke Cooney

SAGCSA

Newly appointed SAGCSA committee member Nathan Bennett (Royal Adelaide Golf Club)

With spring upon us and finer weather South Australia has been experiencing, a lot of clubs will be gearing up for renovations. The SAGCSA wishes all members the best for what is a critical practice to ensure the long-term health of our playing surfaces.

In late July the SAGCSA held its Annual General Meeting at Royal Adelaide Golf Club (host superintendent **Nathan Bennett**). About 35 attended the day with guest speaker **Kevin Osborn** from the Port Adelaide Football Club talking about his involvement at the Power and his life in business. The new SAGCSA committee for the coming 12 months is:

- **President**: Bazz Bryant (Mt Osmond GC)
- **Vice-president:** Chad Dawe (Willunga GC)
- **Honorary Secretary/Treasurer:** Richard James (The Grange GC)
- **General Committee:** Stephen Chapman (Barossa Valley GC) and Nathan Bennett (Royal Adelaide GC)

After lunch about a dozen members played the iconic Royal Adelaide layout on a glorious day, with **Rohan Bock** (The Dunes, Port Hughes) collecting the Superintendents Trophy and **John Mansfield** (David Golf) taking home the Trade Trophy.

In the middle of August the SAGCSA held an education day at the Westward Ho Golf Club which is part of the Adelaide Shores complex (host superintendent **Tim Warren**). Fifty-five attended the day with excellent talks on a variety of topics. The highlight of the day was a presentation from long-time NSW Golf Club superintendent **Gary Dempsey** on his career in the turf industry and his time at the iconic Sydney club. He had some great photos and stories on his time in the industry.

After lunch there were machinery demos from a couple of our sponsors before the day concluded. Thanks to all our sponsors, trade partners and attendees for their support on the day.

Over the next few months we will be conducting a number of events including a Superintendents Forum (October), the SA Golf Industry Awards night (October) and a visit to Blackwood Golf Club (late November/early December).

BAZZ BRYANT
PRESIDENT, SAGCSA

GCSAWA

At the recent GCSAWA AGM at Hartfield Country Club I was elected as president of the WA association which I take on with enthusiasm in continuing to promote and support our industry.

Des Russell (Bunbury GC) stood down as president after many years of service both on the committee and as GCSAWA president. Des put a lot of effort into many areas with special mention of his contribution to the Golf Industry Awards Night and the Margaret River conferences.

Simon Bourne (Cottesloe GC) also stood down after many years' service to the association. Simon was treasurer for the last few years and organised the 2013 conference in Margaret River which was a big success. **Paul Needham** (Kwinana GC) also stood down as vice-president after several years' service, including the past two as secretary where he put in many hours.

With these changes I would like to welcome my new committee with some of the old guard returning to fill some of the vacant positions.

- **President:** Neil Graham (Melville Glades GC)
- **Vice-president**: Idris Evans (WA GC)
- **Secretary:** Trevor Strachan (Lake Karrinyup CC)
- **Treasurer:** Darren Wilson (Wembley GC)
- **Golf Secretary:** Jason Kelly (Royal Fremantle)
- **Committee:** Glenn Cross (Mt Lawley GC), Adam Strachan (Secret Harbour GC)
- **Trade Representative**: Geoff Kirk

The committee is looking to implement some more educational days by pursuing 'walk and talk' days that will be held at courses that have carried out recent construction, special projects and implemented successful maintenance programmes. We also want to continue to promote the Water Wise golf programme which will include organising of training days.

The Toro Cup was also held during the AGM with congratulations to the following:

- **Toro Cup:** Winner – Michael Dennis (Royal Perth GC); Runner-up – Brad Anderson (Sun City GC)
- **Alan Barlow Trophy:** John Forrest (Murdoch Tafe, pictured); Runner-up – Jason Kelly.

The GCSAWA Super Series continues to run and the final two events will be held at Sun City Golf Club (8 October) and Kwinana Golf Club (11 November).

NEIL GRAHAM
PRESIDENT, GCSAWA

ON THE MOVE

Paul McLean: From Nuturf to superintendent Sanctuary Cove Golf & Country Club, Qld.

Simon Snedden: From assistant superintendent to superintendent Gold Creek Country Club, ACT replacing Scott Harris who has joined Nuturf.

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Mark Jennings & Jim Waring with the Box Hill Golf Clubs Lowara Hydrovar pump set

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- Mark Jennings Superintendent Box Hill Golf Club

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