AUSTRALIAN
Turfgrass
MANAGEMENT
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Pine Valley
Behind the Guarded Gates

Centre Court
The Wimbledon Experience

POISON

WARRINGAH GOLF CLUB
An Accident Waiting to Happen

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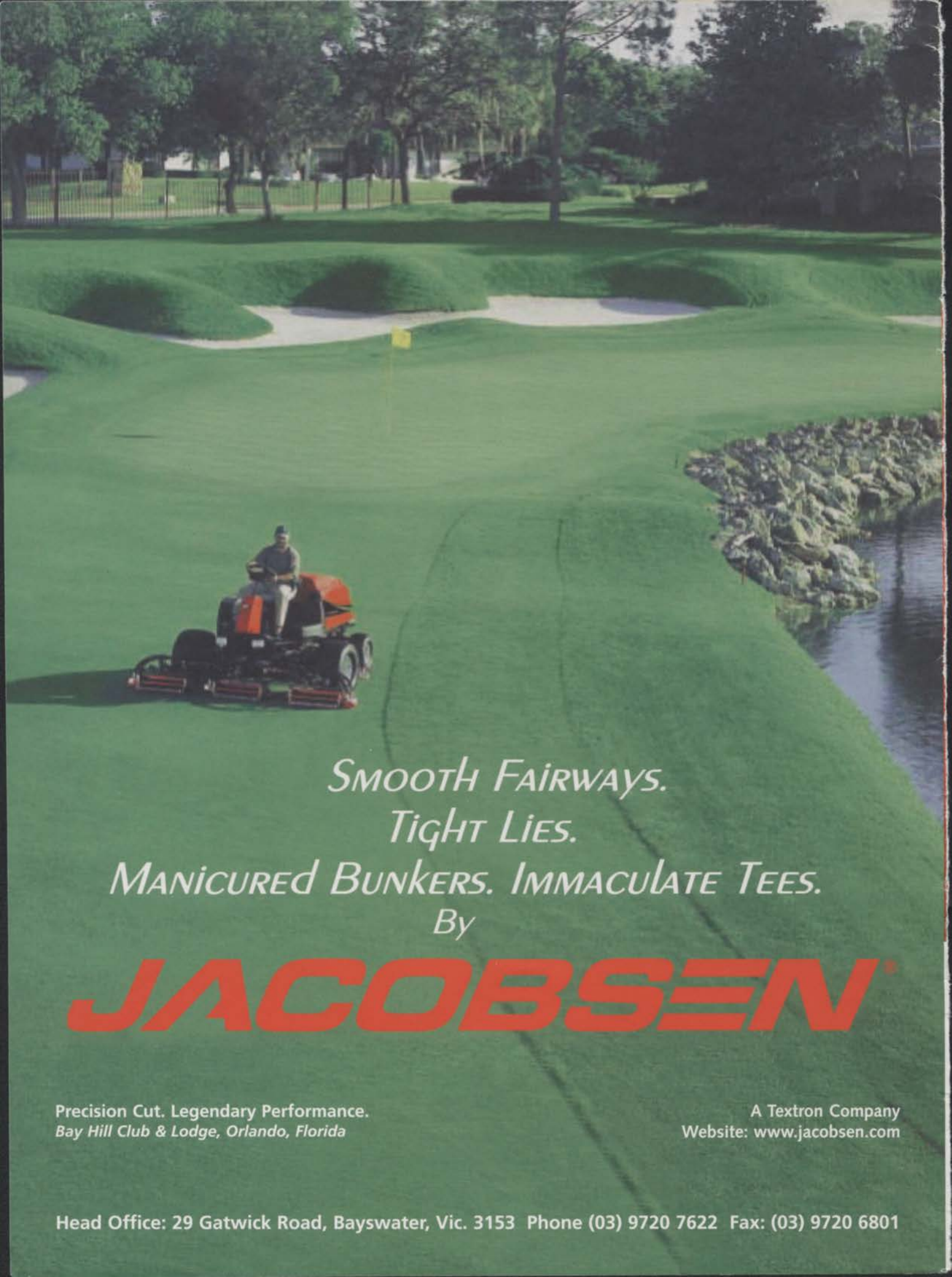
Ball Marks on Bentgrass

Turf Evolution
Stepping Back in Time

volume 5.6
December - January 2004



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Suite 1, Monash Corporate Centre
752 Blackburn Road
Clayton North, 3168 Vic
Ph: (03) 9548 8600
Fax: (03) 9548 8622
Email: info@agcsa.com.au
Website: www.agcsa.com.au

President: Mr. Mark Couchman
Directors: Mr. Jeff Gambin
Mr. Martyn Black
Mr. Martin Greenwood

CEO: Mr. Steven Potts

Editor:
Brett Robinson Ph:(03) 9548 8600
brett@agcsa.com.au

Advertising:
Scott Petersen Ph:(03) 9548 8600
scott@agcsa.com.au

Administration Manager:
Fiona McPadden
fiona@agcsa.com.au

Design & Production:
Publicity Press

Art Direction & Design:
Andy Cumming
Luke Foley

Design Studio:
Kristie Stewart
Tiffany Loftus-Hills

Accounts/Subscriptions:
AGCSA
Suite 1, Monash Corporate Centre
752 Blackburn Road
Clayton North, 3168 Vic
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cover

WARNING! The industry has been put on environmental alert following the Warringah Golf Club verdict

special features

research

in every edition

The Big W

No, I'm not talking about the department store or that little war-mongering Texan George 'Dubya' Bush and his recent visit Down Under to see his "good friend" in the "war against trrrrsm" Little Johnny.

Nor do I mean 'water', despite it being a very hot topic at the moment considering the extent of enforced water restrictions right across Australia.

The 'W' I'm referring to in this instance is 'Warringah', or rather the verdict handed down against the Warringah Golf Club in the NSW Land and Environment Court back in September in respects to the 2001 pesticide spill which purged Manly Lagoon of four tonnes of marine and bird life.

Over the past month and a half I have been trawling through this case and the earlier ruling against the club's former superintendent Craig Coggins. Both judgements make for fascinating, if extremely sobering reading, and I am sure all will agree there is no doubt this case will have lasting ramifications.

The golf industry as a whole must sit up and take notice of this case. If it doesn't then it risks horrific consequences. The facts are there for all to read in black and white; a $600,000 fine for the club, while the superintendent copped 250 hours of community service as well as financial and emotional scars that will last a lifetime.

In this edition of ATM we examine the fallout from the Warringah saga and gauge the reaction of an industry that is still reeling. Every superintendent and golf club manager should take time out to read the extensive Warringah feature which includes an article from expert Terry Muir, an EPA investigative officer during the case and now an environmental risk consultant.

This truly is a landmark case for Australian golf and it has even taken on global proportions. Talking with current Warringah superintendent Brett Maurice, he told me he has fielded calls from American superintendent magazines questioning him about the case and the precedent it is likely to set. According to Maurice, the size of the fine is what has shocked our cousins from across the Pacific and has even prompted warnings from various golf associations.

Finally, as this is the last edition for 2003 I would like to say a big thank you to all those who have given me plenty of encouragement and feedback in my first few months as editor. I trust the summer will be frenetic one for all, but be sure to take some time out and reflect on what has been a difficult, yet character-building year for the industry.

All that's left for me to say is have an extremely merry Christmas and a memorable New Year, and we'll do it all over again come 2004.

Cheers,

Brett Robinson
Editor

BRETT ROBINSON
EDITOR

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AGCSA

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DOOMBEN RACING CLUB

President's Pen

Mark Couchman, AGCSA President

With summer now upon us, many turfgrass managers are looking to the heavens for good rains as the water crisis deepens in many parts of Australia.

The recent workshop series, I am sure, would have been extremely beneficial for those who attended to develop and communicate the need to implement water management budgets through data collection on site, auditing irrigation systems and many other aspects in order to utilise such a precious resource to gain maximum efficiencies.

Hopefully all the respective golf courses hosting tournaments over the coming months are able to utilise their resources to present the playing surfaces that we all come to know and respect during the long Australian summer.

I am sure that all AGCSA members wish those superintendents hosting tournaments, not to mention all other turfgrass managers hosting sporting events, the very best of luck in these difficult times.

With the 2003 Rugby World Cup behind us, stadium managers throughout Australia who hosted games must be congratulated for all their efforts in presenting world class playing conditions to the millions of spectators worldwide.

Recently, the AGCSA Board held a meeting with the State presidents as part of our objective to maintain open lines of communication. The productive meeting gave each State an opportunity to discuss any issues of concern and where the AGCSA could offer assistance or guidance.

The meeting also gave everyone a chance to get to know what is going on at State level and to relate some of the issues back to their own members. Craig Easton, from NSW, also took the opportunity to entertain all in attendance with many "life" experiences that will no doubt make great reading when his autobiography makes it to print.

At the time of writing this, the National Turf Education Working Group was due to hold its second meeting in the last week of November. For those unfamiliar, the committee was established to monitor the educational pathway within the turf industry and make recommendations to the Australian National Training Authority by means of AGCSA representation on the national amenity/ horticulture advisory committee on all issues affecting the pathway.

It is hoped the committee will increase communication between all parties and work towards creating a degree of national consistency. The committee consists of Robert Macdonald (Joondalup Golf Resort), Chris Grumelart (Shearwater Resort), Anthony Uhr-Henry (Marcellin College), John Lloyd (Parliament House), Phil Ford (NMIT), Frank Dempsey (NSI Ryde TAFE), Steve Dargie (Challenger TAFE), Peter Le Riche (TAFE SA), Bruce Davies (Canberra Institute of Technology), Geoff Bird (QLD TAFE), Neil Jones (TAFE NSW), Tony Audley (RTCA), Tony Dodson (Hortus Australia), Glenn Cross (Mt Lawley Golf Club) and Daryl Sellar (Glenelg Golf Club).

Excellent progress continues to be made regarding the 2004 conference in Melbourne, with the tradeshow set to be a major highlight.

Three major international speakers have already been confirmed including Jim Moore who is the director of construction education for the USGA's Green Section. Jim's area of expertise includes the current changes being made to USGA greens specifications, the management of new bentgrasses, and the problems, successes and management of ultradwarf hybrid bermudagrass.

Also confirmed for the 2004 conference are Bob Carrow and Ron Duncan from the University of Georgia. Three very worthy speakers, I am sure you will agree.

Finally, I would like to take this opportunity to wish all readers and their respective families and colleagues a very merry Christmas - may Santa bring you all that you need (rain would be nice) - and a happy and prosperous New Year. Good reading.

Mark K Couchman
President, AGCSA
Golf Course Manager, Cromer Golf Club

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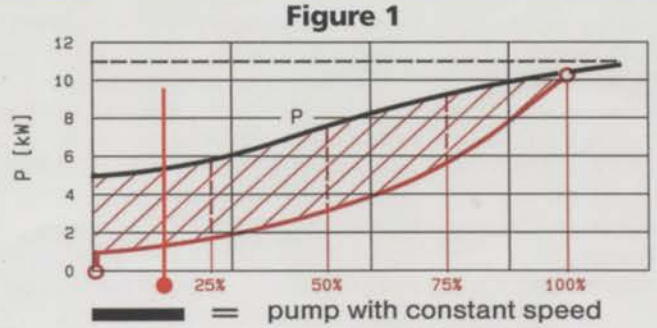
Figure 1



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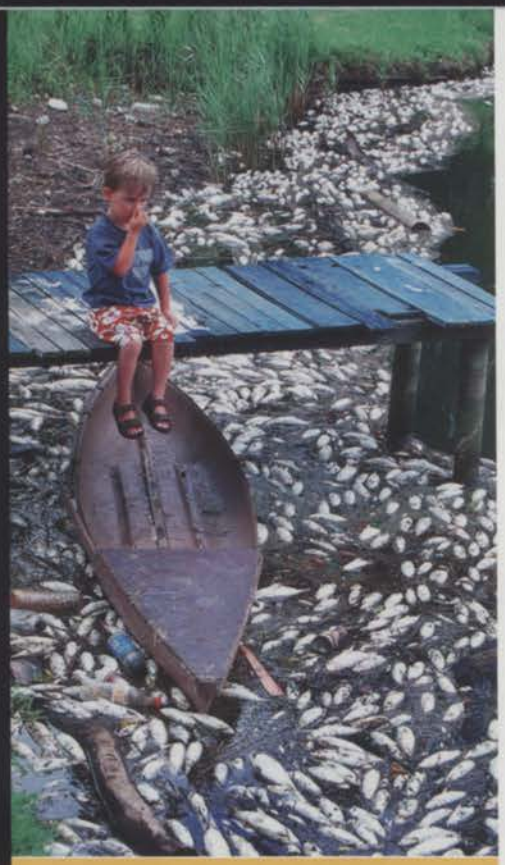
The Warringah Verdict

An Accident Waiting To Happen



Over 10,000 fish were killed as a result of the February 2001 pesticide spill at the Warringah Golf Club, an accident which cost the club $600,000 and its former superintendent 250 hours of community service

ATM Editor Brett Robinson surveys the fallout from the landmark Warringah Golf Club verdict and examines what one of the biggest legal decisions ever against an Australian golf course means for superintendents.

Photos courtesy of Martin Lange, Manly Daily News and Warringah City Council

September 30, 2003 will go down as a landmark day for all Australian golf clubs and course superintendents.

It was on this day that Justice Talbot of the New South Wales Land and Environment Court (LEC) imposed fines and costs approaching $600,000 against the Warringah Golf Club after finding it negligent for its role in a pesticide spill which lead to a major ecological disaster in the Manly Lagoon in 2001.

The sentence came three months after Justice Cowdroy, also of the LEC, sentenced former Warringah superintendent Craig Coggins to 250 hours of community service and ordered him to pay costs of up to $50,000 for his part in the incident which killed 4.16 tonnes of marine and bird life.

Slowly but surely the news of the verdicts has sent shockwaves through the industry considering the extent of the fines and the ramifications the judgements have for not only superintendents but golf clubs as well.

While the ruling against Coggins has alarmed superintendents and raised issues of professionalism, it is the judgment against the golf club itself that makes for more interesting reading.

In handing down his decision, Justice Talbot launched a scathing attack on the club, stressing that the condition of the superintendent's compound was "an accident waiting to happen" and added "if appropriate and effective physical barriers, systems and procedures had been in place, the discharge of the poison would not have occurred".

He added: "...the description of the defendant's (Warringah Golf Club) failure to appreciate its obligations cannot be confined to gross incompetence. The actions were more heinous than that.

"It was emphatically and utterly foreseeable that the conditions were totally inadequate to deal with even sporadic handling of dangerous toxic compounds in close proximity to a sensitive waterway."

In fining the club $250,000 and ordering it to pay costs and undertake further works, 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".

"There was a blatant disregard of a responsibility to conduct the club's affairs in a manner that paid due regard to the protection of the environment.

"The general deterrent aspect of this sentence is important because the elements of this offence are not exclusive to golf clubs. Numerous entities utilise herbicides and pesticides in the course of their business."

The outcome is unfortunately a black mark against an industry that has been striving for a number of years to raise its level of environmental awareness and stewardship. It also detracts from the achievements of courses that have won environmental awards and Audubon certification.

The publicity surrounding the accident was high due to the visible manifestation of pollution the spill caused, not to mention the fact that the course is located in the middle of Australia's largest city.

On top of that, the waterway affected was and still is the subject of a major environmental clean-up program that involves local community groups and authorities.

For those that are unfamiliar with the two cases, it breaks down like this.

On 12 February 2001, then Warringah superintendent Craig Coggins instructed one of his staff to spray greens with an insecticide called Gusathion, a Schedule 7 poison, in an attempt to contain an outbreak of Argentine Stem Weevil.

The tractor spray unit – which ironically is still in use at the club today – broke down and after failed attempts to get it working, Coggins instructed a member of his staff to empty the contents of the sprayer directly onto a concrete slab in the compound to ascertain the fault.

The slab had no bunding. This was despite several failed attempts by Coggins to get the club to install such a precaution. Coggins then hosed the chemical solution off the slab which then entered a nearby stormwater grate that fed directly into nearby Brookvale Creek, a tributary of the Manly Lagoon.

The outcome was disastrous. Some 10,000 fish were killed and 4.16 tonnes of dead marine and animal life were colleted in the aftermath. The Environment Protection Authority (EPA) became involved and both Coggins and the club were charged for negligently causing harm to the environment, a 'tier one' offence which carries severe penalties.

This is a very simple explanation of the case and the full judgements can be read by visiting the LEC website (see details on page 8). Also on page 11, 'Countdown to a Catastrophe' details the timeline of events leading up to the accident.

Predictably, industry reaction to the verdicts has been wide and varied with some supporting Coggins' assertion that he was made a scapegoat by the club, while others have labelled it a long-overdue wake up call the industry needed.

Council clean-up crews begin the grizzly task of retrieving dead marine and bird life from Manly Lagoon the day after the spill

"Certainly in NSW it has put the wind up everybody and guys that may not have been weary of the potential of something like this happening have been put on notice," says AGCSA Board member Martyn Black.

Adds AGCSA president Mark Couchman: "I'd hate to think it has given the industry a bad image but it is certainly a wake-up call. We need more accountability.

"I don't think the EPA will come down harder on golf courses, but they will be more aware of what we do and the potentials of what could happen. Everyone is waiting for a knock on the door."

Whatever reactions have been, the saga has become case law. It is now up to clubs and individual superintendents whether they make themselves aware of the findings, their ramifications and the lessons that can be applied.

A common thread throughout the industry so far has been to use the incident as a learning experience.

A HUGE WAKE-UP CALL

So what can be learnt from this whole saga? Let's break it down into two distinct points of view – that of the superintendent and that of the club.

Superintendents

For superintendents the verdicts have raised the issue of professionalism in respects of the day-to-day running of the shed and what happens out on the course through to ensuring that environmental management plans are in place, making sure that staff are trained and familiar with policies, and being aware of legislation and guidelines.

"The response has been for superintendents to change their practices about where they fill up their pesticide tanks from, where they dump their residues, training staff and trying to improve all their maintenance practices in and around chemical safety," says NSWGCSA president Craig Easton.

More importantly, however, the saga highlights professionalism in terms of the way superintendents conduct business at board and committee level and adapting to the changing nature of the job.

"Superintendents *must* pass these findings on to their boards, because it specifically states that the board was more negligent due it its inaction," says Easton, superintendent at Carnarvon Golf Club.

Warringah Golf Club

"Superintendents now have to become more proactive and not wait for their committee to ask them to put procedures in place.

"Now I know that this is against the principals of some superintendents to sit down in an office and start doing paper work. But they need to look at washdown bays, runoff areas, waterways, and any areas of environmental concern.

"They need to identify them, prioritise them, go to their committee and inform them that these issues need addressing and put a figure against them.

"That's going to have to happen. If they don't start putting this sort of the thing in place and have documentation that shows they are trying their best, or perceived to be doing their best, they are going to fall over in a big way."

Adds AGCSA Board member and Kingston Heath Golf Club superintendent Martin Greenwood: "It should be a wake-up call for superintendents in all aspects of their job, not just in the way they handle pesticides but in respects to the paper trail.

"Documentation is such a crucial thing nowadays. Superintendents should get into a regime of documenting and getting reports minuted at official meetings to cover themselves."

Couchman says the verdicts provide perfect ammunition for superintendents to put in front of committees to support their calls for improved facilities and practices, particularly for those superintendents that are encountering board-level resistance.

"It is a big wake-up call for the committees," says Couchman. "They have got to realise that a 'she'll be right' attitude is not acceptable.

"That's where it comes back to the superintendent. They have to make sure they stand up and request that reports be minuted at meetings and know their rights in the committee room.

"If they put a proposal forward, which is clearly a workplace safety or environmental issue, or any issue that has ramifications on the superintendent personally, and the board says 'no' they need to be able to say 'Please minute that'."

If superintendents need any motivation to take heed of this saga they only need to look at the personal impact the whole thing has had on Coggins. While the club will absorb the financial burden in time, the emotional scars inflicted on Coggins will take a long time to heal.

According to court documents, Coggins incurred $220,000 in legal fees relating to the proceedings, investigations of the fish kill and unfair dismissal proceedings (Coggins was initially sacked after the incident but was reinstated on grounds of unfair dismissal. However, he subsequently resigned from the club.)

Coggins was forced to sell his Sydney house and relocate his family to Coffs Harbour, while his retired parents loaned $100,000 to help fund the legal battle.

Not surprisingly Coggins suffered severe emotional stress as a consequence of the offence and resulting legal battle, which has been exacerbated by his sentiment that he has been made a scapegoat for the actions of other persons.

Despite this, however, the LEC said that such changes to the lives of Coggins and his family did not constitute extreme and exceptional hardship to warrant a more lenient penalty.

ATM attempted to contact Coggins and left a number of messages but received no reply before deadline. ATM understands that Coggins has since completed his community service requirements and is working in the landscaping industry.

Golf Clubs

For golf clubs, the verdicts reinforce the need to operate according to best practices right across the facility, whether it is in the clubhouse or out in the shed.

Boards need to be proactive, be involved and have expert knowledge of operations and polices at all levels. Communication channels need to be efficient and effective, while there needs to be consistency and accountability.

One of the positive things that may result from the case is the shattering of the commonplace attitude held by many boards that there is a shed on the course which house blokes who just 'cut the grass'.

The verdicts also highlight that boards are just as liable as superintendents if something does go wrong on the course, and that the financial ramifications can be crippling.

As Greenwood sums it up best, in this case "there are a lot of zeros for boards to ignore".

The Warringah Verdict

What the Courts had to Say

JUSTICE TALBOT
(EPA v Warringah Golf Club)

4: "It is appropriate to repeat my primary findings on guilt of the judgment delivered on 19 June 2003:

> **71:** "*The primary offence was caused by either the wilful or negligent act of Mr Coggins in hosing the poisonous substance off the concrete slab* **under conditions where there were no adequate measures in place to prevent a discharge to the creek.**"
>
> **72:** "*The conditions that gave rise to the commission of the offence by Mr Coggins* **... are the state of the greenkeepers compound and associated buildings, including, in particular, a workshop, chemical store and concrete slab...**"

7: "The prosecutor's submission, that the **condition of the greenkeepers compound made it "the site of an accident waiting to happen"**, is adopted by the Court."

11: "The Court found that **WGC was negligent in material respects by omitting to take reasonable steps to prevent** the escape of a dangerous substance from its premises **and thereby contributed to the conditions that gave rise to the commission of the offence ... The contribution by WGC is the essential ingredient of the offence.**

12: "The contribution to the conditions at the greenkeepers compound had direct consequence for the environment. If appropriate and effective physical barriers, systems and procedures had been in place the discharge of the poison would not have occurred. It was the sole responsibility of WGC to provide the conditions that prevent escape of dangerous substances from its premises. In that sense the club's negligent omission was the prime cause of harm to the environment."

13: The evidence shows that **a draft environmental policy and a master plan for the golf course were essentially not acted upon.** Furthermore, the president has given evidence that the board had in recent years focussed on other matters in the belief that **they had no responsibility in respect of environmental matters and that it was entitled to delegate such responsibilities to management employees."**

14: "...the description of the defendant's failure to appreciate its obligations cannot be confined to gross incompetence. The actions were more heinous than that. It was emphatically and utterly foreseeable that the conditions were totally inadequate to deal with even sporadic handling of dangerous toxic compounds in close proximity to a sensitive waterway."

17: The Court is convinced that a clear message must be sent to non-profit entities operating public facilities that they are equally liable to punishment ... The general deterrent aspect of this sentence is important because the elements of this offence are not exclusive to golf clubs. Numerous entities utilise herbicides and pesticides in the course of their business."

18: "... 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."

19: "There is justification for specific deterrence in this case. **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."**

JUSTICE COWDROY
(EPA v Craig Coggins)

30: "... the defendant ... **does not regard himself solely to blame for the environmental damage resulting from the offence. The defendant refers particularly to the failure on the part of the club to install the appropriate bunding around the workshop area. The defendant maintains that the club rejected the requests to provide bunding.** In response, the management of the club declined such claiming that there were insufficient funds ..."

42: "The defendant, but for this offence, has proven to be a responsible citizen, and a person who has been held in the highest regard by his peers. **The defendant's antecedents, good character and employment record mitigate heavily in his favour."**

45: The prosecutor initially submitted that the defendant had not co-operated with the investigators. When the environmental damage resulting from the offence was discovered **the defendant ... gave a false account of the circumstances leading to the offence. The Court is satisfied that the defendant provided the false account because of his fear of the consequences of his actions ... To his credit, he confessed within a matter of days.**

To view the full judgements of both cases log on to the Land and Environment Court website through **www.lawlink.nsw.gov.au.** *Go to* **NSW Courts and Tribunals**, *then* **Judgements**, *then* **Land and Environment Court**. *Click on* **2003** *which brings up all judgements. Warringah Golf Club is* **Case No.222** *and Coggins is* **Case No.111**.

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The Warringah Verdict - An Accident Waiting To Happen

Clean-up crews collected over four tonnes of dead fish and bird life from the Manly Lagoon. Traces of the pesticide azinphos-ethyl found in the dead fish were 10 to 500 times the concentration that would cause their deaths

Warringah Golf Club's defence was that it was the superintendent's act that directly led to the spill. However, the club was found to not have the correct procedures or the proper facilities in place to help prevent such a disaster.

Even more damning was club president Ron Newell's admission that the board believed it had no responsibility in respect of environmental matters and that it delegated such authority to the likes of Coggins.

As such, the fine imposed by the LEC should be enough for any golf course to sit up and take notice of their environmental responsibilities.

"The deterrent that comes from this is of course the financial one – $250,000 is quite a significant penalty – but also in terms of credibility," says environmental protection officer John Dengate, from the recently formed Department of Environment and Conservation.

"Golf courses have an image of being green and healthy and a nice place to spend some time pursuing the sport of golf, and in that sense golf clubs who have these sorts of impact on the local environment are risking more than just a financial side. They are risking their credibility and the very environment on which their industry depends.

"Our primary concern in this case was that the club did not have appropriate environment controls in place. For something like $7000 they could have had some simple precautions that could have gone a long way to preventing the incident.

"It's vital to send a message to anyone using agricultural chemicals that they do pose significant threats to the environment and community and to make sure that their environmental controls are absolutely up to scratch.

"As of now, simply pointing to this case would be strong motivation for all golf course managers that they do have their environmental controls in place given the severe penalties that can occur if you don't."

Easton adds that the case would have opened a lot of eyes up at board level and that it is important they act upon the findings.

"I've emailed the findings to my president and automatically he mailed that to the board. There's no doubt that it has started a process in NSW to ensure that clubs put policies in place," says Easton

"It was sad for Warringah Golf Club but it was probably the kick in the seat the industry needed because a lot of clubs have acted too slowly on what the EPA and others have stated for a long time - if you don't get into line you will be fined.

"I would say about one per cent of golf courses have the correct procedures in place at the moment, but I guarantee that now it will go up one per cent every week."

Concerns

While there are many positives for the industry to take out of this case, confusion still exists around the exact guidelines superintendents should follow in order to make sure they are environmentally compliant.

By imposing a massive fine on Warringah, the courts have sent a powerful message to every golf course that it is imperative they comply. However, there are no specific EPA guidelines relating to golf courses and ultimately golf courses must comply with council guidelines.

In this particular case the EPA was not the regulatory authority but became involved due to the nature of the offence and the huge environmental consequences.

This somewhat confusing situation is a major concern according to Easton and one which he says needs to be rectified.

"There needs to be improved communication," says Easton.

"There are no specific guidelines, no standardised formats for the construction of chemical washdown bays and chemical containment facilities. Golf courses are expected to comply with EPA guidelines yet the EPA does not afford the industry standardised plans.

"It's up to the golf course, bowling club, turf management facility to go out there from scratch and try and work out what the EPA requires. That makes it very difficult and extremely expensive.

"It has the potential to destabilise the financial situation of some clubs and that's a major concern with some clubs, especially in the country, already teetering on the edge after being affected by poker machine tax and water licence issues.

"I just don't think the EPA gives us enough ammunition to cover ourselves."

Easton says it is imperative that the EPA, councils and superintendents associations communicate more effectively to keep the industry abreast of any legislative requirements or changes.

He says that during his term as NSWGCSA president he will attempt to work with the EPA a lot more and "come up with a standardised format that is inexpensive, that can be utilised for the benefit of not only the environment but the golf course as well".

"We need to be proactive. We need to work with the EPA rather than have them come to us. We need to contact them and not be scared of the EPA. There's a lot of great work that superintendents and the associations have done and they are aware of that. They can see that as an industry we have changed a lot and put in a big effort as far as environmental issues are concerned."

The other concern is that the likes of country clubs in NSW lack the manpower and financial resources to not only conduct environmental risk assessments but to implement the outcomes.

"It's not going to be easy," says Easton.

"A lot of clubs will be putting together documentation that will outline their fiscal constraints and how much they can then direct towards OH&S, environmental matters and then prioritise them and tick them off as they go along.

"But there are a lot of clubs out there that don't have the financial means to implement a lot of these requirements.

"The other thing too is that no matter how many policies and procedures are put in place, they will never cover every possible eventuality."

Continued on page 12

The Warringah Verdict

Countdown to a Catastrophe

Friday, 9 February 2001

- A member of the groundstaff notices pest damage, believed to be Argentine Stem Weevil, to the 5th green. Superintendent Craig Coggins instructs one of his employees to fill the club's spray unit with approximately 20 litres of water to which he adds approximately two five-litre tins of Gusathion, containing 400g per litre of azinphos ethyl.
- Manufactured by Bayer, Gusathion - a Schedule 7 poison - was withdrawn from the market in 1998, and replaced by a safer and more effective active ingredient, imidacloprid. At the time of the offence, it was still lawful to use the product. Azinphos ethyl is a phosphorodithioate organophosphorous pesticide and seven grams (or 1 teaspoon) of it in an Olympic-sized swimming pool would destroy aquatic life within a matter of hours. (Azinphos methyl, also a Schedule 7 poison, is still sold by Bayer for use on fruit crops.)
- Employee Toni Nolan attempts to use the spray unit on the golf course but it fails to spray. The spray unit is returned to the workshop area.

Monday, 12 February 2001

- Coggins instructs employee Ben Hansen to spray the greens with the spray unit. The chemical solution was left in the spray unit over the weekend.
- Despite some mechanical problems Hansen is able to spray 10 greens.
- At 9am the spray unit fails completely. Hansen drives it to the workshop and parks it on a concrete slab in the workshop area for repairs.
- Hansen and another employee, John Edwards, attempt to rectify the defect with Coggins joining them.
- After unsuccessful calls to the manufacturer concerning the fault, Coggins decides that it is necessary to disconnect one of the hose lines and drain the tanks to determine the location of the blockage.
- Coggins instructs Hansen to remove the hose line. Hansen does so causing the chemical solution to flow across the concrete slab.
- Coggins hoses the liquid from the concrete slab so as to prevent his workers from coming into contact with it. The chemical solution moves along a depression in the ground adjacent to the concrete slab until it meets a grated stormwater drain that leads into Brookvale Creek that feeds into Manly Lagoon.
- Later that afternoon, local residents report hearing splashing noises.

Tuesday, 13 February 2001 - Sunday, 18 February 2001

- Full extent of the spill becomes evident as dead fish begin to wash up around the shores of the lagoon. Warringah and Manly councils call in special clean up teams to remove the dead marine and bird life. The EPA is called and begins what will eventually be a 10-month investigation with 80 potential witnesses.

Environmental Consequences

- The spill resulted in the death of more than 10,000 fish including bream, snapper, mullet, Australian bass, herring, trevally, and eels. The Manly and Warringah councils collected more than 4.16 tonnes of dead fish and eels. It was estimated that at least 12 species of fish within the lagoon perished. Local residents also observed dead and dying ducks, cormorants, and herons.
- Azinphos ethyl was found in the waters of the creek and of the lagoon and in fish samples and in several ducks that died in the days and weeks following the fish kill. Tissue concentrations of azinphos ethyl in the dead fish collected on 13 February 2001 were 10 to 500 times the concentrations that would cause their deaths.

The Warringah Verdict - An Accident Waiting To Happen

Continued from page 10

Residents reported strange splashing noises the afternoon of the spill. It wasn't until the following day that the full extent of the disaster was evident

Warringah Today

So where is the Warringah Golf Club at almost three years after the incident?

As far as general manager David Airey is concerned the club has accepted the LEC decision and is moving on.

"There is a sense of relief that it is over," says Airey, who only started in the job two months before the original incident took place.

"I wouldn't want to see this happen to any other golf club. It has been a tough two-and-a-half years. You wouldn't wish it on anyone.

"For us there's got to be a whole different way of doing business. We weren't operating in a best practices manner. It's a wake up call for golf clubs and it is very important that other clubs learn from this.

"The main lesson the club has learned is that the whole organisation has to be involved and have a knowledge of the operations and polices, especially written policies, and that staff are fully trained in those policies.

"Everything has to be consistent and there needs to be good communication at all levels. The whole organisation from the top down needs to be aware, and not just rely on staff to make sure that everything is in place.

"We have adopted an environmental management plan, but obviously we still have a lot of work to do. We don't see it as just a one-off thing. We've got to continually improve it over time and improve ourselves."

In handing down his verdict, Justice Talbot commented that the club faced "a financial dilemma". Airey, however, is adamant that the club, which has 890 members and clocks up between 72,000 and 75,000 rounds annually, will not close despite the huge financial burden it now faces.

While admitting the financial ramifications will impact the club for at least the next decade, Airey says the fine imposed was fair, and while strong enough to send a message, was not too high to put the club out of business.

The fine couldn't have come at a worse possible juncture for the club. For the past three years it has traded at a loss and a further loss of $190,000 is expected for the 2003 financial year.

The financial difficulties hark back to 1999 and 2000 when the club carried out reconstruction of several holes and renovations to the clubhouse at a cost of $400,000.

Airey says the club is currently assessing its options in regards to financing the fine and is likely to increase green fees and competition fees.

For current superintendent Brett Maurice, who has worked at the club for the past 13 years, the verdict is also liberating and means he and his crew can close what has been an unfortunate chapter in the club's history and get on with business.

Maurice says that since the original incident a lot of work has been carried out at the compound and a number of new policies established to help improve working conditions.

"Everything that has been asked of by the courts has been carried out or is in motion," says Maurice.

"With all the strategies now in place there is absolutely no chance anything will happen again. It's all for the better.

"I think the board has finally realised that there were issues that need to be addressed over at the shed and they are now much more aware of their environmental responsibilities."

Since the incident the club has paid out $6,614.59 for bunding around the concrete slab, raising retaining walls around soil storage bays and constructing a new diesel storage area.

The club has also brought in an engineering company to build a dedicated washdown bay, a pumped connection to the sewer and construction of a dedicated roofed and bunded chemical filling and emergency storage facility. The estimated cost of these works is upwards of $300,000.

Manly Lagoon

Draft plans for the washdown bay have been drawn up and a development application is currently before Warringah Council.

In addition, the club has adopted a site-specific environmental management strategy using the recently released AGCSA/EPA environmental manual as a guideline, while a separate OHS and environmental issues committee has been formed.

Specific polices on machine washdown, chemical use and machine repair have also been adopted, while a chemical spill kit has been purchased and staff trained in its use.

"It has been a difficult time," sums up Maurice on the past two years.

"All the guys on staff now were there when the incident happened. The mood was very down for about three months but it was a matter of turning all the negatives into a positive.

"We just have to accept it. We just have to do our best and the committee understands that. It's now time for the club with all the awareness this incident has created to move forward.

"It's just unfortunate that we were the ones made an example of."

See Page 45 of this edition of ATM – ACGSA, DEC Launch Environmental Management Manual for Golf Courses.

Have your say! What are your thoughts on the Warringah Golf Club saga? Put pen to paper or finger to keyboard and send a letter to the editor. Correspondence can be sent to the AGCSA at Suite 1, Monash Corporate Centre, 752 Blackburn Rd, Clayton North, VIC 3168 or email brett@agcsa.com.au

The Warringah Verdict

Around the Traps - What Supers are Saying

ATM caught up with five NSW-based superintendents to get their thoughts on the Warringah verdicts and the ramifications they have for the industry.
Each superintendent was asked three questions;
1. What are your impressions of the verdict?
2. What was the most crucial point to come out of the cases that superintendents need to be aware of?
3. Have the verdicts made you look at your club's environmental management plan and has it increased your awareness of your club's environmental responsibility?
Here's what they had to say.

Bruce Carruthers
Woodlands Country Club
1. "They [the verdicts] were handed down as an example of severity and to teach a big lesson to the industry by sending a warning that this is what could happen if you are not up to shape."
2. "The most crucial point is that superintendents need to be totally aware of the products they are handling, what they are doing with them, how they use them and how they dispose of them."
3. "Yes. This is a wake-up call for the industry not to be blasé or apathetic towards the statutory rules that are in place."

Norm Foord
New Brighton Golf Club
1. "I think it was probably expected. They [the courts] were always going to make an example of this case to everyone by invoking pretty heavy penalties. Unfortunately it had to be a golf course. I guess it has been coming for a long time."
2. "That our stewardship and environmental awareness now has to be even more stringent with current legislation. We're probably more aware than most other horticulturalists of these issues, but it emphasises we need to be up to speed with the latest legislation in all areas regarding the environment. It emphasises the need for more professionalism.
The other big point is that the board of directors now have to take an active role, know what is going on and be aware that they are liable."
3. "I was already aware of the ramifications and potentials at my club. More so, it has raised the awareness of my staff, our golfing membership and the board of directors."

Mark Parker
Concord Golf Club
1. "I think the poor guy [Craig Coggins] went through more than he should have. It appeared to be an accident with no intent. We all make mistakes, with people having made far worse without ramifications. He was unlucky and made a scapegoat. I think it also highlights society's growing intolerance of environmental mismanagement at certain levels, yet the hypocrisy surrounding far greater environmental disasters that occur daily and are allowed because it affects our wallets."
2. "I think vigilance and written documentation, particularly in regards to any OSH or environmental issues. You need to have everything documented at club committee meetings and carry out regular official meetings with your entire staff and document the minutes."
3. "My immediate reaction is to say no because I feel we are already proactive in that respect. We carried out an environmental audit some seven years ago, looking at what our systems are and what we do. But realistically yes it has. At the end of the day even though we carried out an audit, it makes you question, "Did we do it well enough, what else do I need to cover?" There wouldn't be any club in Sydney that didn't stop and think about it."

Anthony Rowland
Charlestown Golf Club
1. "Things went wrong and they weren't turned around and rectified once they went wrong. Ignorance doesn't count anymore, basically. It's going to have a strong impact on the way people look at environmental issues across the board and committees will need to strongly enhance their awareness of such issues."
2. "That if you make a mistake, you have to rectify it as quick as possible by alerting the authorities, instead of putting your head in the sand. It seems that if things had been done a bit differently there might have been less consequences for the club and the superintendent."
3. "I took my president along to the AGCSA workshop in October at Pennant Hills. He had a few interesting looks on his face. I'm pushing for some additions here and he's now one of my very strong supporters. The verdict has definitely raised the club's awareness."

Scott Lane
Oatlands Golf Club
1. "I think it has opened a lot of guy's eyes to what they can and can't do. We've got a lot of stuff in place here at Oatlands so that sort of thing doesn't happen to us. But I probably think it was warranted. We need to be seen as a leader in the industry."
2. "The fines. Also, everyone needs to be made aware of what can happen. Even though you might not be on site, it's still your responsibility. You've got to make sure you train your staff correctly in all these types of things. The EPA and WorkCover laws are changing all the time and in places conflict, and I think as an industry we need to do something to keep us up to date.
"Greenkeeping is not the same as it once was. I've been in the game for more than 20 years but I'm not really a greenkeeper any more. I'm more an office manager. I'm constantly in meetings, updating risk assessments and WorkCover stuff, and training staff. I only get to look at my course maybe once a week. That's when I rely on my 2IC and 3IC to keep me up to date.
"Everyone needs to made aware, especially the smaller country courses, because they could get themselves into a lot of trouble. Some of them simply don't have the resources and the manpower to commit to risk assessments.
3. "We are currently re-doing ours at the moment to keep it up to date as a result of the verdict.

The Warringah Verdict

An Expert's Perspective

The Warringah case should send a huge warning to clubs to raise their level of environmental awareness

At the time of the Warringah incident I was working for the EPA as a specialist environmental investigator attached to their legal branch and following the incident I was part of a large investigative team.

The EPA charged the club, being the occupier of the golf course, with negligently contributing, in a material respect, to the conditions that gave rise to Craig 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 that contributed to his offence. The court found that the club had been criminally negligent in that, among other things;

1. Poisonous chemicals, including pesticides, were frequently handled and mixed on a concrete slab in the greenkeepers' compound;
2. The slab was near Brookvale Creek and adjacent to stormwater pits that lead to the creek;
3. The slab was not surrounded by a bund or other protective devices;
4. Little or no precautions had been taken by the club to prevent the escape of dangerous substances from the greenkeepers' compound; and
5. The escape of the pesticide and the potential harm were foreseeable and it was an accident waiting to happen.

The conditions that contributed to the offence included:

- Permitting the handling of chemicals upon a concrete slab which had no bunding;
- Permitting the handling of chemicals near a stormwater grate, one which was not protected by bunding;
- Failing to provide the superintendent or any other employee with any or any sufficient instructions that chemicals were not to be handled in the vicinity of the concrete slab or the stormwater grate;
- Failing to provide the superintendent or any other employee with any or any sufficient instructions in relation to the handling of dangerous chemicals or chemical spill management procedures;
- Permitting the carrying out of repairs to equipment on an unbunded concrete slab and near a stormwater grate;
- Failing to erect bunding around the concrete slab and stormwater grate;
- Failing to install washdown bays; and
- Failing to provide the superintendent and other employees with spill prevention and containment plans and/or equipment.

There is no doubt this incident was preventable. During the hearing the EPA submitted that on the basis of the facts proved in the case it is clear beyond argument that had the spill been contained on-site no environmental harm would have occurred or would have been likely to occur.

It must, however, be stressed that many of the major environmental incidents that I have investigated result not from malice but from ignorance of the environmental impacts of individual actions or of ignorance of our obligations under the law.

Had the club an appropriate environmental management program in place the likelihood of this incident could have been significantly reduced.

This case exposes a number of weaknesses in the environmental management programs at many golf clubs;

- The absence of a systematic process of environmental management;
- There are no formal mechanisms to identify potential and actual problem areas;
- Failure to plan short and long term environmental goals and actions;
- Failure to identify appropriate operational controls and procedures;
- Some clubs fail to see the environment as a business issue;
- Failure to view environmental management as a public relations asset;
- Unable to realise that environmental programs can save money;
- Failure to integrate environmental management into daily operations.

The case showed that the club did not have appropriate programs of environmental management in place at the time of the incident. As a result, the club was not in a position to;

- Reduce and manage environmental risk;
- Claim due diligence as a defence;
- Claim they exercised due diligence as a factor in mitigation;
- Reduce the likelihood of the club, its directors, managers and staff from being prosecuted.

Unfortunately the absence of an environmental management program exposed the club and its employees to environmental legislation with heavy penalties and few defences.

This case clearly demonstrates that environmental legislation throughout Australia can render golf clubs to criminal and civil liability. Golf clubs can also be liable for the acts of their employees and contractors.

Had the club been duly diligent they would have identified, assessed and managed the specific environmental risks likely to be faced as a result of their activities.

Environmental due diligence is an important corporate and individual environmental responsibility tool that the golfing industry is yet to fully embrace.

Significantly, due diligence can be a defence to environmental criminal liability throughout the Australian jurisdiction. Importantly, it must also be regarded as an effective method for golf clubs to control and minimise environmental risks.

Interestingly, although due diligence is a statutory provision in all but one Australian state, it is not defined in any of the legislation.

The Courts will determine if due diligence has been exercised, but simply put, it is a master plan to demonstrate the golf club identified and assessed the specific environmental risks and designed and implemented a system to specifically manage those risks.

There is no all-purpose list of magic steps to environmental due diligence but there are activities that golf clubs should be doing by taking every precaution reasonable.

A due diligence program is process and systems based and will specify standards and procedures to be followed in managing environmental performance.

It will identify, assess and control environmental risks and be complemented by a system of on-going management and review.

The ultimate goal is to ensure individuals throughout golf clubs recognise their environmental responsibilities, are accountable for their actions, and demonstrate a sense of environmental ownership.

Golf clubs who adopt this approach may not only demonstrate they have acted duly diligently but may also enhance the image of the industry by demonstrating that robust internal environmental performance criteria apply to all environmental decisions.

One of the main aims of the Parliaments in criminalising environmental breaches in Australia is deterrence. As reported during the Warringah case, Justice Talbot commented, "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."

The environmental performance of golf clubs must move with, and in some respects be in advance of, community and government expectations.

Environmental responsibilities of golf clubs must be managed in the same manner as its fiduciary, economic, legal and human resource responsibilities. Golf club board members and senior managers must;

- Become familiar with environmental effects of all sections of their club;
- Identify staff who have responsibility for environmental management;
- Prepare an integrated environmental program;
- Keep a register of policy and legal requirements;
- Demonstrate environmental responsibility to employees and contractors;
- Exercise control over the actions of contractors;
- Maintain adequate records to demonstrate compliance with environmental requirements.

For the golfing industry to work together and foster a culture of continuous improvement in environmental management, senior management at golf clubs must provide a self-imposed set of environmental rules for the carrying out of specific activities.

They must take a leading role in setting minimum environmental standards and provide resources and support in developing practical measures to prevent and minimise the risk of environmental harm.

The starting point is top management commitment because they define organisational goals and provide leadership and direction. They also make decisions and must view environmental management commitment as an opportunity to improve.

The Warringah case also highlights that many activities at Australian golf courses involve inherent environmental risks that require ongoing management. These include natural resource consumption, chemical and waste storage, air, noise, soil and water pollution.

While there is no fool-proof plan to guarantee the prevention of environmental incidents, the golfing industry must commit to an holistic approach of environmental risk management using simple risk management tools that enhance environmental decision-making, accountability, responsibility and defensibility.

The environmental programs at golf clubs are constantly in need of evaluation or improvement.

The Court found beyond reasonable doubt that the club itself breached its duty to take reasonable steps to avoid or minimise harm to the environment. It negligently, and in a material respect, contributed to the conditions that gave rise to the commission of the offence by its employee.

This is because it failed to implement fundamental safeguards and procedures to protect the environment from harm in the event of an accident or the careless or negligent performance by an employee.

Sadly, the golfing industry stands atop the list of offenders in NSW, along with the Karuah Caravan Park case (the defendant was sentenced to 12 months jail), as the equal highest fine imposed in any single environmental investigation in NSW.

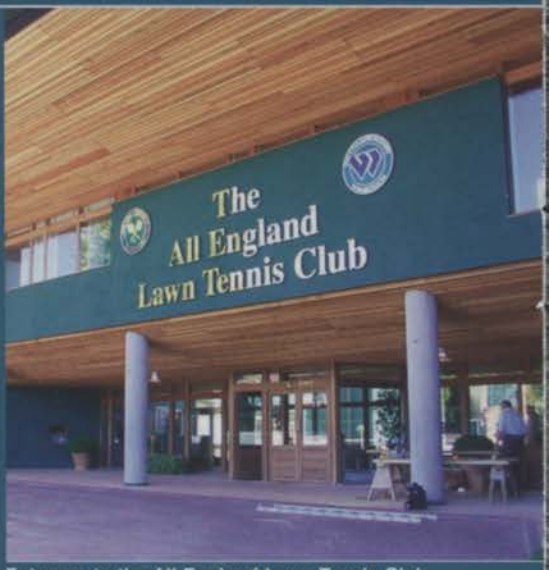
Already, the EPA and local councils in NSW have commenced audits and site inspections of golf clubs and there is no doubt the industry will be closely scrutinised by environmental regulators.

Club's now need to review their environmental status taking into consideration environmental records, reports, materials, work procedures and staff, and making it a priority to inspect the site to identify the strengths and weaknesses of the current way of managing the environment.

Terry Muir was an investigating officer for the EPA during the Warringah Golf Club and Craig Coggins cases. He now runs his own environmental management consultancy called Environmental Business Solutions.

Centre Court - The Wimbledon Experience

The Wimbledon complex and below, Matthew Dowlan



Entrance to the All England Lawn Tennis Club

Over the past three years aspiring turf manager Matthew Dowlan had the unique experience of working at the All England Lawn Tennis and Croquet Club, or Wimbledon as it is more commonly known. Here the 25-year-old Melbournian recounts his time there and gives an insight into preparing surfaces at undoubtedly the world's premier tennis facility.

"If you can dream and not make dreams your master, if you can think and not make thoughts your aim, if you can meet with triumph and disaster and treat those two impostors just the same" - *Rudyard Kipling 1865 – 1936.*

I never realised that some day this quote would mean as much as it did when I read it upon entering Centre Court at the All England Lawn Tennis and Croquet Club (AELTC) – Wimbledon.

The quote is set in gold lettering in the foyer of the players' entrance and was quite apt considering I too was about to realise my dream of working at the oldest and most prestigious lawn tennis facility in the world.

The Championships, as it is called, at Wimbledon have developed from the garden party atmosphere of the first meeting in 1877, witnessed by a few hundred spectators, to a highly professional tournament attracting an attendance of almost half a million people and a TV audience of millions worldwide.

The AELTC has the status of being at the forefront of lawn tennis turf management due to its ready-available resources and continual research through annual seminars hosted at the club.

The opportunity to work at the AELTC came about while I was working as a groundsman at the Royal South Yarra Tennis Club in Melbourne under the auspices of Bill Turner. Through contacts an opportunity arose to work at the AELTC and in July 2000 I is was offered a position starting in April 2001.

My role would be to assist maintaining all grass, red shale, clay and hard courts as well as assist in the day-to-day running of the facility.

Upon arriving for my first day I was formally introduced to everyone at the AELTC and given a full day's orientation of the facilities and staffing arrangements.

Wimbledon is more than its famed Centre Court. It is a complex of 42 tennis lawns, three clay courts, one Hard True court, one Soft B court (French Clay) and five shale courts, as well as the members and competitors lawns, surrounding garden lawns and croquet greens. Head groundsman is Eddie Seaward who has presided there for the past 13 years.

He is assisted by Mark Sheather who has worked there for over 30 years and possesses unrivalled practical experience in lawn tennis turf management.

Both Eddie and Mark control a team of 12 full-time groundsmen as well as two full-time mechanics who maintain a large fleet of machinery. There are also three full-time employees who are based at Aorangi Park, the Wimbledon practice courts.

The remaining contingent of groundsmen, such as myself, are on contracts which last anywhere from a month to eight months, and come The Championships in the last week of June, staff numbers swell to around 25.

Since the mid-1980s some 20 Australians have had the opportunity to work at the AELTC and with the addition of myself there were five in 2001, four in 2002, and five in 2003.

SPRING RENOVATION

I joined the club during the spring renovation season, which in England starts in March. With the grass courts coming out of the winter period only a small amount of work was being done including regular cutting and checks for damage and fungal disease attack.

According to the full-time groundsmen the only real pests they experienced were the Australian groundsmen! Just joking. In actual fact, fusarium patch was the biggest issue for groundstaff to contend with as it seems to thrive in England's cool, moist climate.

As the grass courts are 100 per cent ryegrass and heavily fertilised, they are an ideal breeding ground for the disease.

But through good cultural practices and management – which includes the removal of dew every morning and regular applications of carbendazim fungicide – fusarium is well contained.

During my time at Wimbledon it was apparent that tradition played an integral part in preparing the surfaces, especially Centre Court. For years the courts have been prepared exactly the same way, although in recent times the advent of new technologies and further research into new grass strains, which possess better wear qualities, has meant some practices have been altered slightly.

By the time I arrived, the AELTC had introduced 100 per cent perennial ryegrass (*Lolium perenne*) across the courts compared with the 70 per cent ryegrass and 30 per cent fescue mix of years gone by.

Other new methods included the introduction of the Koro field topmaker during the autumn renovation period where the machine is adjusted to remove unwanted weeds (mainly *Poa annua*) in readiness for the overseeding process, while during the spring renovation period a HydroJect was used to aerate the soil.

The spring maintenance process is dependent upon a number of factors including the weather and when the courts are due to open for play. Following the winter season, after any outbreaks of fungal disease have been contained, an assessment of the playing surface is made.

The following is a timetable of what occurs during the spring renovation period in the lead-up to The Championships.

Renovation of all courts begins immediately after The Championships. Here the Koro field topmaker is used on Centre Court

Scarification

The scarification process starts in late March, the intensity of which depends upon how much scarifying was carried out the autumn before.Centre Court is scarified first followed by the outer courts. The process is carried out using two walk-behind scarifiers and a tractor-mounted scarifier.

Aeration

Again the degree of intensity depends upon the autumn renovation period. If the aeration program has been sufficient, very little, if any, is required.

Centre Court - The Wimbledon Experience

The HydroJect is an effective way to aerate the soil without risking damage to the playing surface or affecting the characteristics of the court

Aerating Centre Court

Overseeding

Once the courts were scarified and mown to a suitable standard, they were then overseeded with a specific ryegrass seed mix with a pedestrian pro-seeder.

Topdressing

Topdressing took place only if there was sufficient time before the opening of courts for play, so as to weather in and be totally ameliorated with the playing surface.

Mowing

During March the height of cut (HOC) is 12 millimetres throughout, with frequency dependent on growth. The grass is not allowed to grow so long that more than 2mm is removed at any one time.

A fleet of Toro 20" cylinder walk-behind mowers with groomer attachments is used each producing 110 cuts per metre.

In April, frequency is increased to at least three times a week. Verti-groomers are introduced, set at 1mm below the HOC which is reduced over the month to 9mm.

In May, as The Championships draw closer, the HOC is reduced to the playing height of 8mm and groomers are used as required. This process continues through into June with frequency increasing through to the tournament.

The same operator always mows the same courts, to ensure sharp lines. One half of the court is mowed first right out to the sides. When using the 20" cylinder mowers, there should be exactly three cuts between the tramlines.

Rolling

Rolling starts as early as the weather allows, and if possible most is undertaken pre-season. However, rolling is normally a daily occurrence during The Championships. The heaviest rolling does not exceed three tonnes.

With play scheduled to start in mid-May, rolling becomes a regular operation with the frequency increased up until the tournament.

Fertilising

Fertiliser is applied using a cyclone spreader at the very end of April or at the beginning of May. To ensure an even distribution, two passes are made – one along the length of play and the other across the line of play.

Marking Out

Courts are marked out about 10 days before play is due to start. This allows time to achieve the correct shading on the courts when mowing.

BUILD-UP TO THE CHAMPIONSHIPS

With the spring maintenance period passed, the grass courts are ready for the opening of play for members before The Championships begin.

Centre Court, however, is not used. Remarkably, Centre Court at Wimbledon is mainly used for just the two weeks of The Championships. For the remainder of the year it is a tourist attraction. By the Monday following the tournament, autumn renovation begins, the surface is re-seeded, and within five weeks new growth has sprouted.

Centre Court receives no preferential treatment, although it and the Number One court are surrounded by a small electric fence to ward off vixens (foxes), as their urine consists of high traces of ammonia that can ruin even the highest maintained surface.

With The Championships fast approaching, attention starts turning towards preparing the facility as a whole. Fences and barriers surrounding the outside courts are erected, marquees set up and public seating set out. All lawns and edges surrounding the courts are manicured, scoreboards erected and net posts installed.

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Bayer Environmental Science 391–393 Tooronga Road East Hawthorn, Vic. 3123.
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BAYER

Centre Court - The Wimbledon Experience

Topdressing Centre Court

Another major issue during the build-up is the weather and the covering of the courts pre-tournament. The covers are installed in the final week of May and two weeks before the tournament starts the covers on every court have to be pulled and inflated every night before closing.

With the warmer weather and increase in humidity, staff work later at night. It is important not to cover the courts too early. Doing so can increase the risk of sweating causing a damp slippery surface which is more susceptible to fungal disease.

The month of June is hectic to say the least. It kicks off with Overseas Week where all the players come in for accreditation and are allocated practice times.

With the AELTC being a private club, the public is not allowed entrance at this stage so it gives the staff a fantastic opportunity to watch the players train up close, have a chat with them and in the case of fellow Australian groundsman Dave McCrimmon have a hit with them.

Dave was watching Richard Krajicek on Court 11 when his hitting partner failed to turn up. Dave ended up having a 10 minute session with the 1996 Wimbledon champion!

THE CHAMPIONSHIPS

By the time The Championships roll around, there is a full complement of 25 groundstaff.

During the tournament a timetable exits with all courts mown and marked out by 9am before the gates open at 10.30am.

During my three years I had the opportunity to cut courts 2, 3 and 4. It was a thrill as they were show courts and the stands were full of people seeing my work. We would also dress the courts.

This is the general routine for the two weeks unless there was a forecast for rain which meant we went on standby to pull the covers. During the tournament there is over 200 staff (mainly students) that help pull the covers in case of rain.

They are all trained two weeks prior to the tournament, though the groundstaff are given the important jobs of covering Centre Court and Number One.

During the tournament there is considerable wearing of the turf surface around the baselines and at the net, especially in the second week. Nothing can be done about the thinning of turf but it wears evenly and the players get used to the change.

The only maintenance practice is to tidy up the baselines by using a Billy Goat vacuum to suck up any unwanted material.

Another great experience during The Championships is Finals Day where as part of tradition the groundstaff get to be a part of the net presentation ceremony. We are split into two groups and on all three occasions I was lucky to get men's final every time.

Watching the trophy presentation from an arm's length away is incredible, and I was fortunate enough to see Goran Ivanisevic (2001), Lleyton Hewitt (2002) and Roger Federer (2003) lift the trophy.

AUTUMN RENOVATION

With The Championships over, the autumn renovation period (August to October) starts immediately.

This is the most vital time in lawn tennis court maintenance. The standard of the court the following season will, to a large extent, depend on how thoroughly the autumn work is carried out.

A programme of work must be planned in advance, so that all the required materials are on site and available when needed. The autumn renovation program goes as follows;

Irrigation

Irrigation is used during this period to soften the soil profile so that aeration and scarification can be made easier. As an aside, during The Championships 3000 gallons of water is used to irrigate the courts.

Scarification

At this time of year the machine is adjusted to cut into the surface 6mm, thus removing any unwanted growth that may have formed.

The procedure starts by working lengthways across the court with debris being removed with the aid of a sweeper. On average this is done four times in opposite directions. The HOC is then slightly raised and the same procedure carried out across the line of the court.

Aeration

It is important to aerate as much as possible to relieve compaction and encourage root growth. In the past, the program has been to vertidrain the entire area to a depth of 100mm. This will be reintroduced at some time in the future.

Seeding

For reasons of cost and tradition all courts are re-seeded rather than re-turfed. With a complex of 42 tennis lawns - 20 for competition and 22 for practice - that's 3.5 hectares and is more cost effective. The seed is a perennial ryegrass mix – 50 per cent AberImp, 50 per cent AberElf.

The seed is spread at a rate of 85 grams per square metre imbedded in a soil profile 21 to 22 per cent clay and the rest sands and silt deposited to a depth of 250 millimetres. Below that is a 150mm layer of crushed rock for drainage.

The soil is naturally from Britain, but not native to the Wimbledon area. A Surrey-based company provides the soil which has absorb about 290 kilograms per square centimetre for breakage point.

It must be compatible with the existing soil. If not, a layered effect may be produced within the soil profile which can cause the grass roots to fracture and movement of the top layer.

Centre Court - The Wimbledon Experience

Court 13 striped, marked and ready for play

Over the years it has been found that the Scis Seeder is a very effective method of sowing. Initially seeding is carried out by going over the entire court at least twice.

Once this is completed, further attention is given to the baselines and other high-wear areas. A tilth is created by the use of a 'weasel' and further seed is sown by hand. Following seeding a light dressing of topsoil is applied to assist with germination.

Germination Period and Test Cut

When seeding is completed, regular light irrigation takes place so that the seed does not dry out. Germination normally takes four days.

Once the new grass has reached a height of 18mm it is mowed. The HOC is adjusted so that the grass leaf is lightly tipped. Over the next three weeks the turf is regularly mown with the HOC slowly reduced to 8mm in preparation for topdressing.

Topdressing

The main purpose of topdressing is to provide a level surface for the following season.

The application of topdressing is done by hand. Each court is covered with approximately one tonne of soil using lightweight shovels. A 3m-levellawn straight edge is then pulled diagonally across the area, which has the effect of brushing the soil into the turf.

Any low spots will show up and these areas can be luted in then given further treatments of soil to bring it level. Once the operation is completed the entire area can be drag-matted to give the final brushing in.

DIFFERENCES

While many of the practises are identical, there are a number of differences in lawn tennis turf management between Australia and England.

The main difference, obviously, is the turf. At AELTC, all courts are cool-season ryegrass, while at Royal South Yarra warm-season Legend couch is preferred.

As a result, preparation of the playing surface is different. A couchgrass surface has a higher drought and heat tolerance compared to ryegrass and can withstand long hot dry spells and lower cutting heights (any where from 4mm down to 2mm) which present a faster court and higher bounce. This is compared to an 8mm cut on ryegrass.

Furthermore the soil profiles are different. Royal South Yarra is based on Merrie Creek soil, a highly-concentrated clay loam that when dry and rolled creates of hard true surface.

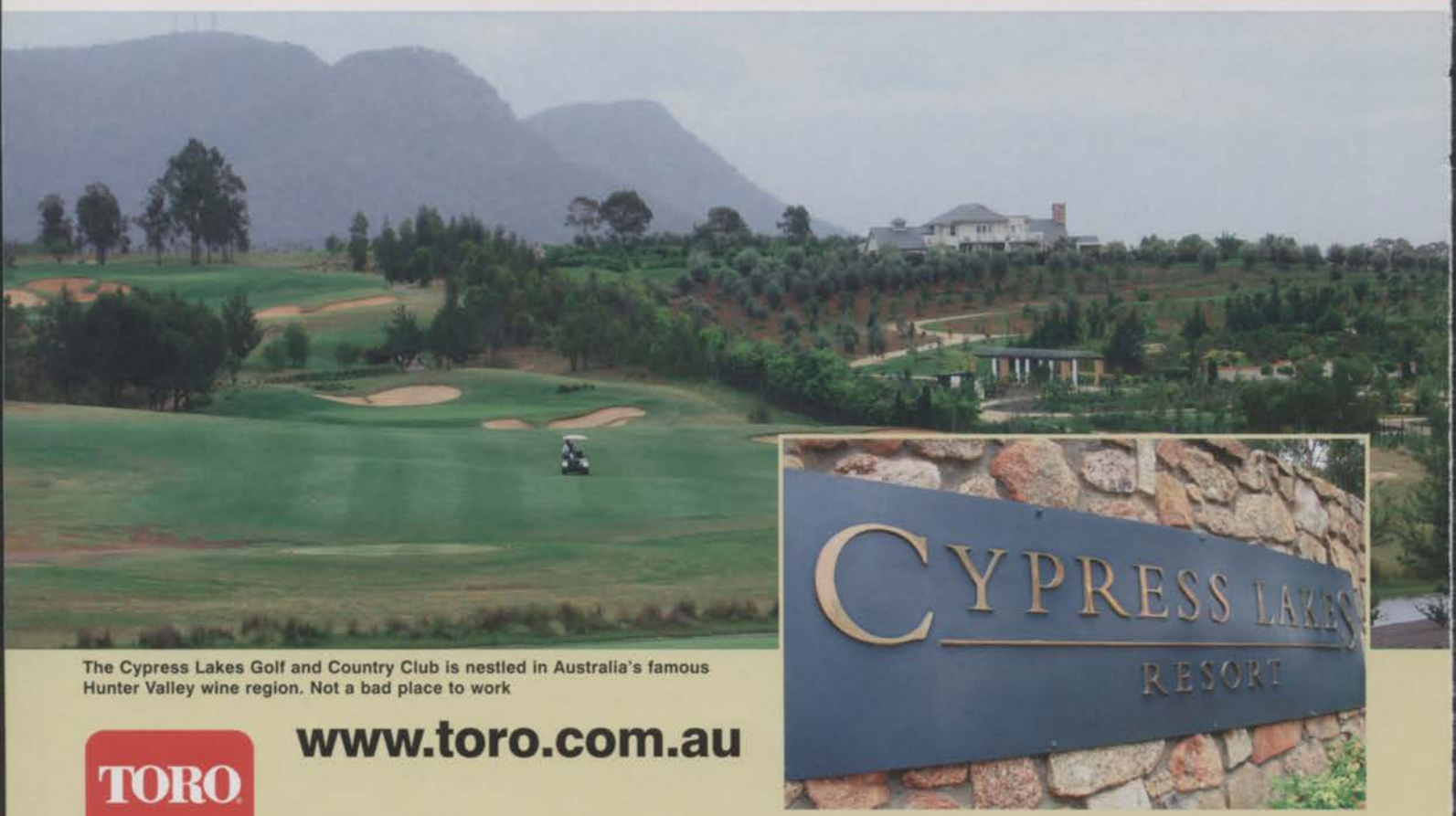
During my time at Wimbledon I could not have asked for a better way in which to further my career in turf management. It opened my eyes up to new methods of how to prepare lawn tennis surfaces.

The major highlight for me was experiencing all facets of preparing surfaces at one of the most unique sporting venues in the world and being entrusted to do so.

Not to mention the incredible opportunity to socialise and network with people on the professional tennis circuit as well as travelling the world in the off-season. Truly a case of game, set, match!

Toro Turf Tour

Location: Cypress Lakes Golf and Country Club, Hunter Valley, NSW



The Cypress Lakes Golf and Country Club is nestled in Australia's famous Hunter Valley wine region. Not a bad place to work

TORO

www.toro.com.au

Located just a couple of John Daly drives up the F3 from Sydney and a lobbed wedge from Cessnock, lies the 160-acre Cypress Lakes Golf and Country Club.

Built smack bang in the middle of Australia's renowned Hunter Valley wine region, the 18-hole championship golf course was designed by Steve Smyers of Florida and unveiled in 1992.

Weighing in at 6,359m and a par 72, the front nine is tree lined with sloping fairways, while the back nine boasts a distinct links-style layout.

Sixty voracious bunkers guard some dramatically shaped and elevated greens, while each tee and green have stunning panoramic views of the valley's famous vineyards and surrounding mountain ranges.

Sounds like the ideal place to have a whack doesn't it? Sounds like the ideal place to work too!

Mention the name Cypress Lakes to any superintendent around Australia and the answer will generally be the same – "That's Merv's joint!"

Yes, steward of this palatial course is none other than Mervyn Hayward. "Swervin'", as he is more commonly called, is known around the industry as a bit of a larrikin and is a whirlwind of wit and comedic talent.

Hayward has been ensconced at Cypress Lakes since construction began on the course in 1990, and together with his crew has established it as one of the leading resort courses in Australia.

Hayward is the sort of guy you can't keep down. He's guaranteed to steal the show at any function and, of course, who can forget the ever-present famous pink wig which gets a regular airing.

Yet there is a serious side to this former rugby league bullock-cum-mirthful superintendent.

Despite having a penchant for the finer things in life, when it comes to the job he is a very shrewd operator and places huge demand on his equipment to keep the course in pristine condition year-round.

Not surprising then that Hayward's preferred choice of machinery equipment is Toro.

Hayward switched his fleet across to Toro two years ago and says he made the decision based not only on Toro's exemplary reputation, but also because of one other very important factor.

"Toro's service has improved out of sight and that is one of the reasons why we shifted our fleet across," explains Hayward.

"Once upon a time it was a bit difficult to get parts for Toro machinery, but that has changed so much these days. Service is an important factor for us here at Cypress Lakes because we are so far away from everything.

"It's really nice to know that if you need a part or something fixed under warranty they will be here the next day for you to sort it out – no hassles. They're really good hands-on.

"Also I think their machinery and the range Toro has is far superior. I wouldn't swap back."

Hayward is hoping to expand his fleet of Toro Greensmaster 1000 walk-behinds next year

The other attraction for Hayward is Toro's ability to now put together machinery packages which include spreaders, trailers and rollers.

Hayward and his crew run a machinery arsenal that includes:

- One Reelmaster 5500-D fairway mower
- One Groundsmaster 328-D rough mower
- Two Sand Pro bunker rakes
- Six Greensmaster 1000 walk-behind greens mowers
- One Reelmaster 3100 surrounds mower (Sidewinder)
- One Pro Core aerator
- One Greensmaster 3150 greens/tees mower

The irrigation system too is all Toro and the Cypress Lakes site boasts over 700 heads. Hayward is currently in the process of changing the heads over from the old 600 Series to the new 730 Series at a cost of about $30,000 a year. This has been an ongoing process with around 300 still left to be converted.

For those that have had the experience of playing Cypress Lakes, a lasting impression is the number of huge fairway and green-side bunkers which pock-mark the landscape.

It therefore comes as no surprise that Hayward's two favourite pieces of Toro machinery are the new Reelmaster 5500-D fairway mower and the Reelmaster 3100 surrounds mower (Sidewinder).

"They're just fantastic," says Hayward. "They're so adaptable with the adjustable front heads and with the really steep bunker faces we have at Cypress Lakes it makes our work so much easier. And they are easy to maintain as well.

"The fairway mower cuts sensational."

Most recently, Hayward purchased the Reelmaster 3100-D surrounds mower (Sidewinder), and is so impressed with its performance that he is looking at purchasing another in August 2004.

The unique Reelmaster 3100-D triplex mower is on the cutting edge of technology. Its exclusive Sidewinder cutting unit system and three-wheel drive allows it to perform in places other trim mowers cannot touch, and its rear-engine design offers greater operator safety and comfort.

The Reelmaster 3100 surrounds mower (Sidewinder) is put through its paces on the undulating Cypress Lakes course

The optional Sidewinder cutting units can be shifted right and left, on the fly, for increased reel overhang and to vary the tyre tracks. It is powered by a 21hp Kubota engine and the exclusive Series/Parallel 3WD traction drive system is quick and efficient.

Also on Hayward's shopping list next year is another fairway mower from Toro's extensive range. Hayward is already the proud owner of a Reelmaster 5500-D which has already clocked up some serious hours at Cypress Lakes.

One of the innovative features of the Reelmaster 5500-D is the optional rear roller brushes which are designed to optimise after-

Continued next page

Toro Turf Tour

Location: Cypress Lakes Golf and Country Club, Hunter Valley, NSW

Cypress Lakes' shrewd superintendent Mervyn Hayward

The Reelmaster 5500-D fairway mower which Hayward describes as "just sensational"

cut performance and eliminate the clumping of grass clippings during wet cutting conditions.

Features include;

- Even dispersal of grass clippings, even in heavy dew morning conditions.
- Power brushes which sweep the rear rollers while mowing.
- Easy operation and installation.
- Belt driven, powered off the reel.
- Eliminates the need to drag or blow the fairways after mowing.
- Keeps fairways looking great without the labour intensive clean up.

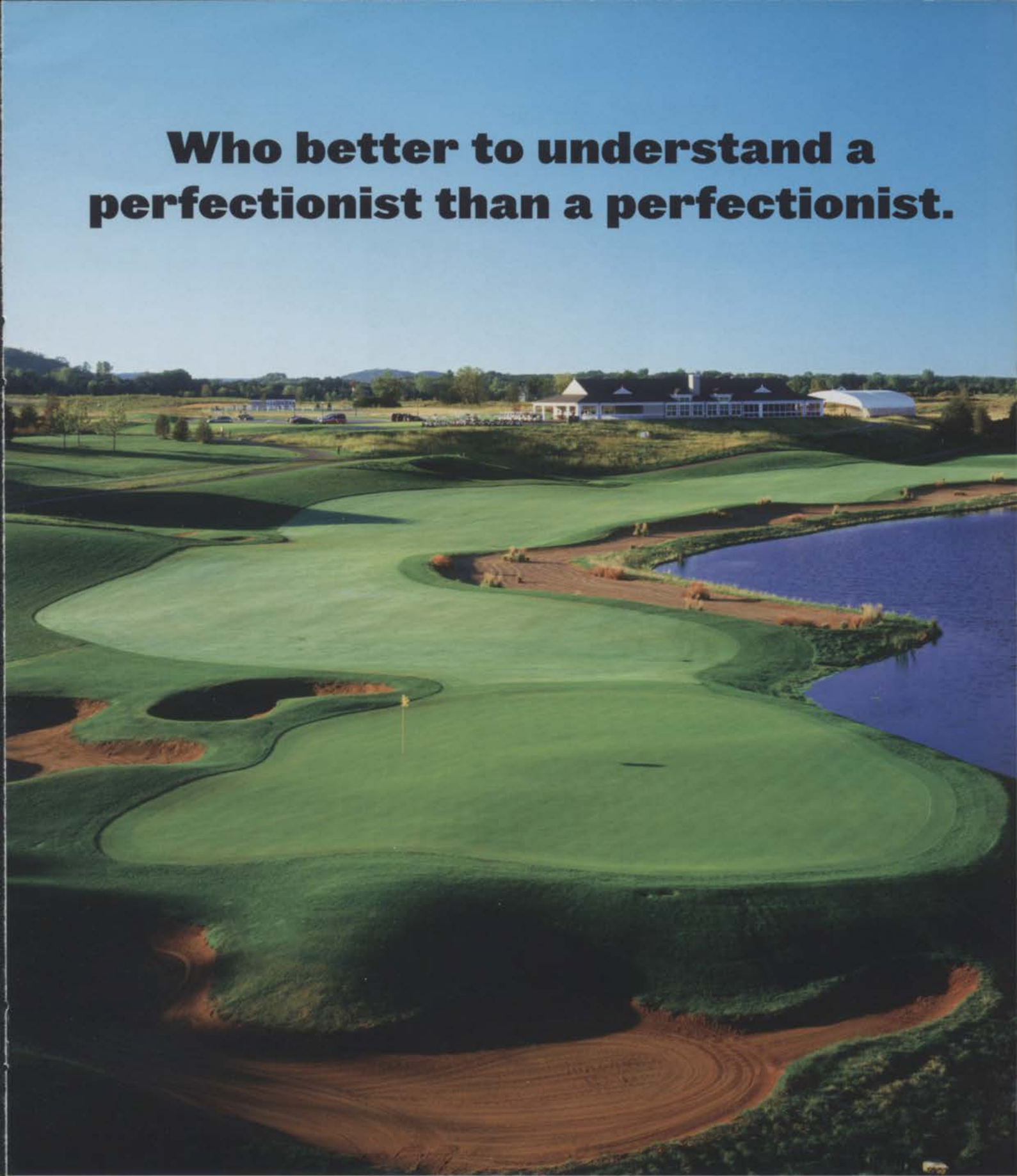
And what shopping list wouldn't be complete without another triplex tees mower, a rough mower and two more of Toro's legendary Greensmaster 1000 21' walk-behind mowers.

Aside from keeping the course up to exacting standards, Hayward and his team are currently embarking on a bunker upgrade program, reshaping many of the course's well-known pits at a cost of around $70,000, while there is also an ongoing native revegetation program.

Also in the pipeline is a new $120,000 superintendent's shed in which to house Cypress Lakes' ever expanding fleet of Toro machinery.

Toro machinery working in perfect harmony

Who better to understand a perfectionist than a perfectionist.



At Toro we know when it comes to your course, no detail is too small.

That's why pros like you are the best source for new ideas on ways to make it look great. And keep it looking great year after year. To us, it's the perfect relationship.

For further information contact your Toro Area Manager or visit us at www.toro.com.au.

TORO Count on it.

HGMbody TC1910

AGCSATech : Update

By John Neylan

In this AGCSATech Update, John Neylan debunks a few myths about soils, reviews the recent AGCSA water management workshop series held around the country and examines sportsfield safety.

UNDERSTANDING SOILS

There continues to be a misunderstanding about the characteristics of soils and in particular sands used for greens construction.

In part it is due to a lack of knowledge of soil physics and also due to personal opinions expressed by experts in the industry. As one notary expressed at a seminar some years ago, an opinion is worth very little unless it is based on fact.

One of the recent misconceptions being discussed about sands is the relationship of water holding capacity (i.e. volumetric water content) with hydraulic conductivity (drainage rate) and a general paranoia about high drainage rates.

There still seems to exist a belief that if a sand has a high hydraulic conductivity it will have a low volumetric water content. Volumetric water content and hydraulic conductivity are determined by the porosity characteristics of the sand and not necessarily related. That is, the macropores (pores greater than 0.5-0.05mm) affect water movement and the micropores (pores between 0.05-0.0002mm) affect moisture storage.

With many of the sands that we test it is often possible to have a relatively high drainage rate as well as a moderate to high volumetric water content. There are several possible reasons for this, with particle shape (in particular rounded particles) having a significant influence.

To explore this relationship we analysed the results for 230 soil samples that have been tested by State Chemistry Labs for hydraulic conductivity (compacted) and volumetric water content (at 30cm tension). A regression analysis was undertaken and a chart of the results is shown in Figure 1.

The linear regression analysis is a statistical method to fit a line through a set of observations. Using this method it is possible to analyse how a single dependent variable is affected by the values of one or more independent variables.

In this example it provides a means of determining how strong the relationship is between hydraulic conductivity and volumetric water content. The results of the analysis on this data set demonstrate a very poor relationship, as indicated by the low R-square value (an R-square of 1 is a perfect relationship). The predicted values are also plotted and are based on an equation derived from the relationship of the real data.

By examining the data points it is obvious why there is a poor relationship (i.e. a low R-square). The data points are well scattered around the predicted relationship which therefore increases the variability and weakens the relationship between the data sets.

For example, the point that represents a hydraulic conductivity of 1560mm/hr and volumetric water content of 21.9 per cent (on chart marked with an arrow) is well outside the predicted relationship.

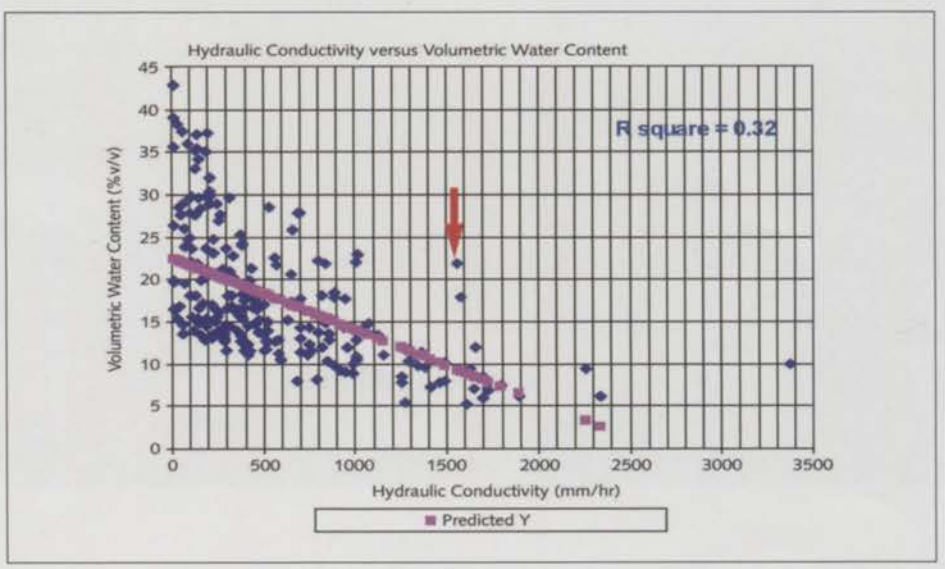
There are well established testing protocols for determining the characteristics of soils and in particular sands for greens construction. There is no reason or place for generalisations based on "feel" or part results.

If you are selecting a soil for a particular purpose it is important that you test for the key characteristics of particle size distribution, water retention, aeration porosity, compaction and hydraulic conductivity. **Test for all the parameters.**

WATER MANAGEMENT PLAN WORKSHOPS

The AGCSA workshop series on water management plans (WMP) has been completed and the most

Figure 1: Relationship between hydraulic conductivity and volumetric water content (Regression analysis)



interesting aspect was that not only does each State have its own particular water issues, but also each golf course has site-specific issues that need to be addressed.

The workshops highlight the need for every golf course to undertake a site analysis in terms of soils, water, turf and vegetation and to have a WMP. A WMP and, more broadly, an environmental management plan (EMP), details how we manage our resources in a sustainable manner and meets the increasing demands of environmental and water authorities to demonstrate industry best practice.

There are many issues affecting turf irrigators and the following are some of the key factors identified;

- Lack of a constant water supply;
- Potable water no longer available for irrigating turf;
- Water quality (salinity, bicarbonates and sodium);
- Use of treated effluent as an alternative supply;
- Securing alternative water supplies;
- Improving control systems;
- Upgrading irrigation systems;

With the increasing pressure on our water supplies, those outside of the turf industry consider the use of water on turf to be wasteful. Even some landscaping and gardening 'gurus' are discouraging the use of grass by replacing it with hard materials and drought-tolerant plants.

Turf in the urban environment still has an important place by moderating the temperatures generated by concrete, bitumen and rocks, however, species selection is a most important consideration.

Recreational turf areas such as sportsfields are of considerable community benefit and there are increasing concerns about the quality of these surfaces with water as a key input that affects surface quality.

With the current water restrictions in some States banning the irrigation of sportsfields, at what point will they be considered unsafe due to surface hardness, inconsistent turf cover and soil cracks?

In the long term, for all turf areas to be ecologically and economically sustainable they will have to;

- Demonstrate industry best practice;
- Make do with lower quality water sources;
- Alter management practices;
- Treat the water and soils to offset the detrimental affects of salts, bicarbonates and nutrients;
- Introduce more water efficient and salt-tolerant turfgrass species;
- Require a greater knowledge of water quality and its impact on soils and plants with increased soil, water and plant monitoring;
- Require improved irrigation practices.

As the pressures on water supplies increase, turf managers are increasingly being required to demonstrate industry best practice, increased water use efficiency and improved environmental management.

In relation to water this can only be achieved by having a good working knowledge of all aspects of where the water comes from, how it is applied and how much and what are the off-site effects.

The process of forming a WMP will provide the necessary information for demonstrating best practice and identifying where improvements can be made.

A WMP identifies the works and practices that will improve irrigation and drainage management and water use efficiency for the golf course. The development of a WMP has several important objectives;

- Secure future water availability through sustainable practices;
- Environmental responsibility;
- Assess current water management practices;
- Comply with regulations;
- Integral part of business strategy;
- Communicate to members and community.

A key component of the WMP is the issue of communication, not just with other turf managers but also with golfers, neighbours, regulatory authorities and environmental groups.

SPORTSFIELD SAFETY

Sportsfield safety is becoming an increasing issue, whether it is a major venue such as the Telstra Dome or a small municipal ground.

In my experience there has been an increase in litigation related to the condition of playing surfaces where a player has been injured. The recent drought conditions have added another dimension in terms of increased surface hardness due to a lack or insufficient water.

What makes an unsafe surface? This is undoubtedly the million dollar question. In my experience the main factor that has resulted in player injury is inconsistency in the surface. This can be due to many factors including;

- Poor construction;
- Inconsistent surface levels (in particular holes);
- Cricket pitches in the middle of football grounds;
- Variable turf cover;
- Inconsistent surface stability;
- Inconsistent surface firmness;
- Inconsistent drainage;
- Poor irrigation uniformity;
- Sprinklers that are not flush with the surface;
- Foreign objects (e.g. glass, metal etc.).

Some councils have developed risk management programs as a means of minimising risk and ensuring safer surfaces. The problem that I have seen is that many risk management protocols are too complicated to be practically useful and are therefore not implemented. Even where problems have been identified they are not rectified quickly enough or they are only partially repaired.

In simplest terms, fields would be safer if good construction and adequate maintenance techniques were employed, and on a day-to-day basis, surfaces would be much safer if they were level (i.e. free of localised depressions) and had a complete grass cover.

Geoff Connellan (left) with Richard Kirkby and John Neylan at the NSW water management plan workshop held at the Pennant Hills Golf Club

The Evolution of Turfgrass Management

The first manually pushed Budding reel mower invented in 1830

In today's modern world, turfgrass managers have a plethora of products and technology at their disposal. But how did these come about? Here ATM looks back at the early evolution of turf management and pinpoints some of the major innovations which have revolutionised the art of the turfgrass practitioner.

The evolution of turfs as we know them today occurred in association with animal agriculture in climates favourable for grass growth, especially rainfall and temperature.

The earliest significant uses of turfs for lawns was in the United Kingdom where the rainfall distribution throughout the year is reasonably good and where the moderate temperatures favour the growth of cool-season turfgrasses, such as Agrostis, Festuca, Lolium and Poa.

In addition, the grazing of sheep was a significant agricultural activity throughout the countryside even from 1800 to 1950.

The key advances that furthered the use of turfgrasses involved inventions and developments achieved through trial-and-error activities.

Twelve developments that highlighted the turfgrass discovery and invention era are discussed in the following sections.

DEVELOPMENT 1 – REEL MOWER

Then

For years, turfed areas were cut to a relatively uniform height either by the hand scythe or by a hand cycle in the case of closely maintained turf areas that were cut more frequently.

The leaves of grasses were best cut by the scythe or cycle when the grass was wet, such as during early morning dews or after rains. This was a very laborious, time-consuming activity meaning lawns of even a reasonable quality were limited primarily to wealthy estate owners.

This started to change in 1830 with the invention of the reel mower by Edward Beard Budding in Gloucester, England.

This first manually pushed reel mower was more cost effective, which allowed the opportunity for middle-class residents to maintain residential and village green turfs which enhanced their quality of life.

The original 1830 leaf cutting design of the Budding reel mowers continues to be used to this day, more than 170 years later.

Now

In recent times major advancements in mower technology, and in particular triplex mowers, have been based around both operator ease and safety. Machines are better designed for ease of use and comfort as well as safety features to minimise accidents.

They have become more lightweight to reduce impact on surface compaction and reels are hydraulically driven to provide a more consistent high quality cut.

Walk-behind mowers offer a higher standard of cut without the chance of hydraulic leaks. They also do not create the same level of compaction as a triplex mower but require a greater number of staff to be able to cut all greens with walk-behinds.

Floating heads are the newest technology in walk-behinds to give an even more superior cut by following all surface contours.

Electric mowers are now on the market and provide a very good alternative if greens have to be cut early during the day adjacent to neighbours. Battery life is the most limiting factor with electric technology but as this is refined their popularity is likely to increase.

These days a top quality walk-behind mower will set the turf manager back somewhere near $10,000, a triplex greens mower costs upwards of $40,000 while a five-gang fairway mower tips the scales at anywhere from $70,000.

DEVELOPMENT 2 – CLAY DRAIN TILE

Then

Cylindrical clay tile sub-surface drains were developed in the United Kingdom during the 1840s.

This was the standard worldwide technique for sub-surface drainage of soils for over 100 years. During most of that period the clay tiles were installed by manual digging of the trenches.

Therefore these sub-surface drains did not come into widespread use until the development of the powered mechanical trenching machine in the early 1900s.

Now

Drainage principles have remained similar over time, however, manual trench digging has almost been entirely replaced with mechanised systems.

Clay pipes have been replaced with perforated PVC and corrugated plastic pipes.

The corrugated plastic pipes are easy to install but their flow rate can be restricted to 75 per cent of that of smooth sided PVC pipes.

The use of flat pipes is becoming more wide spread in golf greens construction due to the greater surface area exposed and the need not to dig trenches, therefore providing both labour and cost saving benefits.

DEVELOPMENT 3 – WEED-FREE GRASS SEED

Then

The next major advance occurred in the 1880s involving the marketing of weed-free grass seed based on proper seed cleaning, processing and testing techniques as pioneered by Orlando M. Scott of Ohio, USA.

Initially he used a manually-cranked, wooden seed cleaning machine that he had modified. Prior to that time grass seed was harvested from pastures that were typically contaminated with weeds and the resultant seed sold directly to turf users.

There were no effective selective controls for the weeds in seed harvest fields or in the home lawns and turf areas planted with the weed seed contaminated grass seed.

The solution was the development of procedures to clean the weed seeds out of the grass seed. In addition, O.M Scott pioneered seed testing procedures long before governmental agencies enacted laws requiring seed testing and labelling.

Now

In the last couple of years there has been independent research conducted of bentgrass, ryegrass, tall fescue and couchgrass varities in Australian conditions.

This gives Australian superintendents an objective understanding of their performance in Australian conditions and not just from research conducted in other countries, primarily the United States.

Seed in recent years has been sold as certified seed that requires per cent purity and germination to be clearly marked on each bag being sold.

This provides superintendents with the assurance that the seed they are buying is of the highest quality and is not contaminated with weeds or other unwanted grass species and has an acceptable germination rate.

Seed coatings have been around for sometime which may enhance germination, minimise establishment diseases such as damping off or simply provide the germinating cotyledon with a more favourable growing environment.

Endophyte has become common particularly in ryegrasses to protect the plant from chewing insects.

Cultivars are continually being bred to adapt to ever-changing environmental conditions, with major focus on providing superior playing surface with less inputs. These inputs are often irrigation, nutrition and pesticide applications.

New species are being introduced that have greater tolerances to adverse environmental growing conditions such as salinity. Warm-season grasses are also being adapted to colder winter climates to reduce their dormancy periods to provide a better year round performance.

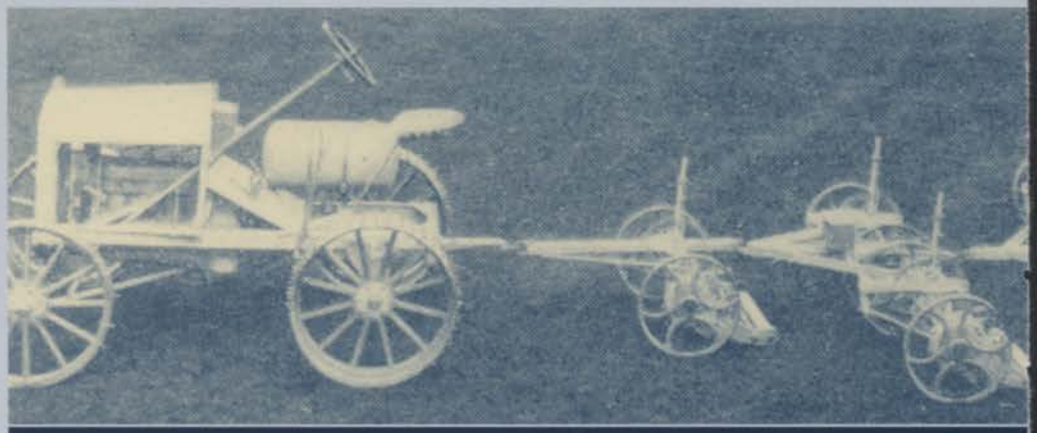
DEVELOPMENT 4 – EARTHWORM MANAGEMENT

Then

The next major advance in the 1890s was the development of an earthworm management control by Peter W. Lees of England.

The Evolution of Turfgrass Management

Watering in the earthworm irritant



The Worthington side-wheel drive mower on a multiple gang frame developed in 1914

Prior to this event the two main practices discussed in gardening books were rolling and mowing of the turf, with rolling listed first. This can be attributed to the disruption of the surface by extensive earthworm populations, particularly in England where early turf culture evolved.

Thus, with the development of earthworm management, rolling became substantially less important as a cultural practice. In fact, rolling was eventually recognised in the 1920s as having negative effects in terms of soil compaction, especially on clay soils.

The procedure involved applying the irritant to the soil surface and watering it in with excess quantities of water. As a result the earthworms came to the surface, were raked into piles, shovelled onto wheelbarrows, and physically hauled off the turf area.

It also should be noted that prior to this event the game of golf and golf courses had been limited principally to the coastal areas of Scotland and northern England, called links land or seaside courses.

Attempts to develop upland golf courses were relatively unsuccessful, principally because of the unplayable putting green surfaces caused by earthworms.

The emergence and major expansion of golf courses on upland soils occurred at the same time, and could be attributed to the earthworm management procedure developed by Peter Lees.

Now

With the advent of sand-based opposed to native soil-based greens the need for earthworm management has become somewhat obsolete.

DEVELOPMENT 5 – SIDE-WHEEL DRIVE, MULTIPLE GANG MOWER

Then

The side-wheel drive mower on a multiple gang frame was developed in 1914 by the Worthington Company in Pennsylvania, USA.

It was a major advancement and opened the way to economical mowing of extensive turf areas in parks, golf course fairways, sports fields, recreational areas, and other large turfed areas.

Now

See Development 1.

DEVELOPMENT 6 – SLOW-RELEASE TURF FERTILISER

Then

The first commercially produced slow-release turf fertiliser was marketed in 1928 by the O.M. Scott and Sons Co. in Ohio, USA.

It was a natural organic product developed at Ohio State University through research funded by the O.M. Scott and Son Co. of nearby Marysville, Ohio.

It was marketed in a large cloth bag under the name of Scott's Turf Builder. This branded slow-release fertiliser continues to be sold today 74 years later.

Now

Fertiliser technology has been based around the development of controlled release fertilisers.

Controlled release fertilisers are coated with a membrane of resin, plastic or wax. The method of release is usually dictated by water, temperature, microbial activity or a combination of all three.

Controlled release fertilisers have the ability to release nutrition at a rate equivalent to the plant's needs and therefore have a longer period of activity, which means less application requirements and reduced loss in leaching and volatilization.

Prills are generally manufactured now that are homogenous meaning each prill or granule contains each element that eliminates blotchiness that can occur with prills containing different elements. Micro prills are manufactured so fine turf areas can be fertilised and the fertiliser is simply not then picked up by mower catchers.

Liquid and soluble fertilisers are becoming commonplace for fertilising areas of fine turf. The advantage is that they do not require to be watered in especially if rainfall is unpredictable or irrigation supply is limited. Many of these types of fertilisers are compatible with other products and therefore can be applied with one application.

DEVELOPMENT 7 – TURFGRASS FUNGICIDE

Then

During the late 1920s and early 1930s two fungicides for the control of a number of turfgrass diseases were developed by Drs John L. Montieth and Arnold S. Dahl of the USDA-USGA Arlington Turf Research Centre in Washington, DC.

The first truly effective fungicide controls for the control of Microdochium patch, Rhizoctonia brown patch, Sclerotinia dollar spot, and Typhula blights involved the use of inorganic mercury and cadmium compounds, which continued in use for 40 years.

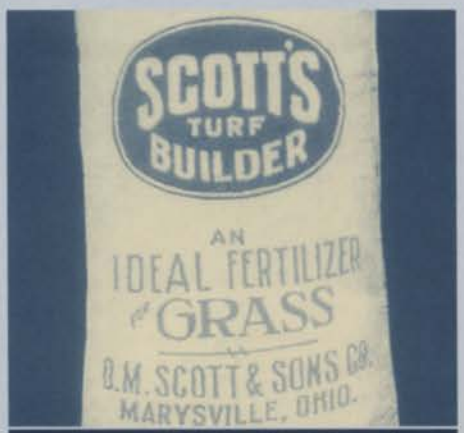
Now

In recent years many pesticides have been withdrawn from the market due to safety issues related to users. These have included both mercury and cadmium based products such as PMA and Thimer.

Many herbicide products now are manufactured with more than one active ingredient. This can increase the broad spectrum activity of the product but also reduce the likelihood of resistance which can render a particular product worthless.

The big advancement is the use of pesticides that are less hazardous to users but also use less active ingredient per hectare making them far more environmentally friendly.

Making pesticides less hazardous for the users has also seen advancements in application technology. Powders are now available in water soluble bags that can simply be placed into a spray tank without breaking the seal, granules have replaced some powders to eliminate dust, while containers are being manufactured that are easier to pour from.



The first commercially produced slow-release turf fertiliser

Application equipment have included hooded booms to reduce drift, control droplet applicators to reduce the amount of active ingredient required and multiple nozzle holders to reduce the contact with changing nozzles for different spraying requirements.

Formulations have changed to water-based formulations to reduce the affects of volatilization from ester-based formulations.

Even with these advancements it is likely in the future that more pesticides will be withdrawn from the market.

DEVELOPMENT 8 – ROTARY MOWER

Then

In the 1930s the first powered rotary mower was developed by W. Waters in the United States.

This resulted in the capability to mow minimal maintenance turfs at a higher height and at less frequent intervals, which are conditions in which reel-type mowers are not effective.

Now

See Development 1.

DEVELOPMENT 9 – POP-UP SPRINKLER HEAD

Then

In the early 1930s the first underground pop-up sprinkler head was developed by the Thompson Company in California, USA.

This was a major advance compared to the numerous types of individual, fixed, hose-end sprinklers of the oscillating or rotating type previously available, as they had to be manually moved frequently for effective irrigation.

Now

Automatic irrigation systems have been the saviour of many golf superintendents and golfers. They have permitted the watering of courses at night and cause no disruption to play due to hoses on fairways during summer months.

The advancements in irrigation controllers mean complete courses can be watered either by the touch of a button or even a phone call. Sprinklers are now designed to throw more evenly in windy conditions and are gear driven rather than impact driven.

In the future it is likely that moisture sensors will play a far bigger part in irrigation cycling and water conservation.

DEVELOPMENT 10 – 2,4-D: SELECTIVE BROAD-LEAVED WEED CONTROL

Then

In the mid-1940s the first truly effective herbicide for the selective removal of broad-leaved weeds from perennial grasses was developed by Gretchen Fannie-Fern Davis in Washington, DC.

Some of the earliest turfgrass tests were conducted on the turfed mall area between the U.S. Capital and Washington Monument.

The Evolution of Turfgrass Management

The development-use strategy for 2,4-D on turfgrasses was a major event. It remains a key herbicide in the management of quality turfgrass areas more than 50 years later.

Now
See Development 7.

DEVELOPMENTS 11 & 12 – POWERED CORING MACHINE AND VERTICAL CUTTING MACHINE

Then
In 1946 the first powered coring machine was invented by Thomas C. Mascaro in Pennsylvania, USA.

A manual three to four-tined coring unit was developed in England in the 1920s. However, it was not a widely used practice because of the very intense manual labour involved.

It was not until the development of the mechanically-powered, hollow-tined coring unit by Mascaro that extensive coring of intensively trafficked turf areas came into widespread usage, and continues to be used.

In 1952 Mascaro also developed the first powered vertical cutting machine, the basic design of which continues to be the standard in use to this day.

Thatch had been a continuing problem on turf areas for a long time, and there was no truly effective way of selectively removing an excessive accumulation of thatch other than the total physical removal of the turf-thatch profile with a sod cutter and re-establishment.

For the first time in 1952 there was an efficient, effective method for vertical cutting into the turf canopy and removing the excess, dead organic material without totally destroying the living turf canopy.

Now
Advancements in cultivation equipment have made the renovation tasks far more mechanical. Mechanical core harvesters have replaced shovels and precision machines have replaced hand forks.

Aeration equipment such as the HydroJect and Vertidrain have become commonplace in machinery sheds to relieve compaction and increase aeration.

Aeration equipment has been designed to create the maximum compact relief while causing as little disruption as possible to the playing surface so as not to inconvenience golfers.

Dusting and topdressing machines have been developed to deliver precise amounts of sand onto putting surfaces to replace the art of hand spreading with shovels.

Summary
In our modern times some of these developments seem of minimal significance. However, at the time they were developed or invented, these contributions were major advances in improving the quality and lowering the cost of turfgrass maintenance.

Modern turfgrass science evolved gradually based on these early inventions and trial-and-error developments between 1800 and 1952. These pioneering individuals and companies need our utmost respect for their very important contributions.

Acknowledgements
This article has been adapted, with permission, from a paper by eminent turfgrass agronomist James Beard that was first formally presented as a keynote address at the 9th International Turfgrass Research Conference in Toronto, Canada, in July 2001. It is derived from a draft of a book on the history of turf being prepared by Dr Beard who is the president and chief scientist of the International Sports Turf Institute Inc in College Station, Texas, USA.

Table 1. Twelve key events in the turfgrass discovery and invention era

Year (circa)	Contribution/Invention	Contributor
1830	Reel mower, mechanical hand pushed	Edwin Beard Bussing, England
1843	Cylindrical clay tile drains	England
1880	Weed-free grass seed processing, testing and marketing	OM Scott, Ohio, USA
1890	Irritant for earthworm management and control	PW Leeds, England
1914	Side-wheel driven mowers on multiple-gang frame	Worthington Co., Pennsylvania, USA
1928	Slow-release organic turf fertiliser	OM Scott and Sons Company, Ohio, USA
1930-1932	Turfgrass fungicide development	JL Monteith and AS Dahl, Washington DC
1930	Powered rotary mower	W Waters, USA
1930-1935	Pop-up sprinkler heads	Thompson Co., California
1945	2.4.D selective broadleaf weed control	GFF Davis, Washington DC, USA
1946	Powered coring machine	TC Mascaro, Pennsylvania
1952	Powered vertical cutting machine	TC Mascaro, Pennsylvania

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8.6% Nitrogen (N) as Aminoureaformaldehyde	
5.4% Nitrogen (N) as Methylenediurea and Dimethylenetriurea	
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BEYOND THE GUARDED GATES
The Pine Valley Experience

Adam Mortimer and fellow Pine Valley staff hand broom one of the greens following topdressing

In Vol 5.5 of Australian Turfgrass Management we reported on the range of internship programs open to up and coming turf managers to further their careers. In this edition, Adam Mortimer from the Brisbane Golf Club recounts his time spent on internship at the prestigious Pine Valley course in New Jersey, USA, perennially rated as the best in the world by many of golf's leading publications.

After spending two full days travelling from Brisbane to Columbus and a further three days at Ohio State University, I got a chance to meet the people behind the Ohio State University International Agricultural and Horticulture Intern Program.

I went on a tour of the university - the second biggest in the country - and saw the incredible football stadium which seats an amazing 105,000.

With around 110 international interns currently studying through the Ohio program, Michael O'Keeffe and his staff had every last detail organised for my arrival and gave me a warm welcome the American way.

Upon entering through the carefully guarded entrance gates at Pine Valley Golf Club, I certainly had high expectations of the course. However, anything that I had imagined previously would not even come close to the reality of this amazing golf facility.

After a two-hour tour around the course and surrounding property, I quickly came to realise why Pine Valley is ranked the No.1 golf course in America and the world by the likes of Golf Digest and Golf Magazine.

Pine Valley is situated just south of Philadelphia in a town called Clementon and sits upon 180 acres of slightly hilly, pine tree covered land that boasts predominantly sandy soils.

George Crump designed the course with construction starting in 1913. Unfortunately he died in 1918 with four holes still in construction and so was unable to witness the completion of the masterpiece he had designed. H.S Colt took over the project that was finally completed in 1919.

Pine Valley is a very private men-only club. Not many people know it exists and because the course does not host a major PGA tournament it receives very little media attention, just the way the members like it.

The club is steeped in history and follows very ancient club policies and traditions. Every hole is unique with the golfer being put to the ultimate test on every hole.

Although not on the PGA tournament calendar, course preparation is no different with members and the very select few guests lucky enough to pass through the gates expecting tournament conditions every time they head on to the course. This is the way the members want it and as a result Pine Valley remains a mystery to the general golfing public.

At Pine Valley, staffing levels fluctuate depending on the season. When I first started we had 51, which was obviously a big surprise, and as the season progressed we reached as high as 65 at one stage.

This included five assistants, two assistants in training, and between five and 10 interns who all came from various backgrounds across the US.

Adam Mortimer hydrojects one of the practice greens at the Pine Valley Golf Club

There was a mix of full-time workers who had been there for over 20 years through to local high school kids who started at 12pm each day and worked through until their assigned tasks were completed.

The interns and assistants do all the specialised cultural practices and are expected to work long hours to keep Pine Valley in perfect condition.

During the peak summer periods total staff numbers increased to 65 with a separate crew of 10 Spanish-speaking Americans helping prepare the course for daily play.

The Pine Valley old course is maintained links-style, with fairways and greens kept hard and fast and not overly green through controlled watering and fertiliser programs.

The latest cultural practices are also used, keeping the design and playing conditions the same as Crump had originally intended.

The facility also boasts a 10-hole short course designed by Tom Fazio. It is a replica of the old course, but is par-three only and simulates the second shot of some of the course's famous holes. There is also a massive driving range and short game area.

Within the Pine Valley property there are also 25 residences, 11 of which have bentgrass putting greens in the back yards that are maintained by the staff at tournament speed.

The old course greens are all *Poa annua* and the short course and practice facilities are a bentgrass mix, with each assistant designated a specific area to oversee.

As an intern I worked closely with the assistants and was given a wide variety of projects to complete, with a very enthusiastic

superintendent always on hand to answer any questions or problems that cropped up.

Interns are relied upon to complete the majority of the specialised cultural practices and are under constant pressure to learn and adapt to the methods used and to put them into practice on all of the fine turf.

Weather conditions played a significant part in our daily routine and were constantly monitored by weather stations set in the irrigation computer and via the Internet with radars on display in the office.

During the summer, temperatures reached as high as 40 degrees Celsius and combined with high humidity the cool-season grasses became stressed within hours meaning constant hand watering was required to keep wilt and hot spots under control.

Pine Valley has a state-of-the-art Rainbird Cirrus central irrigation computer with six-inch main lines along each fairway and misting heads around all the green banks, and Rainbird heads covering all the greens, tees and fairways as well as the residential gardens.

Pine Valley has a total of five separate pump houses that feed the irrigation lines and one dedicated primarily to pump fresh water to the drinking fountains and residences.

They only use this in extreme conditions and the superintendent prefers to hand water greens and fairways to keep the course playing hard and fast.

With so much stress on the cool-season grasses during the summer months, disease prevention is the highest of priorities with pythium and anthracnose constantly monitored through soil and tissue tests.

Assistants and interns are constantly on the lookout while mowing and walking the greens daily for irregular dew patterns or any weak plants in high-traffic areas.

Pine Valley also has several leading USGA agronomists and consultants on hand to inspect and inform on any problem areas.

All interns are trained in chemical applications, which was one of our main duties along with disease identification and record keeping. It was vital an application wasn't missed because the consequences could have been devastating.

Needless to say, a lot of responsibility rides on the assistants training the interns and handing off some of the pressure that comes along with such a famous course where any minor imperfection is noticed and nothing but perfection is required.

Interns are the first to arrive each day to set the mowers up and the last to leave, making sure all equipment used during the day is back where it belongs and the workshop is secured.

The workload is huge and the staff average 75 hours each week and are expected to be there every day during the summer to keep the course in pristine condition.

Interns also help with hand mowing the green and tee banks along with bunker preparation when the weather conditions are favourable.

The bunkers at Pine Valley are more like waste areas with no rakes in them for the golfers to tidy up footmarks and we only raked them twice a week, except during tournaments when they were raked daily.

Bunkers were also kept firm to minimise footmarks but fluffy enough for the golfer to execute a bunker shot. Bunker preparation at Pine Valley is very unique and is another challenge staff members have to deal with.

BEYOND THE GUARDED GATES
The Pine Valley Experience

Towards the end of my stay, staff numbers fell dramatically to 15 regulars, and with two major tournaments hosted in early October it was a madhouse.

Pine Valley superintendent Richard Christian has been at the helm for the past 16 years and secured the job when he was just 22-year-old.

He expects nothing short of the best from his staff and has a wealth of knowledge on managing cool-season grasses in extreme conditions – hot and humid in the summer to three feet of snow covering the whole course during the winter.

I enjoyed working under him immensely and gleaned as much knowledge from him as I could.

While at Pine Valley I interned with guys from Muirfield Village, Oakland Hills, Castle Pines and Merion who all had experience and ideas to impart from the big tournament courses and colleges across America.

Richard expects all interns to gain a memorable yet educational experience while at Pine Valley and to proudly carry the prestigious name with them wherever they go.

I would encourage anybody in Australia to make the big step and take up an overseas internship, whether it is through the Ohio program or another scheme. It certainly opened up my eyes to the world of turf management and the experience I gained was priceless.

There are many people I have to thank for encouraging me to take this opportunity and for organising my placement. They include Michael O'Keeffe (program coordinator), David Goldie (the Australian advisor for the program) and Brett Morris of the Brisbane Golf Club.

Editors Note

Since writing this article, Adam has migrated south for the winter and together with fellow Brisbane Golf Club intern Angus Mahoney, will be based in Key Largo at the private members course Cardsound. After his time there, Adam plans to return to Pine Valley for a further five months before returning to Australia.

For further details on the Ohio State University intern program, contact David Goldie (Thirteenth Beach Golf Club dngoldie@hotmail.com or Michael O'Keeffe at okeeffe.1@osu.edu).

AMERICA'S TOP-15 GOLF COURSES, 2003
As Ranked by Golf Magazine

1. Pine Valley, New Jersey *(1)*
2. Cypress Point, California *(2)*
3. Shinnecock Hills, New York *(4)*
4. Augusta National, Georgia *(5)*
5. Pebble Beach, California *(7)*
6. Pinehurst No.2, North Carolina *(9)*
7. Sand Hills, New England *(11)*
8. Merion (East), Pennsylvania *(14)*
9. Oakmont, Pennsylvania *(15)*
10. Winged Foot (West), New York *(18)*
11. Pacific Dunes, Oregon *(19)*
12. National Golf Links of America, New York *(20)*
13. Seminole, Florida *(22)*
14. Prairie Dunes, Kansas *(23)*
15. Crystal Downs, Michigan *(24)*

(#) Figure in brackets represents world ranking

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research

Ball Marks on Bentgrass

Blame the Golfer, Not the Cultivar

Ball marks were simulated by pneumatically ejecting golf balls from a PVC cylinder at a static pressure of 6, 8 and 10psi. Two to three marks were made in each plot

Dr Jim Murphy demonstrates the ball mark simulator during the Rutgers University trial

Researchers at Rutgers University in New Jersey used a pneumatic device to fire golf balls on putting greens-height plots of creeping bentgrass. Data collected included initial ball mark injury and recuperative ability of 15 cultivars. In general, less damage and more rapid recovery occurred on the newer bentgrass cultivars.

Growth of the game of golf and advancements in turfgrass breeding have led to the construction of new putting greens or resurfacing of existing greens with new and improved bentgrass cultivars.

In general, the newer bentgrass cultivars possess finer leaf texture, greater shoot and root density, and improved tolerance to pests and environmental stress relative to earlier-released cultivars, many of which are still commercially available.

Nonetheless, it is common to hear superintendents who now manage the newer cultivars say that they would prefer growing older, longstanding cultivars like Penncross. Why is this so?

One of the most common reasons given is that the newer cultivars are perceived to be less aggressive with regard to growth habit and recovery from divots or ball marks. Poorly repaired or not repaired at all, ball marks are a major factor that limits turf quality and playing conditions on putting greens.

Field experience and research are scarce when it comes to the durability and recuperative ability among the newer cultivars of bentgrass, especially as it relates to ball marks. Although observations about growth rate and recuperative ability on the golf course may be accurate, interpretations and conclusions based upon these observations can be confounded by a number of other factors beyond the scope of the cultivar itself.

Important factors that can contribute to the severity of ball mark damage and rate of recovery include the age of the turf (maturity of the thatch and mat layers), rootzone mix and its physical properties, topdressing material, cultural management, growing environment, and turfgrass cultivar.

A sound assessment of each factor, independent of the other factors, is needed to properly conclude which contributes to damage and recuperation from ball marks on putting greens.

The objective of this project was to evaluate the rate of ball mark recovery among 13 creeping bentgrass and two velvet bentgrass cultivars without the confounding effects of age, construction, topdressing medium, cultural management, and growing environment.

Study conditions

This study was conducted during 2001 and 2002 on a sand-based putting green located at the Rutgers Horticultural Research Farm II in North Brunswick, New Jersey.

The putting green was constructed in 1998 according to USGA recommendations using a mix consisting of 85 per cent sand and 15 per cent peat (by volume). Creeping bentgrass cultivars were seeded in May 1999 at a rate of 340 grams per 93 square metres. The velvet bentgrass entries, SR 7200 and MVB, were seeded at 200g and 400g per 93m^2, respectively.

During the study, turf was mowed six to nine times per week at 2.9 millimetres and fertilised with 1.8 kilograms, 1.29kg and 1.31kg of N, P_2O_5, and K_2O per 93m^2, respectively, in 2001 and 0.8kg, 0.27kg, and 0.27kg of N, P_2O_5, and K2O per 93 m^2 in 2002.

The plots were cultivated with solid tines once or twice and topdressed three to five times per season with a medium sand. Some layering of topdressing and thatch was evident but this did not produce management or performance problems related to excessive puffiness, scalping of the turf, poor water infiltration, or rooting of the green.

The combined thickness of the thatch and mat layers was less than 2.54 centimetres during the evaluations reported here. Irrigation and fungicides were applied as needed to avoid drought and disease stresses.

Traffic treatments were initiated in October 1999. Wear and compaction treatments were applied four times a week using a modified

walk-behind Sweepster and a Brouwer water-filled turf roller, respectively, from May through to September.

Compaction treatments also were applied using a one ton pavement roller that occasionally was operated with vibration applied to the rollers.

The experimental design consisted of a split-plot factorial arrangement of treatment combinations; four levels of traffic (no traffic, wear, compaction, and wear plus compaction) represented the main plots and 15 bentgrass cultivars represented the sub-plots, with three replications of each combination.

Ball marks were simulated by pneumatically ejecting golf balls from a PVC cylinder at a static pressure of 6, 8, or 10psi. Two or three marks were made in each plot. Visual assessments were made for initial severity as well as recovery of ball marks.

Results

Significant differences in ball mark damage and recovery were found among the bentgrass cultivars grown on sand on most rating dates in 2001 (Table 1).

In general, less damage and more rapid turf recovery occurred on the newer bentgrass cultivars, notably A-4 and G-2, which are being increasingly used on golf courses throughout North America.

Contrary to common perceptions, the velvet bentgrass cultivars SR 7200 and MVB also ranked among the best in regard to injury and recovery. On the other hand, older cultivars like Penncross incurred the most damage from ball marks and also took the longest time to heal.

Not surprisingly, ball mark injury was more severe and recovery time was slower on turf that received a combination of wear and compaction.

Table 1. Ball mark damage ratings on a sand putting green marked on August 14 and October 20, 2001. Entries are ranked according to recovery rating 74 days after initial marking.

Cultivar	Initial Damage 14/8/2001	Damage Rating (Days After Marking)			Initial Damage 20/10/2001	Damage Rating (Days After Marking)
		7	32	74		7
		Rating (9 = least, 1 = greatest)				
G-2	6.4	4.2	6.6	8.1	5.1	3.1
A-4	5.9	3.7	6.9	8.1	4.2	2.2
Century	5.6	3.7	6.8	7.9	4.7	2.9
SR 7200	6.1	4.8	6.8	7.8	5.3	2.5
L-93	4.7	3.5	5.8	7.7	5	2.5
Cato	5.5	3.7	6.6	7.7	5.3	2.8
Southshore	5.6	4.0	6.6	7.7	5.4	2.5
MVB	6.2	4.0	6.2	7.4	4.7	2.8
SR 1020	4.6	3.6	6.0	7.4	5.9	2.6
Putter	4.5	3.6	6.1	7.3	4.6	1.8
SR 1119	5.1	3.7	5.8	7.2	6.1	2.7
Pennlinks	5.1	3.8	5.9	7.1	6.4	2.3
Penneagle	4.7	4.0	5.9	6.8	6.3	2.8
Providence	4.6	3.4	6.0	6.7	5.5	2.3
Penncross	3.9	3.4	5.6	6.4	6.3	2.3
LSD $_{0.05}$	0.9	0.8	0.8	0.9	1.3	NS
TRAFFIC						
None	5.9	3.8	6.4	7.7	--	--
Compaction	6.0	4.1	6.8	7.9	5.5	2.6
Wear & Compaction	3.8	3.4	5.6	6.7	5.3	2.5
LSD $_{0.05}$	1.3	NS	NS	0.7	NS	NS
CV%	18.4	21.0	13.4	13	20.3	34.8

Cultivars in **boldface** print are velvet bentgrass species. All other cultivars are creeping bentgrass species.
$LSD_{0.05}$ = Least Significant Difference. There is a ‡95% probability that the difference between two means is due to cultivar effects if it is ‡ the LSD value.
NS = Not Significant. There is a †5% probability that the difference between two means is due to cultivar effects.
CV% = Coefficient of Variation (expressed as a percentage). Provides an indication of the degree of variability in measurements among cultivars at each rating date.

Ball Marks on Bentgrass

Blame the Golfer, Not the Cultivar

Table 2. Ball mark damage ratings on a sand putting green marked on July 13 and 26, 2002. Entries are ranked according to recovery rating 27 days after final marking.

Cultivar	Initial Damage 13/7/20012	Damage Rating (Days After Marking)			Initial Damage 26/7/2002	Damage Rating (Days After Marking)		
		7	25	41		7	19	27
		Rating (9 = least, 1 = greatest)						
Century	3.9	5.8	8.3	8.7	4.7	6.1	6.8	7.5
MVB	5.6	6.4	8.2	8.1	5.8	6.8	7.1	7.3
A-4	5.0	6.1	8.3	8.3	4.7	5.9	6.5	7.0
SR 7200	5.2	6.7	8.0	8.2	5.0	5.7	6.3	6.8
L-93	3.9	5.0	8.5	7.8	4.6	5.4	5.9	6.8
Cato	2.7	3.8	7.9	7.3	4.7	5.3	5.3	6.3
G-2	4.9	6.1	8.7	8.6	5.0	5.3	5.5	6.1
Penncross	3.2	5.0	7.6	7.3	3.8	4.5	4.9	5.9
SR 1119	3.5	4.8	8.1	8.3	4.6	5.3	5.7	5.8
Putter	2.9	4.6	8.0	7.9	3.4	4.8	5.0	5.8
SR 1020	3.8	5.5	8.5	7.8	3.6	4.8	4.9	5.7
Southshore	4.8	5.6	8.2	7.8	4.3	4.6	4.9	5.7
Pennlinks	3.0	3.8	7.5	7.3	4.0	4.1	5.2	5.5
Penneagle	3.8	4.7	7.6	6.3	4.0	4.7	4.6	5.5
Providence	3.3	4.7	8.1	7.4	4.3	4.9	5.1	5.4
$LSD_{0.05}$	1.6	1.5	NS	NS	0.7	0.8	0.7	0.7
TRAFFIC								
None	--	--	--	--	4.5	6.5	7.1	7.7
Wear	--	--	--	--	4.8	5.4	5.6	6.4
Compaction	--	--	--	--	3.7	5.2	5.8	6.8
Wear & Compaction	--	--	--	--	4.7	3.9	3.9	4.1
$LSD_{0.05}$	--	--	--	--	NS	NS	NS	NS
CV%	28.1	19.1	7.1	12.9	15.2	15.0	11.4	11.2

Cultivars in **boldface** print are velvet bentgrass species. All other cultivars are creeping bentgrass species.
$LSD_{0.05}$ = Least Significant Difference. There is a ±95% probability that the difference between two means is due to cultivar effects if it is ± the LSD value.
NS = Not Significant. There is a ±5% probability that the difference between two means is due to cultivar effects.
CV% = Coefficient of Variation (expressed as a percentage). Provides an indication of the degree of variability in measurements among cultivars at each rating date.

Injury and recovery ratings were taken in time following ball marking

Ball mark injury and recovery were exacerbated by simulated wear using a Sweepster

Interestingly, cultivars that received only compaction treatment did not respond differently to ball marking compared to non-trafficked cultivars, indicating that wear damage, more than compaction, exacerbates the problem of ball mark damage.

This suggests that the management practice of rolling for increased ball roll would only exacerbate ball mark damage when the turf was experiencing aggressive damage from wear. Cultivars receiving wear treatment only were not assessed in 2001.

The ball mark experiment on sand was repeated two additional times in 2002 (Table 2). Relative injury and recovery among cultivars was similar to 2001, however, results from 2002 suggest that an additional year of turf maturation narrowed differences among cultivars and helped to expedite recovery from ball marks.

Although fewer significant differences were found with respect to the effects of traffic on ball mark injury and recovery, general trends once again indicated that ball injury and recovery time are exacerbated by the presence of both wear and compaction stress.

Thus, management efforts to substantially reduce either wear or compaction should improve turf tolerance to ball marking as well as recuperation.

Conclusions

Currently, some golf course superintendents and architects are reluctant to use improved and better adapted cultivars of bentgrass because of unsubstantiated field observations and conclusions that these newer cultivars are less aggressive and slower to recuperate when compared to earlier released cultivars like Penncross.

Thus, they continue to choose older cultivars largely because of the comfort with knowing their growth habit and performance characteristics. While turf vigour and recuperative ability are no doubt related to the cultivar genetics, it appears that other factors including turf maturity are more responsible for field observations of severe ball marking problems.

Today, newer cultivars are established on rooting media that contain a high percentage of sand. In most cases, these greens have not had time to mature (develop a mat layer) to the point where performance and play are similar to older sand or soil based greens that superintendents are accustomed to managing.

Furthermore, superintendents should consider the possible role that annual bluegrass plays in their perception that older cultivars (e.g., Penncross) were more aggressive than the newer monostands of cultivars they now manage, especially during the spring when annual bluegrass growth is considerably more aggressive than bentgrass.

Furthermore, observations of rapid healing of ball marks on older Penncross putting greens may be due to the rapid invasion of annual bluegrass seedlings into the damaged ball marks rather than healing from the bentgrass cultivar itself.

Age of a putting green turf is probably the most important confounding factor affecting people's perception of newer bentgrass cultivars.

The highly attractive cover of a newer bentgrass cultivar on a recently established green may provide a false sense of maturity

occurring under that turf cover. In reality, it likely will require two or more complete growing seasons before the subsurface mat layer and rootzone stabilize and become resistant to the forceful impact and spin of a golf ball.

This stability and impact resistance is largely a function of the soil structure that develops from the growth of crowns, stolons, and roots in the upper surface layers of the putting green. Over time, these parts of the grass plants become integrated with the rootzone and topdressing material applied to the surface.

Subsequently, as this interwoven mixture of grass and soil develops, a structure analogous to a fibre mat is formed, adding strength and stability to the putting surface.

Much lecturing and discussion is focused on how to manage excessive layering of this mat relative to the health of the turf, when in fact the contribution of the mat layer to the durability of a putting green is often overlooked.

In summary, whether you're contemplating or currently managing newer bentgrass cultivars, recognise that time and patience are needed for maturation of new putting greens, and realise the cultural management that worked for older cultivars like Penncross may not be what's best for cultivars that are finer-textured and considerably more dense.

One only has to look at the National Turfgrass Evaluation Program on-site putting green trials (http://ntep.org/onsite/ost.htm) to see how advancements in breeding have produced bentgrass cultivars with improved turf quality characteristics and tolerance to stress.

Last, but certainly not least, did we fail to mention that it would be extremely helpful if golfers repaired their own ball marks?

Acknowledgements

Dr. Jim Murphy is associate professor and extension turfgrass specialist at Rutgers University, New Jersey; T.J. Lawson (research technician) and Joe Clark (assistant farm manager) also hail from Rutgers.

The AGCSA is grateful to the authors and USGA Turfgrass and Environmental Research Online for allowing publication of this research in Australian Turfgrass Management magazine. USGATERO 2(12): 1-6.

The Innovative Way

The Lobz Machine pitch mark repairer

LOBZ MACHINE PITCH MARK REPAIRER

All superintendents know the feeling. It's a lot like smashing your head against a brick wall and then sticking your hand in a fairway mower just for good measure.

We're talking repairing pitch marks. It seems no matter how many times golfers are told to repair them they either don't or do it in such a way that they leave a bigger mark than what already existed. It's a never-ending battle.

Now, however, a group of NSW boffins have devised a rather crafty device called the Lobz Machine that will no doubt find gainful employment at a number of golf courses.

Over the past six years the syndicate, headed by NSW superintendent Robert Ashes, has designed and constructed the device.

"We wanted to look for better ways to repair pitch marks and create a device that was the turf manager's preferred method of repairing them," says Ashes.

"Existing repairers lift the turf and provide a good level putting surface, but they don't do much for actual turf repair."

The Lobz Machine works by aerating a neglected or fresh pitch mark in one swift downward thrust. The resulting core is closed by blades slicing the surrounding turf while filling the void with living grass and viable root material. The action is completed in seconds.

"It took a bit of money and we had a few prototypes, but now it is ready to hit the market," says Ashes.

"It's not the cheapest gadget in town but it's cost effective, quick and easy to use and helps keeps greens in pristine condition."

The Lobz Machine, patented in Australia, has been extensively trailed in a controlled test lasting 28 days on a putting surface of Penncross bentgrass contaminated with 30 per cent *Poa annua*.

After 28 days, 97 per cent of the original pitch marks repaired by the Lobz Machine were no longer visible, compared with 90 per cent of those repaired by course staff, a 42 per cent recovery rate for the untouched control sections and a 31 per cent recovery rate for repairs made with the Greenskeeper tool.

Syngenta recognises our innovative superintendents and is proud to present Robert Ashes with a $150 AGCSA book voucher.

If you have through necessity, devised/created /built a tool/piece of machinery/gadget or made additions/alterations to an existing piece of workplace machinery/tool to make the job easier, then we want to know about it!

Send you stories and pictures through to: Brett at the AGCSA, Suite 1, Monash Corporate Centre, 752 Blackburn Rd, Clayton North, VIC 3168 or email brett@agcsa.com.au Ph: (03) 9548 8600

Wynnum superintendent Jason Adams

JASON ADAMS
(Wynnum Golf Club, Brisbane, QLD)

Full Name: Jason Adams
Age: 33
Family: Married, two boxer dogs.
Years as a superintendent: 5
Years as an AGCSA member: 10
Number of staff: 7
Course Specs: Greens 328; Fairways predominantly Blue couch, Tees Green-Lees park.
Most embarrassing moment as a superintendent?
Having to tell my mechanic he was right.
Funniest moment you have seen as a superintendent?
A 35-year-old churchgoer decided to strip and cleanse his body in our creek and then walk through the course naked on Associates Day. The ladies loved it!
Plans for the course over the next year?
An upgrade of our irrigation system, bunker re-design and tee reconstruction.
Best advice ever received about the job?
To concentrate on the things that I control and worry only about them.
If you could change one thing about your job, what would it be and why?
Being able to educate committees what is involved in the job when they are newly elected to the board. It's not like looking after your home lawn.
Best part about being a golf course superintendent?
Seeing the rewards of your work first hand and golfers enjoying their round.
Worst excuse you have ever heard from one of your staff?
1. It wasn't me. 2. It was working when I put it back.
Career highlight?
Representing Wynnum Golf Club and Australia in the final of the John Deere World Teams Championship held in Scottsdale, Arizona last year. It was a real eye-opener.
The overseas course you'd most like to visit?
Any in America. They are awesome.
Favourite movie?
Shawshank Redemption.
Name 3 CDs you could not live without.
Ministry of Sound, Best of INXS, Nick Skitz.
If you could be any musician, who would you be?
Ricky Martin. The chicks love him.
Food you could not live without?
Steak and chicken.
Favourite sporting team?
Any team that goes in as underdogs and ends up coming out on top eg: the Penrith Panthers.
Dream car?
SS Commodore ute.
Ford or Holden?
Holden.
Beer or Bundy?
Beer, then a Bundy.

Growforce Australia recognises the job our superintendents do and is proud to present Jason Adams with a 20 litre container of NUTRI-GRO Plus.

MOONAH ON COURSE FOR OPEN DEBUT

In the last edition of ATM we profiled superintendent Leigh Yanner and the Moonah Links Open course which was due to host the Australian Open at the end of November.

Rather conveniently, right as the edition was going to press, the Australian Golf Union made the call to switch the tournament date to 18-21 December because of a clash with the Davis Cup final and the Seven Network's preference to provide coverage of the tennis over the golf.

The decision raised a few eyebrows around the golfing fraternity, none more so than Yanner himself.

"I was very surprised, but I guess it made sense because of the clash with media coverage," says Yanner.

"It will be better for us down here. The population will be starting to grow on the peninsula with the summer approaching. All we need now is a couple of days between 28-30 degrees, a light northerly breeze and conditions will be perfect to play and watch golf."

After a difficult spring the extra three weeks grace to prepare the course for its first Australian Open couldn't have been timed better according to Yanner.

It has also meant the glut of peripheral work on the new clubhouse, hotel complex and Legends course has been completed, leaving Yanner and his crew ample time to concentrate on tournament preparations.

"I'm glad to get that out of the way," says Yanner. "All the clubhouse and hotel areas have been turfed and now we can get on with tournament preparations.

"The Legends course is open but only for limited play as the harsh spring weather has affected the course.

"Spring was quite harsh down here. We didn't have any frosts but it was overcast, wet and extremely windy. I think during September and October we only had one day over 20 degrees.

"The wind and the cold haven't allowed the couchgrass to jump out of its dormancy, but now with the extra three weeks up our sleeves and the start of the warmer weather, the couch has responded well and will grow more aggressively.

"We'll also be able to get that contrast between the rough and the fairways. With the rainfall we've had over spring the roughs are green and lush but they will brown off by the time the tournament comes.

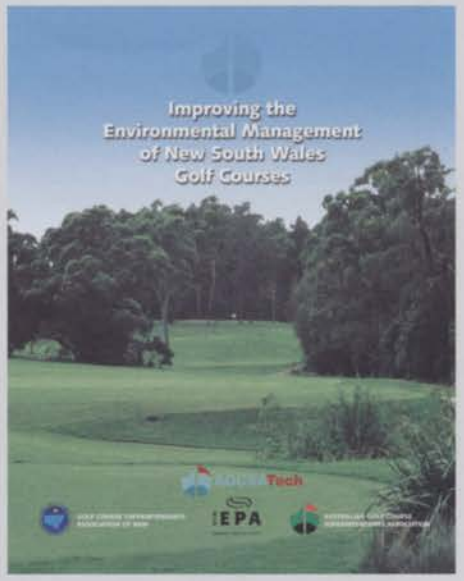
"The real positive, however, has been the good average rainfall over spring. Our only concern now is the warmer weather and keeping an eye on watering because this course drains like a sieve."

Problems Yanner was experiencing with Spring Dead Spot have abated, while winter applications of iron and magnesium have proved beneficial, as has a preventive fungicide program instituted in February.

As this edition goes to print, Yanner and his crew were beginning tournament preparations, stepping up around the clock hand-watering of greens, as well as fertiliser and fungicide applications and general grooming.

Yanner is also building up his complement of staff and recently had AGCSA Graduate of the Year award winner James Dalton move across from Thirteenth Beach to help out during the tournament. A second mechanic has also been brought on board for the Open.

On top of that, construction has started on a brand new maintenance compound and is due for completion around March.



AGSCA, NSW DEC LAUNCH GOLF COURSE ENVIRONMENT MANUAL

The handing down of the Warringah Golf Club verdict in the NSW Land and Environment Court coincided with the recent launch of the *Improving the Environmental Management of NSW Golf Courses* manual.

Unveiled at the AGCSA's water management workshop held at the Pennant Hills Golf Club in October, the education reference manual has been produced by the AGCSA in conjunction with the newly formed NSW Department of Environment and Conservation (DEC) – formerly the Environment Protection Authority (EPA).

The manual has been partly funded by the NSW Urban Stormwater Education Program (USEP) that aims to educate the community, industry, local councils and other stakeholders about ways to reduce urban stormwater pollution.

It is a key component of the Urban Stormwater Program and the NSW Government's Waterways Package, which address the issues of water quality management and water pollution.

The turf industry was identified by the USEP as one with the potential to impact negatively on urban stormwater. Golf courses are a key sector of the turf industry with approximately 450 golf courses in NSW.

If managed well, golf courses can provide many environmental benefits such as stripping urban stormwater of contaminants and nutrients, and providing native wildlife corridors in congested urban environments.

If managed badly, however, golf courses can be sources of nutrient and chemical run-off causing pollution of waterways and can lead to the degradation of indigenous flora and fauna habitats.

It is hoped the manual will facilitate better environmental management practices on golf courses and comes at a time when industry awareness of environmental issues has been heightened following the huge fine imposed against the Warringah Golf Club for a pesticide spill in 2001 which resulted in a major environmental disaster in Manly Lagoon.

John Dengate, environmental protection officer with the newly formed DEC, says the manual is an ideal reference tool for superintendents and golf clubs looking at raising their level of environmental awareness and implementing an environmental management strategy.

"We've been working with golf courses in a parallel process and we would certainly recommend the manual to anyone who is wondering whether their environmental controls are up to speed," says Dengate.

"We're very pleased to be working with the industry and our approach is that you are far better off, as is the environment, to prevent any environmental mishaps before they happen, rather than the DEC coming in afterwards and prosecuting people and imposing huge fines.

"That may send a strong message, but we would think it a much better result if prosecution was not needed in the first place.

"The Warringah Golf Club case shows very simply that you have to have environmental controls in place.

"It's important to talk to the DEC or the local council. Get hold of the manual. The DEC's contact details are in there – 131 555. That's a good start. We're happy to have superintendents ring us and we can help them with any issues they have and put them in touch with experts if need be."

The manual covers chapters on establishing environmental principles for golf courses; water management; integrated pest management; pesticide storage, handling and application; fertiliser practices; grass selection; soil management; native vegetation and wetlands; clubhouse and facility management; machinery operations; and education and training.

The *Improving the Environmental Management of NSW Golf Courses* manual can be ordered from the AGCSA for $119.90 (includes GST and postage). **Call (03) 9548 8600 or email info@agcsa.com.au**

APPOINTMENTS

With GCSAQ president Jon Penberthy now ensconced at Tewantin Noosa, his former assistant Justin Kelly has been promoted to superintendent at Gainsborough Greens.

Brad Butler, formerly 3IC has been made assistant superintendent.

***

Stuart Pollock, one time former assistant at the Mt Martha public golf course is now superintendent at the Altone Park Golf Club in Beechborough, WA.

Know of any new appointments? Contact Brett at the AGCSA on (03) 9548 8600 or brett@agcsa.com.au

The VC60 broad acre scarifier

VC60 SCARIFIER BENDS THE RULES

The new VC60 broad acre scarifier runs rings around any other scarifier on the market - quite literally!

Featuring the patented swivel hitch, the VC60 will turn with the tractor while fully operational, without damaging either the machine or the turf.

According to ASPAC Golf and Turf's Steve Lewis this feature enables turf managers to scarify to the contours of fairways or ovals, and significantly increases productivity as the machine rarely has to be turned off or raised during a job.

"A great deal of time is wasted during large scarifying jobs as you are forced to cut in straight lines" says Lewis.

"But with the VC60 you can continue verticutting, even with the tractor on full lock, without damaging the turf or the machine.

"This enables you to scarify to the contours of fairways or sportsgrounds, significantly increasing productivity and eliminating equipment failure due to the constant raising and lowering of the unit."

No rollers on the VC60 is a real positive, eliminating traditional blockage points and untrue scarifying depths through build up of material on the rollers.

The VC60 features a patented swivel hitch

The self-adjusting nylon skids combine with a very simple height adjustment system, giving the unit accurate depth control and an effective anti-scalping system.

If you are considering the purchase of a broad acre scarifier you really need to try the VC60 on your turf.

To give it a test run, contact ASPAC Golf and Turf on 03 9796 4254, fax 03 9708 6702 or via email at info@aspacgolfandturf.com.au

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Turfgrass Maintenance Reduction Handbook - Sports, Lawns & Golf

By Doug Brede *(Ann Arbor Press)*

$132.00

Turf managers are forever looking at ways of maximising resources and minimising time, labour and costs.

Reduction of turf maintenance translates directly into money savings, not to mention less reliance on valuable natural resources.

This book, by US turf researcher Doug Brede, claims to provide "encyclopaedic coverage of sure-fire strategies for maintaining turf in perfect condition while using less water, fertiliser, mowing, pesticides and labour".

The book contains a vast amount of information on management strategies, complete with instructions on soil preparation, seed rates and planting, turf establishment and renovation.

Brede presents labour-saving and cost-saving techniques for effective mowing, thatch control, pest management, water conservation, water management, fertiliser use, and stress management that is presented in an easy-reading manner complete with checklists.

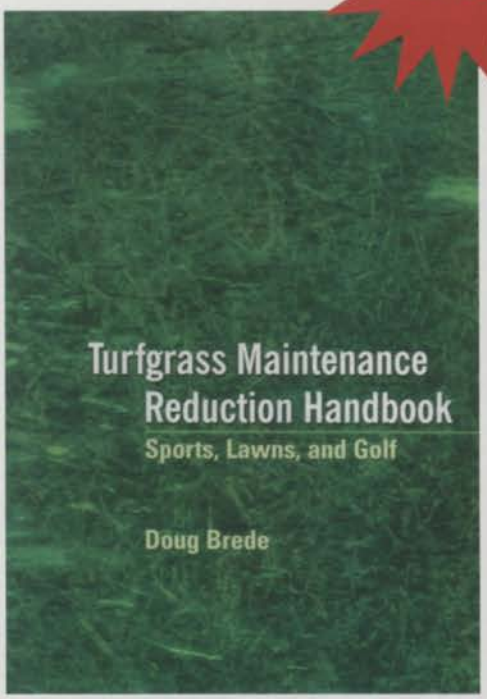
According to Brede, maintenance reduction involves an amalgamation of tools and practices. It may require changes in grass species or variety, soil, fertiliser, mowing, or pest control practices.

It involves preparation and design. It takes a concerted effort with all of the changes working together to produce a tough, healthy turf capable of withstanding less care.

Brede professes that the single biggest ingredient in cutting maintenance is not bioinsecticides, natural fertilisers or high-tech irrigation systems.

The most important ingredient is the turf manager. Lower maintenance calls for a new way of thinking. It involves questioning present practices and developing new ones.

Brede's rather laid back yet informative approach will win over a lot of readers and although it is from an American perspective and is also aimed for a general audience, is a useful reference tool for the turf manager looking to trim maintenance costs.



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state REPORTS

GCSAQ

Once again the weather is just beautiful in Queensland at the moment. We have been having clear days with some overnight rain and at the time of writing no extreme weather yet.

Our November turf research fundraiser was held at Brookwater Golf Club, the newest Greg Norman-designed course to open in Brisbane. Fortunately the format for the day was Ambrose otherwise some of us would still be out there as it is a punishing golf course if you stray.

The aim of the day was to generate funds to investigate the potential of some of the newer greens grade turf varieties available and to determine their suitability in different climatic regions in northern NSW and Queensland.

Dr. Don Loch is working with AGCSATech's John Neylan and hopefully some valuable information on how the varieties perform under different conditions and maintenance practices will be forthcoming to give superintendents a better idea of their options in the future.

Thirty-three teams lined up for the day with the team from Tewantin-Noosa narrow winners over a fresh-looking Gainsborough Greens club with a net score of 52. **(Smacks of match-fixing – Ed)**

Planning for a 'Future of Queensland Golf' conference is continuing, the concept being for each different sector of the golf industry to provide input into identifying where the future lies for golf in this State and what roles the different bodies will play.

Some of the issues to come from the preliminary meetings include the impact of future legislation on golf courses, noise, insurance, viability of clubs, the environment and junior golf.

Queensland's golf industry awards night was held recently at the Hilton Hotel in Brisbane. Steven Kelly from Pacific Golf Club was named Golf Turf Apprentice of the Year, while the Tewantin-Noosa Golf Club collected the Environmental Award.

The Industry Recognition Award was presented to David Burrup for his many years as head of Grovely TAFE and his role as a turf consultant. Long-time Oxley Golf Club superintendent Ian Earp won the Superintendents Achievement Award, while brother Charlie Earp and Paul King both received the Services to Golf Award.

The upcoming blue ribbon event is the Wet and Wild Christmas party sponsored by Scotts Australia, where the hotly contested speed slide challenge will again see tactics rule the day. Is it better to eat that extra barbequed steak sandwich to provide greater downhill mass, or will John Nelson's "less is faster" theory win on the day?

Jon Penberthy
President, GCSAQ

GCSAWA

Greetings to all our state members and sponsors, as well as to everyone around the country. Thank you to those who have forwarded some information to me. I have been receiving it but unfortunately, or possibly fortunately, not a lot has been happening in Western Australia that I could send in reply.

To start with, congratulations to the AGCSA, John Neylan and Geoff Connellan for the water management roving seminar held in early October.

Unfortunately I had to make the hard choice between a honeymoon or the seminar, so I couldn't attend. All reports back, however, suggest that it was an extremely interesting and professionally run event. Thank you to Mt.Lawley Golf Club for hosting the event.

Again this year WA has been subject to water restrictions but fortunately not to the same extent as some other states. It is important, however, that while our neighbours can only water on set days, all turf managers should be managing their asset as professionally as possible to minimise any animosity felt by those around us looking ever so critically in.

As we are into our busier period, GCSAWA events have been scaled down somewhat. In November we had our annual Melbourne Cup Golf and Luncheon at Joondalup Country Club which was a great success. Thank you to Rob Macdonald and his hardworking team for the magnificent presentation of the course and to the resort staff for their excellent hospitality.

The last remaining event for this year is the GCSAWA annual family tenpin bowling night held at the Rosemount Bowl on 12 December, so register straight away. Lanes are limited so get in quick.

Before signing off, I would like to thank people for their help and support throughout what has been a very busy year for me personally.

To my wife for her endless support and understanding when the pressures of golf maintenance, members and life in general get up your nose and make you a little grumpy. Those who know me well would be surprised that, I too, get grumpy! No way.

Additionally, a big thank you must go to the WA executive committee – Glenn, Jeff, Craig, Darren and Kirky – for taking a huge chunk of responsibility off my shoulders and contributing to another fun successful year.

A special thank you must go to John and my course staff at Melville for their support over the last year while I have been fulfilling my commitments as State President.

To all those I have visited or called chasing information, thank you also for your support. I hope one day I can return all the favours.

On behalf of the GCSAWA I would like to wish everyone a very Merry Christmas and a happy New Year.

Brad Sofield
President, GCSAWA

NSWGCSA

Enforcement of Category 1 water restrictions by Sydney Water is a matter of grave concern for superintendents in the Sydney Basin that rely solely or partially on potable water to maintain their golf courses.

Most of these affected golf clubs have applied for exemptions with the realisation that their entire golf club operation and financial future rest with this single, but extremely important decision to be handed down from Goulburn Street.

The feedback I have received from these clubs to date, has all been grim, with Sydney Water informing these clubs that their application for exemption does not meet the minimum requirements outlined by Sydney Water guidelines.

Since then, the New South Wales Golf Association in partnership with the NSWGCSA and the secretary manager from Pennant Hills Golf Club, Robert Boyd, have lodged an application for an across-the-board exemption based on water efficiency and financial hardship to allow potable water dependant golf clubs to utilise their automatic irrigation systems at night to maintain crucial areas such as greens and tees.

We await the outcome.

On a brighter note, the weather was much kinder in the month of October, with temperatures down considerably and rainfall being abundant across the State.

Most golf course superintendents that are fortunate to have dams, are near full, which all looks positive for the immediate future.

We can only hope that some of this moisture finds its way to the Warragamba Dam catchments to relieve the heartache being experienced by not only our peers, but also all industries as a whole.

The launching of the AGCSA/EPA Improving the Environmental Management of New South Wales Golf Courses manual and water management workshop at Pennant Hills Golf Club was an extremely fruitful seminar with over 60 delegates attending the day.

The manual is an absolute must to have and I implore all superintendents to purchase a copy of the manual through the AGCSA to utilise as reference material and as a building block to form part of your club's own environmental management plan.

The new NSWGCSA Board will be busy over the next 18 months. Richard Kirkby has been assigned the onerous task to engender a new range of NSWGCSA apparel to streamline the currently outdated clothing range available. Most would agree that Richard is the industry's debonair fashion trendsetter and the right man for the job.

Darren Jones is currently devising a long-term and sustainable membership package for the Board to work with over the next three years. Darren has a big job ahead of him and will require all the assistance necessary to

complete this task.

In light of the judgment handed down by the Land and Environment Court in relation to the Warringah Golf Club pesticide spill, superintendents should use this unfortunate situation to educate their committees in regards to the real dangers and ramifications of failing to conform to environmental legislation.

This landmark decision portrayed and exposed the vulnerability not only to management and staff but to the board of directors elected to administer and operate these facilities.

Seize the opportunity! For those clubs that can't afford consultancy, take the time out to self-audit your workplace, prioritise, document and submit your findings to the board as soon as possible.

Craig Easton
President, NSWGCSA

VGCSA

Thankfully Victoria experienced above average rainfall for October, but unfortunately it came too late for any chance of irrigation restrictions being lifted for the summer.

On a positive note, the formulation of a peak body group encompassing golf, bowls, sporting ovals and turf providers has been formed.

The aim of this group, under the banner of VicSWU, is to appeal to the State Government as a united front on how future water restrictions should be implemented for the turf industry.

Some concessions have already been achieved but the real advantages will be gained with this body now having an opportunity to participate in the formulation of government policy.

The State Government is currently creating permanent guidelines that will place Victoria under some form of water restriction for some time to come. With this in mind the turf industry may now finally have a climate and a vehicle that will open previously closed doors.

The VGCSA October meeting, hosted by Eastern Golf Club and Clayton Howell, provided a perfect venue for the morning field trails conducted by Bill Stephens and the Textron team, followed by an afternoon workshop run by the AGCSA.

This format added to the education element of the day with John Neylan and Geoff Connellan doing a terrific job covering the hot issue of water management plans.

I believe joint participation in field days for the State associations with the AGCSA is the way forward for us all. This was the second joint venture day Victoria has held and going by the feedback it won't be the last.

It was also nice to see superintendents and trade members turn out in numbers considering the busy time of year.

The next VGCSA meeting is the twilight event at Kew Golf Club on 15 December. The aim of this function is to end the year on a lighthearted note with afternoon golf followed by dinner and an entertaining guest speaker to conclude proceedings. It is always a fun evening so to all our locals try and get along.

Finally, as this will be my last report for the year I would like to thank our hard working committee - Michael Riordan, Brett Balloch, Chris Grumelart, Glen Davie, Mark Prosser, Adam Robinson and, last but not least, our tireless administrator Lesley Mitchell - for their much appreciated support.

Michael Picken,
President, VGCSA

SAGCSA

Despite an uninspiring spring weather-wise, the below-average temperatures and welcome spring rainfall have set up turf managers for the best start to summer for many years in South Australia.

These conditions will help offset the impacts that current water restrictions are having. Restrictions are still in place but were recently dropped from to category one.

On 28 October the SAGCSA held its country trip, stopping for morning smoko at the Balaklava Golf Club (host superintendent Steve Guy) before moving onto the renowned wine growing region Clare Valley for a fantastic lunch at the Clare Golf Club (host superintendent Kevin Clarke). The country clubs certainly know how to put on a spread.

The day was a great success for all involved, with both Steve and Kevin deserving congratulations on presenting their respective courses in terrific condition.

As with most country clubs in South Australia, budgets are seemingly getting tighter and tighter every year, and this only highlights the efforts of these superintendents who are producing quality courses on limited budgets.

Our most recent meeting was a twilight affair with the Turfgrass Association of South

Australia at the Royal Adelaide Golf Club on 25 November. The twilight format is a new concept and proved very popular.

Our Christmas show this year will be a little bit different from previous years, with a joint SAGCSA and Turfgrass Association Christmas picnic being held at the Adelaide Oval on Sunday, 7 December.

This will be the weekend preceding the Australia vs India Test at the Oval, so I am sure Les Burdett will have the grounds in an impressive condition as usual. This will be a fun family day with the added bonus of getting a glimpse of a top class Test venue just before a major international.

In closing, as 2003 nears an end we look back at the issues which have affected our industry this year. Water, water and water tops the list as do OHS and industry education standards. I believe that these issues have or are being addressed with positive outcomes firmly in sight.

2003 will go down as a year of immense challenges for our industry but because of them we have come out well placed to move forward during 2004.

I would like to wish everyone a safe and merry Christmas and a prosperous 2004.

Peter Harfield,
President, SAGCSA

VGA

The new VGA committee has been elected with Doug Agnew continuing his term as president. The remainder of the committee is made up of

Vice Presidents:
Andrew Kent *(Traralgon Bowling Club)*
Shane Harling *(Kangaroo Flat Bowling Club)*
Secretary:
Duncan Knox *(Maribyrnong Bowling Club)*
Treasurer:
David Sharp *(Oasis Turf)*
Committee:
Warren Braybon *(Sunbury Bowling Club)*
Darren Martin *(Yallourn Bowling Club)*
Matt Perkins *(Essendon Bowling Club)*
Garry Van Kessel *(Webconna Bowling Club)*
Greg West *(Greg West Greenkeeping)*
Gary Thurgood *(G.T Turf)*

Thanks to Bill Hamshere and Ian Latham for their involvement on the VGA committee in the past years.

Congratulations also go to Brendon Brown from the Bendigo Bowling Club who won the Greenkeeper of the Year award for 2003.

Ron McCartney from Sportsturf Consultants will have the results of the Rhizoctonia research in the near future.

Bendigo District will host the 2005 Australian Greenkeepers Federation Conference which will be held in May. This is the first time that the conference will be held outside of metropolitan Melbourne, when Victoria has hosted the event.

Matt Perkins,
Committee, VGA

TGAA (Vic)

What a pleasure it is to be in this spring season with good rainfall. No doubt the lack of heat coupled with excessive rainfall up to the end of October was a nuisance to some, but good spring rains have provided great relief to many.

As we prepare for another busy summer season of sport, from cricket to tennis and all sports in between, your industry body is continually busy with other issues.

On the issue of water restrictions, we hope that these inequitable stage two restrictions currently in place will be lifted in the immediate future. There is no valid reason why our sportsfield industry is the only one that is restricted in such a way.

Hopefully by the time this article goes to print, sanity will prevail and our industry will be given an equal access to water in the same way as the construction industry is, the mining industry is, the forestry industry is, and the manufacturing industry and food processing industries are. I think you get the picture.

At the end of the day, the issue of water use/restriction is a community issue, and water savings need to made by the whole community, not just our industry.

Discussions continue on a national level in relation to the development of a standardised education stream for turf management. What a great thing this will be. More news at this evolves.

I was fortunate to catch up with Adrian Black recently. As many of you will know, Adrian has taken on the challenging role of grounds manager at Melbourne and Olympic Park.

As well as the numerous fine turf lawns and landscape surrounding the environs of Melbourne Park, there is the Old Scotch Oval, Vodaphone Arena, lawns, landscape and playing field at Olympic Park, and the new AFL Collingwood training venue, which has just been established.

For those interested, the new Collingwood training field features a 300mm deep, naturally mined sand profile, irrigation system with independent head control, and a stolonised couch surface planted in autumn this year, which is starting to develop the intensity of cover required for a site such as this.

A tour of a site of this size and profile reinforces the complex nature of the role of today's turf professional. As well as everyday staff and site management issues, this site requires a keen understanding and commitment to a host of various sporting disciplines.

Many levels of our sporting community are represented at this site, from local through to international level. This means the work of Adrian and his team is given not only local, but also world exposure at times.

The work that Adrian and his staff complete is a credit to them all, and a guide to the rest of us as to of what can be achieved in our chosen field at a high profile site.

Jim Marchbank.
Vice-president TGAA (Vic)

TGAA (ACT & Surrounding Region)

A recently discussed issue at the ACT TGAA has been the possible merger of the Victorian TGAA and the ACT TGAA to form a national body, representative of the Australian turfgrass industry.

The ACT TGAA feels that a national body would benefit the industry as a whole, but must be approached with careful planning.

Advantages of a national body could include improved liaisons between State and Territory associations, increased power and support when lobbying government, and the possible establishment of delegates to represent the turf industry in larger bodies such as Horticulture Australia.

The possibilities are endless but much thought and deliberation will have to take place before any proposals are considered.

A meeting held in Melbourne in late November, comprising representatives from ACT and Victoria, highlighted many of the issues that need to be taken into consideration.

In local news, a recently held water forum attended by government representatives and a broad spectrum of groundsmen, superintendents, turfies, curators, and landscapers, proved to be an excellent opportunity to make the water authority aware of our water needs and requirements. This should also help improve the public perception and reinforce the fact that we are not water wasters.

The ACT TGAA is currently updating its somewhat neglected website and hopes that it will serve as a valuable tool to anyone who wishes to keep up to date with what's on, view the latest technologies, access relevant information and keep in touch with educational issues.

This is by no means a full list of services that will be provided on the website. Look in your December issue of the newsletter for the relevant web address.

Till next time, agrostologists, have a happy and safe Christmas and New Year and best wishes for 2004.

Justin A K Haslam
Committee, TGAA (ACT & Surrounding Regions)

AGCSA

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