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Warringah 10 years on What haven't we learned?

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McLeod Country Golf Club:

The 15th green at McLeod Country Golf Club in Brisbane. McLeod was one of a number of courses along the Brisbane River to feel the full impact of the recent floods. Photo: Brett Robinson



COVER STORY: State of disaster - Queensland's summer of destruction

Golf course superintendents and turf managers across the state of Queensland will long remember the summer of 2010/2011. As the state notched up its wettest year on record, flood waters ravaged many parts of the state, culminating in the incredible scenes as the Brisbane River inundated the state capital. More than 30 golf clubs as well as countless turf and sports facilities around the state were impacted by the floods and while the clean-up process is well underway the impact will likely be felt for months, if not years to come. Then to top things off severe tropical Cyclone Yasi cut a swathe through Far North Queensland! ATM looks back at Queensland's remarkable summer of destruction which has tested the resolve of many within the turf industry more than ever before.

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FEATURES Warringah 10 years on what haven't we learned

February 12, 2011 marked the tenth anniversary of the Warringah Golf Club environmental disaster. Even though the final sentencing wasn't handed down until September 2003, the case rates as the most significant in the history of the golf course maintenance industry. Ten years on from the incident environmental expert Terry Muir ruminates on how far the industry has progressed and what lessons still haven't been learned.

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Trees are an integral part of most golf course landscapes in Australia and make a considerable contribution to their aesthetic beauty and playability. However, from an agronomic perspective trees are often considered just another 'weed', albeit a very large one, as they compete with the turf for space, light and water. John Neylan looks at these issues and the benefits of a proactive tree management regime.



Hong Kong turfies benefit from Down Under nous

Environmental parameters, limited resources and rapid urbanisation are just some of the many issues exacerbating turfgrass quality in Hong Kong writes Matt Roche who was part of a contingent of Australian and New Zealand agronomists to recently conduct a two-week turf education course there.



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In light of the recent weather, The Pulse asks superintendents how the past six months have treated them and what lessons they have taken away from what has been a challenging growing season.



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RESEARCH DEEDI wear tolerance trials extended

DEEDI senior research scientist Matt Roche provides an update on the extension of the HALfunded research project investigating the traffic tolerance of warm-season turfgrasses under community sportsfield conditions.

Optimising foliar nitrogen nutrition

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Foliar fertilisation, applying small amount of nutrients to the foliage of putting greens, has become a common practice for golf course superintendents. However, US researchers have shown that the uptake of foliarly applied nitrogen is an inefficient process for creeping bentgrass putting greens.

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When it rains, it pours

'm not a religious man by any stretch – rugby union being the exception of course – but the disasters of seemingly biblical proportions which have befallen Queensland this summer make you wonder what those poor souls have done to warrant such a hit.

Coming from the Shaky Isles where the weather is decidedly beige, I have watched in fascinated horror as the events of the past couple of months have unfolded. Having contacted a number of superintendents and turf managers affected it does become a rather sobering exercise and as I remarked to one colleague I feel like an ambulance chaser. First it was the floods in south east Queensland and tropical cyclone Yasi, then, just as we were finishing this edition, Victoria gets smashed for the second time this summer.

Having visited six Brisbane-based golf clubs a week after the mid-January floods with AGCSA board member Pat Pauli, witnessing the devastation rendered us speechless. If seeing greens, tees and fairways buried under layers of silt, maintenance facilities inundated and irrigation infrastructure destroyed was bad enough, driving between the courses through the suburban streets and seeing the contents of people's homes piled high in makeshift rubbish dumps was quite unimaginable.

Both Pat and myself were extremely grateful to those superintendents and crew members who took time out from the massive clean-up works to show us around and we were heartened by the positive outlook most seemingly had despite the incredible mountain of work that confronted them (and probably still does). When we stopped by McLeod Country Golf Club, superintendent Peter Daly was enjoying a cigar with local Nuturf rep Max Whatman. Given what Peter and his crew had had to confront that week, I'm sure that Cuban had never been more deserved.

While superintendents and turf managers are a resilient lot, you do have to wonder when the breaking point comes. That question is also extremely relevant for the clubs themselves, and the unfortunate aspect of the recent events is that a lot of the worst affected are smaller or regional courses that in most cases were struggling financially already.

Reading Peter Lonergan's GCSAQ report on page 63, he notes that a number of courses have already let go staff and cut back budgets because of loss of revenue or costly repair bills. Many of these courses simply don't have flood insurance because of their location, but given that they provide an important public recreation amenity and are such focal points within our communities, should the question be asked that these facilities receive some sort of special dispensation in the case of extreme weather events?

In this edition we take a comprehensive look at the events which left Queensland reeling this past summer. We talk to superintendents and turf managers from Brisbane to Port Douglas and look at the incredible lengths they and their crews have gone to in order to reinstate their facilities.

To end on a purely indulgent and hopefully not too inappropriate note, you could not have imagined the excitement in the Robinson household, well from one lonely quarter anyway, when the Melbourne Rebels strode out on to AAMI Park for their Super 15 warmup in early February. For the union-deprived wretch that I have become since landing in Melbourne eight years ago, to head along to a rugby game with the lads was liberating. The AAMI Park surface (see photo below) was in magnificent order and I wish Adrian Black, Justin Lang and the rest of the MOPT staff all the best for the Super 15 season and beyond. See you in the stands!







FOREWORD THINKING

JOHN NEYLAN, AGCSA GENERAL MANAGER

Our country of droughts and flooding rains...



The start to 2011 has followed the same traumatic trends experienced towards the end of 2010, with the elements having a major impact on people's lives. In the east it was plague locusts, late spring rains, floods and cyclones and it appeared to be the last act of environmental defiance following many years of droughts, poor crops and, of course, Black Saturday. In the west the drought continues with little or no respite and recent bushfires provide a dramatic contrast. These conditions impact both urban and rural areas with the loss of lives, homes and livelihoods.

In the eastern states, farming communities in particular have been affected in that early in the spring they were looking at a bumper harvest after years of low yields and crop failures and are now faced by waterlogged paddocks, reduced yields and deteriorating crop quality. It raises the question, "How do people manage to keep it all together?"

The other question we often ask is, "Why does it all happen?" In this day and age everything has to have a reason and is scrutinised and analysed. Is it climate change? Is it the natural cycle that has ebbs and flows well outside of our short period of record keeping?

In the excellent book 'The Water Dreamers' by Michael Cathcart there is a detailed account of the ways people struggled to settle Australia and how water and climate were such critical elements in colonial development. It is about how the early pioneers tried to understand this vast continent and how to overcome its obstacles. Water was seen as the essential element in conquering what was always considered to be a harsh climate and the search for large and permanent river systems was seen as the first step in developing the land in a European context. The text contains many interesting stories of early exploration and the challenges that were presented by an unpredictable climate. In one such example, the explorer Oxley found that his way forward into the interior was impeded by impenetrable wetlands yet some years later the same area was dry and arid. In reading this book and reflecting on recent events you have to ask has anything really changed?

The climatic conditions have provided numerous challenges for turf managers, particularly where sportsturf facilities have been inundated, infrastructure destroyed and then the massive costs associated with the clean up. As has been noted on previous occasions the turf industry comes to the fore to offer support wherever possible to assist those affected. Greenkeepers and turf managers are undoubtedly a resilient lot and will find a way.

From an AGCSA perspective the publications team led by Brett Robinson has done a great job keeping the industry informed of what has been happening and who has been affected. The Cut newsletter has been an excellent source of up to date information and it was pleasing to receive praise from a senior golf administrator on how effective the newsletter has been in getting the message out. I would also like to thank all the turf managers that have spoken with Brett and provided photographs.

Again, it has been pleasing to see our members volunteer their services to help out their fellow turf managers. There have been volunteers not only from Queensland but also Victoria, NSW and South Australia. As with the bushfires in 2009, the machinery and product supply companies have again offered equipment and supplies to assist in getting facilities up and going again.



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AGCSA MEMBERSHIP

AGCSA MEMBER SURVEY

Recent events have provided a diversion for the AGCSA team, however, in addition to responding to immediate needs we are looking to the year ahead following our members survey conducted in December 2010. We were very pleased with the response from members with over a 50 per cent return rate and the results are now being reviewed. A detailed discussion of the survey appears in the February edition of the AGCSA Action members newsletter.

Reassuringly there is a high level of satisfaction with what we do as an association. AGCSA members are very active and interested in their association and have provided strong direction for the organisation. As a result of the survey there are several key actions that the association needs to focus on in the future;

- While our communication is very good we need to continue to improve the communication with members. We plan to do this through regular reminders and updates of what is happening at the AGCSA and what resources are available through the website. Keep your eyes on The Cut.
- Provide OH&S templates. We recognised last year that OH&S is still a critical area and we are currently working on the development of an OH&S 'starter kit'. We will also conduct an additional workshop at this year's conference on OH&S.
- Have a stronger focus in the regional centres. This has been a challenge for all associations, however, over 2011 we will have a focus on running 'walk and talk' field days outside of the major centres. We had an excellent response from regional members that have volunteered to assist in co-ordinating a local day and making contact with local superintendents. We are hopeful that the first of these will be Townsville once the clean up from Cyclone Yasi has been completed.
- Continue to promote the revamped AGCSA Accreditation Programme and to explain what the process involves.
- Undertake professional development days in IT, conflict resolution, financial management, agronomy and time management. At this year's conference we will tackle financial management as an additional workshop.

The year has started on a very bumpy road, however, we wish all our members well in their turf maintenance endeavours. If you think the AGCSA can assist with anything, please do not hesitate to contact the office. \pm





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International	. \$195
Trade	. \$292
Retired	. \$130

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QLD - Golf Course Superintendents Association of Queensland	\$88
SA - South Australian Golf Course Superintendents Association	\$75
TAS - Tasmania Golf Course Superintendents Association	\$60
WA - Golf Course Superintendents Association of Western Australia\$	\$110
VIC - Victorian Golf Course Superintendents AssociationPlease call 9645 4	1394

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Where do you start recounting the incredible events which have taken place in Queensland this past summer? Record rains throughout spring and then into December and January caused flooding to vast areas of the state, culminating in the incredible scenes of the Brisbane River inundating the state capital. As well as the tragic loss of life and property, the events also had a wide-ranging impact on the turf industry and its practitioners. Over the next 20 pages ATM editor Brett Robinson looks back at Queensland's summer of destruction and how the turf industry has once again shown its innate resilience and desire to bounce back in the face of adversity.



ever has a cigar tasted so good. It's barely a week after the Brisbane River has turned the lives of tens of thousands of Brisbane residents upside down, yet for McLeod Country Golf Club superintendent Peter Daly it is time to celebrate.

Together with assistant Phil Boag and the rest of the McLeod course maintenance crew, Daly has spent the best part of the week knee-deep in thick, stinking mud, pushing, scraping and dragging a mountain of silt off greens and tees which has been deposited by the incredible volume of floodwaters that inundated 90 per cent of the course.

As well as being immensely therapeutic and providing Daly with a brief and welcome respite away from the heartbreaking condition of the course, sparking up the Cuban represents the first milestone achieved on the long road to getting his beloved club back on its feet. Cleaning off the greens and tees is on the top of an exhaustive list of jobs facing Daly and the sense of relief and satisfaction of being able to put a line through it is almost palpable.

Given what he has endured in the past week, few would begrudge Daly such a small indulgence. It's not every day that you watch on helpless as your course turns into an inland ocean and becomes a victim of one of the greatest natural disasters in recent history. Despite being one to always look on the lighter side of life, even Daly struggles to comprehend what has just happened three weeks shy of him notching up 10 years at the club.

"You just can't fathom it," says Daly. "It's like a disaster zone, yet you drive 10 minutes away and it is like nothing has happened. We have markers from the 1974 floods on the course so we knew what was coming, but I don't think we really believed it until we saw it."

A few kilometres upstream at Wolston Park Golf Club, superintendent Warren Langlands is also trying to get his head around what he has just witnessed. Standing next to a mini skip stacked high with what was once the contents of his office, a look of disbelief is still plastered across his face. That disbelief, however, is slowly being replaced by the grim reality of the task that now confronts him and his small team to get the course back into some form of playable condition.

Among the sodden contents of the skip lies 15 years of Langlands' detailed course maintenance records – from diaries which he religiously wrote in, spray records, equipment and product purchases, inventories, parts manuals, the lot – all destroyed. "I've been here 15 years and it's the first time I've seen anything like this," says Langlands. "When I



first got down here after the flood waters receded, I opened the door to the office but quickly closed it again. It's pretty heartbreaking."

A few bends in the river downstream and at Indooroopilly Golf Club the full extent of just how devastating the floods have been is on show for all to see. Driving through the gates of the 36-hole complex you would be forgiven for thinking what all the fuss is about and aside from a washed out fence and a small but steady trickle of water across the entrance road, the course is seemingly in excellent order.

Continue up to the clubhouse, however, and the jaw quickly drops and the eyes widen. What would normally be a vista of green is now an ocean of dark brown as far as the eye can see. Everything – greens, tees, fairways, roughs, bunkers, cart paths, trees and shrubs – is smothered in a muddy film, the smell of freshly cut turf replaced by the pungent and unpleasant stench of silt and goodness knows what else.

A fleet of 11 posi-tracks, which course superintendent Charlie Giffard has managed to source from all over south east Queensland, drone away in the background, pushing a seemingly endless amount of silt off fairways, while a swamp dozer does likewise on the practice range. Down in the maintenance compound, a muddy watermark near the roofline of the main storage shed provides a shocking reminder of the sheer volume of water that has ripped through the place. Waters reached 8.5m above normal river levels and while most of Indooroopilly's big ticket items were evacuated to higher ground, the compound remains littered with flood-damaged equipment, chemicals and product.

"It's a life-changing event that's for sure, but now that the levels have gone back down we just want to get stuck in and start reclaiming areas of the course and get it back up as soon as possible," says Giffard. "For now it's about trying to rally the staff, the members and the club and figuring out just where to go from here. The road ahead will be long, but we'll get there eventually, one hole at a time."

These were just some of the scenes at many golf clubs and turf facilities which reside along the Brisbane River in the week after the unprecedented floods which hit the city in the second week of January 2011. From Karana Downs, which literally had one of its holes swept into the river, to Indooroopilly, St Lucia and Brisbane just a few clicks from the Brisbane CBD, numerous golf courses and turf facilities were left decimated.

It was the culmination of an extreme spring and summer for the whole of Queensland, the likes of which had never been witnessed before. After notching its wettest spring on record, Queensland would record its wettest December on record and in the first two weeks of the New Year further deluges pushed catchments to saturation point.

Brisbane's Wivenhoe Dam, constructed after the devastating Australia Day floods in 1974, was at bursting point, receiving inflows of up to one million megalitres a day which necessitated the massive release of water into the Brisbane River. At times, up to 170,000 megalitres a day flowed through Underneath this mass of water lies the nine-hole Jindalee Golf Club. Jindalee was completely submerged when the Brisbane River flooded numerous riverside suburbs in the second week of January

A graphic of the Brisbane River showing the locations of the many golf clubs and turf facilities affected by flood waters





These photomaps, taken from nearmap.com, show Indooroopilly Golf Club and Brisbane Golf Club before and after the incredible inundation of flood waters. Indooroopilly (36 holes) is located on the northern side of the river and Brisbane directly opposite on the southern side. More than 95 per cent of Indooroopilly's West Course was submerged while 85 per cent of Brisbane went under Wivenhoe's spill gates and over a four day period from 11-14 January the nation watched as the river reached breaking point and inundated more than 30 Brisbane suburbs and tens of thousands of homes, business and facilities.

For the likes of Daly, Giffard, Langlands and the rest of their superintendent and turf management colleagues, to see their facilities laid to waste has been incomprehensible and you can only hope they'll never have to witness another event like it in their lifetime.

Yet, true to the resilient nature which is the hallmark of many within the turf management profession, these practitioners have proven in the weeks after the floods that there isn't much that they can't handle.

Together with their crews and the help of members, they have thrown themselves unsparingly into the horrendous task of cleaning up their courses. While some have fared better than others (see page 10 for a full damage assessment of Brisbane's courses), across the board the desire of all superintendents has been clear – to get their facilities back bigger and better than they were before the floods hit.

WHAT A DIFFERENCE A MONTH MAKES

A month on from the floods and countless hours of back-breaking overtime later, the progress most courses have made is, quite simply, remarkable. Brisbane Golf Club had all18 holes open for play by Australia Day, while Oxley Golf Club and Indooroopilly's East Course were also open within a matter of weeks.

Despite still showing the visible signs of flood damage, Jindalee Golf Club, which had its full complement of nine holes completely submerged, was back open, while at the time of this edition going to print Indooroopilly's West Course was due to open on 26 February. At McLeod, Daly was waiting on the 15th and 17th greens to improve a little more before opening them up to the members, while Wolston Park, which had 12 holes reinstated relatively quickly, was looking to have the full 18 open by the end of February.

For these clubs to get anywhere near this stage has required an incredible undertaking on behalf of course maintenance crews as well as an army of volunteers. At Brisbane Golf Club, course superintendent Ben Cavanagh had more than 160 volunteers turn up in the days after the floods, while at Indooroopilly more than 250 members rolled up, including a group of lady members who had the delightful task of cleaning out the maintenance facility.

"After seeing the silt deposits when the waters finally receded and to see where we are at now, I am pleasantly surprised," says Giffard. "What faced us on the Saturday immediately after the floods was difficult to comprehend. We more or less started out from the clubhouse and literally dug our way down to the shed.

"You did wonder how on earth we were going to come out of this, but after we got the posi-tracks in and you could see changes each day and some green life coming back, you did start to have some hope. Initially, any progress was fantastic. It was hard yakka rallying all the staff and volunteers and trying to keep some good humour about the whole situation, but I think where we are at now everyone can be very proud of their efforts."

With most turf surfaces now cleaned up and slowly recovering, attention is shifting to repairing infrastructure such as irrigation and staff amenities which were also hit hard. While many had temporary pumping arrangements rigged up relatively quickly, getting their full complement of pumps online is ongoing, and in the case of Jindalee, superintendent Tony Richards is still relying solely on Mother Nature.

Fortunately, or unfortunately depending on how you look at it, Brisbane has received plenty of rain in the six weeks after the floods and despite a relatively dry spell toward the end of January, 15 of the first 21 days of February saw persistent daily falls. While most were in the single figure range, a dumping of 68mm on 21 February put reinstatement works back even further at many courses.

For those club's whose maintenance facilities were inundated and machinery lost, progress varies. While work has started to refit the staff areas within the Indooroopilly maintenance compound, by contrast the Brisbane shed is still the bombsite that was left behind when floodwaters finally receded.

Cavanagh's office remains piled high with ruined furniture, computer components and flooddamaged folders while chairs, upturned fridges and silt-covered work gear remain strewn throughout the locker rooms and lunchroom. Even the mud-stained sign proclaiming 'Clean your shoes, please' still clings resolutely to the entrance door to the staff amenities area.

What could be salvaged, such as mechanic tools, has been moved into a temporary maintenance facility which will more than likely be the Brisbane crew's home for the next three months as the club continues down the path of getting insurance assessments and deliberating possible alternatives on where and in what form a new facility might be constructed.

At Jindalee, where the maintenance facility was one of the first areas to go under and last to re-emerge, the clean up process has been painstaking. With just two full-time and one part-time staff and little in the way of resources, the road back has and will continue to be a long. It took almost



four weeks to get power reconnected, but of more concern for Richards is getting flood-damaged machinery back in working order. With the small nine-hole club simply not having the cash reserves to afford machinery or engine and replacements, Richards has had to rely on a local mechanic stripping back engines and components in an effort to get them working again.

CONTINUED ON PAGE 11

Members of the Indooroopilly maintenance crew continue the painstaking task of cleaning off greens and tees a week after flood waters dumped up to 200mm of silt across vast areas of the West Course

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COUNTING THE COSTS

Indooroopilly Golf Club

- Ninety-five per cent of the West Course (comprised of the Red and Gold nines) goes completely under after river level reaches 8.5m.
 Only hole not affected is 6 Red. Greens on 4 and 5 Red and 4 Gold partially submerged. East Course fares better with just four holes suffering various levels of inundation.
- All major machinery items moved up to clubhouse (which remains untouched) on Tuesday night. Maintenance facility, machinery storage shed, mechanics compound and all staff amenities go under up to roofline. Pump shed, irrigation control system, 45 satellites all damaged.
- Silt deposits range from 20mm to 100mm on greens and up to 200mm on tees, fairways and other areas. One fairway running along the river has drifts of sand up to 600mm deep.
- Total estimated cost of flood (including plant hire \$150,000, irrigation system repair \$200,000, refitting staff amenities \$60,000, equipment lost, overtime and loss of revenue) approx. \$1 million.

St Lucia Golf Links

- 90 per cent of the course inundated. Eleven greens go under. Massive deposits of silt across inundated area, some up to 200mm thick in parts. Clubhouse and maintenance facility unaffected.
- Brand new Rain Bird IC irrigation system, installed just prior to Christmas, is knocked out after pump shed goes fully under.

Brisbane Golf Club

- Eighty-five per cent of the course goes under including the course maintenance facility and pump shed. At the lowest point of the course – the 15th green – the water is the height of a two storey house. Water level up to the roof of the maintenance facility. Clubhouse untouched.
- Assistant superintendent Ray Lawrence has to move machinery twice as flood waters rise rapidly, however, isn't able to move out all machinery in time. Among the main items lost are a John Deere Gator, 2653A and 2500A.
- All manner of debris litters the course and its creeks, including three semi-trailers which were washed in from a neighbouring transport company depot. Course's 600-litre spray tank floats out of shed and deposited half a kilometre away on course boundary.
- Club's two above ground fuel tanks, weighing 3 tonnes apiece, are ripped from their stands and deposited, side by side and fully intact, on the edge of the 12th fairway, 100m away from the shed.

Silt deposits ranged from 20mm to 100mm on greens and up to 200mm on tees and fairways at Indooroopilly Golf Club

Brisbane Golf Club superintendent Ben Cavanagh with a couple of casualties from the January floods

- Two members of the maintenance staff have the houses they were renting in Tennyson and Oxley damaged by floodwaters.
- Estimated course damage bill of \$500,000.

Oxley Golf Club

- Thirty-five per cent of the course goes under, including four greens several tees and fairways and 21 bunkers. Water height up to 4m.
- All machinery moved up to clubhouse on Wednesday. Floodwaters get to within a metre of inundating the maintenance facility and half a metre of the pump shed before starting to drop. Clubhouse safe.
- Debris everywhere bins, countless tyres and 44 gallon drums, 1000-litre fuel tank deposited on the 6th fairway. Loss of 100-plus drought-tolerant trees and shrubs.

Jindalee Golf Club

- Entire nine holes completely submerged. Clubhouse, highest part of the course, has a metre of water through it.
- Maintenance facility, situated on the lowest point of course, is one of the first areas to go under with no opportunity to get machinery out. Entire contents – machinery (including two Toro triplexes, a bunker rake, zero turn mower, JD surrounds mower, JD fairway unit, Kubota tractor, spray unit), chemicals, fertilisers, vehicles – all suffer significant damage.
- Fuel tank ripped out and floats up and over maintenance facility roof and deposited on other side of the shed.

McLeod Country Golf Club

- All except four greens 10, 12, 13 and 16 go under. All machinery, course furniture, pins etc moved to highest ground around 13th green. Machinery shed and clubhouse, both located on the highest points of the course, are safe. Course's two pump stations go under.
- The 15th and 17th greens are the worst affected with both remaining under water for six days.
- Apprentice Jake Jensen's family home at back of McLeod's 12th tee goes under. Water laps backyard of assistant superintendent Phil Boag's home along the 11th.

Wolston Park Golf Club

- Nine greens (1, 12, 13, 14, 15, 16, 17, 18 and the club's practice green) go completely under. Water level between 8-10m above normal river height. Three-inch layer of silt across flood affected greens, tees and fairways. Clubhouse suffers structural damage.
- Caretakers house, greenkeeper's cottage (containing superintendent office and staff lunchroom) and machinery shed have water up to the guttering. Maintenance shed structurally okay but all wiring damaged. All course records, management diaries, parts manuals, turf publications lost. All major course machinery saved after being moved to higher ground at adjacent hospital.



CONTINUED FROM PAGE 9

"We are doing the best we can," says Richards. "We were able to get the fairway mower going so for the first time in about a month we were able to get out and give the fairways a cut. We have got a couple of machines still to get up and running, but until then people will just have to be patient. There is talk that the machinery shed will be relocated to a higher point on the course and hopefully that will happen because the club simply can't afford another event like this."

STEADY AS SHE GOES

For the likes of Oxley superintendent Shane McDonald and Peter Daly at McLeod who haven't had to worry about losing their maintenance facilities, the primary concern now is getting their turf back to optimum health before winter and also trying to balance the needs of the turf with requests from management to lower cutting heights.

"Our root system, which was 25cm deep before the floods, is back to between 7cm-10cm," says Daly. "Some greens were down to as little as 3cm after the floods but they are getting stronger each day which is encouraging. We still have two greens – 15 and 17, which were under for six days – that haven't quite reached the level of the others, but it's just a matter of getting them back slowly and not stressing them too much before opening them."



"Everyone's in the same boat and I'm sure we've all been placed under pressure by management to get everything open as quickly as possible and then to start lowering cutting heights. At the end of the day, though, you can't put too much pressure on the turf after such an event like this. Concentrating further stress on greens by getting them down too quick will only cause further problems in the long run and in most cases will undo all the good work we have done to date.

"It has been a funny season. As well as the rain, it has been very cool and the lack of sunshine has

CONTINUED ON PAGE 13

An aerial photo taken of Jindalee the day after the flood peak of 14 January. The entire course as well as maintenance facility and clubhouse went under







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Headlands Golf Club

AROUND THE TRAPS – HOW OTHER CLUBS FARED

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Cooroy Golf Club



Pacific Harbour Golf & Country

"Superintendent Vaughan Cocks and his team have been working from dawn to dusk to get the course into shape. Our course and suburb was one of the first to be affected in south east Queensland. Ultimately there were only three greens and four tees that remained undamaged. Our signature hole, the 15th, which runs along the Brisbane River, has been badly damaged with three landslides seeing parts of the fairway, green and rough lost into the river, as well as damage to a large amount of power and irrigation lines. There is a cover of sand layering

the hole which was up to 2m deep in places. "Sadly, Vaughan's equipment shed was badly damaged during the event. We have incurred major damage to all mowers (two write-offs) and motor vehicles (one write-off). He has also lost all power tools, chemicals, fuels and oils. We have been greatly assisted by a small team of members who have been hand mowing areas of the course. Unfortunately we are not insured for flood damage and will be forced to self-fund the replacement of machines." David Witt, Managing Director

HEADLAND GOLF CLUB

Sunshine Coast

"We have been really lucky, aside from trying to manage and present a saturated golf course. We received 2378mm for 2010, including 591mm in December, and for January 2011 notched up a further 582mm. Revenue to the club was obviously affected with a 66 per cent loss recorded for January and February. If we compare our previous season, June 2009 to end of January 2010, we received 428mm and had a very serious dry spell where we only had 2-3 weeks water supply left and were only watering greens and tees. It is certainly a land of contrasts." **Ben Tilley, Superintendent**

CAIRNS GOLF CLUB

Cairns

"Since starting here last March we have had all sorts of records broken. We had 3147mm of rain for 2010 with September and October the wettest on record." Brendan Clark, Superintendent

COOROY GOLF CLUB

(15km E of Tewantin)

"We have seen some serious rain in the past two months. Over December we had over 600mm and in January 855mm. The course was closed from Christmas until midway through January due to dangerous conditions which meant we lost all our holiday trading. All our bridges went under suffering minor damage, all our paths were washed away and 70 per cent of the course was under water at times.

"Unfortunately we've had to let one of our groundstaff go, while our casual bar staff have also been laid off due to lack of funds. Now we have the huge task of picking up the pieces with one less employee. I'll be interested to see if any funding is made available to little clubs like ours that weren't in the direct firing line on the Brisbane River. Certainly not a fun time to be a greenkeeper!" **Kirsty Herring, Superintendent**

KILCOY GOLF CLUB

(N of Lake Somerset, 50km E of Caboolture)

"Our greens, tees and fairways up high are the best they've been in a long time, however, our low lying areas are in a mess. We haven't been able to play the course since Christmas as we still have water across many parts which makes mowing impossible. We have had working bees with 35 members whipper-snipping the fairways where we couldn't get machinery on." Bill Tones, Greens/ Course Director

TWIN WATERS GOLF CLUB

Sunshine Coast

"The rain has been relentless since 1 December 2010 and interfered with our major annual event, the Holden Scramble National Final. It was held from 3-6 December with 154mm falling during that period. Only the practice round and the first day's play were completed. Sunday was washed out and Monday was reduced to a composite nine holes.

"Recorded rain for December was 629mm and total for 2010 was 2290mm (annual average is 1600mm). Rainfall for January was 643mm of which 493mm fell between 9-11 January. On Tuesday 11 January we recorded 263mm in the four hours from 6am to 10am." **Gary Topp, Superintendent**

PACIFIC HARBOUR G&CC

Bribie Island

"In December we had 460mm and in the first 19 days of January a further 340mm, which equates to 75 per cent of our yearly rainfall in a six-week period." Kelvin Nicholson, Superintendent

CONTINUED FROM PAGE 11

really affected growth. I reckon we might be in for an early winter and the last thing we need is to go into winter with stressed greens because you can't do anything then.

Our concentration now is getting the greens in as good a condition root-wise as possible, while we are feeding up the fairways with liquids (fertiliser) and mowing them at every opportunity to get them to grow over."

Cavanagh shares Daly's sentiments and while his surfaces were brought back into play relatively quickly, their management over the next couple of months will be critical, as will educating members and committees that while the surfaces may look okay to the eye, underneath it can be a different story.

"We were fortunate not to have the amount of silt that say Indooroopilly had and although our greens have come back well, even four weeks later there is still a hell of a lot of silt coming out of them when we are coring," says Cavanagh. "The big thing is trying to educate the committee and membership about what happens when the silt settles and gets down into the profile and the long-term problems that can eventuate. They have to understand that getting the course back to what it was before the floods is a big job. It's not just a matter of coming back out and cutting at normal heights."

If there is one thing that has surprised all superintendents, it's the ability of their couchgrass to recover despite the hammering it has received, whether through water inundation, machinery traffic during the clean-up process or the mandatory renovations to remove silt within green profiles. Another upside has been that the floodwaters have provided a rather drastic form of weed control and many fairways are now clean of undesirables such as crowsfoot, wire weed, paspalum and carpetgrass.

While reinstating turf surfaces and course infrastructure has been the primary focus in the

The 15th green at McLeod Country Golf Club remained under for six days and along with the 17th was one of the worst affected holes

FROM FLOODS TO A FULL FIELD

S ix weeks after he watched his course turn into a river, City Golf Club course superintendent John Halter and his crew had the course ready to host one of the biggest events on the Queensland golfing calendar. A full field of Australia's leading golfers descended on Toowoomba for the 2011 Cellarbrations QLD PGA Championship and for Halter it was the culmination of a summer – if you can call it one – that was right out of the box.

Toowoomba was one of the first regional centres in south east Queensland to cop a hammering by flood waters. Having recorded 400mm for December, the city notched a further 400mm in the first 12 days of January, 207mm of that falling on 10 and 11 January. Halter's course diary shows that for the 28 days from 14 December the course received 26 inches (660mm) which is not far off its annual average. As he eloquently states the course was that saturated "you only had to spit on the ground and it started running!"

For Halter and his crew of nine they could do little as the course became a raging torrent and he watched on as a car swept in by the floodwaters became wedged underneath a footbridge which traverses the creek which flows through the course. The pressure that built up was enough to rip the 21m span from its foundations, sweeping it downstream before eventually wiping out another footbridge and taking all the irrigation system wiring with it.

In the aftermath, the club held a working bee to clean up debris along the creek, reinstate the footbridges and repair nearly 60 bunkers which had silt and debris through them. Halter could not praise the volunteers enough and estimates they saved his staff 100 hours of work.

With all the rain throughout December and January, Halter's preparations for the PGA weren't exactly ideal and were put back by anywhere up to six weeks. Fortunately after the January floods there was a spell of dry weather, however, in the lead up to the tournament about 100mm fell from 6-8 February. A 17-year veteran of the club, Halter says what he witnessed this past summer is one for the history books.

"I have never seen that amount of water on the course in my life," says Halter. "I've seen flash flooding plenty of times but nothing like that sustained rainfall and volume of water. The amount of debris that came through the course was incredible. I pulled out an old vintage car wooden spoke wheel with the drum brake still attached, an old rusted dashboard and part of a bonnet! I guess the only good thing to come out of all the rain is that our dams are full, whereas 14 months ago we were down to 7 per cent!"



A swamp dozer removes silt from Indooroopilly's practice range



Situated at the lowest point of the course, the Jindalee maintenance facility was one of the first areas to go under, resulting in the massive loss of equipment and product weeks immediately after the floods, attention is also slowly turning to reinstating other areas. On top of an unenviable list is reinstating and refurbishing bunkers which in most cases have been left untouched apart from a quick initial clean out of silt and debris. Many will need to be completely reconstructed, a process which will keep crews going for the remainder of the year.

Then there are the smaller but no less timeconsuming tasks of repairing pathways that were either gouged out or simply washed away, replacing mulch in garden beds and replanting trees (Oxley, for instance, lost more than 100 drought-tolerant plants and trees, many of which had only been recently planted).

LESSONS LEARNED

As with any major disaster of this scale, the lessons learned have been many and varied, even if they have been discovered the hard way. The events have brought out of the best in most and the worst in just a handful, but ask any of those Brisbane superintendents affected and the positive generally outweighs the negative and they will all be taking plenty away from the unprecedented event.

For Giffard, the standout was the camaraderie that was discovered not only among the maintenance staff but within the different departments of the golf club. Mucking in together, it has helped to





forge some new friendships and has given those who work in the clubhouse an appreciation of what the maintenance crew has to put up with sometimes. Giffard says it was also good to have the interaction and connection with the members and he hopes they too will take something away from the experience.

"Without wanting to sound boastful, I think we did a pretty bloody good job," reflects Giffard. "We kept a very close eye on everything from staff fatigue to managing the volunteers and that's half the reason why we are so far down the track. It has been a very good experience in that regard and everyone has done their bit, from Dale (Durant) the CEO, Darren (Richards) the director of golf and Jon Mathias who helped us with HR issues.

"I really can't think of anything that I wouldn't do again. We are certainly now a lot more wary of infrastructure and how we set ourselves up for the future so that if something does happen again we will be able to remove stuff quickly. I guess the only thing I would do differently is get the posi-tracks in a few days earlier than we did. They really saved us and the amount of silt they were able to remove and their ability to work in the conditions was quite remarkable. Even the operators were impressed."

Across the river at Brisbane, for Cavanagh it was the importance of ensuring the welfare of his staff in the wake of the floods, especially seeing they didn't have a maintenance facility to operate of, and keeping a good sense of humour. As well as organising some good temporary accommodation for his crew, Cavanagh inadvertently did his bit for staff morale after he managed to bog one of the machines. What made his efforts priceless was that only a few hours earlier he had dished out a serve to one of his younger staff member for doing the exact same thing!

"It has certainly been a learning experience," states Cavanagh. "The big thing for me was keeping the morale of the staff high, because if you don't have the guys behind you working towards a common goal, you're pushing uphill from the start.

A mountain of silt waits to be removed after being pushed off the 15th green at Wolston Park My blokes were fantastic, but you have to be flexible given the situation and be mindful that this is just as hard on them as it is on you. Setting two or three goals each week and ticking them off as you go was also important but at the same time not overextending and trying to reach for too much."

For someone like Warren Langlands who relied heavily on manually documenting his maintenance operations at Wolston Park, he would have paid more attention to salvaging his records. The major realisation, however, is that he needs to become more computer savvy and were those records in an electronic format he wouldn't be lamenting the loss of 15 years' worth of knowledge.

One of the best things Shane McDonald did at Oxley was to take heed of the advice of some of club's old timers who experienced the 1974 floods. On their word McDonald moved all machinery to higher ground – the shed went under in 1974 – but even though this time around the maintenance facility and pump shed were spared (even if it was only by a matter of metres), it was valuable having that reference.

"Looking back, if you didn't have that advice you would think there would have been no way the water would get that high," says McDonald. "We were of the mindset that it wouldn't be that bad, but now we know what can happen, next time you would be more wary and plan ahead a lot better, both before and during the clean-up. We did prepare but we left



a lot of things to last minute. If there is a next time you would start a lot earlier and we would probably have sandbagged areas like the pump station and shed."

For Daly, who like most of his fellow Brisbane colleagues hopes to be in a retirement village reading about an event of this magnitude should one ever happen again, the one thing he wouldn't do again is concern himself with mowing immediately before the floods. Thinking it best to try and mow as much as possible before the floods hit, Daly and his staff managed to knock off six greens before St Lucia Golf Links superintendent Darren Turner with some of the huge silt deposits left on his course



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QLD FLOODS



Indooroopilly had a fleet of 11 posi-tracks working around the clock in the weeks after the floods removing vast quantities of silt from the fairways

Wolston Park superintendent Warren Langlands lost 15 years' worth of course maintenance records in the floods



GLOBE UNDER WATER

While many golf courses and turf facilities were cleaning up in the wake of the recent floods, so to was the team at Globe's Brisbane service centre and distribution warehouse.

Located in the suburb of Coopers Plains, about 3.5km south east of Brisbane Golf Club, the warehouse and office space had 1.5 metres of water through it after a tributary of Oxley Creek which flows behind the rear of the premises flooded.

According to Globe's national marketing manager John Cooper, the warehouse was inaccessible for two days and when staff were



able to re-enter there was considerable water damage to chemicals, fertilisers and machinery. Pictured is the sales staff doing their bit to get the ship back on track. Rebuilding of the offices got underway shortly after the warehouse was cleaned up and staff were working out of a demountable office in the interim.

retreating back to the maintenance facility. Ironically, those six greens have taken longer to recover than those which had a little more leaf left on them and in the case of one green where only half the surface was mown there is a visible difference between the section that was mown and the one that wasn't.

Depending on the nature of the floodwaters too, Daly believes there could also be merit in putting tarpaulins across greens. In the case of the January floods, water levels rose and receded at a relatively slow and steady rate and Daly says that pegging down a few tarps across greens would have saved countless man hours scraping silt off in the aftermath.

DOCUMENTING A DISASTER

Hindsight is, of course, a wonderful thing and as the saying goes 'what doesn't kill you makes you stronger'. If there is a common overriding thread among all those superintendents that have had to reinstate their courses after the events of early January, it's their desire to document what has happened to them.

Whether it's the various methods they used to remove silt from their turf surfaces, how to best manage staff and volunteers during the clean-up, or simply putting together a priority list of things to do when a flood is imminent, it is their hope that by doing so will not only provide a useful future reference for their club but for the golf course and turf maintenance industries as a whole.

Both Brisbane and Indooroopilly are in the process of creating disaster management policies and procedures manuals that will become part of the fabric of each club and be regularly reviewed and updated. At Brisbane, they have formed a disaster management committee comprising Cavanagh and members of the general committee which now meets on a fortnightly basis to brainstorm ideas. The aim is to have a document that will cover not just flood events but also any other major natural events which could potentially damage the course.

Daly too is in the process of putting together a dossier for McLeod. Already he has a wealth of material from the regular updates he posted onto his course maintenance blog, but being the joker that he is Daly would add a few special touches to such a document.

"It would have been great to have had some sort of reference to what the guys did here in 1974, outlining what happened, the damage to the course and the stuff that did and didn't work when it came to cleaning up," reflects Daly. "I'm not sure what I'm going to call mine, but I reckon on the first page I'm going to have a great big aerial photo of the course showing it completely flooded with the words, 'If you see the course like this - RUN'. Maybe I'll include a plane ticket to Dubai!"

No doubt it will also contain a small glass compartment containing a Cuban cigar with the words 'Break glass in case of emergency.' ^{Ju}

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Rain Bird Australia Freecall: 1800 424 044 Freefax: 1800 424 050 www.rainbird.com.au Email: info@rainbird.com.au © 2010 Rain Bird Corporation It was one of the more defining images from the recent Queensland floods – Suncorp Stadium, Queensland's premier sporting arena, its playing surface under a metre and a half of brown, silt-laden water

As well as the many golf courses which were inundated during the recent Queensland floods. numerous sporting clubs, school fields, bowling clubs and racecourses across the state were badly affected by floodwaters also. ATM editor Brett Robinson looks at the incredible amount of work that has gone into reinstating three of the state's major sporting complexes – Brisbane's iconic Suncorp Stadium, Rockhampton's Callaghan Park racecourse and the University of Queensland's St Lucia campus in Brisbane.

ne month and one day after floodwaters started inching their way across the surface of Brisbane's hallowed Suncorp Stadium, grounds manager Malcolm Caddies and his team were out preparing the ground for what was to be an apt homecoming.

Without a stadium to call home since floodwaters from the Brisbane River inundated the ground in the second week of January 2011, A-League soccer side Brisbane Roar would go on to make a triumphant return, trouncing neighbours Gold Coast United 4-0 to lift the Premiers Plate in front of more than 20,000 fans.

For Caddies, it was a satisfying end to what can only be described as a month that he and his team won't want to repeat again in a hurry. To get the Legend couchgrass playing surface back up to a standard to host the likes of A-League, NRL and Super 15 rugby union has been an exhaustive process and one of the more challenging projects Caddies has been involved with in his turf management career.

Suncorp Stadium was one of the first major sporting facilities to go under as the rising levels of the Brisbane River began to slowly inundate vast areas of the Brisbane CBD and surrounding suburbs. Caddies was supposed to be on holidays as of Monday 10 January, however, at 6pm he found himself making the familiar trek back to the ground after receiving a call from stadium management.

"We took some measurements as to what the predicted heights were going to be for the next couple of days," recalls Caddies. "By Tuesday floodwaters were predicted to come up to the stadium buildings and by Thursday's peak they were supposed to be lapping the field. We took some precautions, but after we were chest deep out in the middle of the ground on Thursday it was pretty clear those predictions were totally wrong."

It was 3am Tuesday when water started entering the arena through the stadium's drainage channels and by midday the whole surface was under. The water level kept increasing until the flood peak on Thursday morning by which stage it was up to the fifth row of seating, or about 1.5m. It wasn't until 9pm Thursday that the water finally subsided and the turf became visible again.

As well as the surface being inundated, all the change rooms, control rooms and officials rooms at the western end of the ground went under, but fortunately for Caddies his office and equipment on the eastern side were unaffected.



What made the flooding more agonising was the fact that the Suncorp surface was less than a month old. Having hosted the U2 360° Tour concert on 8 December, Caddies and his team had completely re-turfed the arena and laid the last sod on 23 December. Having experienced floods earlier in his career and seeing first-hand the amount of damage they can cause, Caddies was expecting the worst when the waters finally receded. However, going out at 10.30pm on Thursday to inspect the surface he was somewhat relieved to find that the silt deposited was much less than expected.

"My first flood experience was at Logandale when we were building that in the early 1990s," recalls Caddies. "The water just sat still for days and we ended up with a foot of silt. That's what I was dreading because it was so still and you could see the silt in the water. But to come in and see that with a pretty aggressive renovation I could probably salvage the surface, I was over the moon. We were very lucky in the end."

When the waters dropped, between 10mm-20mm of silt was deposited across the entire surface. Caddies left that to dry and then scarified and power broomed the surface up to four times to remove as much silt as possible. After that he cored the ground with 19mm hollow tines at four inch spacings, removed the material and then topdressed the arena with 100 tonnes of sand. Some calcium and fertiliser were also applied and with some favourable weather the ground came back well. Renovations finished on 22 January and the ground was back hosting A-League soccer just three weeks later.

"It [the surface] came up well considering we had given it a pretty serious renovation just three weeks before," says Caddies. "There was a little bit of divotting and it was a bit soft, but I think the players and fans were just glad to be back home.

"We used two different stocks of Legend turf when we did the field replacement just before Christmas and it was quite noticeable the differences between the two. The stock that was older came back really well, whereas the less mature stock took a little longer and was a lot thinner.

"At this stage we are still assessing whether we will need to do a full field replacement. There is a lot of silt still in the profile, but we have only one week off in the next 14 due to the end of the A-League and start to the Super 15 and NRL seasons. So if we do decide to do that it'll more than likely be during that free weekend."

SECOND COMING

While Suncorp Stadium is back in business, it won't be until the middle of March that Callaghan Park in Rockhampton makes its long-awaited return to the Queensland thoroughbred racing calendar. The pride of the Central Queensland racing industry, Callaghan Park has been out of commission since the middle of December which has had a dramatic impact on all involved in the industry, from the Rockhampton Jockey Club (RJC) which calls the racecourse home, the trainers and jockeys who use the facilities and the state's peak industry body Racing Queensland.

Rockhampton was one of the first major regional centres to be affected by the Queensland floods in the weeks leading up to Christmas and for Callaghan Park, situated right on the Fitzroy River opposite the city centre, it suffered the agony of being hit twice.

The first inundation came on 16 December when the river peaked at 7.6m and while the track itself didn't go under the stables and jockey club facilities had 18 inches of water through them. The big one, however, came on Boxing Day when the



Rockhampton's Callaghan Park racecourse was under water for a total of 12 days. Between 50mm and 100mm of silt was deposited across the 5ha track





The decision was made to strip the entire Callaghan Park track back with a Koro topmaker to remove the silt and promote new growth peak reached 9.4m which meant the entire track was under by 1.2 metres. It remained under for a total of 12 days and in that time between 50mm and 100mm of silt was deposited over both the course proper and sand track.

It proved to be a cruel blow for the RJC which back on 29 January 2010 celebrated the unveiling of a new-look Callaghan Park which had just been redeveloped by Racing Queensland to the tune of \$6 million. As well as a complete revamp of the stables, club facilities and the sand track, the crowning glory of the works was the new course proper.

Replacing the existing kikuyu-base track, the new track was extended to 2000m (including a 600m straight), was 25 metres wide with crossfalls of 2 per cent on the straights and 4 per cent on the bends, and was solid turfed with Wintergreen couch. Underneath the turf a completely new profile was constructed using local sands and a new irrigation system installed complete with a 9.5km subsurface drainage network.

"It was a brand new track," says Racing Queensland's racecourse development manager Warren Williams, who has overseen the reinstatement works at Callaghan Park following the floods. "It was a very good track, had excellent drainage



capabilities and had been performing extremely well since opening. It is one of the state's newest tracks and it was imperative that we reinstated it to its original condition. We [Racing Queensland] didn't want to take any shortcuts to just get racing back up and running on an inferior surface."

Once the water subsided, the first priority was to get all the stables and jockey club facilities cleaned out and ascertain the damage to both the sand track and course proper. Williams' primary concern was the amount of silt covering the track and how they were going to remove it. There was also one area of subsidence at the 1000 metre mark which required repair work down to the gravel blanket.

"At first we were thinking we would have to strip all the turf off and completely re-turf the track," says Williams. "We didn't bother trying to remove the silt – it was too big a job – but when some areas started to dry out we put a set of harrows across to break up the silt and then we mowed it down really short. It was then that I thought, 'I know a better way to do this'."

Calling Geoff Hatton from NSW-based Sustainable Turf Renovations, Williams soon had two of Hatton's Koro field topmakers going flat out shaving the track down to about 10mm above the profile which left enough rhizome and stolon activity for regrowth. Over three and half days the entire five hectare track was scalped after which the profile was aerated and a Ronstar/starter fertiliser application made.

"Geoff was fantastic and couldn't have been more help," says Williams. "He's a bloke who really has his heart in the industry and he just dropped everything he was doing to help out. It really was the best avenue to take and we were able to do it in just one pass which left a very clean surface. The Wintergreen has proven to be extremely resilient and it's remarkable that after such a period under water it came back. Within a week of us ripping the top off we had about 25mm of new growth.

"It was quite incredible the amount of material that came down the river. We even had a cow that had floated, alive, from 60km upstream and ended up on the track. When we first got in we just found it grazing there! One of the staff reported the tag number and it was collected three weeks later!"

Another casualty of the floods was a small trial area that Williams had established on the track. Two $20m \times 1.2m$ plots of Grand Prix and Hatfield couchgrass were being assessed for their tolerance to horse racing, and now with the track stripped back to its bones, Williams is interested to see how these varieties will recover.

One of the more interesting tasks was cleaning out the stables and not just because of the amount of silt which needed removing. A variety of vermin had taken shelter in the roof of the stables and at one stage Williams had to call in snake handlers to remove up to a dozen brown snakes, some of them up to two metres in length. Once removed, the

The Callaghan Park straight after it was chopped down. Some 25mm of new growth could be seen less than a week later stables were then sanitised to make them hygienic in order for the 100-plus horses which call Callaghan Park home to return (they were farmed out to properties as far away as Brisbane and McKay when the floods were imminent).

The reinstatement works at Callaghan Park, which will cost upwards of \$600,000, have been part of an overall \$1.55 million flood relief package that Racing Queensland announced in the first week of January. A total of \$1 million was set aside for facility remediation while a further \$550,000 licensee relief and relocation package was set up, whereby those who were unable to ply their trade due to facilities being flooded, such as trainers, would be able to apply for financial assistance.

Although Callaghan Park was the worst affected racecourse, Williams says Racing Queensland has also been assisting at Emerald and Warwick to reinstate their tracks. Like Rockhampton, Warwick copped two waves of flooding, Emerald just the one (both were under for between 3-4 days), with both suffering extensive damage to their sand tracks and running rails. All in all Williams believes the repair bill for these facilities will be \$150,000 apiece, while other minor works have been undertaken at Bundaberg and Gladstone.

With the track growing back well, Callaghan Park is set to re-open its gates on Saturday 19 March for the popular St Patrick's Day race meet and will then host the \$100,000 Magic Millions Plate on 7 April.

THE GOOD, THE BAD, THE UGLY

For Shane Biddle, senior supervisor grounds at The University of Queensland's St Lucia campus in Brisbane, the days and weeks since the January floods have been a blur. Overseeing all the sporting and recreational areas within the 114-hectare campus, Biddle and his staff of 22, together with a myriad of contractors, have been working flat out trying to get this veritable mini-city back up and functional.

Home to nearly 30,000 students, the St Lucia campus is also the base for a plethora of sporting clubs affiliated with UQ Sports, the not-for-profit body



which oversees the management of the university's sporting facilities. Unfortunately for these clubs, the many grounds, courts and tracks on which they train and compete on took the full brunt when flood waters started entering the grounds late on Tuesday 11 January. With more than three quarters of the campus bounded by the Brisbane River, it was inevitable that the campus would be inundated and by Tuesday night Biddle, who has been there 15 years, was preparing for the worst.

In total, six of the university's eight major turf playing fields which are used for cricket, soccer, touch, rugby union, hockey and AFL were damaged, with water inundation ranging from 1.5m to 4m. The campus's 50m eight-lane outdoor pool, 24 tennis courts, three netball courts, full length athletics track and softball diamond also went under.

The running track, which had only been resurfaced prior to Christmas and was awaiting line marking, will need to be completely replaced (a 24-week process), while parts of the Eric Freeman Boathouse, which housed rowing, canoeing, waterskiing and diving clubs, were so badly flooded that they are awaiting a condition report to ascertain what will be done.

The campus irrigation pump system was also lost and it wasn't until mid-February that a temporary system was able to get up and running. Compounding irrigation issues, the supply of An aerial shot of the University of Queensland's St Lucia campus. In the foreground, submerged, are rugby union playing fields 5A and 5B and tennis courts, with playing field 2 under water in the top left of the photo. Six of the university's eight major turf fields were inundated by floodwaters



QLD FLOODS



UQ's playing fields 5A and 5B under water



Playing fields 4 (pictured) and 6 were the two grounds most affected by silt deposits

The UQ running track, which rings playing field 5A, had only been resurfaced prior to Christmas and will need to be replaced recycled water from the Fairfield treatment plant across the river was cut off and will remain so until further notice.

Remarkably, when ATM talked with Biddle in mid-February, a total of 3000 tonnes of silt had been removed since the floods, with deposits of between four and eight inches across 30 hectares of grounds, roads, parkland areas and courts. Some 1500 tonnes alone was removed from Sir William MacGregor Drive which runs along the river. A further 500 tonnes was scraped off the tennis and netball courts while 400 tonnes was removed from the grass surrounds and parkland areas. One of the worst affected playing fields (PF4 – see below) which is just next to the pool complex where flood waters first entered the campus, had more than 700m³ of silt removed.

"I have never witnessed anything like it," says Biddle. "We knew we were in trouble on Tuesday afternoon and we could see the water level rising up the footings on the bus bridge which connects the back of the campus to the city. We managed to move our machinery and equipment to higher ground and then tried to get as much other stuff as we could to safety. I think we finished about 11pm.

"I ended up staying on campus for the next seven days and when the water finally receded we had another couple of staff stay from Friday through to the following Tuesday. I can't say enough about the staff; they were great and really got stuck in.



"We knew there would be a bit of silt and we had the contractors all booked in for the Friday. We thought it would take a few days and maybe a few hundred tonnes, but we couldn't quite believe what we came across when the waters receded. It took us 10 days to remove it all. Even now we are still finding areas that need work."

As Biddle quips, in the aftermath of the floods he has had to deal with a mix of the good, the bad and the very ugly. Two of the playing fields – Oval 1 (cricket) and Playing Field 3 (PF3, soccer) – were left unscathed and were back in use relatively quickly. PF5A (the main rugby union ground) and PF7 (the AFL oval which is also used for touch and Ultimate disc) suffered total inundation but after quickly being cleaned up, renovated and amendments applied the turf recovered well. Those four are the 'good'.

Then there's 'the bad'. PF2 (cricket and soccer) and PF5B (the second rugby union ground which is wedged between PF5A and the tennis courts at the northern end of the campus) have been cleaned up but will require at least another scarify or vacuum in order to get them back to some sort of playable condition. Then comes the 'ugly' – PF4 (soccer, touch and hockey) and PF6 (the third rugby union ground which is also used for touch and touch rugby league – TRL) – which are write-offs.

Work began in the second week of February to reinstate PF4 which unfortunately had been earmarked before the floods as a trial site for a Horticulture Australia Limited-funded project being undertaken by DEEDI (see Matt Roche's article on page 42-43 for more information on the project – Ed). After the top four inches of the surface was ripped off, the ground was rotary hoed and laser trimmed before being re-turfed. Work was also about to start on PF6 at the time of this edition going to print with a similar process planned.

Although mindful of the need to get the facilities back up as soon as possible due to the huge amount of disruption caused to training and playing schedules, the university has been extremely mindful that they are completely safe for users when they return. Despite contemplating an option to sterilise PF2, 4, 5A and 5B, which would have also destroyed any beneficial bacteria contained within the soil, the university has opted to treat the affected ovals with lime (5 tonnes per hectare) to increase the pH to levels unfavourable for the bad bacteria. This treatment will last for up to four weeks followed by further testing 10 days later.

"If all goes to plan and the levels come back acceptable it is hoped these grounds will be back open by the end of March," says Biddle. "It has been very frustrating for the clubs and we have tried to give them estimates of when they can get back on, but we want to make sure the grounds are safe for everyone. On the upside for us it means that we'll have another four weeks of prime growing season so hopefully the fields will be in a great condition when they come back."



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While south east Queensland was still mopping up after the devastating mid-January floods, a fortnight later Far North Queensland was smashed by severe tropical cyclone Yasi, a category five storm which left a trail of destruction from Cairns down to Townsville. ATM looks at the cleanup works undertaken at a number of golf clubs hit by the cyclone's destructive winds.

G where the structure of the structure

Both Morris and Clarke had been preparing for the worst after Bureau of Meteorology predictions had Yasi tracking for a direct hit on Cairns a week out before it eventually made landfall. Fortunately for them and their golf courses the cyclone dipped south as it closed towards the coast, eventually slamming into the small communities like Mission Beach, Tully and Cardwell about 150km south of Cairns.

With winds around the eye of the cyclone reaching up to 290kph, the likes of Cairns and Townsville recorded gusts of up to 165kph which caused widespread damage to a number of golf courses. The likes of Sea Temple (Port Douglas), Cairns, Half Moon Bay and Paradise Palms (all Cairns-based) and Townsville area clubs Rowes Bay, Townsville, Willows and Magnetic Island all suffered severe damage to vegetation. Other smaller golf clubs and courses in and around the main cyclone impact zone included Innisfail (which was levelled following Cyclone Larry in March 2006), Gordonvale, Tully, Dunk Island, Cardwell and Ingham.

While all staff and families that the AGCSA contacted in the aftermath were safe and well, there

was initial worry for GCSAQ life member and former Oxley Golf Club superintendent Ian Earp, who had recently retired with his wife to Cardwell, one of the communities which was hit head on. After the AGCSA put out a call in its email newsletter The Cut, Windaroo Lakes superintendent Dave Morrison was able to get in contact with Earp who fortunately had evacuated before the cyclone hit.

STRIPPED BARE

Mitch Hayes, who has only been at Townsville Golf Club for the past two years, was thinking about how his course was suffering while bunkering down at home when the cyclone hit, but even he wasn't prepared for the sight which greeted him when he arrived at the course the following day.

"The course was a wreck," reflects Hayes. "I haven't seen anything like it. Trees that you thought wouldn't get uprooted were ripped out of the ground and what trees weren't blown over were totally stripped of all their vegetation. The course is heavily tree-lined but now you can see from one side of the course to the other. We had a lot of big fig trees, albizias and coconut palms blown over like matchsticks and a lot of the gums which remained upright had their canopies blown out."

It was a similar story just out of Townsville at Rowes Bay Golf Club which resides right on the coast. Superintendent Jason Bushell was fearing the worst with a storm surge predicted, but thankfully that didn't eventuate. Compounding the clean up at Rowes Bay and other courses in the area, more Left: Cairns Golf Club superintendent Brendan Clark with some of the damaged vegetation in the wake of tropical cyclone Yasi. Since joining the club last year, Clark has seen record rainfall levels (over 3000mm for 2010) and now the damaging impacts of 165kph cyclonic winds

than 300mm fell in the days after the cyclone and in the case of Rowes Bay it meant that the back nine resembled a lake for a number of days. Intense heat and humidity also meant disease pressures were high and a close eye had to be kept on the greens, especially as power cuts rendered irrigation systems useless.

"It's the first time that I have been through anything like this and riding it out at home was a little nerve-wracking," says Bushell. "It was like a train going past your house all night and you were just waiting for it to get worse. My wife and I have an eight-month-old so we were a little bit anxious and had the house packed up like we were leaving town, with mattresses against doors and windows taped up.

"The golf course looks totally different. Getting to the course was like driving through a war zone. Sand had been pushed up from the beach and deposited all over the road and the amount of tree debris was incredible. It didn't look like a golf course at all – it looked like it was somewhere out in the bush. All the greens, tees and fairways had debris across them and on one fairway in particular it looked like we had got everyone in Townsville to come and dump their green waste on it!

"We prepared for the worst and had everything packed in the shed. It is a fairly old shed so we weren't sure what we would find when we came back, but it somehow remained intact. We lost some temporary roofing between the office and chemical shed, the weather station was knocked out and there was a bit of water in the office."

ON A LEAN

While the Rowes Bay shed remained intact, off the coast of Townsville on Magnetic Island, superintendent Grant Vormister's shed wasn't quite so lucky after a large tree fell across it. The only thing holding the shed up was the roll bar on the John Deere tractor.

Like those courses on the mainland, the little nine-hole Magnetic Island Country Club was hit hard with widespread damage to vegetation. Vormister, the sole man in charge of maintenance operations at the club, lives opposite the course and emerging at first light the following day he set to work with a chainsaw and leafblower trying to remove as much debris from the greens as possible.

"You can see right the way across the course," says Vormister, who now has to get the course ready for the club's major tournament of the year in the second week of March. "All the trees that I hoped would go remained intact and the ones I hoped would survive didn't!





"Apart from the shed having a large tree on the roof, we survived pretty well. We just packed everything in it and went around pulling signs down and bins from around the course. I filled the chemical spray tank with water so it wouldn't move and tipped our box trailers upside down so they wouldn't fly away."

While a number of residents on the island headed to the mainland in the days before the cyclone, Vormister rode out the storm at his home, along with his wife, three friends, two kids, two cats and a pet bird.

"We didn't get much sleep that night," says Vormister. "It was quite scary, but then you think what those poor people up in Cardwell and Tully copped we were very lucky. They always talk about the sound being like a 747 going overhead. Well, we may not have had it overhead but we could certainly hear it in the distance all night. I have never been through anything like that before and I don't want to go through it again either." Top, above and below: Cyclone damage sustained at Rowes Bay Golf Club, Townsville



Below: A sheet of tin roofing from the clubhouse sliced the 18th green at Cairns Golf Club



Narringah 10 years on - what haven't we learned

ebruary 12, 2011 marked the tenth anniversary of the Warringah Golf Club environmental disaster. Even though we had to wait until 30 September, 2003 (over 940 days) after the incident for the final sentencing, the case sent shockwaves through the turf industry.

The verdict handed down by the NSW Land and Environment Court against Warringah Golf Club for a pesticide spill in 2001 provided a huge wake up call for the golf course management profession about its environmental responsibilities. But 10 years on from the incident have superintendents and golf club management fully learned the lessons from this landmark case? Terry Muir reflects on the post-Warringah environment and asks whether the industry

Warringah did more than highlight the environmental risks and liabilities associated with golf course management. It became abundantly clear the case would necessitate new policies, new administration, new procedures and wide ranging environmental improvements across the industry.

For many, those 3650 days since Warringah have been spent delivering positive environmental outcomes. For too many, however, they have learned little from Warringah and the decade since has passed relatively quickly with little change in their management practices.

HOW FAR HAVE WE COME?

Golf club managers and superintendents, like anyone else, want to be regarded as responsible members of the community in which they operate. Up until the incident, Warrinagh's management most likely thought they had been doing a pretty good job of presenting the club as environmentally responsible. But following the incident, the club, along with every other golf club and superintendent, found themselves in a public relations freefall.

The industry and its personnel were finding it hard to separate their image from the screaming daily headlines detailing failure after failure. John Devens, the mayor of Valdez when the Exxon Valdez came aground on Bligh Reef on 24 March 1989 said in response to the recent BP spill in Gulf of Mexico, "We didn't learn much in 21 years; BP seems to be making exactly the same mistakes Exxon made."

Looking ahead, one might expect that the next 10 years for golf would produce more environmental outcomes and greater certainty for the game, but first let's examine the last 10 years as it is timely to reflect on how far golf's environmental profile has shifted since that fateful incident.



Apart from the environmental and public relations damage caused by Warringah, there was also no easy way to make lives whole that were turned upside down by the incident. Those are lessons learned the hard way and were a warning to every golf business and golf business employee that management apathy can kill a business, taint an industry and ruin lives.

Warringah was a life-changing and terrible event, and everyone in the industry knew about it. Should we be asking what lessons can be learned from Warringah, or rather, what did we fail to learn from Warringah?

From Warringah we learned that the employees at the club were good people with excellent knowledge and years of experience. We also learned they were merely going through the same motions year after year and not keeping in touch with regulatory and community expectations.

When the superintendent pointed out that the club required upgraded spill management and containment structures, he was not supported. From that we learned club management just weren't ready to hear his suggestions and were simply not ready to do anything about it.

Perhaps environmental management was too new to them in 2001, but 10 years on we know the club has embraced strategic environmental management through an environmental management system. They learned the hard way. We also know that 10 years on many senior managers and directors

is green enough?



The Warringah Golf Club verdict, covered extensively in Volume 5.6 of Australian Turfgrass Management, did more than highlight the environmental risks and liabilities associated with golf course management. It became clear the case would necessitate new policies, new administration, new procedures and wide ranging environmental improvements across the industry

at other clubs have failed to learn a significant lesson from Warringah - the ability to comprehend the legitimacy of environmental management as a prerequisite for managing a golf facility.

Warringah also provided evidence that robust environmental management was a significant gap in golf course management regimes across the country and, as it turned out, internationally. Has the industry closed the gap over the last 10 years? Is there unfinished business, or will the 10 years post-Warringah be regarded as the 'lost decade and a lost opportunity for golf?'

I hope to expand on this, but in summary I am convinced golf has started closing the gap. I am also convinced there remains significant unfinished business and regrettably I believe the last 10 years will be the 'lost decade' for many clubs because they will continue along as-is, unmotivated to embrace environmental management.

LEARNING FROM THE PAST

Post Warringah, environmental and social issues will not allow the golf industry to continue a haphazard approach towards environmental management. As such, environmental protection and regulatory scrutiny are never going away as critical issues.

Warringah presented an opportunity for the industry to make reforms and allocate resources to environmental improvements. Driven by the Australian Golf Course Superintendents Association (AGCSA) it was a swift response to the Warringah incident when they launched the world's first strategic environmental management initiative for golf. The goal was that every golf course superintendent should have an environmental management system because the public and regulators expect they have one. What the public and regulators won't accept is 'Whoops! I never thought that could happen to me'.

Just as the AGCSA was doing something about the industry's 'environmental gap', the legislators too were hard at work. The proliferation of environmental legislation reflected modern public concern for the environment. The golf industry was subjected to random site inspections and audits as regulatory agencies delved into the operations of golf course maintenance operations.

New laws and regulations created an environment in which golf clubs had to expand more financial resources to meet federal, state and local regulations. Many met the challenge but for some it became simply more expedient and more economical to circumvent the regulations and ignore their environmental responsibilities.

Following Warringah, the issue of identifying who within a golf facility had responsibility for environmental management became a hot topic. Some superintendents laid responsibility with their GMs, GMs with superintendents, boards with GMs and vice versa. Others simply remained apathetic, yet many took positive action and embraced the

CONTINUED ON PAGE 29

This photo, taken by Martin Lange of the fish kill in Manly Lagoon, was splashed across the entire front page of the Manly Daily newspaper as the extent of the incident became apparent. The golf club, along with every other golf club and superintendent, went into a public relations freefall as a result of the Warringah incident



WARRINGAH GOLF CLUB – THE VERDICT

The Warringah Golf Club verdict rates as the most significant in the history of the golf course maintenance industry. Australian Turfgrass Management covered the landmark NSW Land and Environmental Court decision extensively in Volume 5.6 (December 2003-January 2004) and here we provide a brief summary of the major findings that the court made (this summary can be found on the NSW Department of Environment, Climate Change and Water website).

WHAT HAPPENED?

Warringah Golf Club is located adjacent to Brookvale Creek which flows to Manly Lagoon. On Friday 9 February 2001 a grounds person noticed that an insect pest (suspected to be Argentine Stem Weevil) was causing damage to the 5th green. To treat such infestations the club kept various pesticides, including Gusathion, in its workshop area which is located in close proximity to Brookvale Creek.

On Friday 9 February 2001 a spray unit, attached to a tractor, was filled with water and Gusathion added. However, despite attempts over several days to spray the greens, the spray unit failed to work properly and failed completely on Monday 12 February 2001. The unit was driven to the workshop and parked on a concrete slab in the workshop area to enable repairs to be effected.

Two employees and the course superintendent, Craig Coggins, attempted to rectify the fault and after unsuccessful calls to the manufacturer the superintendent decided that it was necessary to disconnect one of the hose lines and to drain the tanks to determine the location of the blockage. Accordingly the superintendent instructed one of the employees to remove the hose line. This caused the chemical solution to flow across the concrete slab.

To remove the chemical solution from the concrete slab the superintendent hosed the liquid from the slab. The chemical solution then moved along a depression in the ground adjacent to the concrete slab until it met a grated stormwater drain which led directly into the Brookvale Creek. The chemical solution entered the drain and the creek and ultimately migrated into Manly Lagoon resulting in the destruction of 4.16 tonnes of marine life and birds.

The Environment Protection Authority started prosecutions against both Warringah Golf Club and Craig Coggins as an individual. Coggins was charged with negligently causing the pesticide to escape in a manner which harmed the environment. The EPA charged the club, as the occupier of the golf course, with negligently contributing, in a material respect, to the conditions which gave rise to Coggins' offence. This did not mean that the club 'caused' Coggins' offence, rather, it meant that the club, through its own acts and omissions, created conditions which contributed to his offence. Both Coggins and the club were charged under section 116, a Tier 1 offence, of the Protection of the Environment Operations Act 1997.

Initially Coggins tried to hide the evidence by removing the empty Gusathion containers and providing a false account of how the incident occurred, however, he confessed to the false information within a few days and cooperated with investigators. Warringah Golf Club pleaded not guilty and attempted to blame Coggins.

CONSIDERATIONS

Warringah Golf Club and Coggins were tried in separate court cases by separate judges. The cases were complex and the following is an amalgamated summary of the judgements. In favour of the defendant the judges found that:

- Craig Coggins was of excellent character, pleaded guilty to the offence, did not commit the offence with malice or intent and expressed some (limited) contrition;
- The evidence presented showed that there was some recovery in the lagoon after several months; and
- Warringah Golf Club had cooperated with the investigation.
- In favour of the prosecutor the judges found that:
- Despite the recovery of the Lagoon, the harm caused must be viewed as permanent, because of the death of a wide variety of wildlife;
- The escape of the pesticide and the potential harm were foreseeable, both by Coggins and the Warringah Golf Club;
- Coggins did plead guilty to the offence, but only after six months during which time considerable expenses were incurred by the prosecutor.
- The club had been criminally negligent in that, amongst other things:
- Poisonous chemicals, including pesticides, were frequently handled and mixed on a concrete slab in its greenkeepers' workshop area which was adjacent to stormwater pits that lead to Brookvale Creek and that there was no bund or protective device in place;



- Little or no precautions had been taken by the club to prevent the escape of dangerous substances from the greenkeepers' workshop area; and
- There was evidence to suggest that the club's board of directors considered environmental safeguards to be outside their responsibility and took little or no account of them.

OUTCOMES

Both offences were proved and Craig Coggins and Warringah Golf Club where convicted of the offences. The club was required to:

- Pay a fine of \$250,000 and pay the EPA's costs of \$190,000;
- Pay Warringah Council's clean up and investigation costs of \$24,270 and Manly Council's clean up costs of \$26,230;
- Construct a wash bay, a pumped connection to the sewer and a dedicated roofed and bunded chemical filling and emergency storage facility within 12 months; and
- Publish a notice about the offence in its newsletter to members, the wording of which was prescribed by the court.

Craig Coggins was:

- Ordered to serve 250 hours of community service;
- Required to pay \$1236 in disposal costs for the dead fish and birds;
- Required to pay the EPA's costs;
- Lost his job at the golf course as a result of the offence. He was reinstated after he won an unfair dismissal claim but resigned, finding it untenable to work there; and
- Incurred \$220,000 in legal costs for the defence of this case and his unfair dismissal case – he paid these himself.

CONTINUED FROM PAGE 27

AGCSA's environmental initiative and why wouldn't they?! The words of Justice Talbot, when handing down the sentences in the Warringah case, should still be ringing in everyone's ears.

Scathing of the industry and club management, Justice Talbot said, "The Court should send a powerful message to sporting club operators, and in particular, golf clubs, that mismanagement or, particularly as in this case, abandonment of environmental responsibility will lead to condign punishment."

He went on to state, "The club, through its board and management, never seriously addressed the issue of environmental responsibility. Some preliminary positive steps have now been taken in that regard but future, as well as present, board members must be made aware that the consequences of a re-occurrence could be catastrophic to the financial viability of the club." A more powerful message directed at golf industry management could not have been made.

Post-Warringah the laws have changed, penalties are greater and individual responsibility and liability is clearly spelt out. For example, Blake Dawson lawyers reported that in 2008/2009, the average maximum total penalty ordered by the environment courts in Australia was nearly \$500,000. These figures clearly indicate that the courts are not



reluctant to order substantial fines and penalties for companies that breach state legislation.

Last year in Port Macquarie, NSW the local council along with its director were prosecuted by the EPA. The council was ordered to pay \$45,500 in fines and pay the prosecutor's costs of \$114,000. The director of the council was also prosecuted as an individual and ordered to pay \$57,000 and the prosecutor's costs of \$167,500 because of the vicarious liability components of the law.

Post-Warringah the regulatory agencies are still very active and the legislation is evolving, yet we know of many clubs continuing to shun environmental management. Many remain unaware that a number of defences available to those concerned in the management of a golf club from prosecution 10 years ago are no longer in the statutes. This clearly exposes many managers and directors of clubs to personal liability. Post-Warringah, environmental and social issues will not allow the golf industry to continue a haphazard approach towards environmental management. As such, environmental protection and regulatory scrutiny will never go away



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Warringah presented an opportunity for the industry to make reforms and allocate resources to environmental improvements and as a response the AGCSA launched the world's first strategic environmental management initiative for golf In too many facilities the lack of response to the management of systemic environmental risk continues. Robert Keel wrote an interesting paper on the subject of behaviour and choice. Superintendents and GMs are rational thinkers when it comes to decision making and this involves an end/means calculation. They will base their behaviour, both conforming and non-conforming, on this calculation.

Environmentally-violating behaviour or poor environmental behaviour for example will occur when the superintendent or the GM decide to risk violating the law after considering their own personal situation (time, money, apathy, values,) and situational factors (risk of detection, will the regulators be on site, punishment).

Put simply, poor environmental performance is a personal choice and the regulators and community know it. What we have learned from Warringah is that this type of behaviour is far too common and we have some work to do convincing decision makers within golfing facilities that being a profitable and sustainable golf facility goes hand in hand with being a good environmental steward.

ARE WE GREEN ENOUGH?

There is no doubt the Warringah case did provide general deterrence, but 10 years is a long time and that can fade. Over the next 10 years we should expect a greater part of the industry to view environmental management as a strategic business opportunity that will enhance the sustainability of their enterprise and the industry. Having said that, it is obvious many environmental super heroes have emerged over the past decade who have enhanced the profile of golf and saved their clubs money.

With these champions, Australian superintendents are leading golf's environmental charge. They utilise environmental management systems, many are becoming certified as EMS professionals and they are ensuring their staff are trained and environmentally inducted to minimise environmental risk. They have standard operating procedures displayed throughout their workplace, they participate in and host simulated environmental emergency exercises. Clubs with over 30 staff and clubs with just one or two staff are doing this and are influencing other golfing nations and even other industries. The challenge is to minimise the number of underperformers.

Today we have an industry split between those who are enlightened environmentally and want to take the industry forward and those caught in the old ways of running a golf course. A simple analogy is the Jetsons and the Flintstones. The environmental champions are the George Jetson futuristic types moving forward with the times, projecting golf club culture into another time period. Then there are the Flintstones, those whose environmental management outlook is stuck in the Stone Age.

The environmental commitment of the Jetson type clubs has been widely communicated so the Flintstones are well aware of what the Jetsons are doing, but they fail to follow their lead. Fred Flintstone lived on Cave Stone Road, Bedrock and George Jetson lived at Skypad Apartments, Orbit City. Many clubs need to seriously look at where they are post-Warringah and if it is in Bedrock along with Fred and Barney they have a lot of work to do.

The AGCSA in isolation cannot continue as golf's lone environmental champion at an organisational level. The Australian Golf Industry Council is critical to golf's environmental cause with a key role to play over the next 10 years. Yet of the members of the AGIC, the AGCSA remains the standout in regards to building golf's environmental profile.

The challenge over the next 10 years is to sustain momentum and have broader industry support with a unified approach from industry associations, managers, board members and superintendents.

Warringah opened everybody's eyes and many responded, but too many did not. Today environmental incidents and 'near misses' are still occurring too frequently, with high profile superintendents overseeing serious incidents with machinery, hazardous and dangerous goods and even work experience kids and volunteers. These superintendents are aware of the risks they are continuing to place on the lives of their staff and the environment and still choosing not to take action.

In branding you reap what you sow, 10 years on from Warringah and the game's decision makers are not green enough and that has to change if we are to take anything from the last decade. Every club can, and should, have a programme of environmental management and due diligence in place.

Philosopher George Santayana once said, "Those who cannot remember the past are condemned to repeat it." Let's not forget Warringah but identify what we didn't learn from it and get it right over the next 10 years. We have to because golf's brand depends on it. #

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AGCSATECH UPDATE

While trees have a role to play on the golf course they can affect the quality of turf and playing surfaces and often the effects don't manifest themselves until some years later as the trees grow in height and the canopy spreads

Out on a

Trees are undoubtedly a key component of the layout and playability of many golf courses. In this instalment of AGCSATech Update John Neylan looks at the turf management issues trees can present for superintendents and stresses the importance of effective tree management programmes.



rees are an integral part of most golf course landscapes in Australia and make a considerable contribution to their aesthetic beauty and playability. From an agronomic perspective trees are often considered to be just another 'weed', albeit a very large one, as they compete with the turf for space, light and water.

The challenge is finding a compromise that fulfils the architectural requirements of using trees without having too negative an impact on the agronomic aspects of growing high quality turfgrass and producing good playing surfaces. The biggest challenge, though, is understanding that they will continue to grow in height and width for 30-plus years which changes the local environment including space, shade and air movement. The other consideration is that as trees approach maturity they require increasing levels of maintenance.

The architectural and landscaping value of trees on the golf course needs to be left to the golf course architects to argue about, however, on a new treeless site consideration has to be given to the types of trees, their location and their purpose.

In recent times the incorporation of trees and other flora can be more to do with restoring and complementing the indigenous flora and creating biodiversity than being a key design element. In some situations, trees have come to overwhelm the course from an agronomic and playability standpoint, causing widespread turf problems and imposing restrictions on the strategic intent of the original golf course architect.

Where trees are part of the golf course environ they can cause problems with turf growth and surface quality through the influences of:

- Shade;
- Air flow;
- Tree root competition; and
- Interfering limbs and branches.

Shade is potentially the number one killer of turfgrasses, particularly where the turf is prepared as a playing surface and subjected to the stresses of low cutting heights and the normal traffic associated with golf courses. Turfgrass plants need light to photosynthesise and produce carbohydrates for growth and regeneration. When light levels are inadequate for extended periods, carbohydrate reserves are depleted and the turf becomes too weak to quickly recover from traffic injury.

Only a small portion of solar radiation reaching the earth is used in the process of photosynthesis. Cool-season and warm-season grasses have different irradiance requirements for photosynthesis to begin. Productivity in terms of synthesised organic matter increases with increased photosynthetic irradiance up to 116-233 Wm⁻² for cool-season grasses and 390-465 Wm⁻² for warm-season grasses (Dudeck & Peacock, 1997).

The difference in light requirements can be attributed to the different photosynthetic pathways of the two grasses. Cool-season grasses (C_3 grasses) utilise the Calvin cycle and require a lower light intensity to function than the C_4 pathway used by warm-season grasses.

Warm-season grasses not only require high levels of photosynthetic irradiance but also high temperatures to achieve optimum carbon fixation, which is the conversion of carbon dioxide into organic compounds. Shade is often referred to as a percentage reduction of sunlight. However, this is not the only factor affecting turfgrass growth as the quality of light can also have a direct influence on the quality of turf as well as the quantity of light.

Solar radiance available for plant growth occurs in a spectral band from 400-700nm wavelengths and is called photosynthetically active radiation (PAR) (Dudeck & Peacock, 1997). The radiant energy



available for plant growth is a combination of direct, diffuse and reflected solar radiance.

Diffuse irradiance results from the scattering of solar spectra by atmospheric aerosols and other molecules. Diffusion causes the blue colour of the sky and enables blue light to strike the earth at any angle. Reflectance occurs when solar radiance is deflected by a nearby surface and the intensity and spectral quality is controlled by the proximity and origin of the reflecting material.

Shade, regardless of whether it is buildings or trees, reduces PAR and alters spectral quality, affecting plant photosynthesis and photomorphogenesis. The light quality under a dense stand of trees can be altered since the canopy acts as a spectrally selective filter. As sunlight reaches a tree's canopy it is either:

- Absorbed by the leaves and used for photosynthesis;
- Reflected back into the atmosphere; or
- Transmitted to the plants (turf) below (Tankersley and Samples, undated).

Under tree canopies, preferential absorption of photosynthetically active radiation, especially in the blue and red spectra, reduces the proportion of PAR transmitted. However, as far red light is not active for photosynthesis most of this is transmitted through the tree canopy causing the increase in the proportion of far red light. Goss et al. 2002 states that the higher proportion of far-red light increases the amount of inactive phytochrome (Pr), thereby increasing gibberellic acid biosynthesis in grasses, resulting in a taller and more spindly growth habit with longer and narrower leaves.

Shade combined with poor air movement predisposes the turf to certain diseases that would not be a problem were the turf is located in an open position and subjected to good air movement and full sun. The lack of direct sunlight on a turf area also increases the period of leaf wetness which leads to greater disease activity. The combination of low light, lack of recovery of the preferred turfgrass species and increased surface moisture favours the infestation of weed species such as *Poa annua*.

POOR AIR CIRCULATION

Another of the consequences of too many trees in close proximity to important play areas on a golf course such as greens and tees is poor air circulation.

In the summer months poor air circulation results in increased ambient temperature and humidity in these areas where soil temperature and moisture levels also tend to remain higher for a longer period. In the cooler months the main problem associated with poor air circulation is increased leaf moisture (dew) that often persists for many hours unless it is physically removed. As a result of these factors, disease activity, heat stress, the invasion of *Poa annua* and soil compaction are common problems on turf growing in such an environment.



On many US golf courses fans are used to modify the environment (by removing the saturated air from the leaf canopy) and therefore resulting in improved turf growth and health. Research by Guertal and Han (2002) demonstrated that fans and syringing often produced statistically significant differences in soil temperature. They found that statistical analysis of the data revealed that both fans and syringing often lowered soil temperature, and that the combination of fans and syringing sometimes lowered soil temperature more than the fan or syringe treatments alone.

Sydney's Avondale Golf Club has been trialling fans on a heavily shaded green that sits in a depression and another that has tall trees on three sides, where there is very little natural air movement, and there has been a substantial improvement in plant health, turf density and quality of the playing surface. This demonstrates the importance of something as simple as good air flow across a turf surface in maintaining good turf health.

TREE ROOTS

One of the great hidden hazards of trees on the golf course is the effects of their roots on nearby turf. Like turf, trees absorb water and nutrients through Where trees are part of the golf course environ they can cause problems with turf growth and surface quality through the influences of shade, air flow and tree root competition

Where trees are an integral part of the course, irrigation management can be severely compromised because of moisture demand from trees. Depending on the existing irrigation system, there can be advantages in installing a separate system in the rough



AGCSATECH UPDATE



A successful tree management programme is about doing a little preventative work every year rather than facing the challenge of convincing members that extensive tree removal is required years later their roots to sustain life and are very often in direct competition with the turfgrasses for available water and nutrients.

Where there is irrigation, the tree roots tend to congregate in the surface soils and the active rootzone of the turfgrasses providing greater competition for soil moisture. The consequence is that the turf areas affected by tree roots suffer noticeably during periods of high temperatures and low soil moisture.

Where trees are an integral part of the golf course landscape, irrigation management can be severely compromised because of the moisture demand from the trees. In many situations the fairway turf can be overwatered in an effort to maintain the turf under the influence of the tree roots.

Depending on the existing irrigation system, there can be advantages in installing a separate system in the rough. Where this has been tried, water use efficiency has been improved by more than 20 per cent and improved turf quality across all areas of the fairway. There is obviously a capital cost involved, however, this needs to be assessed across the other factors of reduced water use and improved playing conditions.

TREE LIMB INTERFERENCE

Tree limbs that interfere with a golf shot from a tee can often cause indirect agronomic problems. Trees planted many years ago to one side of a tee eventually grow to the extent that their limbs interfere with a shot from that side of the tee.

Golfers will compensate for this interference by hitting most of their tee shots from the opposite side of the tee and as a result this area often suffers heavy wear. It is not uncommon in these instances to have a section of the tee being consistently thin, weak, and dominated by weed species such as *Poa annua* or summergrass.

TREE MANAGEMENT

Trees are undoubtedly a key component of the layout and playability of many golf courses. Trees and the other associated flora in landscaped areas are very important in creating biodiversity and restoring and complementing the existing indigenous flora. This is a particularly important factor to consider on golf courses that are in heavily urbanised environments.

While trees have a role to play on the golf course they can affect the quality of turf and playing surfaces on a golf course and often the effects don't manifest themselves until some years later as the trees grow in height and the canopy spreads. As the canopy spreads so does the root system, with shade, poor air circulation and competition from tree roots affecting turf quality.

The simplest solution to minimising the adverse effects of trees is to consider the potential effects on playing surfaces when planning the vegetation for non-turf areas and the subsequent planting of trees on the golf course.

From an agronomic perspective, the golf course architect needs to consider the height, spread and density of the mature treescape in the design phase. It is important to consider whether trees are necessary either from a design, safety or aesthetic point of view around greens and tees.

A green or tee secluded among a mature stand of trees 30 metres in height may look artistically spectacular, however, it will be creating a maintenance nightmare that will be cursed forever. In the southern hemisphere always be aware of the impact of having heavily planted areas on the north side of key turf areas as winter shade will have a significant affect on turf health, quality and presentation.

Where trees are an integral part of the golf course design, the golf course architect needs to produce a tree management plan for the golf course so that severe problems do not develop over time. From day one a good programme of selective tree removal or canopy thinning can increase sunlight penetration and air circulation to a great degree, and interfering limbs can be removed as needed to allow full use of tees. The removal of shrubs and understory trees is often enough to significantly improve the situation.

A successful and unobtrusive tree management programme is about doing a little preventative work every year rather than facing the challenge of convincing members that extensive tree removal is required several years on. There is no greater challenge than trying to remove that large and most loved tree.

Trees on the golf course undoubtedly add to the layout and aesthetics of the golf course. A golf course architect on a new site can minimise the long-term impacts of trees on the health, condition and presentation of the playing surfaces through good planning and setting in place an ongoing tree management plan.



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While it is hoped that initial recovery of turf surfaces following the inundation of floodwaters is rapid, there are likely to be longer-term implications if ongoing remedial actions are not implemented

Flood <u>recovery</u> in the long-term

Following the recent devastating effects of flooding in Queensland and Victoria, AGCSATech senior agronomist Andrew Peart looks at what maintenance activities superintendents and turf managers should be undertaking once their surfaces are back in play.

Food events are extremely disruptive to the operations of sporting clubs, not only in terms of the damage they cause to playing surfaces but to the facility in general. Depending on the health of the turf, the period of water inundation and the quantity of silt and debris deposited, these can ultimately affect the rate of recovery and the processes that must be implemented for recovery to occur.

Due to the inconvenience of having turf surfaces out of action, play is generally resumed even if their condition is not ideal. While it is hoped that initial recovery from flood damage is rapid, there are likely to be longer-term implications that will affect the playing surfaces if ongoing remedial actions are not implemented.

SILT DEPOSITS

One of the most damaging aspects of silt is its very small particle size. A particle is classified as silt if it is between 0.002mm and 0.05mm in diameter, which is smaller than sand but larger than clay (Handreck and Black, 2007). Silt is both physically and chemically distinct from clay, as grains of silt are approximately the same size in all dimensions (generally spherical), whereas clays are formed from thin plate-like shaped particles held together by electrostatic forces. Silt provides little chemical activity within a soil whereas clays are responsible for the vast majority of chemical activity (i.e.: cation exchange capacity).

Due to the very small size of the particles they are very easily transported in water and when they settle out they not only form a layer on the surface but can penetrate down into the thatch layer and block macropores resulting in long-term poor gaseous exchange (air movement) and reduced infiltration (drainage rate).

WATER INUNDATION

Generally flood inundation from excess rainfall has few contaminants, as often it is simply that river banks have broken and generally 'fresh water' has flowed over the surface. However, in respect to the massive floods seen in Queensland the water has accumulated a multitude of differing substances that have no doubt affected the water quality and subsequently may affect turf and soil quality.

Looking at some of the recent flood images on nearmap.com, for example, you can quite clearly see fuel and oil slicks in the floodwaters, while a number of golf clubs whose maintenance facilities were submerged had chemical containers and fertiliser bags badly damaged. While the volume of water was huge, these contaminates may still be in small quantities based on parts per million (ppm).

The other contaminant when flooding occurs close to coastal regions is no doubt salt from tidal rivers or rising sea water (storm surges). Salts can be far more damaging and their removal from the turf surface and soil profile is critical. The best way to evaluate the impact of chemical or salt contamination is by undertaking soil and even tissue tests of affected areas and then to undertake the necessary remediation works.

RENOVATION PRACTICES

Generally on small scale turf areas such as golf greens, the silt layer is ideally removed manually while the silt is still in a sludge-like state on the surface. Larger areas will often see a bobcat, positrack or other devices used to push silt off the surface.

One other piece of machinery used after the recent flooding at Rockhampton Racing Club was the Koro field topmaker to strip the surface and remove the silt from not only the top but within the existing thatch layer. This technique is better suited for warmseason grasses that can regenerate from stolons and rhizomes and for those situations that do not require play or usage to be immediately resumed. This technique could be utilised on sportsfields and golf course fairways if time permitted.

However, on the majority of sporting surfaces it is presumed that there is still a large amount of silt contained within the thatch layer or between the grass surface and the constructed profile below. The best way to assess the impact of the silt layer is by taking a core sample from the profile, ideally using a profile corer, however, a 50mm diameter corer, turf doctor or even a simple spade would suffice.

Before starting any remedial works to the profile it is recommended that the grass is allowed a period of time, once the surface silt is removed, to recover from the shock of the flood and subsequent silt inundation. It may have enough stored carbohydrates to regenerate some new leaf material, however, imposing another stressful event immediately may do more harm than good to the plant.

Apart from stripping the entire surface, and depending on the depth of the silt penetration, scarifying will assist in removing some of the silt from the thatch layer. However, the best method would be to hollow core to remove all the silt within the cored area. Ideally after hollow coring the entire surface should be topdressed with a sand similar to the construction material.

Sand topdressing will bury the silt layer deeper within the profile so ideally coring at the most intensive spacing will limit the amount of silt that is the trapped. Hollow coring should be undertaken as frequently as possible so that the silt within the profile does not build up, but that must also be balanced against trying to maintain the surface in a playable condition.

Hollow coring outside optimal times can lead to further damage through heat related stresses or longer recovery time from below optimum growing conditions. Due to the timing of these flood events it will provide turf managers with very favourable conditions for turf improvement over the next three months in both Queensland and Victoria.

DISEASE CONTROL

During the initial weeks following silt removal and during some subsequent scarifying/coring, the application of a preventative fungicide may assist in helping to maintain a disease-free surface. Without knowing the full impact of the flooding, it may have provided an ideal environment for disease pathogens, particularly during humid weather and if the grasses are being heavily trafficked.

SOIL AMENDMENTS

It is recommended that a soil test is undertaken to determine the impact of silt deposits as well as any subsequent leaching from the silt into the soil profile.



The most important aspect is to encourage leaching of any contaminants past the plant's rootzone and this is best achieved with equipment such as a Vertidrain or even an earthquake type machine that will also be very good for decompaction.

It is, however, recommended that as much silt as possible be removed from the surface and even within the top 50mm of the profile so that it doesn't migrate further down the profile once Verti-draining or other decompaction activities are undertaken.

REFERENCES

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Apart from the visible aspects, floodwaters are likely to have contained a variety of contaminants which can have a deleterious effect on turfgrass quality and soil chemistry, so plant tissue and soil monitoring is highly recommended

TURF RECOVERY IN FLOOD SITUATIONS

- he GCSAQ through Golf Queensland issued the following information shortly after the recent Brisbane floods to assist golf course superintendents get their courses on track.
- Once silt has been removed it can take between 4-12 weeks for the turf to return to pre-flood conditions.
- One of the best ways to remove silt from fairways and tees once they are accessible is to either use bunker rakes and then a front end loader/bobcat/posi-track to push piles into lakes or out of play areas which can be cleaned up when it's a little dryer.
- Once mud has been removed and the greens surface washed down, after a few days rest they will need to be flushed and chemicals added to assist in getting salt out of the rootzone.
- Once the top foot or so of the rootzone dries out, it is important to replace potassium levels in the plant as these are extremely low after the plant has been submerged under water for more than a 6-12 hour period (the plant expels this element as part of its survival mechanism). It is critical potassium levels are reinstated so the turf can function properly and fight off disease and fungi which can easily attack weakened turf.
- Heights of cut should be high (5.5mm-6mm to start off) and very slowly lowered over the following weeks so as not to place the plant under any undue stress again. This will be a slow process as the mowers have to be kept extremely sharp so they do not rip the leaf. Lots of time will be required in height adjustment and sharpening of bedknives to achieve the desired results.
- Above all, be patient. As the plant returns to a healthy state, looks can be deceiving and if play or stress of any kind is placed on the turf before it is ready to handle it, turf loss will occur.

Seasonal stresses

The past half year has certainly been one out of the box weather-wise and from continuing drought in WA to severe floods in Queensland and Victoria, superintendents have again had to call on every ounce of their ability to keep their courses operational. The Pulse asked superintendents how the past six months have treated them and some of the lessons they have learned as a result.

"Here at Whittlesea Golf Club the past six months have proved to be quite challenging weather-wise. We have gone from dams that have had very little water in them to watching them overflow. With most fairways under water at some stage this past season we have had to play preferred lies and golfers being golfers they still wanted to play. With the course being quite wet we had to balance out the damage being done by allowing play to continue and when to stop play. We only closed for two days over the wet period which kept the members happy. In saying that we had a lot of challenges with getting the water off the course, a problem I never would have envisaged some 12 months ago!

One thing all the rain did show us was that our greens weren't draining as they should. After some investigating we found that a lot of the drainage outlets had become clogged with couch runners which didn't allow the drains to flow, hence we started to get the formation of black layer. We have now cleaned all of them and will make it part of normal practice to clean them every season.

The other problem we had was with the strong winds which caused a lot of trees to fall and a lot of debris around the course. We are now starting to remove more dead trees to prevent this and removing any dead timber from the remaining trees. The main benefit from all the rain, however, is that the native couch in the fairways has taken off and the feedback from members has been great. Our course has never had such good coverage in February in the 20 years I have been here." Brad Tucker, Whittlesea Golf Club, VIC

"We have been hard hit by the debilitating fairway patch disease this summer with the very hot humid weather we have experienced in Sydney. But our problems pale into insignificance when you see the plight of the golf courses and families devastated by the floods all over Australia and the recent cyclone.

The loss of life, animals and property, the silt and sludge through homes and knee deep on greens and fairways put my worries into perspective. It is heartening to speak to some of those affected and hear their spirit, determination and resolve to make their world good again. I wish them every success." John Odell, Royal Sydney Golf Club, NSW

"The past six months has proved to be very challenging in lots of ways for myself, the staff and our 'Dad's Army' volunteers with locust outbreaks and now widespread flooding of the course. Red Cliffs Golf Club was the first place to have an outbreak of locusts in Victoria on 8 September 2010. Locust control was given a high priority because the locusts had eaten the course bare of grass the previous autumn. We sprayed our fairways, tees and greens non-stop from that date to just before Christmas because we could not get any longlasting chemical that was available due to supply hold ups. We have now had another hatching in mid-January in pockets around the course due to the hot weather, so it is all hands to the pump literally as we're back spraying!

From December onwards we had 450mm of rain which caused widespread flooding and closure of holes and the course for up to a week at a time. The biggest deluge came in on 4-5 February where the course received 250mm in a 30 hour period. We will have to keep the course closed for nearly a month! The 'Grass Growers' turf farm is situated within the golf course and is run by the golf club and it too is completely under water. This is one of our main sources of income. We have nowhere to pump the water to and the water is still entering the course from all sides, so for now it is just a waiting game." Simon Newey, Red Cliffs Golf Club, VIC

"The past six months has certainly been an interesting time and the weather has, as is so often the case, been the dominant factor. An exceptionally wet October was followed by a dry but very cool November and then the second wettest December on record for this area. The first two weeks of January followed with wet, cool and cloudy



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conditions and it became very apparent to me just how important sunlight is to couchgrass, particularly on greens. I have heard superintendents in more tropical areas bemoan the lack of sunlight causing problems due to the low light intensity through summer and I promise not to doubt them again.

At last year's Australian Turfgrass Conference on the Gold Coast Dr Tom Nikolai showed a photo of a trial area that had no dollar spot present in an area of putting green height bentgrass that had been rolled regularly. This roused my interest as I have near chronic problems with dollar spot in my bent greens all year round (we have 18 couch and 18 bent greens here at Coolangatta & Tweed Heads).

I returned to work and set about trialing a rolling programme on my nursery area. Within three weeks there was an outbreak of dollar spot on the green and there was barely a spot in the rolled area. I continued on for another month and another outbreak occurred, but once again there was no dollar spot in the rolled area. I then implemented a rolling programme on the course proper just prior to the wet and coolish October and we had no dollar spot appear in the greens despite conditions being favourable for the disease.

The other interesting aspect of the trial rolling area is the lack of dry patch that develops there which is still in the assessment stage at the moment. I have continued the rolling programme over the summer and despite somewhat cooler wetter conditions, my bent greens are the best they have ever been at this time of year." Peter Lonergan, Coolangatta & Tweed Heads Golf Club, NSW

"Our biggest concern at the moment, apart from general summer decline of bentgrass, is the reaction we get from some members who want to point the finger at us every time they have a reaction on their bodies to the environment. Immediately it is our fault because we must have sprayed something.

We have had 1221mm of rain since October, with 440mm between 22 December and January 11. Not nearly as much as our northern neighbours, but enough to cause us grief with our bentgrass greens as we are located at the northern end of the Gold Coast. The issue that has arisen from this is that when we went into damage control mode, we basically had to treat our greens like new greens again. This meant more frequent feeding at reduced rates, lighter watering at night and preventative hand watering during the day. This is on top of the increased fungicide programme we have had to adopt as well.

It basically means that we are on our greens twice a week, sometimes three, applying the necessary products to sustain what we currently have. This constant treating of our greens has brought on a spate of complaints from some members stating that they are getting reactions because of our modified spray programmes. We have not changed any products, just condensed the spacing of applications but reduced amounts we use where possible.

After several exchanges between some members, with the help of our WHS consultant Dean Scullion (e-par) and a fantastic bit of research from my assistant Luke Mortimer, we discovered a little heat rash problem that goes by the name of 'golfers vasculitis' (Google it). Hopefully it can help any other supers out there who are having problems with golfers complaining all the time about reactions to chemicals and fertilisers. Now I am not saying that some people don't react, but at last the poor old super can fight back with a bit of ammo for once and get on with what he needs to do to try and keep the golfers happy." Andy Date, Arundel Hills Country Club, QLD

Red Cliffs Golf Club in north western Victoria in early February



superintendents and golf clubs course maintenance practices



local Hong Kong turf managers

The Sai Tso Wan Sports Ground was one of a number of venues visited as part of a two-week turf programme conducted by Australian and New Zealand agronomists for the benefit of

Environmental parameters, limited resources and rapid urbanisation are just some of the many issues exacerbating turfgrass quality in Hong Kong writes Matt Roche who was part of a contingent of Australian and New Zealand agronomists to conduct a two-week turf education programme there in January. S ituated on China's south coast, Hong Kong has a land mass of just 1104km² with a population of over seven million people. These figures make parks and recreational areas in Hong Kong scarce and heavily utilised and therefore the need to provide manageable recreational areas to enhance the health and wellbeing of Hong Kong's population is important.

To design and manage a sport and recreational facility in Hong Kong's humid subtropical climate is challenging. An initiative by the Hong Kong government which has been ongoing over the past 10 years is to provide free turf/agronomy educational seminars, in a block format, to Hong Kong turf managers.

Organised by the Hong Kong Leisure and Cultural Services Department, the programme allows turf managers to learn about practical subjects such as turfgrass physiology, soil science, principles and practices of irrigation, pests and diseases, nutrition, pesticide application and safety, species selection, drainage and how trees and shrubs interact within turfed areas.

To facilitate the successful delivery of such a diverse programme, every two years the Hong Kong Leisure and Cultural Services Department calls for educational groups or trained facilitators to submit a tender to undertake the workshop. This year the successful tender was submitted by Keith McAuliffe from the Sports Turf Institute (Aus.).

To assist with the delivery of the two week programme which contained practical, technical and scientific agronomic advice, expertise was sought from New Zealand and Australia. Block educational sessions and presentations to the 22 attending turfgrass managers were conducted by Keith McAuliffe, Everett Darlington (New Zealand Sports Turf Institute, NZSTI), David Howard (NZSTI) and Matt Roche (Queensland Department of Employment, Economic Development and Innovation).

The New Zealand and Australian turf agronomists also held a series of field trips to local community sports facilities, parks and gardens and elite venues such as The Hong Kong Jockey Club and Hong Kong Stadium where the international rugby sevens tournament is held.

During one of the scheduled field trips, attendees of the class and the presenters inspected three multiuse sports facilities in Hong Kong – Sai Tso Wan Sports Ground, Kwai Chung Sports Ground and Wo Yi Hop Road Sports Ground. Each of the three venues was used for a diverse range of sporting activities and their construction and management inputs varied immensely.

Sai Tso Wan Sports Ground was the first permanent recreational facility in Hong Kong built from landfill. The ground is primarily used for baseball and football, but also encompasses a children's playground and jogging/training track.



It is situated within a gated facility in Lam Tin (the playing field is inaccessible for non-scheduled games or events).

Designers of the sports facility placed significant emphasis on utilising environmental friendly resources such as wind turbines, solar panels and rain/water collection devices that have the ability to provide sufficient water to irrigate the playing field. They even went as far as using a recycled, lightweight, porous material made from cement and shredded old tyres as a sub-surface drainage layer positioned beneath a sand layer.

The design and turfgrass management techniques being undertaken of the combination sward (couchgrass oversown with ryegrass) playing surface are first-class given the intense user requirements (scheduled games and training).

Kwai Chung Sports Ground was like many community sports facilities in Hong Kong – heavily worn and limited by field specifications (e.g.: soil type, species selection, drainage, irrigation set up). The field was predominantly broadleaf carpetgrass (Axonopus compressus) with patches of green couch (Cynodon dactylon) being grown on a heavily compacted soil. The direction of play was evident with a wear pattern clearly seen up the centre of the field and surrounding both goal squares.

A major limitation of the sports facility is that it uses three large gun irrigators positioned along each sideline to irrigate the field. However, coverage of the playing surface is not efficient with approximately 20-30m of the centre of the field not being irrigated. The efforts to apply additional water are fruitless because of the slightly crowned field, but also with the presence of numerous undulations and 'blow outs' across the field.

The Wo Yi Hop Road Sports Ground was an interesting multiuse facility. In 1995 the Hong Kong Leisure and Cultural Services Department commissioned the set up of the Wo Yi Hop Road Golf Driving Range on the sports ground. The 60 yard (54.9m) driving range comprises of 15 bays which are open to the public through a booking scheme three days per week year round. The golfing experience attracts many persons and groups with heavy foot traffic noticeable on the couch/broadleaf carpetgrass surface behind where the golfers tee off on the halfway line. At least divoting is not an issue with golf tee mats being installed.

The complex also accommodates soccer and athletics and a full size running track like that at Kwai Chung Sports Ground is installed. Both running tracks get used routinely as a place of exercise by members of the local community because of the limited space available for parks and recreational areas.

Species selection at these three and other venues across Hong Kong are concerning. However, limitations such as environmental conditions (low light intensity and heavy rainfall), resources (the majority of the turf comes from China; quality sand/ soil and machinery to undertake turf installation and drainage etc... are in short supply), education (knowing that other species and cultivars to suit their user requirements are at hand) and available money are contributing factors as to why one grass species may be chosen over another.

It may take several years for the turfgrass industry to catch up to other amenity horticulture industries such as landscaping in Hong Kong. The beautifully landscaped roadways and parks and gardens comprising a vast array of exotic plant species are a testament of this. However, with turf managers like those who attended the Hong Kong Leisure and Cultural Services Department course in Kowloon and financial support from the Hong Kong government, there is evidence that greener fields await. The 22 Hong Kong turf managers passed all modules of the two week course and graduated following a ceremony and presentation of their certificate in late January 2011.

請勿踐踏草地 Keep off the grass Kwai Chung Sports Ground was like many community sports facilities in Hong Kong – heavily worn and limited by field specifications. Hollowing tyning had just taken place of the predominantly broadleaf carpetgrass surface



Turfing being undertaken adjacent to a Hong Kong roadway



While high quality landscape plantings are widely evident across Hong Kong, turf quality at some of the sporting facilities by comparison is sometimes of a lesser standard

A universal turf industry mantra regardless of what language you speak



DEEDI has been given the go ahead to extend its HAL-funded project on wear tolerance of warm-season turfgrasses under community sportsfield conditions. Redlands Research Station will be utilised to undertake further studies including efficacy/ phytotoxicity testing of Trinexapac-Ethyl and mowing frequency trials

DEEDI senior research scientist Matt Roche provides an update on the extension of the Horticulture Australia Limited-funded research project investigating the traffic tolerance of warmseason turfgrasses under community sportsfield conditions



n 2008, a two-year research project (TU08018), funded by Horticulture Australia Limited (HAL), was set up to investigate the effect of wear and compaction of different turfgrasses, primarily for sports field use. Trial sites were established at Redlands Research Station (RRS) and the Redlands Touch Association (RTA) to apply and assess wear in a single simulated site utilising the Department of Employment, Economic Development and Innovation's (DEEDI) wear traffic simulator at RRS and two sites (RTA) undergoing actual wear through the playing of touch football games.

To obtain meaningful wear tolerance and surface hardness (de-compaction) information, it was necessary that the trial work be extended to capture a minimum of two years of replicated data at all three sites (one at RRS and two at RTA). Doing so would provide community sporting groups who rely on the performance, including safety, of natural turf surfaces with solid information on which to base future turf installation decisions.

The original two-year HAL study ended in November 2010. Following discussions and support from various turf associations and members of HAL and the Turf Industry Advisory Committee, voluntary contributors were sought and an out of session project application to extend the project was submitted to HAL in December 2010.

As part of the extension work it was decided that other smaller trials be set up at the same time to obtain meaningful data from the same grasses being trialled. By choosing to do so it not only strengthened the TU08018 project, but it also meant that the data collected would be invaluable and provide significant benefit directly to members of the wider turfgrass industry.

The additional trials are being undertaken on a range of warm-season grasses (see Table 1) suited for sportsfield, recreational, golf and/or lawns bowls use and include:

wear tolerance trials Cectended

- The construction of a larger trial site (case study) at the University of Queensland (UQ) St Lucia Campus to undergo actual wear and be rated against cumulative field usage hours;
- To undertake/analyse studies of morphological and agronomic characteristics (vertical growth rate, lateral spread etc.);
- Efficacy/phytotoxicity testing of the growth regulator Trinexapac-Ethyl;
- Ash and lignin fibre testing to correlate against wear tolerance data; and
- Mowing frequency trials.

Project work is continuing in line with the original TU08018 project proposal, with data such as quality and percentage bare ground, traction, hardness and moisture being collected from the RRS and RTA trial sites.

Work to install the case study site at UQ was to start on 17 January 2011. However, given the recent deluge and subsequent flooding received in south east Queensland, the planting of Grand Prix, OZ TUFF, TifSport and Wintergreen onto the two multiuse (soccer and hockey) sportsfields had to be rescheduled.

The 114-hectare campus situated seven kilometres from the Brisbane CBD was extensively damaged by flood water and debris from the neighbouring Brisbane River. Silt removal and

TABLE 1. TU08018 EXTENSION STUDY CULTIVARS

TifSport™	Grand Prix
OZ TUFF™	CT-2
Wintergreen	AGRD
Hatfield	Winter Gem
Conquest™	Premier
Legend®	Blue Dynasty
Tifgreen	MiniVerde™
Tifdwarf	Novotek [™]
MS-Supreme	Santa Ana
TifEagle	Patriot
Tropika	QLD Blue
Aussiblue	MRD-1
Sea Isle 2000	Velveteen™
Sea Isle Supreme™	
Whittet	

Note: Not all turfgrass cultivars are being tested in each study.

intense cultural practices were necessary on all nine sporting grounds, including Playing Field 4 where the case study was earmarked to be planted. Turfing of Playing Field 4 was carried out by staff from UQ, Dad and Dave's Turf, Evergreen Turf, Oz Tuff Turf, Australian Lawn Concepts and Twin View Turf in early February 2011.

Work has also been undertaken by DEEDI experimentalist Jon Penberthy to prepare the greens grass test facility, which was constructed for the national warm-season greens grass study (TU05001), and medium- to long-textured grasses, initially established for the purposes of undertaking a Plant Breeder's Rights study.

The latter two sites, both located at Redlands Research Station, will be used to undertake mowing and Trinexapac-Ethyl studies. Such work, particularly the medium- to long-textured grasses (suited for fairways, sportsfields and/or recreational areas) will be monitored and mown using the 'onethird mowing rule' (i.e.: never remove more than one third of the grass blade). The data will provide useful information on how frequently particular grasses need to be maintained when compared to other species and cultivars under the same management regime.

Data and information collected throughout the duration of the HAL study will be made available to the golf and wider sports turf industry through milestone reports, website updates, a field day (date TBC) and finally through the publication of a final report. The TU08018 extension project is scheduled to conclude in June 2012.

ACKNOWLEDGEMENTS

DEEDI gratefully acknowledges support from the following organisations, clubs and business groups in funding, contributing in-kind or assisting with the trials. They include: Horticulture Australia Limited,



Redlands Touch Association, Q Turf Machinery, Sports Turf Institute (Aust.), Sports Turf Association QLD Inc. (STA QLD), Sports Turf Association NSW Inc. (STA NSW), Turfgrass Association Australia Inc. (Victoria) (TGAA VIC), Australian Golf Course Superintendents Association (AGCSA), Golf Course Superintendents Association Queensland (GCSAQ), Golf Queensland, Syngenta Crop Protection Pty Ltd, Oz Tuff Turf, Australian Lawn Concepts, Dad and Dave's Turf, Evergreen Turf, Twin View Turf, Turf Force, Turf Solutions, Turf World, Caboolture Turf, Jimboomba Turf and Progressive Seeds.

A special mention should be made of their proactive approach to keeping the community's sportsfields safe and open and investing in research that will allow members of the community to continue playing sport and living a healthy lifestyle. For more information about the above trials, contact Matt Roche via email Matt.Roche@deedi.qld.gov.au.

Wiedenmann

The construction of a larger trial site at the University of Queensland's St Lucia Campus is also part of the extended work, however, the area designated was severely impacted by the recent floods to hit Brisbane



The Redlands greens grass test facility will also be used



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RESEARCH

Foliar fertilisation, applying small amounts of nutrients to the foliage (leaf surface) of putting greens, has become a common practice for golf course superintendents

Although foliar feeding is a common practice among golf course superintendents, US researchers Bruce Branham, Shelby Henning and Richard Mulvaney have shown that the uptake of foliarly applied nitrogen is an inefficient process for creeping bentgrass putting greens.

Optimisation of ODDAL nitrogen nutrition

G olf course turf management is an exercise in managing plant stress. Grasses are put under incredible stress by mowing as low as 2.5mm, mowing daily and growing under less than ideal conditions (e.g.: shade, traffic etc...). It is remarkable that any plant can tolerate this kind of intentional damage. But survive they do, although occasionally the combined stresses will lead to plant death, devastating disease outbreaks or other types of plant injury.

When thinking about plant health, it is useful to consider the energy balance in plants. That is, plants take in light energy and convert it to chemical energy. But, for turfgrasses, energy can often be a limiting factor. For example, consider Kentucky bluegrass mowed at 150mm. What factors will limit its growth? Generally water and nutrients will limit additional growth of Kentucky bluegrass under these conditions.

But let's consider a creeping bentgrass putting green mowed daily at 3.2mm; what limits its growth? The turf manager watches these greens daily, provides water whenever needed, fertilises frequently with low doses of nitrogen, phosphorus, potassium and micronutrients. What can these plants possibly lack?

The answer is energy. When a plant is only allowed to have 1/8 of an inch of leaf surface, and what little growth the plant can muster is whacked off each day, you can readily see that what these plants lack is enough energy from photosynthesis.

The lack of energy is manifested in several ways: root growth is restricted, shoot growth is diminished and the plant lacks overall vigour. What management practices can be instituted under these conditions to improve plant performance and energy balance?

NITROGEN ENERGY DYNAMICS

Nitrogen is the mineral element used in the greatest amount by plants. On a dry weight basis, nitrogen content can range from 2-5 per cent. While other nutritional elements are important, none are used in the quantity of nitrogen.

A complicating factor when discussing nitrogen is its frequent transformations in soil and plants. Nitrogen is a very labile element that can be utilised by bacteria and converted into a number of different compounds. A key nitrogen transformation in soil is the conversion of ammonium ion, NH_4^+ , to nitrate, NO_3^- . The oxidation of ammonium generates energy for bacteria, which in essence is their food supply. The waste product of this process is nitrate.

One can readily see the similarity between this process and the oxidation of reduced carbon (carbohydrate CH_2R_2) to oxidised carbon (CO_2). Both steps yield energy from the process and leave an energy-depleted substrate (nitrate or carbon dioxide), molecules that require energy inputs to again be useful in biological processes.

Plants take up nitrate not because they want to, but because they are beaten to the ammonium by bacteria. In order to be useful in plant biochemistry, nitrate must be reduced to ammoniacal N for incorporation into amino acids, proteins, enzymes, etc.

How much energy does this process require? Estimates in the literature go as high as 20 per cent of plant energy is used in the process of reducing nitrate to ammonia. If this number is accurate, then a significant portion of plant energy could be saved for other purposes if a way could be found for plants to take up ammonium instead of nitrate.

Root uptake of ammonium instead of nitrate by roots is problematic since soil bacteria are present



in vast numbers and ammonium is their filet mignon. Several commercial products have been developed to inhibit the breakdown of fertiliser urea, however, the effects of these products are transient so they generally have to be applied concurrently with each nitrogen application in order to have any effect.

Finally, it is difficult to determine how effective these products are because it is very challenging for plant scientists to measure plant uptake of ammonium versus nitrate. That is, it is not trivial to discern whether the nitrogen in a plant comes from nitrate or ammonium.

One way to get ammonium directly into the plant is to bypass the root system altogether, and apply ammonium directly to the leaf surface. This approach, termed foliar feeding, has become the preferred way to fertilise at low rates of N application.

When granules are applied at low rates of N application, say less than 0.75lbs N per 1000 ft² (approx. 360g/100m²), the spotty distribution of granules often leads to a speckled looking turf. Spraying N gives a much more uniform response at these lower N application rates. Spraying N also provides turf managers a chance to get a significant amount of the applied N absorbed directly by the leaf. However, leaves are not necessarily absorbing organs like roots so getting the applied N to be absorbed by the leaf may be more difficult than simply spraying the turf with liquid N.

RESEARCH EXPERIMENTS

To determine if foliar feeding results in energy savings for plants, the University of Illinois conducted two experiments. The first set of experiments was designed to optimise foliar N uptake by turfgrasses. That is, what factors can be managed to maximise foliar N uptake? Once those factors were determined, we compared foliar N nutrition to root applications of N at three different cutting heights. We used cutting heights as a legitimate, we think, proxy for energy stress. The lower the height, the more the turf will benefit from any extra energy derived from foliar feeding of N.

So, what did we learn? Our foliar feeding trials compared three different nitrogen sources

- Urea;
- Ammonium sulphate; and
- Calcium nitrate.

These are all soluble N sources that can be dissolved in water and sprayed on the turf. The nitrogen in these trials was labelled with ¹⁵N, a method that allows us to distinguish fertiliser-nitrogen from soil-derived nitrogen in plants.

Urea was applied at various spray volumes using an even flat fan spray nozzle. The results showed that the lower the spray volume, the more urea was recovered inside the leaf (Figure 1, page

RESEARCH SUMMARY - FOLIAR FEEDING

Coliar fertilisation can be used to apply low amounts of nitrogen to turf. The name implies that the foliage is being fertilised, but this is an assumption. University of Illinois research examined the quantity of nitrogen actually absorbed into the turf foliage as a result of foliar applications.

When applying foliar fertilisers, turf managers have the opportunity to choose the form of nitrogen to apply. Applying an ammonium fertiliser offers the potential for uptake of ammonium directly into the plant. Ammonium uptake through roots is somewhat rare since ammonium in the soil solution is rapidly converted to nitrate by heterotrophic soil microorganisms.

The second part of this research project was to determine if foliar fertilisation with ammonium-containing fertilisers leads to improved plant performance. Plant performance may improve if a significant amount of ammonium is taken up by plants because the plants will not have to use photosynthetic energy to convert nitrate back to ammonium. This extra energy can be used for additional growth, which is limited under low cutting heights used in golf turf management.

Results from experiments indicated that:

- Uptake by foliage from foliar-applied fertilisers is low and ranged from 14-37 per cent of the applied nitrogen, depending upon environmental conditions and other factors;
- Spray volume has a significant effect on foliar uptake with higher volumes (80 to 100 gallons per acre, approx. 7.5-9.4l/100m²) significantly reducing foliar uptake compared to spray volumes of 20 to 40 GPA (approx. 1.9-3.7l/100m²);
- Spray adjuvants, regardless of type, improved foliar uptake compared to fertiliser applied without adjuvants; and
- There was no increase in plant performance (i.e. no increases in shoot growth, root growth, or turf quality) from foliar fertilisation of bentgrass putting greens compared to traditional soil fertilisation.



Research at the University of Illinois in the US has demonstrated that only about 10 per cent of foliarly applied ammonium gets absorbed by creeping bentgrass putting greens



51). Higher spray volumes, 80-100 gallons per acre (approx. 7.5-9.4l/100m²), resulted in nearly 25 per cent less uptake than was observed with lower spray volumes. The take-home message is simple – using lower spray volumes results in higher levels of foliar N uptake, presumable by increasing spray retention on the leaf surface.

An important point to note is the relatively low level of foliar uptake. Even at 20 GPA (1.9l/100m²), less than 20 per cent of the applied urea was taken into the leaf. Much of the urea remains on the leaf surface and can be washed onto the soil/thatch with irrigation and rainfall. One can also see the value of returning clippings since a portion of the applied N is undoubtedly removed by mowing.

EFFECT OF FOLIAR N NUTRITION ON PUTTING GREEN PERFORMANCE

Researchers concluded that while the idea of improving plant energy status through foliar feeding with ammonium is biochemically valid, the practical limitations imposed by nature make it difficult for turf managers to achieve significant benefits

The next step in our research project was to determine whether foliar N nutrition, that is, applying ammoniacal forms of N directly to the leaf for uptake,



could increase turfgrass performance. Again, our thinking was to use decreasing mowing heights as a means of imposing energy stress on the bentgrass plants. If our hypothesis was correct, we should see better turf quality from the foliarly-fed turf, with this improvement in quality becoming more apparent at lower heights of cut.

We maintained L-93 creeping bentgrass at heights of 3.2mm, 2.8mm and 2.4mm. The fertility treatments were:

- No nitrogen (control);
- 0.1 lbs N/1000ft²/wk (approx. 4.8kg/ha/wk) as a foliar spray; and
- The same foliar spray but followed immediately with irrigation applied with a hand-held nozzle (to serve as a soil application).

Additionally, to further assess whether application of ammoniacal-N results in significant energy savings over that of nitrate-N, we applied nitrogen as urea or calcium nitrate.

We monitored visual turf quality, clipping weights and root mass for a two-year period and despite our hopes we saw no statistically significant differences. Upon some reflection, this may not be unexpected. First, there have been a number of studies of fertiliser uptake by turfgrasses. If the studies are done with ¹⁵N-labelled fertiliser, the only way to accurately measure fertiliser usage, most of these studies have shown that about a third of the nitrogen recovered within the turf comes from the applied fertiliser.

The bulk (two thirds) of the nitrogen used by plants comes from the soil. This is a fact ignored by many turf managers, fertiliser salesmen and others who work with plants. The soil is the key supplier of nutrients and what we add supplements the soil.

In addition, our foliar uptake work indicates that only about a third of the foliarly-applied N gets absorbed by the leaf. The rest of the applied N stays on the leaf surface or reaches the soil/thatch surface where microbes will transform it.

So, by these calculations (1/3 from fertiliser x 1/3 efficiency), only a little more than 10 per cent of the N in the plant might come from foliar absorption. The potential energy savings are not so great when such a small fraction of the N in the plant is coming from foliar uptake.

Foliar N fertilisation may be more effective on sandy, USGA-type soils. Our trial was conducted on a native soil green, which has plenty of N-supplying power. Sandy soils, particularly new putting greens, may have significantly less ability to supply N and the fraction of N coming from foliar feeding could be higher under these conditions. However, as these greens age, the sandy soils grow in organic matter and become more fertile and capable of supplying a higher level of N.

To save plant energy by utilising ammonium over nitrate, a significant portion of the nitrogen supplied to the turf must come from foliarly-applied N. But the problem, as demonstrated in our foliar



Decreasing mowing heights were used as a means of imposing energy stress on the bentgrass plants during the project

uptake studies, is that well under 50 per cent of the foliarly-applied N actually gets into the plants. This should not be terribly surprising, as the leaf is not the main absorbing organ of a plant.

We did study the effects of adjuvants and tankmixing on the uptake of nitrogen into plants, and while there was some improvement in uptake, it was not dramatic.

Environmental conditions also can affect foliar N uptake. As long as the spray droplet remains liquid on the leaf surface, foliar uptake can continue. Once the droplet dries, uptake slows significantly. Thus, applications made early in the morning under humid conditions will achieve better foliar uptake than applications made at noon. Further, applications made in arid climates will see limited foliar uptake because drying is so rapid.

While the idea of improving plant energy status through foliar feeding with ammonium is biochemically valid, the practical limitations imposed by nature make it difficult for turf managers to achieve significant benefits with this approach. Future research should examine ways to improve the foliar and root uptake of ammonium.

ACKNOWLEDGEMENTS

ATM thanks USGATERO for allowing publication of this research article (USGATERO VOL. 9 No. 19, October 1, 2010). Authors Bruce Branham, Shelby Henning and Richard Mulvaney are from the Department of Crop Sciences at the University of Illinois. A full list of references can be obtained from the AGCSA on (03) 9548 8600 or info@agcsa. com.au. 业

volumes on foliar uptake of urea into turfgrass leaf tissue

Figure 1. Effect of various spray







Margaret River Golf Club is about three hours south of Perth and is located 8km out of the main township of Margaret River towards the coast

In the last edition of ATM we profiled Barossa Valley Golf Club in South Australia. In this edition we venture to another hallowed wine growing region – Western Australia's Margaret River – which is home to the Margaret River Golf Club and course superintendent Mark Lewis.



Superintendent: Mark Lewis. Nickname: Wiggs. Age: 32.

Period as a superintendent: Four years. Association involvement: GCSAWA.

Turf management career: I have been in turf management for nine years, starting out as a general hand in golf course construction/maintenance in Victoria, working on courses such as Moonah Links (3 yrs) and the Sandhurst Club (1 year). I then relocated to the south west of Western Australia in '05 and took up a position as assistant/2IC at Margaret River Golf Club before taking on the superintendent role in 2006.

Turf management qualifications: Cert III Hort. (Turf), Murdoch TAFE (Challenger Institute of Tafe) in Perth.

Give us a bit about your background in turf management. How did you start out in the industry, why did you chose a career in turf management and take us through the path which led you to Margaret River Golf Club. I started out in construction/maintenance with Greenmaw (now the Golf Course Company). My dad was the project manager for construction of Moonah Links and so helped me get a foot in the door. I came on board predominantly for the grow-in phase at Moonah Links before hand over six months prior to the first Australian Open held there back in 2003. I enjoyed the construction side of things a lot and also being outdoors suited me as I'm not the office type.

After this I went to The Sandhurst Club in Carrum Downs where our next project was well under construction. It was a great learning experience for me going from Moonah, which has very sandy, free-draining soils, to Sandhurst which was built on a heavy clay base. The increased works with drainage and shaping was incredible, and I felt very lucky to have worked with some of the best construction crew in Australia.

Give us an overview of Margaret River Golf Club and some of its unique characteristics? Margaret River Golf Club was established in the early 1950s and constructed by some very dedicated locals, some of whom are still enjoying a round today. The course has evolved from a sand scrape course developed in harmony with its natural setting. The site melds with the landscape and is unsullied by the extensive earthmoving associated with the moonscape character of many 'shaped' courses.

Take us through your turf management operations there and how you have fine-tuned them during your time as superintendent? Our turf management operations here, as with most regional courses, are dictated by the resources available to us. Having said that, for the majority of the time, I have had a very supportive and accommodating committee which has showed a great deal of trust and faith in what I am trying to do in line with the forward direction the club is heading.

With a full-time staff of three including myself, time management, forward-planning and prioritising are of great importance. We also have a select group of incredibly hard-working volunteers without whom we just could not get the jobs done.

As far as fine-tuning operations, I couldn't put it down to any one thing since I've been superintendent. I think that over five years you do get to know what works and how turf responds to varying situations for that particular course, and its this knowledge I continue to pass on to staff. That no doubt helps with productivity, without compromising quality.

What are some of the unique features about Margaret River Golf Club from a turf management perspective? Is it an easy/hard facility to manage? Overall, Margs would be looked at as an easier course to manage, but with staff and budgetary constraints it is always a challenge to meet objectives. The kikuyu on the course is very hardy, but my main challenge and area of concern is the sections of turf that are accumulating mat layers, creating unintentional perched water tables.

I would like to do a whole lot more renovations, coring/de-thatching, even introduce a Verti-drain to the course for the first time. The main areas are the surrounds, where I have found that while getting almost the same amount of irrigation as the greens, they receive nowhere near the amount of renovation and attention, resulting in a lot more mat layer and heavy thatch levels.

What are some of the major turf management challenges facing Margaret River Golf Club and how have these been resolved? Some of the challenges facing our golf club include increasing the year round quality and playability of the course. This has hopefully been solved by recycled water coming online.

In the past, the course, fairways in particular, would dry out severely during late summer through diminished water resources, resulting in a cycle of trying to re-establish stressed turf each autumn which led to increased weed and disease pressures through winter. In addition our bore water gets very acidic too, as low as pH 3.5, so having recycled water is a god send for the club and I very much look forward to using it to take the course to the next



level, providing a nice green track all year round.

The recycled water is delivered from the Margaret River Waste Treatment Plant as part of the shire's recycled water scheme, which also irrigates local parks and schools. Getting it set up was a massive undertaking and is the end result of a decade-long quest by the golf club. The pipe length to the golf club is 11.8km, though the club's 'section' was 5.5km and cost just over \$600,000 (the club received some funding – \$260,000 – through a government sport and rec grant). In the end it took some eight months to complete our section and the water now delivered is Class C which will see our capacity grow from 105 megalitres per year to over 200ML.

Any special environmental considerations that you have to incorporate into the management of the course? With the implementation of recycled water on the course the environmental considerations have increased greatly, requiring monthly water testing and a strict monitoring programme of the recycled water system. The Margaret River maintenance crew (from left) Will Norris (assistant superintendent), Mark Lewis (superintendent) and Mat Brewer (apprentice)



The Margaret River crew maintain 30 hectares of turf including 1020 bentgrass greens/surrounds and kikuyu tees, fairways and roughs



Margaret River Golf Club was established in the early 1950s and has evolved from a sand scrape course developed in harmony with its natural setting PROFILE



After a decade-long effort by the club, it recently flicked the switch on a new recycled water supply, a "god send for the club" according to Lewis

Outline any major course improvement works you have completed in the past couple of years and highlight any ongoing or future works that the club is undertaking. Over the last few years we have extended three greens, installed four bunkers, re-levelled a few tees and carried out some select clearing/removal of undesirable tree species (i.e.: robustas, tuarts) while regenerating some areas with other select native species.

The one product I couldn't manage my course without is... the Toro irrigation system because it does the work of about a dozen blokes and means we can fully utilise our new water supply. What are some pros and cons of being a regional superintendent? Pros include getting to know many of the members/committee personally and feeling part of a tight knit community. The cons include constraints on available resources, staff, machinery, budgets etc...

Are expectations of course presentation and conditioning any less than that placed on your metropolitan counterparts? Couldn't comment on city courses, but my personal opinion is that there are different areas of stress and expectation, but we are all in the same boat.

Do you have to be more resourceful as a regionalbased superintendent? Given that you are more likely to have fewer resources than metro clubs, what innovations/tricks of the trade do you employ or have found over the years to make your turf management operations easier or run smoother. Beer works quite well! It's a universal language.

If you could change one thing about your job as a regional superintendent what would it be and why? A new maintenance facility – this one is circa-1850!

How important are the relationships you have with other nearby regional course supers/trade reps? Extremely important, and the WA superintendents

AT A GLANCE - MARGARET RIVER GOLF CLUB

Where in the world is Margaret River Golf Club? Margaret River is about three hours south of Perth and 30 minutes south of Busselton. The club is located 8km out of the main township of Margaret River towards the coastline.

Course specs: Margaret River Golf Club boasts 18 holes and measures 6092 metres. We maintain 30 hectares of turf – 1020 bentgrass greens/surrounds and kikuyu tees, fairways and rough. Members: 350.

Annual number of rounds: 30,000.

Major tournaments/events: No major events as such, apart from club championships etc... although we have a few big days sponsored by some of the very generous vineyards located in the area. Other events include the Cowaramup Agencies Scroungers Cup, The Women's Classic, WA Disabled Golfers Association Charity Day. With the recent acquirement of recycled water we hope to hold some Pro-Ams in the near future.

Annual course management budget: \$240,000

Staff structure: Mark Lewis (course superintendent), William Norris (assistant superintendent) and Mat Brewer (apprentice).

Climate: Mediterranean-style (856mm rainfall for 2010 – Bureau of Meteorology's Witchcliffe station, 9km SSE of Margaret River). Soil types: Sandy loam.

Water sources: Recently acquired recycled water which delivers about 1 megalitre per day, in addition to two small ground-fed lakes and three bores delivering an additional 300 kilolitres daily. Irrigation system: Toro Site Pro 2.2 GDC decoder system.



Margaret River Golf Club has a wide variety of abundant flora and fauna, including geese, many varieties of birds and resident kangaroos

Cutting heights: Greens (3mm), tees/aprons (9mm), surrounds (30mm), fairways (11mm) and rough (50mm)

Renovations: We core greens with hollow tines twice a year, core tees once a year, surrounds in alternate years. Scarify/de-thatch of fairways every few years.

Major disease pressures and how you combat them: The major concerns are predominantly fungal disease (dollar spot, brown patch, winter fusarium). We have had good success in controlling these with light potassium applications as a liquid fertiliser and a preventative spraying programme using a rotating course of chemicals.

are a super tight bunch too. It is peace of mind knowing there are dozens of comrades you can call if needed, whether it's to borrow a roller or a few blokes to help lay some turf.

Callum Hitchings from Busselton Golf Club has been a great help over the years, particularly as he acquired recycled water some years ago and was able to walk us through the various requirements and planning involved. Also Ewen Nettleton and John Forrest at Challenger TAFE have helped me out greatly early on after I took over as superintendent.

Josh Walker (Nuturf) and Danny Hambleton (Globe) are invaluable in keeping us up to date on the latest products and gossip, while Chris Williams and Geoff Stevens from Toro have also gone out of their way to help me with irrigation and machinery challenges. Cheers lads!

What are some of the more unusual requests/ things you have had to do as a superintendent of a country course? Can't think of any, but I'll be carrying out a few of my own for the greenkeeper's revenge day in a few months. Sweet!

What have you got in your shed?

- Two Toro 3250Ds;
- Toro 2000D;
- Toro 3280D;
- Toro 6500D:
- Toro SandPro 5020;
- Three tractors;
- Yamaha YFM 250 quad; and
- Plenty of bits 'n' pieces.

Which piece of machinery gets trashed the most and what item would be on your equipment wishlist? The Toro 3280D gets smashed, as the rough here lives up to its name. As for a wishlist, it would consist of a complete shed replacement (structure and contents).

Favourite spot on your course? View from 18th tee as you're at the highest point looking down over the whole region.



Looking down the 18th at

Margaret River

Most pleasing/rewarding moment during your time as Margaret River Golf Club superintendent? Attaining recycled water to enable me to take the course to the next level.

Name three golf courses that you would like most to visit and why? Barnbougle Dunes (the best in Australia); St Andrews (the first); and Cape Kidnappers, NZ (wow!).

OFF THE COURSE -MARK LEWIS

Family: Wife Monique, no kids yet (we only got married before Christmas!)

Any claims to fame outside of turf management? I won a lawn mower for nearest the pin once. Cheers Stevo!

Any unusual hobbies/past-times away from turf? Drumming, music, classic cars.

Favourite sporting team? Wallabies.

What book are you reading now? The Kite Runner.

Golf handicap: 25

Favourite golfer: Geoff Ogilvy and Kristie Smith (Margaret River local).

The best thing about Margaret River (aside from the golf club) is... the beautiful countryside and laid back lifestyle/people.

What do you do to get away from it all? Bali with the missus; works every time!

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For the second year in a row **Commonwealth Golf Club hosted** the Australian Women's Open in early February

RACV Royal Pines superintendent Paul McLean concentrates on his lines ahead of the second round of the ANZ Ladies Masters

COMMONWEALTH AND RACV ROYAL PINES IN TOP SHAPE FOR ALPG'S SHOWCASE EVENTS

opping 120mm of rain overnight between the second and third rounds is not the sort of weather you need when you're in the midst of a televised tournament. For the course maintenance crew at Commonwealth Golf Club, however, that was the reality which greeted them on the Saturday of the Australian Women's Open after Melbourne received upwards of 140mm in parts, causing widespread flooding and damage to a number of golf courses.

Play had to be halted late during Friday's second round as a storm front rolled in across Melbourne and between 7.15pm and 8.15pm the



Commonwealth rain gauge recorded 63mm. By 9am Saturday that figure had risen to more than 120mm causing widespread surface flooding and bunker washouts.

Renowned as one of the best draining courses within the Melbourne sandbelt, the playing surfaces recovered quickly but the crew was faced with the mountainous task of pumping out the course's massive bunkers ahead of the third round, the start of which was delayed by a few hours.

Bunkers provided more than their fair share of headaches across the tournament and ahead of the second round superintendent Mark Prosser had no less than 10 members of his crew packing the face and base of the greenside bunker on the 18, this after Karrie Webb's approach shot late in the first round plugged. A small army used Workmans, bunker rakes as well as hand boards and rakes to push, pack, rake and shift a mass of sand ahead of the second round. "You can't win," laughs Prosser. "The members keep telling us they're too firm and now they're too soft."

After missing last year's tournament due to ill health, Commonwealth assistant superintendent Travis Scott made a welcome return as part of the team this year, while Prosser also had extra hands on deck from Royal Melbourne and Victoria golf clubs as well as the services of his three sons - Billy, Rhys and Jack - who were roped in for the second time in as many years.

While the weather had the Commonwealth crew under the pump, by contrast the ANZ Ladies Masters held at RACV Royal Pines the following



The RACV Royal Pines crew – a lovely bunch of chaps!



The Commonwealth crew goes to work on the greenside bunker on 18 ahead of the second round

week passed by without a hitch. The benign weather made for a pleasant and welcome change for course superintendent Paul McLean and his team as in previous years the course has been routinely smashed by storms just days out from the start of the tournament.

Fortunately for McLean most of the bad weather happened well in advance of the tournament. Like many courses in south east Queensland, RACV Royal Pines experienced an extremely wet end to 2010 and start to 2011. This resulted in numerous bunker washouts, but with the tournament looming rather than reinstating them McLean made the call to leave them until closer to the tournament.

ERI (ectotrophic root-infecting fungi) also caused a few headaches in the weeks leading

up to the Masters with temperatures in the mid-30s and humidity consistently above 90 per cent, meaning that disease pressures were a constant challenge. Despite the tournament 12, 17 and 18 greens still a little weak when the tournament rolled around the Royal Pines layout was in fine order and to help him out McLean had a number of Gold Coast superintendents on the tools including Peter Lonergan (Coolangatta & Tweed Heads), Mark Hauff (Colonial) and Daryl Edwards (Gold Coast Burleigh), while Colin Thorsborne from Simplot kept the crew fuelled with a BBQ breakfast each morning.

Photos of the Commonwealth Golf Club crew in action during the Australian Women's Open can be viewed through the AGCSA's Flickr photostream page www.flickr.com/photos/agcsa.



Members of the Commonwealth crew with course superintendent Mark Prosser (third from left)



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VICTORIA FEELS THE EFFECTS AS PLAGUES, FLOODS WRECK HAVOC FOR TURFIES

Plague locusts at Corowa Golf Club on the Murray River. Swarms forced the cancellation of the final leg of the Murray Masters due to be held at Corowa in mid-December



Waterford Valley was just one of a number of golf courses to be

a number of golf courses to be flooded after Melbourne copped in excess of 140mm in a 12-hour period in early February ust as Queensland had its share of natural disasters over the summer months, Victoria too has had battles of its own with locusts descending in plague proportions in the north and north west of the state, while many rural communities experienced flooding after higher than average spring and summer rainfalls.

Even before the growing season started authorities had warned rural Victorian and NSW communities of the impending threat of locust plagues and they proved to be on the money. The first outbreak occurred around Mildura in early September and with favourable conditions prevailing, the plagues descended on Swan Hill, Horsham, Yarrawonga, Tocumwal, Echuca, Moama, Howlong and Corowa. Damage varied from course to course, with most superintendents reporting that cool-season grasses in surrounds and common couch were the most susceptible to damage.

So thick were the plagues that they forced the cancellation of the final leg of the Murray Masters, a three-tournament event held between Thurgoona, Howlong and Corowa golf clubs. "It was a tough decision to have to make as the tournament is very important, but we had no other choice," says Corowa superintendent Darren Harvey. "I grew up on the Murray and I have never seen anything this bad or damage to turf like this in all my life."

Howlong managed to get through its leg but only because of the sterling efforts of course superintendent Sara Hagy and her team, as well as help from other clubs in the area. "I have never seen anything like it," says Hagy. "We had the debris blower going all afternoon, but 15 minutes later the turf was covered in locusts again. We had people on every green with blowers and we even had to rake them out of bunkers."

140 INTO 12

Most recently it was the turn of Melbourne golf courses and turf facilities to feel the effects of floods

after more than 140mm fell in less than 12 hours in the first weekend of February. Clubs in the eastern and south eastern suburbs were slammed by the storm front, including Keysborough, Rossdale, Southern, Waterford Valley and Kingston Links, while those along the Yarra River, including La Trobe, Greenacres, Kew and as far up as the 36-hole Heritage complex suffered extensive flooding and not for the first time this season either.

For Shaun Bilston, superintendent at Kingston Links, it was the fifth time since starting at the course in March 2010 that the course had been under. "It was by far the worst I have seen on a golf course live and is the fifth time since I started that we have had some sort of flooding," says Bilston. "We lost our pumps, there was more than a metre of water through the shed and we lost up to 16 of our 17 control panels plus large damage to the course."

The situation was similar just a few kilometers away at Waterford Valley. Course superintendent Thomas Smith has been at the course for nine years and had never witnessed such widespread flooding. While Waterford Valley itself recorded 120mm, the problem was exacerbated by runoff flowing through the Monbulk and Ferny creeks which border either side of the course. Both are fed from runoff by Mt Dandenong and with the BOM station there registering 170mm Smith says the course was always going to be in trouble.

"It was amazing to see how high the water level was," says Smith. "I have seen floods through here but this would have been the worst and the most amount of water/damage. The car parks were even flooded so you couldn't get to the clubhouse.

"The silt on the greens and fairways was the biggest concern. The low areas in the greens where you could see the water pooling meant all the silt and algae left a crust of film. We scraped this back and washed it off with hoses. The worst effected greens were double scarified to get as much silt off the top as we could and then we vertidrained with 8mm tines to stop the surface from sealing. We also applied wetting agent.

"The 1st fairway was worst affected with 30mm of silt covering 3000m². We tried bunker rakes but they made more mess so we ended up using the front end loader bucket and dragged the silt backwards into the rough. We selected one area of the rough to drag it too. This area quickly turned into a mud pit and we picked the pile of silt up with the front end loader and tipped it into a trailer.

"The area of rough was very muddy so we washed as much of the silt through so that the rye and fescue could stand up. This area was then roped off and left to dry out and will be oversown. The debris and rubbish was raked into piles around the course and picked up and then we blew off any remaining debris. Most fairways had a dark silty look to them where the water level came up but after they were left to dry for a few days we were able to cut them." A long with many parts of Australia, Canberra has been in drought for the past seven year and as a result been subjected to water restrictions. Parliament House reduced its water usage to comply with the restrictions and big impacts were felt in the parliamentary landscape with over two hectares of cool-season grass lost, thousands of native plants perishing, water features left dry and annual beds left vacant.

Due to plentiful rain across the region this year, Canberra's water storage dams are at 100 per cent capacity and water restrictions have been lifted which has enabled the Landscape Services department to undertake a number of drought recovery initiatives to help revive the parliamentary grounds.

Almost a hectare near the Ministerial entrance has been line planted using Grand Prix couchgrass and over 9000m² of Conquest couch sod has been laid on the viewing strips and front lawns around Parliament House.

The Conquest couch sod was supplied in maxi rolls and laid over a two week period. Because most of the areas are on significant slopes, a lot of surface preparation was required prior to laying the couch. Soil levels required correction as much soil erosion occurred when the cool-season grasses were lost. Weed control was also required as all manner of grass and broad leaf weeds were present. Soil pH was adjusted and mono ammonium phosphate and



an organic fertiliser were applied immediately before laying. Much of the existing irrigation required repair due to the long period of no use.

"The aim is to 'drought proof' the landscape and continue saving water over the long-term," says Landscape Services supervisor Dwaine Joanknecht. "Couchgrass was chosen for its resilience and recovery potential after periods of little to no rainfall.

"Parliament House occupants have expressed plenty of positive feedback about once again having green grass in these areas. The couch is at least green for now, but Canberra's winter will cause it to go dormant. Landscape Services is prepared to accept the visual aspects of dormant couch in order to provide a resilient landscape for future weather cycles." Conquest couch was used to relay the viewing strips at Parliament House in Canberra

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Q Turf Machinery, the Australian and New Zealand distributor of Wiedenmann turf renovation equipment, is now selling the latest in the Terra Spike aerator range – the GXi8.

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Features of the GXi8 include:

- Weight: 900kg
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- Coring: 10mm, 12mm, 16mm, 20mm, 25mm
- **Rollers:** Front and rear standard
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- Productivity: Square hole pattern 110mm (5600m²/h)

For a demonstration of the Terra Spike GXi8 call Q Turf Machinery (Terry Griffiths) on (07) 3245 6082 or email terry@qturf.com.au

Left: John Deere's HD200 and HD300 SelectSpray Series sprayers complement the ProGator utility vehicle



JD SELECTSPRAY SERIES

John Deere is making the job of spraying greens, tees and fairways a much more accurate process with the introduction of its HD200 and HD300 SelectSpray Series of turf sprayers.

Complementing the John Deere ProGator utility vehicle, the HD200 and HD300 offer a choice of centrifugal or diaphragm pumps, manual or automatic rate controls, and boom options that come standard with an electro-hydraulic lift. No tools are needed for tank removal and storage stands allow the operator to get more out of the vehicle, even while not spraying.

The optional CleanLoad chemical agitator makes it easier to load chemicals by ensuring that every drop is used, and a powerful jet agitator makes sure the tank solution is mixed thoroughly. The HD200 is equipped with a 757-litre (200 gallon) impact resistant tank, while the HD300 boasts a 1135-litre capacity.

An efficient valve bank design simplifies operation and plumbing, while standard triple nozzle

bodies make nozzle changes simple. Controls are mounted at the operator's fingertips and can be removed without tools for storage. The 11-gauge booms feature bi-directional breakaway to protect the boom, while there is also the option of an adjustable rate foam marker.

For more information visit www.johndeere.com. au or call 1800 800 981

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Following the recent introduction of the B3300 compact tractor, Kubota now has a range of eight economy tractor models from 33 to 67 horsepower which it hopes will attract buyers on a budget.

The compact general purpose 33 horsepower B3300 has hydrostatic transmission and four outlet hydraulic valve, making it easy to operate and ideally suited to front end loader work. Kubota's mid-size basic tractors range from 34 to 51 horsepower and are available with either hydrostatic or manual transmissions with all manual models featuring a shuttle for forward and reverse operations. The 51 horsepower model (MX5100) has a clutchless hydraulic shuttle for easy forward/reverse direction changes. The largest basic model – the M7040SUD – is an all-round utility tractor.

All basic tractor models have a flat or semi flat operator's platform. Gear levers are conveniently located so as not to obstruct the operator while all other levers are mudguard mounted. Some basic models feature hydraulic PTO engagement.

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I have already received many complements from members, most of whom (previously) felt the high fence would be a visual intrusion on our lovely course. <u>That the net is almost</u> <u>completely transparent is quite amazing".</u>

Allan Shoreland Secretary Manager The Metropolitan Golf Club



AGCSA BOOK SHOP



Best Golf Course Management Practices (Third Edition) By L.B. McCarty

Prentice Hall, 2011

Inversity of Clemson professor of horticulture Bert McCarty and more than 20 leading US turf experts have teamed together to produce the third edition of Best Golf Course Management Practices, published by Prentice Hall, which was released at the start of 2011.

One of the most current and comprehensive golf course management publications on the market, Best Golf Course Management Practices covers all major grasses used on golf courses, their weaknesses and strengths; ways to build golf courses and greens; latest information on fertilisers including rates and sources; soil amendments and pesticides used on golf courses; how to manage grass with poor quality water; complete pest descriptions, biology and identification pictures; environmental concerns and solutions commonly associated with golf courses; and budgeting, financial management and personnel issues and needs for golf course management.

The book is broken down into eight sections with a total of 27 chapters, and at more than 770 pages the information contained is extremely comprehensive and certainly meets the author's aim of acting as a reference guide for golf course superintendents, assistants, club managers, greens committee members and students.

Given that it has been eight years between the second and third editions, this latest incarnation contains:

- Updated coverage on the latest pests, their description, biology and control strategies;
- New or expanded content on managing seashore paspalum golf greens, newest bentgrass and couchgrass cultivars and strategies on avoiding and/or reducing organic layer accumulation;
- Latest strategies for all facets of golf course construction, establishment and management of various turfgrass;
- Updated content on best golf course environmental management practices; and
- Expanded financial and personnel management considerations.

Aesthetically the book is vastly improved from the previous edition with diagrams and charts crisp and clear, colour tones earthy and layout easily navigable. The appendices are also extensive and deal with calculating hydraulic conductivity, soil porosity and surface area, the chemical and physical properties of organic material used in turf as well as calibration formulas and metric conversion tables.

One interesting feature of this revised edition is the ability of the reader to access an online lab manual through publishers Pearson Education. On the inside cover the book there is an access code (you have to scratch off the panel to reveal the code) which once entered into the Pearson Education website gives the reader access to the online lab manual which contains 15 activities that illustrate and reinforce the concepts contained within the book.

Best Golf Course Management Practices (Third Edition) is now available through the AGCSA Bookshop and AGCSA members can get a copy for just \$179 (non-members \$215). For a full AGCSA Bookshop list visit the AGCSA website.

ALSO CURRENTLY AVAILABLE THROUGH THE AGCSA BOOKSHOP....



Golf Greens: History, Design and Construction By Michael J. Hurdzan

Wiley, 2004

hose golf course superintendents who have an appreciation of golf course design will be well versed with the philosophies of US-based course architect Michael Hurdzan. Over the past four decades Hurdzan has become one of the more prominent and respected members of the course architecture community and has a number of books to his credit, including the best-selling Golf Course Architecture: Design, Construction and Restoration.

In 2004 Hurdzan published Golf Greens: History, Design and Construction, which brings together observations and experiences from Hurdzan's many years spent on the ground. Comprising nine chapters and reaching some 330 pages in length, this hardcover book looks at:

 The design and construction of push-up, USGA and California spec greens;

- Guidelines for determining the best construction methods;
- Turfgrass selection;
- How to use design to make greens fast or slow to match players and course expectation as well as provide a foundation for agronomically sound maintenance practices;
- Cultural and physiological stress, rapid grow-in procedures, biotic problems and physical soil test results.

Perhaps the most interesting part of the book, aside from the fascinating opening chapter which delves into the history and evolution of the golf green, is the concluding chapter where Hurdzan recounts some of his personal experiences building golf greens and ruminates about the future direction of green design and management.

Golf Greens: History, Design and Construction is now available through the AGCSA Bookshop and AGCSA members can purchase a copy for \$120 (non-members \$139).

Registration Now Open www.agcsa.com.au

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27th Australian Turfgrass Conference and Trade Exhibition Adelaide 13-17 June 2011

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STATE REPORTS

SAGCSA 📀



Kooyonga Golf Club will be on show when it hosts the Toro AGCSA Golf Championships during the 27th Australian Turfgrass Conference in June S outh Australia has had a mild summer to date and while the stress of water management in most cases has eased from recent years, disease control has increased, in particular with cool-season grasses in greens and surrounds. I guess this is the nature of our business; as soon as one problem abates you can guarantee there'll be an issue somewhere else around the course to keep us on our game.

The SAGCSA has been quiet on the meeting and events front recently. We realise everyone is particularly busy through the summer period, but the SAGCSA committee will be endeavouring to hold regular education opportunities for members in the coming months. A couple of ideas we have discussed include holding an education day which will involve sponsors and guest speakers on a range of subjects. Another is a workshop aimed at greenkeeping staff and apprentices on machinery management, maintenance and safe operation. Look out for more information on these days.

This year South Australia is playing host to the 27th Australian Turfgrass Conference and Trade Exhibition (13-17 June 2011). I encourage all SAGCSA members to make the most of this opportunity and attend this year's event. Start discussions with your employer early if you haven't already done so and reinforce the benefits for superintendents and greenkeeping staff in attending this event. It would be great to see a big number of South Australian representatives. Let's be proud of our state, of our wonderful golf courses and show it off to the rest of our colleagues around the country.

Finally, our thoughts must be with those clubs severely impacted by the recent floods in Queensland. The photos I am sure don't do it justice as to the true extent of the damage caused and the clean-up is going to be prolonged and expensive. The SAGCSA has made a donation of \$2000 to the Golf Industry Flood Disaster Relief Fund.

SAM SHERRIFF PRESIDENT, SAGCSA

NZGCSA 🟵

, like all members of the NZGCSA, have been watching the events unfold on the east coast of Australia recently. I am sure I can comment on behalf of everyone in New Zealand that our hearts and deepest sympathies go to everyone who has been affected by the consistent barrage Mother Nature seems to be throwing your way.

In New Zealand we continue to live up to our nickname 'the Shaky Isles' with the Canterbury region still being hit with consistent aftershocks – some 4500 have been recorded since the September quake which rocked Christchurch!

The NZGCSA Board has been busy rejuvenating the website - www.nzgcsa.org.nz - and we would like to make special mention of Ryan Urwin from Queenstown Golf Club for his efforts. The Board is also close to finalising a new logo for the association and hopefully the well-talked about 'no golf logo' will become a distant memory.

2011 will prove to be a big year for us all in New Zealand, with the Rugby World Cup being held during September and October. Just for all those who have fading memories, the last time we won the Webb Ellis Trophy was in New Zealand in 1987 **(Ah,** I remember it well, even though I was only 12! – Ed) so I am hopeful the nation can unite together and get our boys over the line so that we can finally remove that choking tag forever.

The other big event is the 2011 New Zealand Turf Conference & Trade Show which will be held at the Christchurch Convention Centre from 27-29 June. We are very fortunate to have secured a number of quality international and domestic speakers including:

- Daryl Sellar (AGCSA consultant);
- Paul Spencer (Greenway Solutions);
- Dr Mark Coffelt (DuPont);
- Andrew Smith (Yamba GC);
- Steve Marsden (Cape Kidnappers); and
- Dean Murphy (CEO NZ Golf).

The conference and trade show website is now live and registrations are now open. All the information you need is located at www.turf2011. co.nz. We would love to see you there so we can rekindle our friendly Trans-Tasman rivalry before the World Cup.

> PETER BOYD PRESIDENT, NZGCSA

LNCGCSG hen it seems like the rest of the east coast of Australia is recovering from the recent floods, we here on the lower north coast of NSW have not received our share of the rain. The water table at my course at Forster Tuncurry is at its lowest level in the eight years that I have been here. I have been on the Bureau of Meteorology website that much lately looking for thunder clouds, but they always seem to miss us!

Anyway, with instructions to my 2IC not to let the greens dry out, off I went to Port Macquarie Golf Club for the latest Lower North Coast Golf Course Superintendents Group education day held on the first day of February. Considering the time of the year there was a very good attendance at what was our third such meeting since forming midway through 2010. Host superintendent was Steve Brennan and I arrived to a full car park and the course chockers; golf it seems is alive and well in Port Macquarie.

Guest speakers for the day were Chris Poletto (Agrichem) and Craig Easton (Nuturf). Chris kicked off proceedings with a very informative and enjoyable talk on plant nutrition. Chris started with the basics (which is a really good place to start with us) and reminded us about Liebig's law of minimums (Google that one!). We then ran through

the benefits of certain nutrients and also the use and benefits of chelated products.

Following that Craig Easton gave his much talked about presentation on sequential management systems, which, to put it in its simplest form, is the ability to justify expenditure to committees and management. This is a topic that Craig is obviously very passionate about and to shorten its content to a few lines would not do it justice.

You can always tell a group is enjoying a talk when they ask questions and interact with the speaker. Comments were coming from all around the room and the discussion touched on topics such as the need for regular soil, water and tissue tests, the need to keep documentation, as well as the scourge of all greenkeepers - nematodes. Craig's talk finished all too soon, but he has promised to return and continue discussions.

Huge thanks to sponsors Agrichem and Nuturf and also to Garth Annan (Nuturf) for organising the guest speakers. Thanks also to Steve Brennan and the Port Macquarie Golf Club for the use of their wonderful course and facilities. Our next meeting will be at Forster Tuncurry.

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STATE REPORTS





Above: Lake Karrinyup Country **Club course superintendent Trevor** Strachan picked up the McIntosh **Environmental Award at the recent** Western Australian Golf Industry **Awards**

Top right: Bunbury Golf Club's Des Russell received the GCSAWA's highest honour, the Greenline Superintendent of the Year Award

ur thoughts and best wishes go out to all areas on the east coast affected by the extremes of the recent weather. Over in the west we are all asking how can one side of the country have so much rainfall in a few days when we struggle to get the same amount for the entire year! We have experienced one of our driest years on record with only around 550mm of rainfall for 2010 (average of 880mm) and some of the worst bushfires in recent memory.

Many WA superintendents are understandably worried about their irrigation usage as most are reaching figures higher than they have ever experienced before for this time of year, with concerns they will go over their allocations well before the end of the season. I personally have used over 70 per cent of my allocation by the end of January, the highest usage in my records, with long runs of temperatures in the mid to high 30s.

Many superintendents have approached me with concerns over the future of their water availability and if this weather pattern continues for the next few years we may find ourselves short of water. The Department of Water may not consider cutting back our allocations, but if more is required a trading scheme with neighbours may be the only way. Although highly unlikely water will be cut, it is a prospect our association should start to consider and we should put in place some long-term counter measures.

To start with I have been in contact with Carolyn Hills from the Department of Water efficiency branch to help show them that golf courses are setting the benchmark when it comes to water efficiency in WA. Carolyn has visited a few courses and was blown away to see how well golf courses manage their water resources compared to other industry groups.

From this our association is hoping to develop a water wise programme for golf courses where the golf course can be accredited as 'water wise', therefore helping to protect our water resources and ultimately the amount they are able to draw from underground aquifers on their licences and not have them reduced. Golf courses that are accredited can use the logo on their website or however they choose.

On 11 February 2011 the Western Australian Golf Industry Awards night was held at Burswood with the GCSAWA handing out three awards. More than 550 attended the gala event and it was great to be able to recognise the excellent work of our members in front of the whole WA golf industry.

Congratulations to Des Russell on winning the Greenline Superintendent of the Year Award. The amount of work and effort that Des has put in since taking over as superintendent at Bunbury Golf Club has been outstanding and he is a worthy recipient of this year's award.



Congratulations also to Trevor Strachan at Lake Karrinyup Country Club on winning the McIntosh Environmental Award. Trevor's efforts in conserving water using the latest water moisture sensors along with his tree management work showcased his environmental commitment. A very big thank you to McIntosh & Son who sponsored this award at short notice.

Tom Purser from Meadow Springs won the Toro Apprentice of the Year and he will now go on to represent the GCSAWA in the national final. the winner of which will be announced at the 27th Australian Turfgrass Conference in Adelaide. Many thanks to Des Russell and the Golf Industry Awards Night Committee for all their hard work in organising the night and ensuring its ongoing success.

The 2011 GCSAWA Golf Masters Cup is on again with Paul Needham (assistant superintendent. Secret Harbour) organising a wonderful set of golf courses to play. Thank you to Paul and also all sponsors who have again supported this year's event. Be sure to play early so you can allow those bad rounds to disappear as it is again the best four of seven rounds with fantastic prizes to be won.

We are again planning for the 2011 Margaret River Conference to be held at The Margaret River Hotel. Glenn Cross is organising a great three-day event with some well-known east coast Australian superintendents attending to provide insight into their operations, as well as some WA boys showing us what they have been up to. The format will be similar to previous years with the costs remaining low so all can attend.

Let's hope the weather around the country settles down and we can all have a less stressful remainder of 2011.

> DARREN WILSON PRESIDENT, GCSAWA

GCSAQ 🛓

ell, where does one start after what Mother Nature has dished up to Queenslanders so far this summer? I almost feel guilty as I pen this report as I look out at my own course that is in probably the best condition I have seen it in for this time of year and yet within an hour's drive up the road in Brisbane, not only have golf courses been virtually destroyed but there has also been the tragic loss of life and people's lives changed forever.

I am sure ATM editor Brett Robinson will cover the floods in detail so I won't bore you with too many details, suffice to say congratulations to all affected superintendents and their staff on a monumental effort in restoring their golf courses under exasperating circumstances.

The amount of rain that fell in December and January in the south east of the state has had a disastrous effect on the income of all golf courses in the region from the very best to the smallest nineholer. I don't think I have spoken to a superintendent who hasn't had budget cuts either implemented or planned which is a huge blow coming at our peak growth time.

The period from Boxing Day to New Years Eve normally sees at least 500 players a day on my course, but this year figures were lucky to reach 500 for the week. The first two weeks of January were not much better. It was the same story across most of the region and the flow on effect will be felt for a long time with staff reduced and capital expenditure put on hold.

On an association front it has been an extremely quiet start to 2011 given the weather conditions and our plans for the year are still pretty much just that, plans, with changes to the format for our meetings and annual bus trip in the pipeline. We are normally fairly quiet at this time of year anyway but with the climatic events of the past three months, 2011 is certainly slower than normal.

On a happier note, the Queensland Golf Industry Awards are coming up and our Graduate of the Year has been finalised. This year's recipient is Dane Robertson from Indooroopilly Golf Club, who edged past a very strong field that included Anthony Harris (Arundel Hills), Mark Spalding (Gainsborough Greens) and Andy Boswell (Mount Coolum). Congratulations to all finalists and thanks to GCSAQ committee members Ben Tilley (Headland GC) and Charlie Giffard (Indooroopilly GC) who co-ordinated the interviews and judging.

PETER LONERGAN PRESIDENT, GCSAQ



GCSAQ Graduate of the Year Dane Robertson from Indooroopilly Golf Club



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STATE REPORTS

TGCSA



Ratho Golf Links is Australia's oldest golf course and recently played host to its first professional event, the Highlands Pro-Am



Greg Ramsay shows TGCSA delegates around Ratho Golf Links in Bothwell

U in thoughts go out to all those affected by the recent weather events around the country. So many areas have suffered devastation with the country now in the grips of the La Nina weather pattern. To see Queensland hit by massive flooding and then the devastation wrought by Cyclone Yasi has certainly put things into perspective for us all.

Around 25 delegates attended the final TGCSA meeting for 2010 which was held in Bothwell, home to Australia's oldest golf course Ratho. Thanks to Adrian Box (Kingston Beach Golf Club) and our host Greg Ramsay for organising this event and also our sponsors Total Turf Care and Godings for their excellent presentations. I would like to ask members to support these and all other sponsors of our organisation who help keep the cost of these days to a minimum. Without their ongoing support these days would cost upwards of \$60 for members.

Delegates converged on the Golf Museum at Bothwell in the state's central highlands on the first day of December 2010. We were able to catch up with fellow turf managers for morning tea while checking out memorabilia and also some photos of courses and early mowers from years gone by. Greg Ramsay started the proceedings with an insightful presentation titled 'The 400-year evolution of golf course maintenance – from sheep, to the keeper of the green, to the modern superintendent'.

RATHO HOSTS FIRST HIGHLANDS PRO-AM

Ratho recently held its first 'money' event with the Hanson Concrete & Irrigation Tasmania Highlands Pro-Am. More than 110 golfers teed up for the event with Michael Hansen from Queensland defeating Scott Priest in a playoff.

"Being from country Queensland, and playing some pretty rough 'n' ready layouts up there, some of the more quirky aspects of the golf course around here were no real surprise to me," said Hansen. "The course played great and it was a fun way to win in the playoff on the 9th green in front of the shearing shed."

The event was played over 15 holes and course restorer Greg Ramsay hopes to have the full 18 in play for next year's event. Tournament director Nick Thornton from the PGA was impressed with the event, commenting that the Ratho staff prepared the course magnificently and ran a wonderful event in their first professional Pro-Am at the course.

Following Greg, Nick Hanson from Total Turf Care gave a presentation on his growing business, before Geoff Koop talked about changes to the Jacobsen dealership and his new role working with Godings.

We then moved on to Ratho Golf Links where Geoff had two of the newest pieces of equipment in the Jacobsen range on display, with several delegates taking the opportunity to trial these demo machines. Golf, including the North-South Cup, was played in the afternoon over 11 holes and congratulations to the southerners who retained the Cup again.

Following golf, Greg Ramsey took everyone on a tour of the new holes that are still growing in. These are due for opening later in 2011, along with the new clubhouse and accommodation. We then headed back to the Elm Café and Corner Bar for a BBQ lunch followed by presentations. Thanks again to all involved.

Our first day for 2011 will be held at the Devonport Cricket Club on Wednesday 2 March. While the day is still being finalised, Andrew Peart, senior agronomist from the AGCSA, will be heading over to give talks on wicket table management and the ongoing AGCSA bentgrass trials. Nick Hanson will have some of his large equipment, including the sand slitter, to demonstrate, while there will also be other new equipment on display from Jacobsen and Toro.

We are endeavoring to put more information sessions regarding cricket wickets and sports ground maintenance into our field days to cater for the large range of turf managers that are involved in this field. Hopefully we can encourage more sportsfield curators to attend and become part of the TGCSA. The amount of this content will eventually depend on attendance. I look forward to seeing you there!

> TONY SMITH PRESIDENT, TGCSA



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AGCSA







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Rob Christie Course Superintendent Marysville Community Golf & Bowls Club

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