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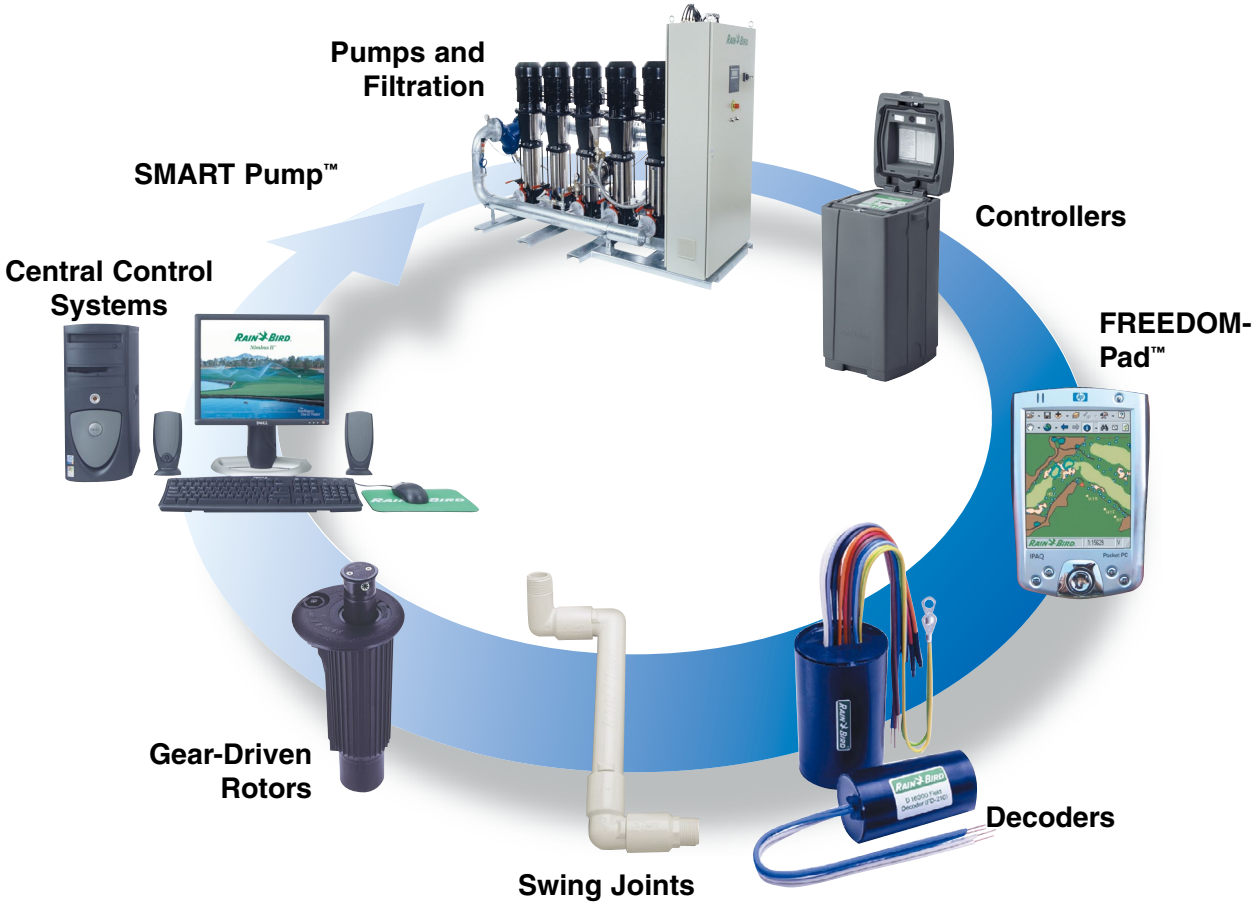

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contents

COVER: North Lakes Golf Club

The picturesque par five 11th at North Lakes Golf Club. North Lakes, home to superintendent Malcolm Ollard, will play host to the AGCSA Golf Championships which will be contested during the 22nd Australian Turfgrass Conference.

Photo: Brett Robinson

FEATURES

expectant times

Welcome to this conference edition of Australian Turfgrass Management magazine. No doubt the turf industry is eagerly awaiting the 22nd Australian Turfgrass Conference which this year returns to Brisbane. A great line-up of speakers has been brought together and combined with the legendary 'networking opportunities' such a week affords, it looks set to be another impressive gathering.

As in previous years, ATM will act as the official guide for the conference which will be held from 17-21 July at the Brisbane Convention Centre. The 24-page guide in the middle of this edition has everything you would ever want to know about the conference, so if you're a first-timer heading to the Sunshine State make sure you take some time to read what's in store.

On a personal note, I will unfortunately miss the Brisbane gathering on account of the small fact that my beautiful wife Katherine is about to give birth to our first child. So while you're all tucking into the canapés and downing a coldie at the welcoming cocktail reception, spare a thought for yours truly who will be up to his armpits in nappies!

To kick off this edition (which, incidentally, is our biggest offering since the Millennium Conference edition (Volume 2.3) of 2000) we continue our extensive look into the construction and upgrade of maintenance facilities. In Volume 8.2 we presented the first part which looked at some of the works being undertaken around the country, while Terry Muir also examined the integral components of any maintenance facility – the washdown bay and chemical mixing areas.

Since hitting the streets I have received plenty of feedback about the last edition, but none more satisfying than the phone call I took from Western Australian superintendent Norm Ashlin. The well-respected and long-serving superintendent is currently in the process or upgrading his maintenance facility at Collier Park and apparently slapped a copy of ATM Volume 8.2 on his general manager's desk and told him to have a read!

Norm might have cause to do the same as in this edition we take a further look at some of the facilities recently constructed, while on pages 16 and 17 superintendents impart some sagely advise on what to do and what not to do when it comes time to undertake such a project.

Elsewhere in Volume 8.3 we take a whistlestop tour around the recently completed Pacific Harbour Golf and Country Club with superintendent Marcus Hartup, while Drs Marcelle and Graham Stirling shed some light on the role ERI fungi can play in couch decline.

Finally, as some of you may be aware, ATM recently scored international honours at the Turf and Ornamental Communicators Association (TOCA) annual awards held in the US. ATM magazine collected four awards at the 1st Annual International Communicators Contest, picking up two merit awards and two first place awards each for editorial and design.

The awards are a huge fillip for us here at ATM and together with manager Scott Petersen and art director Jo Corne, I would like to thank all our readers and contributors who play a key role in making ATM what it is. Enjoy the magazine.

Brett Robinson
Editor

Contributors to Australian Turfgrass Management Volume 8.3

Gary Bass (Croydon GC)
Michael Bradbery (NSWGCSA)
Brett Burgess (Hutt GC)
Gary Dempsey (NSW GC)
Peter Donkers (Long Reef GC)
Doug Fox (VGA)
Peter Frewin (Barwon Heads GC)
Jeff Gambin (Gold Coast Burleigh)
Matt Hanrahan (Geelong Grammar)
Peter Harfield (Blackwood GC)
Marcus Hartup (Pacific Harbour)
Justin Haslam (TGAA ACT)
Dean Henderson (Sanctuary Cove)
Darren Jones (St Michael's GC)
Stuart Laing (Royal Pines)
Dr Don Loch (QDPI)
Graeme Logan (TGAA NSW)
Peter Lonergan (Cool-Tweed GC)
Craig New (Lakelands CC)
John Neylan (AGCSATech)
Malcolm Ollard (North Lakes GC)
Pat Pauli (Horton Park GC)
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David Reid (JW Buildings)
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Daryl Sellar (Glenelg GC)
Brad Sofield (Gosnells GC)
Dr Marcelle Stirling (Biological CP)
Dr Graham Stirling (Biological CP)
Trevor Strachan (Lake Karrinyup CC)
Michael Waring (Royal Canberra)
Leigh Yanner (Moonah Links)

foreword thinking

AGCSA CHIEF EXECUTIVE, STEVEN POTTS

Welcome to the 2006 Australian Turfgrass Conference edition of Australian Turfgrass Management magazine. With the 22nd Australian Turfgrass Conference in Brisbane now just a few weeks' away, things are happening at a frantic pace at the AGCSA.

The conference will run from 17-21 July and will have three education streams including golf course management, sportsfield management and turf mechanics. There will also be a special program for general managers while the Gold Coast Groundstaff Association will also be involved.

Registrations are still coming in and for those who wish to attend Brisbane you have until Monday, 3 July to send your registration forms to the AGCSA. A registration brochure has been distributed in recent months but if you missed out you can download one from the conference section on the AGCSA website www.agcsa.com.au.

A full breakdown of the 22nd Australian Turfgrass Conference, including a comprehensive listing of all the tradeshow exhibitors, is included in the middle section of the magazine. The conference is gearing up to be the pinnacle event on the 2006 turf calendar and I look forward to seeing you all there to discuss what has been a very eventful year for the association and the turf industry in general.

One the major developments that is likely to be a big topic of conversation at the conference is the AGCSA's Environmental Initiative which was launched back in May.

The initiative is continuing to gain widespread support throughout the golfing community. Golf Australia has given its full support of the initiative and we have received in-principal support from many state golf unions and other golf associations which will be announced in the near future. Many local councils are also supportive of the initiative with several providing funding support to assist golf clubs in their municipality to participate.

This initiative, which builds from the 'e-par' environmental management system (see page 76 of this edition for a rundown of the system), culminates with the issuing of compliance certificates to golf clubs and the publication of an annual 'state of the environment' report back to legislative bodies and stakeholders.

This report will detail the true industry story, will go a long way to changing public and golfers' perceptions and increase confidence in the industry through the identification, analysis, evaluation, treatment and monitoring of environmental performance.

An important component of this initiative will be the development of an environmental website linking to all stakeholders. This environmental website will become a major communication tool to ensure that the industry is kept up to date with all environment-related news including legislative changes and specific compliance examples from around Australia.

This environmental initiative is of significant benefit to the industry and will help correct the community's misunderstanding of turf maintenance and raise the profile of our profession in the community. The AGCSA in conjunction with Golf Australia will be writing to the president/general manager of every golf club in Australia providing them with further information on the initiative and asking them for their support.

In other association news, the AGCSA was humbled last month with the announcement that Australian Turfgrass Management magazine (ATM) had been recognised at the recent Turf and Ornamental Communicators Association (TOCA) awards where it collected four awards.

On a sadder note, after five-and-a-half years of dedicated service, events manager Fiona McPadden has announced that she will be moving on to greener pastures. On behalf of the AGCSA Board, staff and members, I would like to thank Fiona for her time at the AGCSA and wish her all the best for her future.

Enjoy the magazine and I'll see you in Brisbane for what will be a great week.


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BY BRETT ROBINSON AND PETER FREWIN

Super sheds - The upgrade and construction of maintenance facilities

In Volume 8.2, ATM presented the first part of its in-depth feature on the construction and upgrade of golf course maintenance facilities. In this second part, ATM continues its look into some of the few facilities being constructed around Australia and brings together superintendents to impart some helpful hints for those considering undertaking such a project. To kick off this first part of the follow-up feature, Barwon Heads course and golf operations manager Peter Frewin recounts the process his club went through in constructing their new facility before we embark on a quick tour around the country to take in recent projects at Moonah Links, Long Reef, NSW, Horton Park and Lake Karrinyup.

The township of Barwon Heads has changed considerably in the past five years thanks to a quirky little program that aired on the ABC called Seachange, with the current maintenance facility site at Barwon Heads Golf Club beginning to feel the pressure of a growing seaside town.

Local residents began making informal complaints about the noise being made in the early morning (one of them my wife!), while the club was also experiencing increased pedestrian traffic associated with the neighbouring primary school.

These issues and the club's desire to provide course staff with a suitable washdown facility were the catalyst for the initial investigations. It should also be stated that this desire was increased following the Warringah Golf Club incident which served to highlight what can happen without proper facilties in place.

Barwon Heads Golf Club has always made decisions that are in the best interest of its current members and those that may join the club in the future. The decision to proceed with a new maintenance facility when the current facility was less than 12-years-old may seem a bit strange, even brave. Most clubs would have taken the easy option and just built a washdown facility on the current site, but times change and to the club's credit the best long-term decision was made which involved relocation.

GETTING STARTED

The process commenced with an 'in principal' agreement that the current site was not the best long-term solution and a new site was to be found. Following many meetings and course inspections, a site was chosen on a part of the club's land that was located away from residential property and that was not likely to be used for future course development.

The issue of design was next on the list; would the area be of suitable size to accommodate a facility that would be a long-term solution? Once the location and rough design was selected, a budget was formulated that incorporated all the new construction, fit out, washdown and removal of current buildings and the remediation of the current site. This was then put through the normal club routine of approval via the committee process.

Without consciously planning, one of the best things that I have done was to take photos of every shed I have ever visited. This gave us a great insight into how sheds have been constructed worldwide. We also took the opportunity to put some staff in a car and visited all the recently completed facilities built in Victoria, and there are a few!

We also sat down on a rainy day and discussed what everyone thought would be a good design. This is something that I would recommend to all about to undertake a similar task.

The new maintenance facility at Barwon Heads Golf Club during the early stages of construction

THE FUN BEGINS

As I was about to find out, getting the club's authority to spend the $880,000-plus turned out to be a great deal easier (and we all know how hard it is to get money out of our clubs at times) than getting local government authority approval. All the basics were undertaken for a planning permit – site selection, shed and site plans, title search etc, and then we started to work on the finer points of the planning requirements.

The first step was for the club to undertake an archaeological survey and with cooperation from the Wathaurong (local aboriginal co-operative) we gained permission to disturb a heritage-listed site to allow the work to be carried out. The only other condition set on the permit was that a member of the local aboriginal community be on site to monitor all excavations.

A flora survey was next, which all went well until a small *Melaleuca lanceolata ssp. lanceolata* (moonah) and a colony of *Pterostylis pedunculata* (maroon hood orchid) was found. The club elected to be proactive and marginally changed the design and site of the shed to fit in with the likely requirement to preserve and protect these plants, rather than go through the lengthy process and leave the shed on the original site and remove the two plants.

The process was then slowed when we had to undertake a 'net gain' assessment for the removal of native plants. At the time this assessment was still in draft form and very few people in Victoria had a good understanding of the process.

The BHGC facility cost over $880,000 but has set up the club well into the future

This assessment is by site inspection, where all the species found in the area to be removed are rated and a final calculation is made which takes into account the type of species and whether it is endangered, significant or a weed. The club, following extensive work in conjunction with consultant Mark Trengove, then had the task to identify an area that would satisfy the outcome of the net gain assessment.

Following a great deal of further investigation and assessment, an area on the course was located that would fit the criteria identified in the assessment process. The area was overgrown with pest plants and introduced pine trees, and the area was deemed by the relevant local authority suitable to offset the amount of native species that was going to be removed from the new site.

A detailed specification sheet was drawn up by myself in conjunction with some representatives from the club that were involved in the building industry, which detailed most aspects of the construction. Particular attention was paid to the important specific items, some of which included the actual shed construction and fabrication, concrete (including reinforcement), electrical wiring and lighting plans and the fit out of staff amenities. This specification sheet along with the shed plans was included as an appendix to the actual contract, which would be signed once the successful builder was appointed.

The club, from the outset, preferred that all works be carried out by the one company, who would undertake, via their own staff or sub-contractors, the task of shed erection, concrete works, staff facility construction, plumbing and all electrical works. The scope of works also included such items as painting, floor coverings, heating, cooling, alarms and air lines throughout the facility, all of which were covered in detail in the specification sheets.

While the permit saga continued, the decision was made to proceed to the tender phase for the construction as we were told by the relevant authorities that final approval was only days away! The relevant documentation was sent to the three Geelong-based companies that the club had selected, two of which had undertaken work for the club previously.

We continued with the tender process so when the permit was issued we would then be in a good position to be able to appoint the successful firm to undertake the works. As it turned out the successful tender came from a company that had worked for the club previously (they constructed the existing maintenance facility) which assisted as relationships had been formed previously.

THE GREEN LIGHT

There was a day of great rejoicing when the planning permit finally arrived in the mail, exactly 365 days after it was lodged, stating that all conditions of the permit had been met and work could start. It took very little time to arrange the earthmovers to clear and level the site before anyone changed their mind. I am pleased to say that at this time work is on time and budget and due to be completed in early June.

The maintenance facility budget was $887,906, including $40,000 of contingencies, and included the following items: Main shed (55m x 26m) and washdown and fuel shed (26m x 14m) (including steelwork, fabrication, erection, concrete, fit out, permits etc); washdown and chemical treatment facility ▶

The impressive $2 million maintenance facility at NSW Golf Club

(including Landa unit, stormwater collection, tanks and pumps); power; sewer; workshop (including hoist and fit out); fertiliser store fit out; soil bins; security fences; car parking and access road; water (including fire service); phone and computer wiring to clubhouse; earthworks and site clearing; landscaping; irrigation system modifications; furniture and fittings; design and permits; consultancy (archeological and flora); re-location of existing fuel and chemical store; and rehabilitation of existing site.

The process has been a great learning experience and when all is finished we will have a facility that should last me out and hopefully my successor. If you are travelling to the area later in the year and you would like to have a look, feel free to drop in and have a look at what the Barwon Heads members are calling 'Pete's Palace'.

LONG REEF GOLF CLUB

State: New South Wales
Superintendent: Peter Donkers
Approx. Cost: $750,000-$1million

SCOPE OF WORKS

The current maintenance facility at Long Reef Golf Club is situated in the middle of the course making it an eyesore due to the open nature of the site. It is very old and in poor condition and according to superintendent Peter Donkers is definitely not worth spending money on.

In conjunction with the construction of a brand new facility, which will be built in an area well out of the way and not visible from residential housing, the club and the local council will divert local stormwater through the course into a dam. The new dam will be excavated from the site of the current shed, and will allow all stormwater currently exiting directly to local beaches to be diverted through the course, filtered through the existing pond system and used for irrigation.

The new maintenance facility will be constructed from scratch with the board deciding to copy the maintenance facility at Avondale Golf Club which is now around 4-5 years old and is of a suitable design for the area which the club has to work with.

Council recently approved the DA after a long process of choosing a suitable site and the club is now waiting on the council to renew the current lease for the golf club site before any work will commence. The club had plans to renew the facility for around 12 years, spending little money on the current shed. It is now in a very poor state with many environmental issues such as improper chemical mixing and filling facilities, fuel fill-up area and chemical and fertiliser storage. Donkers estimates the new facility to cost in the range of $750,000 to $1million.

Some of the challenges facing Donkers and the club have included the location of the new facility due to complaints from local residents. As well, the new facility must comply with all requirements for the Griffith Park Plan of Management which covers the whole of the Long Reef Headland.

As far as maintenance operations are concerned, Donkers plans on washing machinery on course, with a final rinse in a proper washdown containing a separator. As for the pesticide storage and handling areas, the club is looking at the possibility of purchasing a prefabricated unit which complies with legal requirements. The fuel storage fill-up facility will be bunded and covered.

LAKE KARRINYUP COUNTRY CLUB

State: Western Australia
Superintendent: Trevor Strachan
Approx. Cost: $754,000

SCOPE OF WORKS

Lake Karrinyup is one of Western Australia's premier golf courses and the need for a new facility was to help address issues of occupational health and safety, environmental compliance and to improve workplace efficiency.

The new shed is 1100m^2 and is large enough to accommodate all machinery as well as house an air-conditioned workshop, offices, lunch room, change rooms, reticulation office, main office and wet area where all wet-weather gear can be taken off, washed down and hung up to dry.

The old shed that housed the lunch room and machinery was demolished to make way for a new dedicated undercover washdown bay area with a waste water separator, new fuel bowsers and parking bays. Previously there was no washdown facility. The existing shed housing the superintendent's office will be converted into a new chemical and fertiliser storage area and chemical wash bay with a large capacity waste chemical holding tank.

HORTON PARK GOLF CLUB

State: Queensland
Superintendent: Pat Pauli
Approx. Cost: $70,000 (not including fuel storage and filling facility)

SCOPE OF WORKS

Convincing the board that the maintenance facility at Horton Park Golf Club required an upgrade was the easy part for superintendent Pat Pauli. The difficult part has been the subsequent researching, organising, designing and drawing up or tenders.

The upgrade of the facility at the Maroochydoore-based club includes a new mechanics maintenance facility, machinery washdown area, machinery blow down area and plant protection storage area and plant protection machinery fill-up and washdown area. The fuel storage and filling facility is still in the process of being worked through.

"I had no problems convincing the Board we needed the upgrade as they were keen to have a facility that complies across the board," says Pauli, a finalist in the AGCSA's Claude Crockford Environmental Award in 2005. "The rest however has been left to me with everything needing to go back to the board for consideration and then approval. This all has to be done while you continue to maintain the course. It's a lot of work.

"I found it difficult to get a straight answer from anybody. It was hard to find the right person to talk to from local council and what they require. The EPA could not give any

specific requirements as to what and how we should build something, except to say that if we caused an environmental problem we would be in trouble and the full force of the law would be upon us. Every time someone came to see me they would have a different interpretation of what we should do. You get referred to the regulations but you need to be a lawyer to understand them."

The new machinery washdown bay is a concrete area with an oil separator that collects and stores the oil with the remaining water pumped to a nearby garden bed for irrigation. A concreted area adjoins the above which is used to blow all the grass from the machinery. Grass is stored and removed to the compost pile. Some of the bigger machines are still blown off out on different parts of the course with the backpack blower before coming to the washdown bay.

The pesticide storage and handling areas are incorporated in the one building. Waste water within this facility is collected and stored and used for herbicide spraying in gardens. There is also the ability within this facility to collect and separate a spill if the need arises.

NEW SOUTH WALES GOLF CLUB

State: New South Wales
Superintendent: Gary Dempsey
Approx. Cost: $2 million

SCOPE OF WORKS

NSW superintendents who attended the NSWGCSA field day in May at NSW Golf Club would have got a first hand look at superintendent Gary Dempsey's new Taj Mahal. Dempsey and his crew moved into the impressive new $2 million facility in February 2006 after what proved to be a time-consuming yet ultimately rewarding process.

Prior to construction, the NSWGC crew were working out of a facility which was no where near commensurate with the club's status as one of the world's top 40 courses. Now the club is the proud owner of one of the most modern facilities in the country and one that Dempsey says has set up the club well into the future.

While the finished product is something to behold, the process the club went through was certainly protracted. Once a final design was agreed upon after visiting other facilities and


Selecting a suitable site at Moonah Links proved challenging

holding information meetings with members, it took a further 13 months for the DA to be approved.

Due to the environmentally-sensitive location of the course right on the headland of Botany Bay, the new structure required a detailed flora and fauna assessment. As such, the DA was issued with 76 over-riding conditions (mainly on environmental issues) which had to be met before construction could start. Dempsey estimates that it cost about $80,000 to procure the DA.

From there the club moved to hire a raft of consultants for the various specialised areas of the development. They included geotechnical, hydraulic, electrical/mechanical and structural/engineering consultants, while a private certifying company was also engaged by the club during this process. The club also ensured the project complied with all local regulations by using specialists in environmental business operations, OH&S and WorkCover.

The most challenging areas for Dempsey included dealing with local council as well as some of the consultants. "It may sound silly, but make sure the consultants 'consult'," says Dempsey. "They can be a law unto themselves and sometimes frustrating to deal with." Other challenges included trying to budget for the unknown like ground conditions (e.g.: buried rubbish, rock etc).

The new machinery washdown bay is integrated into the new building incorporating the use of rainwater and the treatment and reuse of the washdown bay water. The pesticide storage and handling area is also integrated into the new building and includes natural and mechanical ventilation, bunding and blind sump catchment, undercover and bunded chemical fill station with safety shower. The fuel storage and filling facility comprises an 8000l Convault (4000ulp/4000diesel) concrete-encased above-ground storage tank with remote covered fuel fill station.

MOONAH LINKS

State: Victoria
Superintendent: Leigh Yanner
Approx. Cost: $1 million

SCOPE OF WORKS

After working out of a temporary shed for two and half years (during which time the course hosted the 2003 Australian Open), Leigh Yanner and his crew at Moonah Links were more than ready to make the move into their new $1 million maintenance facility in September 2004.

One of the main challenges to overcome in the building the new facility was finding a suitable site that would not interfere with the surrounding residential properties. The area finally assigned on the masterplan was on the ridge of a hill with the main access road running past. Screening mounds had to be constructed at the same time as achieving dual entry and exit points for vehicles. Yanner has since blocked off the entrance to the main access road for reasons of safety and security, a compromise he is happy with.

Approximately 4000m^3 of sand had to be moved to accommodate the level area required for the building, while three significant Moonah trees in the middle of the site had to be removed before construction could begin.

Design was crucial to gain efficient, safe vehicle movements and to ensure that every bit of available space was used. One of the most challenging aspects of the design was the incorporation of seven portable buildings, which had been used as the temporary clubhouse for several years. These were to be accessible from the main building and act as a separate amenities pod, housing the change rooms, toilets, offices and drying room. This achieved considerable project cost savings.

A two-building design was called for. The chemical, fertiliser store and wash bays were contained in one structure. The other main structure housed the vehicle storage, mechanics workshop and lunchroom, with access to the amenities area to one side. The fuel store and soil bins also had to be squeezed in.

Due to site size restrictions the washdown bay also doubles as a filling area, with all water discharged into sewer via a triple interceptor. All grass clippings collected are recycled into a compost pile. The pesticide storage and handling area is bunded and has two entry points, one of those being a roller door. The fertiliser storage area has three roller doors so this can be easily accessed by forklift for bulk deliveries.

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Visiting other maintenance facilities and superintendents was a common method used to help build up information and ideas

Shedding some light - Super advice from those in the know

Australian superintendents are well known for their sharing of information and with maintenance facilities being a hot topic at the moment, there has been plenty of discussion at state meetings and national gatherings. Here respondents to ATM's maintenance facilities survey provide some helpful hints and advice for those superintendents who are planning to upgrade or construct a new maintenance facility at their golf course.

CRAIG NEW
LAKELANDS COUNTRY CLUB

"We visited three other new sheds in the Perth area – Mt Lawley Golf Club, Western Australian Golf Club and Wanneroo Golf Club. We spoke to the superintendents, and asked the typical dumb questions like "What would you re-do if you had a second chance etc?" We also visited several construction sites and viewed.

"For those clubs considering a new facility or upgrading a facility, think seriously about appointing an independent project manager (not a club member) and liaise with him/her.

"Pick out the worst areas, ones that will give you legislative drama down the track and fix them (eg: washdown, chemical storage).

"Even though our wash down area meets all legislative requirements, I would make it twice the size in hindsight (10m x 10m instead of 5m x 5m). When you have spray equipment and machines to wash down, more area is required than you think!"

PETER DONKERS
LONG REEF GOLF CLUB

"Visit as many sites as possible and make sure you have what you require in your own shed. Make sure there is plenty of room for the future, good light, good access, good workshop, good staff facilities etc… For those clubs with a limited budget, look at agricultural sheds; they are good value for money."

PETER FREWIN
BARWON HEADS GOLF CLUB

"In the lead-up period we visited many facilities while I had also been fortunate to visit a number of overseas facilities when travelling. The web is a good place to look for information, but most importantly listen to the input from your staff. Also, keep consultants out of the process as much as possible.

"I am sure that when our facility is finished there will be things that we will change. We have some contingencies built into the project cost "just in case", but I am happy with most things to date. Law and work practices will change, which will result in changes anyway.

"For those clubs with a limited budget, I recommend visiting other facilities and building with the future in mind; what costs $10,000 today will probably cost $50,000 in 10 years time. An example of that is our current facility (which most clubs would be proud of) cost $120,000 in 2004. The one we are constructing now will cost $880,000!"

PAT PAULI
HORTON PARK GOLF CLUB

"I used a variety of resources – council websites and publications, local authorities, superintendents – along with EPA officers and suppliers of environmental equipment. I took on board what they all said and came up with what I thought would prevent us from having an accident and provide something that the club could afford.

"I think it's important to get professional help. I find it amazing that you can go to any number of clubs and they all believe they have done the correct thing and they are all doing something different, especially in the area of treating and disposal of washdown water.

"For those clubs with a limited budget, getting your club and yourself to know your local EPA officer is a good start. Talk things through with them. I also found talking to suppliers of environmental products can leave you somewhat confused, because there are many and varied products on the market and some are very expensive to maintain.

"Certainly we have to be very careful handling chemicals, but at the end of the day you can have the best and most expensive system but if some idiot does something silly, what can you do? That brings up the issue of more staff training and that's a whole other area superintendents need to deal with."

BRAD SOFIELD
GOSNELLS GOLF CLUB

"Identify your risk to environment, staff safety and financial risk to members by not acting in any manner and demonstrate to members. Or at least have your issues and recommendations minuted.

"Look around industry as well as other industries not directly associated with turf at

their facilities for ideas. Take plenty of pictures. I found other superintendents very helpful and giving of their time, while local companies (e.g.: Perth Petroleum) were good.

"If you have a limited budget, assess your current position and forecast any future growth – machinery, course expansion, procurement of carts and required storage. Set plans even if they are long-term. Assess to see if you can make some short-term solutions to areas of non-compliance to get you over the line while waiting for your long-term plans to eventuate."

MARCUS HARTUP
PACIFIC HARBOUR GCC

"The maintenance facility is a very important tool for the successful day-to-day operation of the golf course. It also makes a statement about you and your staff, so always keep it clean and well organised. Make sure you have a good workshop area so routine maintenance and breakdowns can take place safely and efficiently.

"In most instances you only get one shot at it, so make sure you get it right. Make sure you do your research and that all compliances are met. Get it right the first time and you will have no regrets. Ask the opinions of those who have gone before you, learn from their mistakes and draw on the benefits of experience.

"For those on a tight budget, get the basics right and prioritise the wants and needs of the facility. Build the foundations on a modular format that can be expanded as additional resources become available. Try to use the prefabricated containers for hazardous goods storage over building a bricks and mortar solution as the standards will change and compliance will become more difficult."

LEIGH YANNER
MOONAH LINKS

"Previous experience and looking at other superintendents' sheds and discussing with them their thoughts proved invaluable. It's important to take into account the changes you might foresee in the future with regulations, staff and purchase of machinery growth. It will be probably be another 30-40 years before you get another chance so think ahead.

"Because of site size restrictions we had to construct a wash bay that also doubled as a filling. If we didn't have that restriction a separate filling station would have been more ideal. If we did have our time over again I would change the location of our turf technician's area and have an undercover refuelling area. On the other hand, the best thing I installed was a drying room.

"Those clubs with a limited budget should choose a building that is easy to extend and a large enough site to also allow you to grow.

"Other aspects to take into consideration when upgrading or construction of maintenance facilities include offices and the lunchroom. Nowadays you need to take into account the way the trade is heading and the requirements of training and the need for a temporary class room set-up (e.g.: computer requirements)."

JEFF POWELL
BALLARAT GOLF CLUB

"If I have any advice it is this - fight hard for what you want right from the start, but don't be over the top. Convince the committee that the maintenance facility is just as important as the clubhouse and that it is the nerve centre of the course. You have staff living out of your maintenance facility five, six, seven days a week.

"It takes a bit of clever planning, but press the possibilities or the consequences that might occur if they don't do it right. Impress upon them that you'll only get one chance and that the maintenance facility has to last a long time. Having a new building where you need to stack machinery into it isn't going to work.

Work out how much space you need and try to talk to committee members that will support your needs and that of your staff. They might be the ones who help sway those on the committee that don't understand the impacts. Drum home the environmental and OH&S consequences that the club and superintendent could face if something does go wrong.

"We visited as many facilities as we could to get ideas and asked what worked and what didn't for other superintendents. Also ask your sales reps that service you what facilities they have seen are worth visiting to get ideas from. Take plenty of photos and show these to your committee to give them an idea of what others have and what is required, including the machinery in it. Try to take your committee on a tour to view what other courses similar to yours have.

"But I think the most important thing is to let your groundstaff have a big say in matters. Sit down and talk with them, ask questions on what they think would work and why. Plan it with them because they are the ones that will work within its confines. Sometimes it's just the little things that you miss which makes all the difference."

PETER LONERGAN
COOLANGATTA TWEED GC

"Talk to as many superintendents as possibleDon't use "you'll get fined or put in jail" as a threat to your club to get work done. Do it because it is the right thing to do not only for the environment but also your staff. If we had our time again, I would make the chemical handling facility a lot bigger."

TREVOR STRACHAN
LAKE KARRINYUP COUNTRY CLUB

"First and foremost you must understand what you are trying to achieve. Make the facility work for your operation and plan for the future. Having a good engineer is crucial. Review your waste removal.

"If the club is going to do it in-house, be aware of the time the superintendent will be involved and where that might reduce their time elsewhere. Make a floorplan of where equipment will be stored and understand the amount of equipment you plan to have.

"For those clubs with a limited budget, make it function for your own operation and ensure your OH&S is in place. Ensure staff have good amenities as a clean environment, happy staff and good efficiency save money."

DARYL SELLAR
GLENELG GOLF CLUB

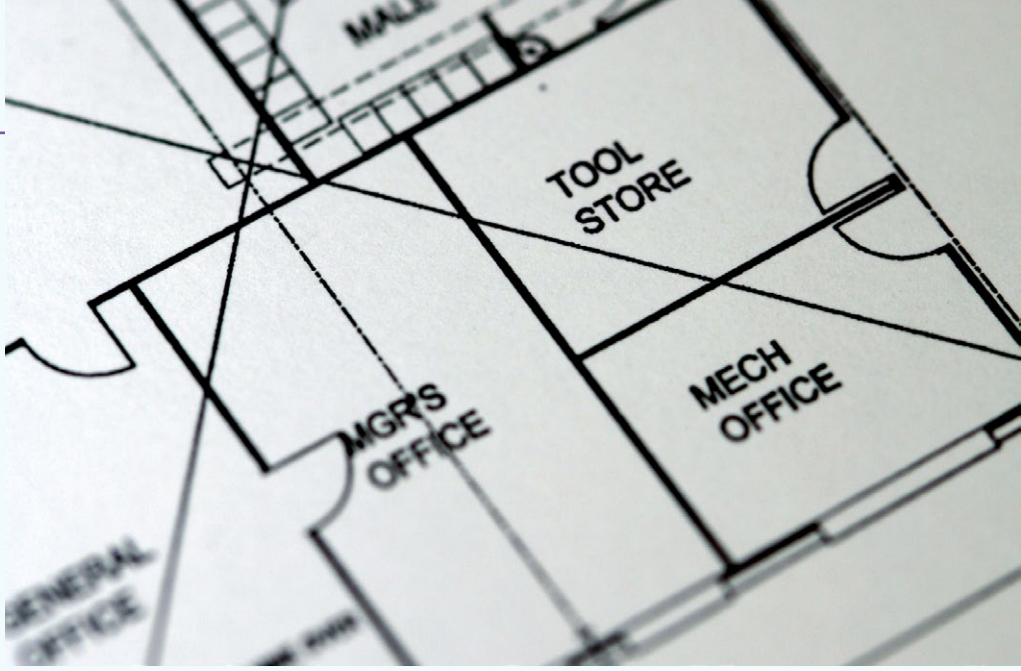
"The advice is simple – do you homework.

- Work out the 'real' spatial requirements of your operation with justifications;
- Investigate the legislation that you will have to abide by early in the planning stage;
- Document everything – meeting minutes, plans, conversations, sketches – and keep them filed for easy reference;
- As much as possible, drive the discussions. Don't be overrun by architects, project managers, committees. You have to work in the facility;
- Establish some key objectives from the facility (i.e.: safety, efficiency, compliance) and continually remind yourself and others of them so designs do not become sidetracked;
- Be very careful with site selection and do your homework as to why one site is better than another;
- Masterplan not only the facility but the entire site to determine the long-term impact of site selection.

"Some resources I found useful included: "*Golf Course Maintenance Facilities*" (GCSAA publication); "*Turf Care Centres: The Heartbeat of Golf Turf Conditioning*" (USGA Greens Section Record article July/Aug 2001)."

BY DAVID REID AND LYNTON REID

Attention to detail in all phases of the design and construction process will ensure that the final facility will be functional well into the future



Building for the future

The construction of a new maintenance facility can be a daunting process for superintendents and one of the most important projects they will be involved with during their tenure at a golf club. Here David Reid and Lynton Reid, who have played a major hand in designing and constructing maintenance facilities at the likes of Sandhurst, Metropolitan and Moonah Links in Victoria, outline the process behind constructing a new facility and what superintendents should take into consideration.

The design and construction of a maintenance facility is without question a complex process. There are several stages involved and numerous complex decisions need to be made which will have a major bearing on the final product created.

While getting approval from club board level to undertake an upgrade or total reconstruction can be a process in itself, setting about designing and constructing a maintenance facility is a completely different process. This article aims to provide some advice on how to navigate through this phase and looks at what a club's management and the superintendent will be required to follow once the decision has been made that works need to be undertaken.

GETTING STARTED

At the outset, the club may have little idea of how much the works will cost and who to approach for advice. The rule of thumb is simple – get advice. Do not try to take it all on yourself or go direct to a shed company or normal builder, as it will most likely cost you more money in the long term.

The first port of call has to be a designer with experience in similar types of projects. Experience is critical in terms of knowing what can be achieved and the most efficient and cost effective solutions. They will be able to offer rapid advice on planning restrictions and the requirements of regulatory bodies.

They will usually have experience across the whole design and construct process, from developing concept drawings to obtaining the building permit. Some will even project manage the builder on site.

Think twice before using a large design firm. They are more used to using a team to mass-produce designs for large-scale works. They will rarely offer personalised service and are usually far more expensive. Choose wisely and you will save the club money and ensure that the whole process runs smoothly.

THE INITIAL CONCEPT

Initially, the designer will meet with the superintendent (and often the general manager) to build up an initial project brief. This brief will usually include preliminary concept drawings and an initial broad estimate of cost.

The designer's experience in converting ideas into a design suited to the site, considering the alternatives and giving instant cost feedback is very valuable. This starts the ball rolling and gives the committee something to review.

At this stage the designer will run the concept past the planners at council level, checking for possible initial reservations they may have. Once the committee has given the go-ahead, allocated funds and provided any input, the project is ready to proceed to town planning stage.

As far as budgeting is concerned, if the club decides to proceed they will want a budget cost range for the works. When arriving at a budget for the works, it is advisable that the club be conservative. Allow for price rises and modifications to the scope of works along the way. During periods of inflation, construction costs can escalate by anything from three per cent to six per cent over 12 months.

On top of this, changes to the brief and fit-out are the norm rather than the exception, so allow a buffer in your funding for such eventualities. The same facility will not cost the same in 18 months time as it does today!

PLANNING APPROVAL

While the preliminary planning drawings are being fine-tuned, a broad layout must be decided upon. Considerations as a part of

the broad layout could include access roads, hardstand areas, car parking, door locations, the colour and appearance of the buildings and general internal room layouts.

The drawings submitted to council must be considered final, as once the application has been submitted to council and the review process has begun, it can be very time-consuming for the club to revise the design. It has to be right the first time!

The assessment process can take months. If the proposed works are close to neighbours then be prepared for some fireworks and a drawn out process.

If the application is rejected, the committee may wish to appeal the decision (in Victoria, for instance, this would be through the Victorian Civil and Administrative Tribunal, VCAT). Appeals in recent years are usually successful, resulting in a council decision being overturned.

Most planning applications will not go as far as somewhere like VCAT and will be approved at council. The club needs through this whole process an experienced designer and town planner who will consider all the risks and potential outcomes.

FINAL DESIGN AND DOCUMENTATION

Once the planning approval has been obtained, the rest of the design process will proceed quickly. The structural and services designs are completed and the building specification will be prepared which contains detailed descriptions of how the works must be performed and the finishes used. The level of detail here will reflect the quality and suitability of the finished product.

It is important for the club to check these drawings again and again which will minimise, or hopefully eliminate, design changes and variations during the works. You must be happy with every last detail, as these working drawings will be final.

The drawings and specifications will be compiled and submitted for building approval. This should be just a formality and granted in a matter of weeks.

CONSTRUCTION

With the approved working drawings in place, a builder will be appointed based on a number of criteria including references. With a competent builder, the club should really only need to keep a general eye on proceedings. They may help out if necessary with general items, such as keeping the site clear and open to the builder, and helping answer any questions they or the project manager may have.

Usually on a job under or around $1million, the designer will take on the duties of project manager or superintendent, on behalf of the client. They will basically ensure the works are carried out in accordance with the plans and specifications and solve any problems that may arise.

GETTING WHAT YOU WANT AND NEED

The club's management and superintendent in consultation with staff will need to develop a brief in list form, including items such as:

- The roles and numbers of current and projected numbers of staff;
- Desired inclusions in the works (such as a new drying room, a new hoist, a double wash-bay, etc);
- All pieces of machinery and whether they need undercover storage or not;
- The superintendent's specific requirements (such as the switchboard panel located in ▶

- the office, or all handles to be levers for ease of use with wet hands, or a two-way charger shelf in the lunch room);
- Any preference in terms of a water treatment system;

As someone who has inevitably been working around golf courses for many years, the club's superintendent will have very specific ideas regarding the specifics of a design. To this end, the superintendent should begin to build up a list of detailed requirements in point form. Don't rely on verbal instructions - they are too easily forgotten.

The superintendent should insist on an open line of communication with the designer during all stages. They should receive a copy of design updates and drawings and be on their e-mail list for all correspondence.

Finally, the club must always check the design and any changes and comment or criticise if necessary. Get involved, as you are going to have to live with the finished product!

WEIGHING UP POTENTIAL COST SAVINGS

For a new facility, the single biggest area of potential saving is in the civil works. This includes reducing the amount of shaping and formation and the amount of material imported or exported from site.

Additionally, you can leave paved areas as crushed rock rather than making a nicely kerbed asphalt or concrete paving (very pricey!). Incorporating or re-using existing structures, by re-cladding for instance, may be another option, depending of course on their condition.

Many clubs reduce the size of the main storage building, although most regret this down the track when unnecessary vehicle movements have to be made to get machines out each morning or they start being parked outside overnight!

Few luxuries are usually incorporated in the design of a maintenance facility. Items such as air-conditioning to an office or lunch room, which was once considered a luxury, is so cheap today that 'doing-without' is really no longer a desirable option.

Cost cutting questions are hard to address for a cash-strapped club. They must be considered carefully. Continual input from the designer is essential, as they have likely had to answer these questions before at other clubs.

THE WARRINGAH INCIDENT

The Warringah Golf Club incident of 2001 has struck fear into the hearts of superintendents Australia wide. This was mainly due to the fine imposed and the torrent of bad publicity. But there was an upside.

Superintendents have been reminded just how potent some of the chemicals are that they deal with daily and the importance of good (or 'best-practice') procedures so that the staff and environment are protected.

In deference to Terry Muir's article in the last edition of the ATM titled 'Getting the mix right', I will not go into detail about the design of wash bays and chemical mixing bays, suffice to say you should engage a designer who is experienced in their design.

They will understand the current environmental and authority regulations, governing the use, storage and disposal of chemicals/fuels/pesticides, or be able to readily check them. They will also design a facility that is easy to service and maintain.

ACKNOWLEDGEMENTS

David Reid is from JW Buildings and Lynton J Reid from Hawthorn Consulting Engineers.

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BY DOUG FOX

Sustainable Water for Golf in Victoria

In the latter half of 2005, the Victorian Golf Association released a detailed report on water use at golf courses throughout the state. Here ATM summarises the report's key findings and looks at some of the case studies which highlight innovative projects designed to reduce or substitute existing water needs.

At a state level, the Victorian Golf Association (VGA) has maintained a charter to assist golf clubs to achieve quality playing surfaces which are environmentally and financially viable. Research and innovation with grass species, irrigation practices and turf management have been important components of this work over many years.

Recognising that water supply and quality was becoming a growing dilemma, VGA instituted in 1999 an ongoing program of research trials and projects targeted directly at reducing water usage and/or replacing existing supplies with recycled water.

The extended drought conditions prevailing in Victoria over the past five years have served to highlight the water-related jeopardy which golf now faces. Many clubs are experiencing rising costs and declining playing conditions as water supplies become scarce. Many clubs foresee an uncertain future unless they can find ways to protect themselves from this cycle.

In recent times the Victorian Government outlined its blueprint for the future in the White Paper, "Securing Our Water Future Together". In response to this, the VGA undertook a detailed survey of current water practices and needs among its clubs.

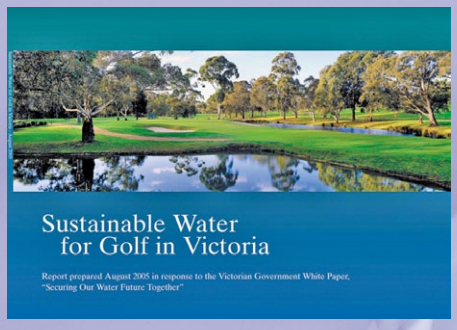
A questionnaire seeking information on a wide range of water use, water planning and related matters was sent to all VGA affiliated golf clubs in October 2004. Responses were received from 230 golf clubs, an overall 70 per cent response rate.

FINDINGS

On average, a golf course with 18 holes and grass greens in Victoria occupies 59 hectares of land area and irrigates an average of 21.5 hectares (2.5 hectares of tees and greens, 14.9 hectares of fairways and 4.1 hectares of other areas).

While some clubs rely on a single source of water, most have access to two or more sources and vary the quantities drawn according to cost, quality and conservation conditions prevailing at the time.

Use of potable and bore water sources for golf course irrigation is proportionally higher among metropolitan and medium sized country courses than for other club types. Many clubs are dependent on one main source of water and have reported concerns, vulnerability and difficulties arising from the recent extended drought conditions.



Metropolitan and very large country golf clubs reported an average expenditure of $60,000 to $76,000 per annum on the purchase and application of irrigation water. In addition, large amounts of capital are invested in infrastructure for distributing, storing or transporting water. As such, water represents a large and growing cost item within the annual operating expenditure of clubs.

A high incidence of concern regarding water for the future was reported by clubs of differing size.

Generally the metropolitan and larger country-based clubs had higher concern levels, reflecting their larger investment in irrigation and their commitment to higher quality playing conditions. Smaller clubs tend to ride out the adverse climatic conditions by accepting reductions in turf quality as they don't have the resources to seek alternatives. Not surprisingly, the person most concerned about their club's water situation was the superintendent.

The inner 'sandbelt' and Yarra River based courses showed high levels of vulnerability with an average storage capacity of less than 10 per cent of their annual water needs. For the sandbelt, the primary water source is bores and the Yarra courses divert the bulk of their water needs from the Yarra River.

Both groups have previously regarded themselves as having limitless supplies of naturally occurring water but the drought conditions prevailing in Victoria over the past five years have raised serious question marks over future reliance on these sources.

Some of the sandbelt clubs have had to spend large amounts on purchasing potable water in order to ride out the drought as aquifer deterioration has reduced the quantity and quality of bore supply.

The questionnaire found that a significant proportion of golf clubs had taken action to improve watering efficiency by irrigating at night-time or at other times where evaporation rates were lower, while between a third and 40 per cent of metropolitan and very large country golf clubs reported having reduced the area of their golf course which is under irrigation.

Despite the high incidence of golf clubs expressing concerns about water for the future and taking steps to reduce usage and/or improve their water use efficiency, there is a surprising lack of formalised strategic planning. In general the proportions are low with less than one third of metropolitan and less than a fifth of very large country-based clubs having a documented plan.

CASE STUDIES

A large section of the VGA report contained a series of interesting case studies which highlighted the key issues and opportunities and the extent of water consciousness which has been already evident within the Victorian golf scene.

Some clubs have experienced hardship or devastation brought on by water issues (the report highlights the case at Castlemaine Golf Club which was brought to the brink of ruin). Others, however, have hurried down the innovation path with projects designed to reduce or substitute existing water needs.

Riversdale Golf Club has dramatically increased its water storage by building new dams to capture stormwater

STORMWATER HARVESTING

Stormwater is the single most obvious source of replacing potable water-use for golf in urban areas. A number of clubs have been pro-active and have embarked upon or completed infrastructure projects to provide themselves with plentiful supplies of low-cost or no-cost stormwater for irrigation.

Riversdale Golf Club, located in Melbourne's eastern suburbs, is one club which can claim substantial progress towards drought-proofing. Over a 15-year period the club has transformed its water use circumstances through a dual strategy of harvesting stormwater and replacing its fairways with Santa ana.

In excess of $1 million has been spent to construct dams, re-build golf holes and erect bridges. In the process the Damper Creek, which dissects the course, has been transformed from an overgrown, weed-infested urban drain into an attractive chain of water ponds which add to the character of the golf course.

Importantly, the club's water storage has been expanded from six megalitres to a total of 50 megalitres and engineered to capture stormwater flows across the entire golf club site and via Damper Creek.

Curiously, the project started out as creek beautification. As it progressed, the multiple benefits of stormwater harvesting, water purification, flood retardation, silt retardation and enhanced environmental amenity became evident.

Melbourne Water became a cooperative ally in the project, providing regulatory approval and contributing some funds and technical advice. The project earned the support of the Friends of Damper Creek, a local environmental protection group, and in 2004 received an engineering award for design on difficult sites.

An unexpected outcome of the project is increased environmental awareness among the club's membership. Members have taken an interest in the water savings, grass plantings which fringe the water ponds, the introduction of silver perch fish and new sightings of ducks, cormorants and pelican.

MELBOURNE'S SOUTH-EAST

Stormwater harvesting programs are in place in a number of golf clubs in the south-eastern extremities of the extended sandbelt area in Melbourne.

As far back as the 1960's the Keysborough Golf Club was forward-thinking in establishing an agreement with Melbourne Water to divert stormwater to holding dams from the Edithvale Drain which flows along the club's northern boundary and then underground across part of the course. During the late 1980's the club improved the system by adding extra storage ▶

capacity. Apart from providing a good supply of adequate quality irrigation water, the system has served as a retarding basin and reduced the quantity of stormwater which ultimately flows into Port Phillip Bay.

Nearby at Southern Golf Club, a major project to replace potable water use with stormwater was implemented during the 1990's, while further to the south-east Cranbourne Golf Club has a secure water supply derived from a stormwater capture project implemented during the early 1990's.

Nearby to the north, the Kingswood and Spring Valley golf clubs also have stormwater harvesting infrastructure in place with gravity diversion drains, pumping, lined storage dams, and storage tanks.

These clubs secure most of their annual course watering supply from stormwater and supplement with bore and smaller quantities of potable water. They maintain a watching brief over water quality and are conscious that back-up supplies from other sources may be needed in the future. The potential of recycled water from the Eastern Treatment Plant at Carrum is a subject of continued investigation.

In all of these cases the morphology of the golf course has been amended by the construction of dams, ponds and connecting water-courses which make up the storage systems.

The key design criteria for the golf clubs has been to enhance the golfing challenge and visual amenity at the same time as establishing sufficient storage to provide for irrigation needs throughout extended periods of dry, hot weather during the summer months. The sharp summer storms which occasionally punctuate Melbourne summers provide immediate stormwater flow and help to quickly replenish the golf course dams.

The forward planning which led to these developments was prompted by necessity, but in each case has been impressive. Storage capacities in these south-eastern Melbourne clubs are 200 megalitres at Keysborough, 35 megalitres at Spring Valley, 58 megalitres at Kingswood, 75 megalitres at Southern and 100 megalitres at Cranbourne.

SORRENTO GOLF CLUB

Sorrento Golf Club is about to reverse its growing vulnerability to water shortages through a beneficial partnership with the Mornington Peninsula Shire.

Immediately to the south of the main street of the Sorrento township, the land spills sharply to an expanse of low-lying terrain. A sports oval, tennis and netball courts, basketball stadium, bowling greens and scout hall are located here together with a wetlands area. During periods of heavy or extended rain the land and the buildings are subject to flooding.

Sorrento Golf Club is one of many courses in Victoria which is future-proofing its water supply

To relieve the risk of flooding, and as a source of irrigation water, the golf club was permitted in 1990 to construct a pipeline and pumping system to take excess water from the wetlands to a holding dam which was constructed nearby on the golf course. The club used the stormwater to top up supplies from bores which had sustained it throughout its history.

In recent times bore water flows and quality have declined at Sorrento. It has been necessary for the golf club to supplement its irrigation program with both stormwater and potable water. The worst period of the 2002-03 drought brought home to the club its growing vulnerability and led to a decision that an improved water solution was needed.

Prospects for supply of recycled effluent water were investigated without success and discussions were held with the Mornington Peninsula Shire to test the feasibility of securing increased quantities of stormwater. This proved successful and in May 2005 it was announced that a $250,000 grant had been allocated by the Victorian Government, Urban Stormwater and Conservation Fund to subsidise an expansion of the existing stormwater harvesting operation and "flood-proofing" of community areas.

A new wetland area and holding basin is to be established at the reserve below the Sorrento township to assist in flood control, water purification and reduction of flow into Port Phillip Bay. The pumping system to the golf course is to be upgraded and storage increased.

In addition, the club is progressing the replacement of its fairway grasses with Santa ana couch and has installed a new reticulation system as a means of water conservation. This is an expensive project for the golf club with some $600,000 in capital works committed, but it should ensure adequate and reliable future water and annually replace 20 megalitres of potable water with stormwater.

MELBOURNE'S YARRA COURSES

The golf clubs and public golf courses located in a ribbon along the Yarra River floodplain between Kew and Lower Plenty in Melbourne's north-east, all have a love-hate relationship with water. The river is both their lifeblood and their greatest threat.

Included in this cluster of high quality venues are the Kew, Green Acres, Latrobe, Heidelberg and Rosanna golf clubs and the Yarra Bend, Ivanhoe and Freeway public courses.

They each rely on the river as their sole source of irrigation water and between them they draw a total of some 840 megalitres annually from the Yarra under diversion licences. This has been a reliable and cost-effective arrangement throughout their history but signs of vulnerability have emerged and the warning bells are ringing.

During Victoria's extended recent drought all of the golf courses were subjected to enforced watering restrictions. Under a Drought Response Plan implemented by Melbourne Water for the Yarra River catchment, licensed water users were reduced to 50 per cent of their normal supply. The prospect of a further 50 per cent reduction was looming before the arrival of drought-breaking rains eased the situation.

During the period of restrictions, watering of golf course fairways was ceased causing

loss of conditioning, weed infestation and patchy turf. Any further tightening of the restrictions would have impacted upon teeing grounds and, ultimately, putting greens.

At times the Yarra becomes a demon for the golf courses. The river periodically breaks its banks in flood and the golf courses play an unavoidable water retardation role. Three floodings have occurred during the past two years, causing costly disruption and damage.

All of the Yarra golf clubs regard water as a key issue for their viability and future planning. All recognise the high vulnerability yet solutions to this vulnerability are not easily forthcoming. Some clubs have sought to establish storage dams to capture excess winter flows. Others have investigated recycled water options as a means to break their dependency on the river.

In each case they are faced with environmental issues arising from their location on the floodplain. Dam construction is not permitted if it will cause alteration to flow patterns or retained water volumes during flooding. Where dams are permitted, the spoil from construction must be removed completely from the floodplain, making this a cost-prohibitive exercise. Acquiring and storing recycled water seems not to be an option due to the risk of river contamination in the event of major flooding.

Some of the golf clubs have reduced water usage by replacing winter grasses with warm-season couch varieties. Freeway has achieved significant water savings by injecting soil wetting agents into its water supply lines. Latrobe Golf Club is continuing to explore an opportunity for the use of industrial grey water but progress has been hampered by environmental complexities.

RECYCLED WATER

The use of "fit for purpose" water is a key tenet of the new policy for Victoria. For many golf clubs this signals a future based on some form of recycled water, at least in the medium to long term. Recycled effluent water is the main opportunity for clubs which have no access or storage capacity to harvest stormwater.

Recycling is not new to golf. Successful projects are in operation in clubs of varying size and in locations spread throughout the state and in some cases have been operating for many years.

Grey water distributions to golf clubs range in volume from as little as 0.5 megalitres per annum up to 170 megalitres. The most obvious opportunities exist for golf courses which are located close to treatment plants or between a treatment plant and the point where water is released into a wetlands reserve or the sea. Elsewhere, the capital costs of establishing the infrastructure needed to distribute recycled water have generally been prohibitive, at least for a golf club working alone.

Some investigation of small-scale, high technology treatment plants has been undertaken within golf but the economics have not been favourable to date. This is expected to change in line with advances in technology and/or costs for potable water.

Not surprisingly, concerns exist within golf about the potential for detrimental impact on turf quality and the risk of health issues affecting golf club members, staff and neighbours. In addition to the VGA's research trials on salt-tolerant grasses, the Australian Golf Course Superintendents' Association, in conjunction with Barwon Heads Golf Club and Horticulture Australia is conducting research to assess the impact of recycled effluent water on soil and turf conditions.

This tertiary treatment plant in south east Melbourne supplies Class A water to turf facilities and other agricultural properties in the region

THE SANDBELT

Many of Melbourne's most famed golf clubs - Royal Melbourne, Victoria, Commonwealth, Kingston Heath, Huntingdale, Yarra Yarra - are at high risk due to their long-standing dependency upon a single or main source of water which is now under threat.

Since their establishment, bore water has been the sole or main source for their irrigation needs. All are now experiencing, or face the prospect of, declining flow rates and reduced water quality together with metering and measuring requirements and the likelihood of limitations and costs placed on groundwater usage.

Most have been forced in recent years to supplement their previously plentiful bore supplies by purchasing potable water during summer months. Huntingdale, which completed a major stormwater storage project in recent years, is the most protected of this group.

Further out in the "extended sandbelt" bore water has always been less accessible and many clubs have reduced their vulnerability by pursuing stormwater and recycling alternatives.

In June 1999, Pacific Coast Design approached the VGA to participate in a series of information-sharing and planning forums on this issue. Various clubs located in the 'inner sandbelt' region attended, together with representatives from VGA, Melbourne Water, and the City of Bayside. Alternative water reclamation technologies and distribution solutions were reviewed and costed with the help of professional consultants funded by Melbourne Water.

The concept was developed of a pipeline from the Eastern Treatment Plant at Carrum to distribute Class A water over a large section of the southern metropolitan area for use in irrigating golf courses and community parks and gardens. Other golf clubs, located in the outer extension of the sandbelt closer to Carrum, also conducted investigations into the potential of recycled water for irrigation.

Over the past two years the sandbelt golf clubs have strongly embraced and pursued this project in conjunction with affected city councils. An information brochure on the project has been developed and discussions are in progress with relevant government and regulatory bodies. The Victorian Government identified the "Sandbelt Recycling Project" for its potential major significance and listed it in the White Paper as a project to be considered for state-level funding support.

Since that time broader interest has emerged among potential industrial users and the cities of Bayside, Kingston and Dandenong, adding depth and variety to the project which is now referred to as the South East Community Water Recycling Scheme.

THE MORNINGTON PENINSULA

In recent years the Mornington Peninsula has seen a wealth of golf course development and the area is now a world-class golfing destination. Water is shaping as the most likely threat to the realisation of this golfing potential.

The peninsula courses draw their water largely from bores which have previously been plentiful in supply. Drought, expanded usage and competition from other users has depleted the groundwater supply and water for irrigation has become an increasing area of concern.

The presence of the outflow pipeline which traverses the Mornington Peninsula from the Carrum Treatment Plant to the ocean at Cape Schanck represents an obvious opportunity for replacing bore water use. In May of 2004 a public meeting of groundwater users was called at Boneo to discuss emerging supply problems and to investigate interest in a scheme to bring recycled Class A water to the area.

Representatives of golf clubs, vegetable growers, orchardists, vignerons and environmentalists attended along with local politicians and officials from Mornington Peninsula Shire Council, Southern Rural Water, South-East Water and Melbourne Water. The water authorities warned that aquifer deterioration was evident in the area and could lead to intrusion by sea water.

Water users were put on notice that meters were to be installed on all bores, no increases would be granted to groundwater licence holders seeking increased water allocations and the building of new dams to catch run-off would not be permitted in the area.

The meeting discussed possibilities for the introduction of Class A recycled water taken from the Carrum Treatment Plant pipeline at Boneo. Melbourne Water officials advised that Class C water was currently achievable but that a local treatment plant would be needed to amend the water to Class A standard.

Four delivery and distribution options to supply 3.1 gigalitres of Class A water annually were identified for feasibility testing. Of this total some 20 per cent was sought for golf with agriculture and industrial users accounting for 75 per cent. Capital construction costs for the required pumping station, treatment plant and pipeline network were estimated at between $11 and $34 million, depending on the distribution option.

The meeting agreed to form a steering committee to work with water authorities and local government to investigate the establishment of the Nepean Sustainable Water Scheme. Among the golf clubs Portsea, Sorrento, The Dunes, Moonah Links, Eagle Ridge, Rosebud, Shearwater, The National and St. Andrews Beach all indicated interest.

ACKNOWLEDGEMENTS

ATM is grateful for the assistance of the Victorian Golf Association in allowing extracts of the VGA's report 'Sustainable Water for Golf in Victoria' to be printed in the magazine. The full report, authored by Doug Fox, can be downloaded from the VGA website www.golfvic.org.au.

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BY JOHN NEYLAN

The Hills Golf Course in Queenstown, NZ

SOUTH ISLAND FINE TURF SEMINAR IN NEW ZEALAND

In this instalment of AGCSATech Update, John Neylan recounts his trip to New Zealand for the South Island Fine Turf Seminar and pays tribute to well-respected turf manager Craig Berwick who died in May.

I was fortunate to be invited to participate in the South Island Fine Turf Seminar at Queenstown in New Zealand recently, and as with all my visits to the Shaky Isles the hospitality was second to none and a most enjoyable experience. Queenstown is a spectacular setting with the snow capped Remarkables mountain range and Lake Wakatipu providing prominent backdrops.

Queenstown and the region in general is becoming a mecca for golf with the Millbrook Country Club the first resort course in New Zealand. It is a beautifully presented championship layout with a stunning mountain backdrop. Browntop bentgrass (var. Egmont) is used on the greens while the fairways are browntop bentgrass and fine fescue. The fairways were of exceptional quality.

Queenstown is the in-place for development at present and the same can be said when it comes to golf course construction. There are two new championship layouts being completed at present, including The Hills Golf Course and Jacks Point.

The Hills is a layout that beautifully utilises the rocky outcrops and mountain backdrops as well as ponds and wetlands. Jacks Point is in an exceptional location with the course bordered by Lake Wakatipu on one side and The Remarkables on the other. The course has been routed through rocky outcrops and utilises the vista of mountains and lake to perfection.

The development of the turf on both new courses has been exceptional with the use of browntop bentgrass (var. Egmont) on the greens and fine fescues and browntop bentgrass on the fairways at The Hills and fine fescue on the fairways at Jacks Point.

In addition to these courses, there are two hidden gems in Kelvin Heights Golf Course and Arrowtown Golf Course. Kelvin Heights sits out on a headland that is surrounded by the lake on three sides. The backdrops to the course are stunning on all sides including the ever-present mountains. The golf course is a typical New Zealand parkland course with brown top fairways and Egmont greens that are very well presented.

The Arrowtown Golf Course is amazing in that the fairways run between parallel rocky ridges which require a straight shot from the tee. The contrast between rock and the very well maintained turf provides a unique and rugged layout.

The seminar was attended by over 120 golf course superintendents and turf managers, with a number of topics discussed. Environmental management was one of the hot topics and while New Zealand is yet to face the same level of environmental scrutiny, recent legislation will require a greater attention to issues such as chemical storage and washdown facilities.

Aside from that, it was also interesting

to note that some of the age-old problems associated with thatch accumulation, the control of moss and the effects associated with dry patch still remain key topics of discussion.

CRAIG BERWICK (1955-2006)

In May the Australian turf industry lost one of its real nice guys, Kooyong Lawn Tennis Club head curator Craig Berwick. Both as a person and as a turf manager Craig was highly regarded and this was reflected in the number of people who turned out for his funeral.

When I started in the turf industry over 20 years ago, Craig was one of the first turf managers I met, working as he did then at Kooyong which was the home of the Australian Open.

As a newcomer to the turf industry I was in awe of Craig and the prestige facility he managed, particularly as we were about the same age. On meeting Craig for the first time I was immediately put at ease by his friendly smile and easy-going manner.

Over the years that I knew Craig, he never had a bad word to say about anyone, regardless of what may have been happening. In an industry that lets itself down from time to time with its rumour-mongering, he was a gentleman in the purest sense of the word. When chatting with several turfies at the funeral and since, everyone remarked on this attribute. He was a genuinely nice guy.

When the Turf Grass Association of Australia was formed in 1990, I somehow ended up as president with Craig as vice-president. The first TGAA committee was comprised of a number of enthusiastic and strong personalities who were keen to establish an association that would represent all those in the turf industry.

As with any embryonic organisation there were many things to be done and lots of ideas as to the direction that the association should take. Craig, despite his quiet manner, always had the knack of cutting through the crap and was one of the more formative people during those early days.

Craig took over as president after me and then had another stint when Scott Bolton resigned. He was a strong, stabilising personality who was always prepared to do his bit.

Craig was the turf manager at Kooyong Lawn Tennis Club for over 20 years in which time he saw the movement of the Australian Open to Melbourne Park, the installation of a rebound Ace surface on the famous centre court, hosting of the prestigious Kooyong Classic (lead-up event to the Australian Open for men) as well as the occasional Davis Cup tie. In that time, Kooyong has developed into more than just a lawn tennis club but into a multi-faceted recreational facility.

The turf industry is not renowned for its longevity of employment. It is a demanding profession and for Craig to have worked at the same venue for such an extended period is a reflection of his work ethic, experience and personality.

Craig was a mentor to numerous turfies that have either worked for him or been at other facilities. His staff at Kooyong will surely miss him as well as all that knew him. Thanks Craig for your influence on the turf industry and God Bless.


Arrowtown Golf Course, NZ

DISEASES

During the past summer and early autumn, the amount of disease activity has been unprecedented in the severity and the variation of disease organisms.

SUMMER ROOT DISEASES IN BENTGRASS AND *POA ANNUA*

The past summer in Sydney was the hottest on record. The humidity was high and heavy rainfall in January really started the cycle. The high temperatures alone placed an enormous stress on bentgrass and *Poa annua* putting greens and there were numerous examples of turfgrass loss as a result.

With bentgrass and *Poa annua* under stress and with weakened root systems, the turf was highly susceptible to *Rhizoctonia* sp. and *Pythium* sp. with Take All (*Gaeumannomyces* sp.) also being occasionally found.

The disease concerns are a reinforcement of the ever-increasing issue of trying to maintain and sustain high quality putting surfaces at low cutting heights during periods of stress. It was interesting to note that wherever there was an additional stress applied such as wear from foot and machinery traffic, the deterioration in the turf was accelerated.

While there are golfer demands for firmer and faster greens all year round, there are times when this demand is completely unreasonable and unsustainable. It is imperative that the cutting heights are lifted and the frequency of cut reduced during these stressful periods.

While it is less than desirable to apply fungicides unnecessarily, it is apparent in some areas that a preventative program over summer is warranted. This is particularly appropriate where high humidity and poor air movement are an issue and where *Poa annua* is the dominant grass species.

KIKUYU YELLOWS (*VERRUCALVUS FLAVOFACIENS*)

Warm-season grasses have also been affected over the summer and in particular kikuyu, where kikuyu yellows (*Verrucalvus flavofaciens*) has caused significant damage.

Kikuyu yellows is a fungal disease specific to kikuyu and the fungus spreads by waterborne spores and explains in part why infestations are associated with low lying areas, runoff areas and around sprinklers. In Sydney there was considerable rainfall in spring that may have provided sufficient soil moisture to trigger the disease.

Kikuyu yellows is a water mould which infects the roots, causing them to rot and this ▶

BY JOHN NEYLAN

Slime moulds are extremely varied in their appearance on turf and are not strictly fungi but are fungus-like

is followed by stem and leaf pathogens which lead to a bright yellow colouration. The disease is noticed in spring and progresses through summer and autumn. The fungus becomes inactive when minimum temperatures fall below 15°C.

Typical symptoms are circular patches of yellowing kikuyu swards and at times there is a reddish fringe around the edge of the affected area. In advanced cases, weeds invade the centre of the circle as the kikuyu is progressively destroyed. In the cases of sports turf areas the diseased area is invaded by couchgrass.

The yellowing, as such, is as much the result of stress caused by weakened roots lacking moisture and fertility. When examining infected plants the stolons are very thin and the root system is almost non-existent.

Kikuyu yellows is a significant disease in pastures and it has been reported that it not only moves through movement of surface water but also on cows' hooves. It is possible that on turf areas it is moved by machinery and foot traffic.

At present there are no fungicides available to control kikuyu yellows, though soil drenching with triadimenol has demonstrated some effectiveness. There is currently some research being undertaken looking at using the antifungal agents in Brassica species for control. The fungus becomes inactive when minimum temperatures fall below 15°C.

It is important to maintain adequate P and K levels within the plant. Benefit can be gained from applying N such as sulphate of ammonia once minimum daily temperatures fall below 15°C to assist in some plant recovery before spring. In pastures, one strategy that is recommended is to spray small patches of kikuyu yellows with glyphosate to 50cm into the healthy kikuyu to starve the fungus and stop further spread. It is recommended to then plant another grass species into the patch until healthy kikuyu can grow back into the treated area.

As kikuyu yellows is a water mould and possesses a flagellum that allows it to move in water, improving soil drainage and limiting run-off potentially provides the best form of control.

SLIME MOULD

"It's bright yellow and nothing like I have seen before!" This was the start of an interesting visit to a golf course that had patches of fungal type fruiting bodies of varying colours growing on a fairway. It certainly had me perplexed until plant pathology whiz Andrew Peart came up with the diagnosis - slime mould.

Slime moulds are extremely varied in their appearance on turf and are not strictly fungi but are fungus-like and generally classed as Myxomycetes (slime fungi). The slime moulds are primitive and can be described as a mass of cellular material which has no definite cell wall - a piece of slime (York, K. 1997).

When slime moulds are found in turf they are associated with decaying organic matter and do not appear to infect living plant material. The slime moulds for most of the time live as a layer of cells on the soil surface, however, with warm and wet weather the slime mould moves towards the surface.

At the surface the slime mould produces fruiting bodies which can be extremely colourful and in this most recent experience varied from dark grey to bright yellow. They change colour over time as they mature producing large numbers of spores. The visible symptoms may only remain for a few days. If the presence of the slime mould results in an unacceptable appearance it can be mown, swept or washed away. There is no need for chemical control.

REFERENCES

York, K. 1997. *Slime moulds - something a little different. Turfgrass Bulletin. Issue 195.*

Slime moulds can change colour over time as they mature producing large numbers of spores

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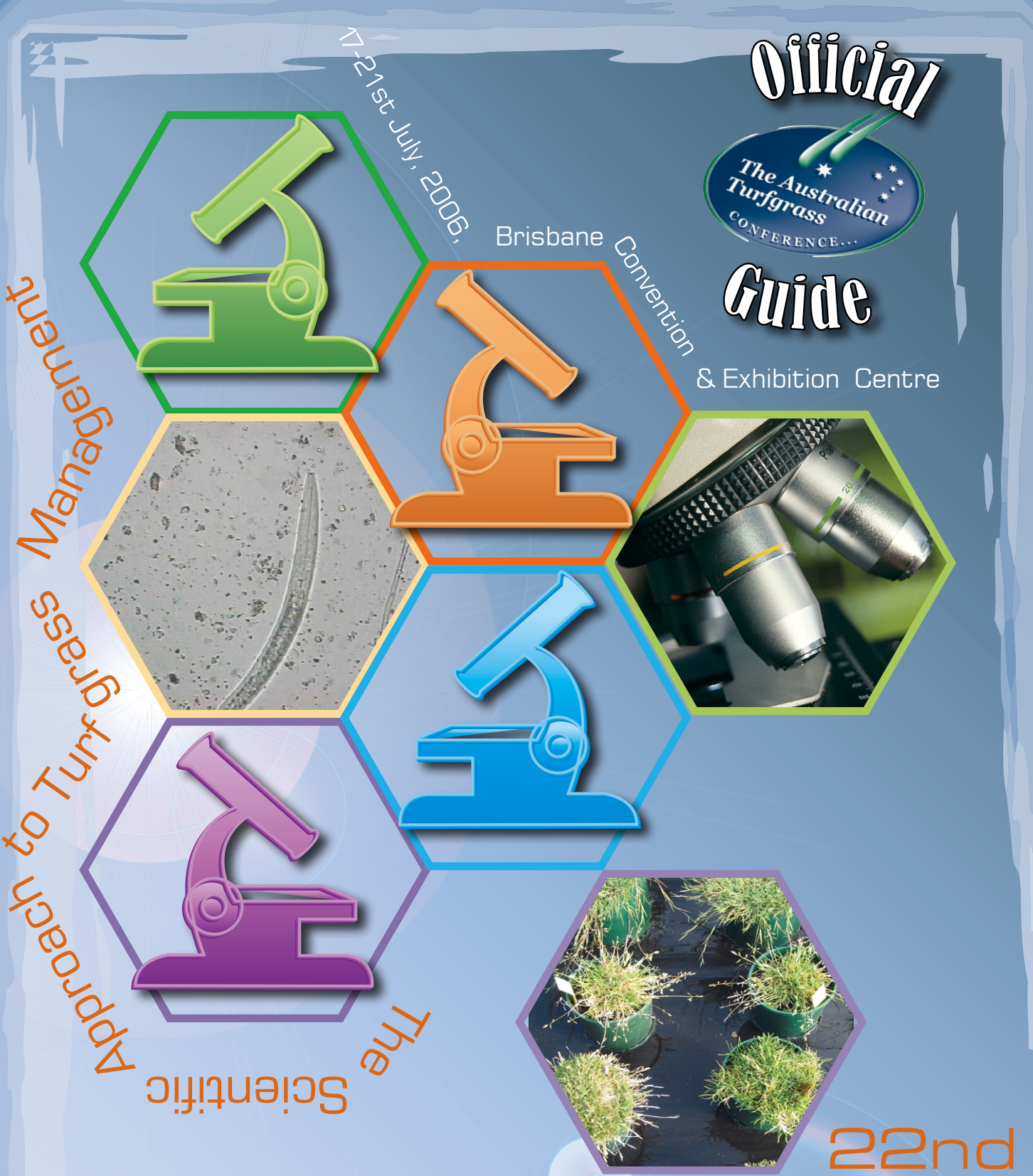


22nd Australian Turfgrass Conference and Trade Exhibition

22nd Australian Turfgrass Conference - Brisbane 2006

Brisbane last hosted the Australian Turfgrass Conference in 2002

WELCOME TO BRISBANE

Welcome to the official guide of the 22nd Australian Turfgrass Conference and Trade Exhibition which will be held at the fabulous Brisbane Convention Centre. Having recently completed hosting our bi-annual State Presidents meeting and touring the convention centre, I can inform conference delegates that all is in readiness, even the weather! Beautiful clear days with cool mornings and warm afternoons have been ordered so all delegates can bring their families or partners and stay on for another week.

The AGCSA staff have again done an excellent job in organising a very informative education section, with a number of outstanding speakers, both international and national, set to present on a wide variety of topics. Then, of course, there are our famous social functions throughout the week which are sure to be a highlight, including the AGCSA Golf Championships and Corporate Cup which kick off the week on Monday at North Lakes Golf Club and Brisbane Golf Club.

I very much look forward to catching up with all delegates in Brisbane, especially those joining us for the first time from the golf management, sportsfield management and turf mechanics streams Finally, a big thank you to all our trade exhibitors in anticipation for what we hope will be the largest trade gathering in the event's history.

JEFF GAMBIN
PRESIDENT, AGCSA

The Sunshine State plays host to the 22nd Australian Turfgrass Conference from 17-21 July, returning north after a four-year hiatus. ATM looks ahead to the week-long event which will bring together turf managers, superintendents, trade representatives, researchers and turf mechanics from across Australia and around the world.

Welcome to the 22nd Australian Turfgrass Conference guide which forms part of this edition of Australian Turfgrass Management magazine. As in previous years ATM will act as the official conference guide for the turfgrass industry's premier event in 2006.

Following on from the last major metropolitan conference (Melbourne 2004) which was the largest turf industry gathering ever in the Southern Hemisphere, the conference heads to Brisbane in 2006. The last time the conference was in Queensland's capital in 2002 over 800 delegates attended with 60 companies exhibiting at the tradeshow, and all indications are that this year will be even bigger.

Over the course of the next 22 pages we will provide you with a comprehensive preview of the week-long event including a full rundown of the keynote speakers and education sessions, a look at the two major golf championships, as well as a wrap of the prestigious AGCSA Awards, including a special look at this year's Graduate of the Year finalists. An easy reference conference program, which covers all education streams, social functions and events, has been included, while those companies exhibiting at the two-day tradeshow outline the products they will have on display.

THE SCIENTIFIC APPROACH TO TURFGRASS MANAGEMENT

Three education streams will be offered in Brisbane – golf course management, sportsfield management and turf mechanics. The conference will bring together some of the most learned turfgrass practitioners from Australia and around the world who will present on a wide variety of topics from personnel management through to water management and disease management.

Full profiles of the keynote speakers that will be presenting in Brisbane are provided on page 35. Some of the keynote presentations to watch for during the 22nd Australian Turfgrass Conference include:

Professor Fred Yelverton (North Carolina State University)

- Future trends in turfgrass weed management
- Weed management with new herbicides

Dr Greg Moore (University of Melbourne)

- Managing aged trees

Professor John Haydu (University of Florida)

- Economic impacts of the turfgrass industry in the US

Dr Milton Engelke (Texas A&M University)

- Rootzone organic matter management
- The use of turfgrass groomers on health of greens

Billy McMillan (British International Golf Greenkeepers Association)

- Greenkeeping is a tough business
- Communication is the key to success

David Howard (New Zealand Sports Turf Institute)

- Decision-making based on course quality evaluations

Other major presentations include John Neylan (AGCSATech) and Don Loch's (QDPI) discussion on recent turfgrass research trials, while John Forrest from Challenger TAFE in WA looks at irrigating sand profile golf greens. Jyri Kaapro from Bayer Environmental Science examines the process of developing chemicals for turf application, while Barry Beckett from Toro will discuss future directions in turfgrass maintenance.

The sportsfield management stream also includes seminars on determining the renovation requirements for sportsfields (David Howard, NZSTI), cricket wicket preparation in the UK (Robert Savedra, Wesley College), irrigating sportsfields with effluent water (John Forrest) and environmental management (Terry Muir). Craig Henderson (QDPI) will look at AFL ground monitoring while Keith Kinsett (R&K Kinsett) will discuss sand injection. Craig Day from WACS will also be returning to look at sprayer calibration.

A feature of both the golf management and sportsfield streams will be the Syngenta Disease Diagnosis Workshop hosted by Dr Alan Windham from the University of Tennessee.

The half-day workshop is designed to explain and demonstrate pathogen identification processes with delegates taking part in hands-on disease diagnosis. The workshop is inclusive to all fully registered delegates and day delegates, however numbers are limited to 40 so be sure to register early.

As in Melbourne two years ago, the turf mechanics stream will include presentations from various companies including Toro, Lanatec, Loctite, Jacobsen, John Deere, Lubrimax Oils, CBC Bearings and CR Seals. As well, Terry Muir will conduct a seminar on environmental issues concerning workshop areas, Craig Day looks at the mechanic's role in sprayer configuration, while Stephen Bernhard looks at the role grinders can play in the health of turf.

PARTY TIME

The start and finish of conference will again be highlighted by two of the industry's premier functions – the Bayer Environmental Science Welcoming Cocktail Reception and the Syngenta Conference Dinner.

This year's Bayer Environmental Science Welcoming Cocktail Reception, which will be held at the Gabba, is set to be a classic with the theme based around iconic 1980s golfing movie Caddyshack. Come dressed as your favourite character from the movie or just wear some really tacky plus-fours. Or if you're really going the whole hog, come dressed as the gopher!

A highlight of the night will be the Scotts Pool Competition to determine who the best pool players are in the turf industry. Teams of two will take part in a knockout format, so get together with a mate and sign up. With places limited, registrations will be taken through the AGCSA website, or if there are any places left you can register on the night. More information will be made available through the AGCSA website.

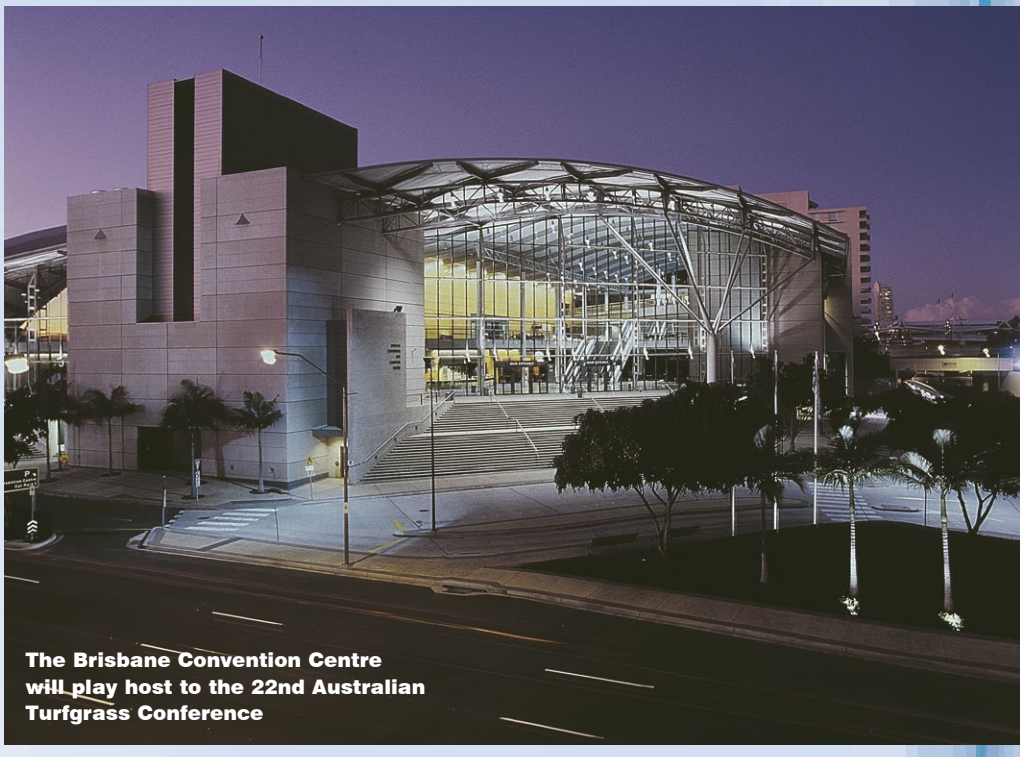
The Syngenta conference dinner on Thursday evening will wrap up the formal part of conference week. The jacket and tie dinner will be held in the Plaza Ballroom of the Brisbane Convention Centre and will again prove to be a great night of entertainment, fine dining and a great way to say goodbye to colleagues from around the country.

2006 TRADE EXHIBITION

One of the highlights of the 2006 conference will be the two-day tradeshow held on the Wednesday and Thursday at the Brisbane Exhibition Centre. Over 10,000m^2 of exhibition space will be packed wall-to-wall with the latest turf equipment and products the industry has to offer. (In the second part of this conference guide there is a comprehensive 10-page listing of exhibitors as well as a handy reference map to navigate your way around the various displays).

Brisbane will see a number of new companies exhibiting at the Australian Turfgrass Conference for the first time, including Namaway Environmental Group, Water Equipment Technology, East Coast Turf Renovations, JRM Inc., Becker Underwood, PJC Sportsturf, Grovely TAFE, PGG Wrightson, Conquest Couch Growers Association, Princess Turf and Albright.

A new feature at this year's trade exhibition will be a dedicated area in the centre of the tradeshow for product launches. There, companies will be able give 10-minute presentations to delegates about their new ▶



The Brisbane Convention Centre will play host to the 22nd Australian Turfgrass Conference

22nd australian turfgrass conference programme

The 2006 tradeshow will again showcase some of the turf industry's finest companies

products to hit the turf market or talk about their company and its place within the industry. At this stage there will be presentations from the likes of Toro, Rain Bird and Floratine. And speaking of product launches, between 12.30-1.30pm on the Tuesday, Toro will be hosting lunch has part of a product launch.

The tradeshow is free to enter, but for those who are planning on attending the tradeshow only (ie: those that haven't registered for other parts of the conference), you are required to register before entering. In order to speed up this process, a tradeshow registration form is available on the AGCSA website. Simply fill it in and send it into the AGCSA.

TURF TOURS

As in previous years, the 22nd Australian Turfgrass Conference will conclude on Friday (21 July) with the very popular post-conference turf tour. This year's tour will take in four venues, starting at one of Brisbane's most respected layouts Royal Queensland Golf Club (superintendent Kelly Hyland).

From there delegates will take in the city's prime sporting arena The Gabba before heading to the recently-completed Pacific Harbour Golf Club on the environmentally sensitive Bribie Island (superintendent Marcus Hartup). The tour will then conclude with a visit to one of Australia's foremost turgfrass research facilities, Redlands Research Station. Buses will depart from the Brisbane Convention Centre's main entrance at 8am sharp on Friday.

The turf mechanics will also hold their turf tour on Friday with visits to the Dick Johnson Racing compound, Hope Island Golf Club and the John Deere warehouse.

PARTNERS PROGRAM

In 2006, to welcome partners of delegates to the 22nd Australian Turfgrass Conference, a complementary luncheon and river cruise will be held.

Meeting at Eagle St Pier on Monday, 17 July, partners will board the Kookaburra River Queen paddlesteamer at 12 noon for a leisurely buffet lunch cruise which takes in many points of interest along the river bank. The cruise returns to dock at 2pm.

It is hoped this informal function will be just the beginning of a memorable week where new friendships are formed and past ones renewed. There is no cost to partners of conference delegates for this function. For more information about the partners program contact Simone Staples on (03) 9548 8600 or email simone@agcsa.com.au.

2006 AGCSA AGM

The 2006 AGCSA annual general meeting will be held on Wednesday, 19 July during the conference. The positions of AGCSA president and Board member will be decided upon. The AGM will be held in Hospitality Suite 1 of the Brisbane Convention Centre and starts at 5pm. For more information email Steven Potts steven@agcsa.com.au or call the AGCSA office (03) 9548 8600.

REGISTER NOW

Although the conference is now just a few weeks away, there is still plenty of time to register. Log on to the AGCSA website (www.agcsa.com.au) to download a delegate registration brochure or call the AGCSA office (03) 9548 8600.

The cut-off date for registration in the lead-up to the conference is Monday, 3 July. After that time the AGCSA asks those who wish to attend the conference to register at the dedicated registration desk which will be set up at the Brisbane Exhibition Centre. For those who attended the 2002 conference in Brisbane, the registration desk will be set up in the same place, just inside the entrance from Rydges.

Upon registering you will receive a conference satchel, sponsored this year by Mentay, which contains a wealth of product information from those companies exhibiting at the tradeshow, as well as copies of ATM magazine and the conference proceedings.

So all is in readiness for what is set to be another fantastic turf industry gathering. The AGCSA trusts all delegates have an informative and entertaining week and we look forward to seeing you in Brisbane.


Speakers have been drawn from Australia and some of the world's finest turfgrass institutes

KEYNOTE SPEAKERS

DR MILTON ENGELKE

Dr Milton Engelke, Ph.D. joined Texas A&M University in 1980 as professor in turfgrass breeding genetics and management. Over the past 25 years Dr Engelke has developed 19 turfgrass cultivars on five different species including buffalograss, zoysiagrass, Chewings fescue, annual ryegrass and creeping bentgrass. Dr Engelke's research in recent years has led to the development of cultural practices which optimise performance of new and existing turfgrasses. Dr Engelke has served on the GCSAA's teaching faculty over the past 15 years and has conducted numerous workshops on bentgrass management, rootzone maintenance, zoysiagrass management and turfgrass identification. Dr Engelke's efforts continue in developing seeded and vegetative bentgrass cultivars with multiple physiological characteristics.

PROFESSOR JOHN HAYDU

Professor John Haydu holds the position of professor and agricultural economist with the University of Florida and is based at the Mid-Florida Research and Education Center in Apopka. Professor Haydu has been working for the University of Florida since 1988 with primary efforts targeted at the nursery and greenhouse industries. Professor Haydu's research has focused on assessing the size, structure and economic importance of these two industries. Professor Haydu's research acts as leverage with legislators when confronted with potential regulations or restrictions including land, water, and agricultural chemicals used in the production process. In the turfgrass area, Professor Haydu has conducted research into the sod production industry in both America and New Zealand and as part of his two keynote addresses in Brisbane will present the key findings from these projects.

PROFESSOR FRED YELVERTON

Professor Fred Yelverton, PhD. is a professor of crop science at North Carolina State University (NCSU). Professor Yelverton is also co-director of the Center for Turfgrass Environmental Research and Education, and conducts research and extension programs in the area of turfgrass weed management and plant growth regulators. He also teaches a course in turfgrass weed management at NCSU. Professor Yelverton's research interests include the biology and ecology of weeds and the development of environmentally sound weed management systems for both warm and cool-season turfgrasses. He also has an active research program in turfgrass responses to plant growth regulators. Professor Yelverton advises graduate students in weed management and in Brisbane will talk on the future trends in weed management.

BILLY MCMILLAN

Billy McMillan joins the 22nd Australian Turfgrass Conference from the vice-presidents chair of the British and International Golf Greenkeepers Association. Mr McMillan will bring over 28 years of greenkeeping experience as course manager/head greenkeeper at many golf clubs including Sunningdale Golf Club (ranked 33rd in the UK). Mr McMillan's career to date has included many major tournaments, alterations and remodelling projects. Tournaments include the 1986 European Open Championship, 1987 Walker Cup and 1986 Brabazon Trophy. In 2003, Mr McMillan started his current role as course manager at Tyrrells Wood Golf Club. Mr McMillan will educate conference delegates on the vital importance of communication strategies and commitees, as well as turf management issues affecting United Kingdom golf courses.

ALSO PRESENTING IN BRISBANE

John Neylan (AGCSATech)
Andrew Peart (AGCSATech)
Don Loch (QDPI)
John Forrest (Challenger TAFE)
David Howard (NZSTI)
Barry Becket (Toro)
Jyri Kaapro (Bayer)
Dr. Greg Moore (University of Melbourne)
Ass. Prof. Neal Menzies (ASSS)
Robert Savedra (Wesley College)
Terry Muir (EBS)
Keith Kensett (R & K Kensett)
Craig Day (WACS)
Matt Roche (QDPI)
Craig Henderson (QDPI)

DR ALAN WINDHAM

Since 1995, Dr Alan Windham has held the position of professor with the Entomology and Plant Pathology Department at the University of Tennessee along with his role as Plant and Pest Diagnostic Centre coordinator. His core responsibility is to provide leadership for an educational program, which makes available up-to-date plant disease information to extension agents and through them to Tennessee turf managers and producers. Dr Windham completed his Bachelor of Science in Plant Pathology and Weed Science and his Masters of Science in Plant Pathology at the Mississippi State University. Dr Windham then completed a Ph.D. in Plant Pathology at North Carolina State University. Dr Windham has written a wealth of books, bulletins, reports, circulars, pamphlets and fact sheets and has refereed articles and reviews appearing in peer reviewed professional journals.

A great week awaits you...thanks to the support of these sponsors

TORO — AGCSA Golf Championships and Lanyards

Bayer Environmental Science — Welcoming Cocktail Reception

Mentay — Conference Satchels

Scotts — Pool Competition

syngenta — Conference Dinner

2006 AGCSA Awards – Recognising Excellence

A strong field has again been nominated for the latest round of AGCSA Awards which will be handed out during the 22nd Australian Turfgrass Conference in Brisbane. ATM looks ahead to see who will be inducted into the 'Class of 2006'.

2005 DSA winner Peter Brown

Every year the AGCSA rewards excellence in the golf course maintenance industry at its annual awards ceremony held during the Australian Turfgrass Conference. The AGCSA Awards represent the ultimate in recognition for members of the industry, and in turn provides the perfect opportunity for the industry to collectively honour its outstanding achievers.

As in previous years, the AGCSA will bestow four awards – the Distinguished Service Award, Claude Crockford Environmental Award, Excellence in Golf Course Management Award and Graduate of the Year (see page 38 and 39 for a rundown of Graduate of the Year finalists).

Three finalists for each award (excluding the Distinguished Service Award) will be selected with the finalists provided with flights and three night's accommodation to attend the final judging session prior to the start of the Brisbane conference. Each award winner will receive a prestigious AGCSA trophy, framed certificate and complementary travel and accommodation to the 23rd Australian Turfgrass Conference to be held in Cairns in 2007.

DISTINGUISHED SERVICE AWARD

Presented in partnership with Scotts Australia Scotts

Without a doubt the premier award to be handed down every year, the AGCSA Distinguished Service Award is bestowed by the AGCSA Board in recognition of an individual that has left an unmistakable mark on the golf course maintenance industry through their many years of service.

The award takes into consideration all aspects – the direction and inspiration handed down to generations of golf course superintendents, involvement at state and national levels, education, communication and research.

In 2005, Moama Bowling Club proved a fitting location as New South Welshman Peter Brown was bestowed the award as recognition for his more than 40 years' service to the wider turf industry. Brown encapsulated the essence of the Distinguished Service Award, having been a bowling greenkeeper earlier in his career before turning his hand to lecturing at the Ryde School of Horticulture and then superintendent at The Lakes in Sydney which hosted the 1993 Australian Open.

In winning the award, Brown joined a prominent list of previous winners including Professor Peter Martin, Peter McMaugh, Bill Powell, Doug Robinson, Neil Adams and Vince Church.

"This is the biggest highlight of my career," Brown said during his acceptance speech in front of more than 200 peers at last year's presentation ceremony. "The AGCSA has meant a lot to me for a long time and I'm humbled to be here and to receive the support and recognition of those who are part of this fine industry."

In recent times, Brown completed his Masters degree in 2000 at the University of Sydney and has also working as a consultant for the NSW Department of Environment and Conservation to help it conduct a series of environmental assessments at 30 NSW golf courses.

AGCSA president Jeff Gambin lauded Brown for his contribution to the industry: "Peter has been a stalwart of the industry for many years, and I, like many other superintendents and turf managers, were fortunate enough to learn from Peter during his years as a teacher. Peter is an absolute gentleman and he truly embodies what this award is all about – someone who through their actions has made a long-lasting and indelible mark on the turfgrass management profession."

CLAUDE CROCKFORD ENVIRONMENTAL AWARD

Presented in partnership with Syngenta syngenta

In these times of heightened environmental awareness and regulation, the Claude Crockford Environmental Award takes on great significance. With golf courses now under increasing public and legislative scrutiny, environmental management has become a primary concern for the modern day superintendent.

The man who this award is named after was a champion of the environment, and the legacy Claude Crockford left at the famous Royal Melbourne Golf Club continues in this award which recognises excellence in golf course environmental management.

It has become one of the most highly sought after at the annual presentation ceremony and always attracts a highly competitive field of nominees.

Such has been the work by many superintendents around the country to improve their environmental management practices, last year's judges couldn't pick a definitive winner, deciding instead to bestow the award jointly to Queensland superintendents Ben Marshall (Club Pelican) and Scott McKay (North Lakes Golf Club). The duo beat home fellow Queensland superintendent Pat Pauli (Horton Park Golf Club), an achievement which was particularly sweet for McKay on account of having been a beaten finalist for the same award in 2004.

Joint 2005 Claude Crockford Environmental Award recipients Ben Marshall (left) and Scott McKay

Both courses are located within or near sensitive environmental areas and ecosystems, and through careful and precise environmental management techniques both McKay and Marshall have ensured their course's long-term sustainability by working in harmony with the surrounding environment.

For Marshall, the award provided a springboard for recognition at international level. At the 2006 GCSAA Conference in Atlanta, USA, Marshall was bestowed the GCSAA's Environmental Leaders International Golf Award, the first time an Australian or Southern Hemisphere superintendent has collected the award.

The recipient of the Claude Crockford Environmental Award must demonstrate a commitment to sustainable land management, long-term planning, community involvement and overall environmental stewardship of the golf course and its surrounding environment. Protection of indigenous plant and animal populations, restoration of habitat and a desire to protect sensitive areas are also highly regarded aspects of this award.

This year the Claude Crockford Environmental Award has a new sponsor in the form of Syngenta. Sam Hole, Syngenta's business manager for turf, said sponsorship of the highly credible award was in line with the company's strong stewardship policies and favourable environmental profile.

"Syngenta is an advocate for environmental best practice and is in full support of the AGCSA's initiative to publicly commend those who excel in this extremely important area," he said.

EXCELLENCE IN GOLF COURSE MANAGEMENT AWARD JOHN DEERE

Presented in partnership with John Deere

Golf course turf management in this modern era is without doubt a most challenging profession. With increased environmental, legislative and budgetary restraints, a superintendent must efficiently and effectively manage their staff to produce exacting playing standards for members and guests.

2005 Excellence in Golf Course Management winner Darren Jones

A living, breathing and highly sensitive natural environment, the golf course is the one area of a golf club which requires specialised management. No longer just mere grass cutters, today's course superintendents are highly trained professionals charged with the upkeep of multi-million dollar establishments which afford enormous benefits to the surrounding community and environment.

With an increasingly demanding golfing public and fierce competition between clubs to attract members and green fee players, course maintenance and reconstruction plays a vital role in the future viability of any club.

The Excellence in Golf Course Management Award seeks to recognise those superintendents who have achieved excellence in their profession within the past two years, whether it is in the presentation of their course or reconstruction.

Launched in 2001, this award has taken over the proud tradition of the previous AGCSA Fellowship Award. The successful candidate needs to provide a description of objectives prior to undertaking works, a description of the golf course prior to the construction/maintenance works, a description of works undertaken and a description of outcomes upon completion of works. The candidate must also demonstrate an extensive knowledge of turfgrass techniques and have a commitment to excellence in their approach to their role as course superintendent.

Previous winners of the award include a who's who of the Australian golf course maintenance industry, including current AGCSA president Jeff Gambin, Gary Dempsey, John Geary, Pat Pauli, Richard Forsyth and Peter Schumacher.

In 2005 Darren Jones from St Michaels Golf Club in Sydney walked away with the award from Graham Haynes (Armidale Golf Club, NSW) and Brett Chivers (Keysborough Golf Club, VIC).

"Winning the Excellence in Golf Course Management Award is certainly the highlight of my turf management career," said Jones. "Having been at St Michael's for only a few years, we have only just touched upon what we ultimately want to achieve. The real potential of the club has remained unharnessed for a long time and members and visitors alike are now starting to see the vision that has been generated through good planning and a supportive board."

AGCSA AWARDS HONOURS BOARD - 2000-2005

Distinguished Service Award	Excellence in Golf Course Management	Claude Crockford Environmental
2005: Peter Brown	**2005:** Darren Jones	**2005:** Ben Marshall and Scott McKay
2004: Ray Keane	**2004:** Peter Schumacher	**2004:** David Warwick
2003: Dene Goldsack	**2003:** Idris Evans	**2003:** Darren Watson and Spiros Skaftouros
2002: Peter Sawyer and Doug Robinson	**2002:** Gary Bass	**2002:** Jeff Austen
2001: Professor Peter Martin	**2001:** Mark Gahan	**2001:** Andrew Baker
2000: Peter McMaugh	**2000:** Allan Devlin	**2000:** Ben Tilley

2006 AGCSA Awards

Graduate of the Year

With the rise of dedicated turf education courses in recent times, the calibre of turf industry graduates increases from year to year, making the AGCSA Graduate of the Year Award one of the most difficult to judge. ATM profiles this year's contenders.

The Graduate of the Year Award rates as perhaps one of the most unique in the AGCSA Awards programme. Today's recipients will be tomorrow's superintendents and turf managers who will ultimately go on to play a major role in the development and direction of golf course maintenance in this country.

For the lucky graduate, the award provides a huge boost, helping to launch their career in the best possible way. For 2005 recipient Damien Bell from Wellington Golf Club, the job offers flowed thick and fast after he picked up the award in Echuca-Moama and not long after took up a position at Manly Golf Club in Sydney.

With Toro coming on board as award sponsor in 2004, a lucrative education package also goes the way of the winner. Bell, along with 2004 winner Craig Webley from Lakelands Golf Club in WA, were flown to the US to attend the Annual Winter School for Turf Managers at the University of Massachusetts.

As well as that, they took in the GCSAA Golf Show as part of the GCSAA's annual conference and toured Toro's headquarters in Minneapolis and manufacturing facilities.

The structure of the Graduate of the Year award was changed in 2004 and now nominees come directly from the individual state superintendent associations' graduate awards programs. In deciding upon who wins national honours, the judging panel will consider the graduate's academic achievements, career aspirations, ambassadorial skills and how winning the award will assist the graduate in meeting their career aspirations.

Just as a strong field gathered in 2005, another talented group will contest this year's award which will be handed out on Tuesday morning of conference week. Here are the finalists.

QUEENSLAND

Name: John Rusanow

Club: The Grand Golf Club

John Rusanow will fly the flag for the host state at this year's Graduate of the Year Award ceremony. Currently employed at The Grand Golf Club under superintendent and GCSAQ president Rod Cook, Rusanow served his apprenticeship at Arundel Hills Country Club from 2001-2004, during which time he completed Certificate II and III Horticulture (turf management).

Working at Arundel Hills under superintendent Jason Foster, Rusanow's work ethic was described as second to none and he quickly became an asset to the club.

"John's TAFE work was always first class," says Foster. "His willingness to learn was a very positive aspect of John's personality and he always returned from TAFE with new ideas and theories on course maintenance.

"John was in a difficult learning environment having to look after bentgrass greens in Queensland, but he approached it as a challenge and was always up to it."

Rusanow began as a greenkeeper at The Grand in 2004 where he has been active in all areas of course maintenance, including the construction of turf surfaces and the installation of drainage and irrigation systems. In 2005 he was named as the GCSAQ's Turf Apprentice of the Year.

WESTERN AUSTRALIA

Name: Blake Humble

Club: Lakelands Country Club

Western Australia's Graduate of the Year representative Blake Humble is set to have an interesting 23rd birthday. The Lakelands Country Club greenkeeper will celebrate his birthday on the same day that he is set to be grilled by the AGCSA Graduate of the Year judging panel (Sunday, 16 July).

Humble developed a taste for turf management while undertaking a landscape certificate. "Remembering back to my first day at TAFE, I saw some of the students from the turf class," recalls Humble.

"I thought to myself, 'That's what I want to do'. I continued studying in the landscape stream, and when the opportunity to perform work experience arose, I jumped at the chance and spent two weeks in the turf industry."

Humble was placed at one of WA's finest golf courses Joondalup Country Club and also spent a further week at Carabooda Turf Farm which gave him valuable insights into a career in the turf industry.

Humble continued to study full time in 2002, completing the Diploma in Horticulture. Immediately after completing that he was appointed as a full-time groundsman at Sun City Country Club, where he worked his way up to the position of qualified greenkeeper.

By the end of his first year at Sun City, Humble was performing all tasks of a normal greenkeeper, from mowing duties, fertilisation, pest and disease control, irrigation maintenance and so on.

During the summer of 2004/05 Humble was called upon to take over running of the course following the superintendent's resignation.

As well, Humble played a key role in planning and designing the construction of a new putting green and the reconstruction of the course's chipping and driving range practice facilities.

After his first year the general manager at the time called him to the office and stated the club would like Humble to further his studies. Jumping at the opportunity, Humble completed the educational component of his apprenticeship in 2005, receiving the Lecturers' Award at the TAFE's Turf Awards night.

That set him in good stead for the GCSAWA Awards and it was no surprise when Humble was named the GCSAWA Best Indentured Apprentice Award for 2006. Earlier this year Humble was appointed as leading hand at Lakalands Country Club.

ACT

Name: Andrew Job
Club: Federal Golf Club

ACT graduate finalist Andrew Job began his apprenticeship at Federal Golf Club in May 2002 and according to superintendent Stephen Lording has always been a keen, diligent employee showing exceptional promise in his chosen career path.

Job has been prepared to work long and exceptional hours far beyond the call of duty, performing such tasks as night insecticide spraying and the construction of Federal's new L-93 greens.

Not only has Job shown promise in the practical arena, he has also completed other courses including:

- ACT WorkCover, OH&S training and is currently the OH&S representative at Federal Golf Club; and
- Chemcert accreditation, and is now responsible in the training of all greens staff in the use of handling and application of chemicals;

During his apprenticeship, Job has taken on many responsibilities, including being:

- The stand-in mechanic responsible for maintaining and servicing equipment and machinery to a high standard;
- The irrigation technician, for which he was trained during the second year of his apprenticeship. This role entails repairing, maintaining and programming all the irrigation equipment on the course, and ensuring that the system is working efficiently;
- Spray technician whereby he was responsible for calibration of equipment, servicing and spraying of a range of pesticides.

Recently, Job was successful in winning the TGAA ACT/Southern Tablelands region turf award for apprentice of the year. This was achieved by displaying a consistently high standard of theoretical and practical assessment at the Canberra Institute of Technology in the Certificate III Horticulture (turf management).

Next year Job wants to complete Certificate IV in Horticulture (turf management). He then has aspirations of completing a Masters degree at Sydney University before heading overseas to pursue an internship with the Ohio State University program.

VICTORIA

Name: Troy Shepherd
Club: Thurgoona Golf Club

Should Victorian rep Troy Shepherd pick up the AGCSA Graduate of the Year Award in 2006 he will do so on his 24th birthday.

Shepherd is currently employed as a fourth year apprentice greenkeeper at Thurgoona Golf Club in Albury, but began his turf apprenticeship at Wodonga Country Club in 2003. He then moved on to the North Albury Sports Club where he worked on bowling greens and cricket wickets. He has now moved across to Thurgoona Golf Club where he is quickly becoming an asset for superintendent Tim Hicks.

"Troy has shown great enthusiasm for his chosen trade and excelled in both his TAFE studies and in the practical side at work," says Hicks. "He was given responsibilities such as organising renovations, working out soil tests and ordering fertilisers and chemicals. Troy fulfilled his duties to an excellent standard and will be a successful greenkeeper in the future."

Aside from his work at Thurgoona, for the past two years Shepherd has been a part of the crew working at Huntingdale Golf Club in the lead-up to and during the Mastercard Masters. His duties have included cutting the putting and chipping greens as well as assisting in the preparation of the bunkers and repairing fairway divots.

Shepherd has also excelled in his studies at Wodonga TAFE and was named as the best first, second and third year turf apprentice. That ultimately paved the way for him to win the VGCSA's Apprentice Greenkeeper of the Year at the association's recent AGM at Victoria Golf Club.

SOUTH AUSTRALIA

Name: Heath Deer
Club: The Grange Golf Club

Twenty-one-year-old Heath Deer will represent South Australia in Brisbane after recently being named as Graduate of the Year at the SAGCSA's AGM at Royal Adelaide Golf Club.

After completing his year 12 studies while living on Kangaroo Island, Deer moved away from home and was taken on at The Grange Golf Club in 2002 under superintendent Chris Klei. Deer was later awarded with an apprenticeship by the club in 2003 and since then has undertaken three years of turf management study at Urrbrae TAFE under Peter Le Riche.

NEW SOUTH WALES

The NSWGCSA was due to name its AGCSA Graduate of the Year Award finalist on 6 June.

The following five graduates were in the running for the NSW award: **Gareth Hammond** (Avondale Golf Club), **David Faggus** (Wallacia Panthers), **Nathan Jones** (Kangaroo Valley Golf and Country Resort), **Sean Sweeney** (The Vintage Golf Club) and **Sean Kingsley** (Yamba Golf Club).

AGCSA GRADUATE OF THE YEAR AWARD – PREVIOUS WINNERS

1996: Jason Blacka
1997: Ian Johnston
1998: Jason Garbutt
1999: Stephen Heskett (Federal Golf Club, ACT)
2000: Brett Barsby (Royal Queensland Golf Club, QLD)
2001: Scott Carruthers (Pennant Hills Golf Club, NSW)
2002: Glenn Dawson (Federal Golf Club, ACT)
2003: James Dalton (13th Beach Golf Club, VIC)
2004: Craig Webley (Lakelands Country Club, WA)
2005: Damien Bell (Wellington Golf Club, NSW)

The par 5 11th at North Lakes

2006 AGCSA Golf Championships – North Lakes Golf Club

TORO

The 22nd Australian Turfgrass Conference will tee off in style with the playing of the 2006 Toro AGCSA Golf Championships. Always hotly contested, a strong field has again lined up for the tournament which is hosted this year by North Lakes Golf Club. ATM previews the big day with North Lakes superintendent Malcolm Ollard.

One of Queensland's finest resort courses, North Lakes Golf Club, will play host to the 2006 Toro-sponsored AGCSA Golf Championships which will be contested on the Monday of conference week. Located just 30 minutes north of Brisbane, the 6455m par 72 course was designed by Graham Marsh and is operated by ClubCorp.

Maintenance of North Lakes is managed by The Golf Course Company and is home to superintendent Malcolm Ollard. The 38-year-old has recently taken over the day-to-day running of the course from last year's joint Claude Crockford Environmental Award winner Scott MacKay and is looking forward to hosting the championships for the first time.

"They can expect a pretty tough set up," predicts Ollard. "I'm certainly not going to make it easy for them. There are some gun golfers among them so hopefully the course will stand up to them. We'll have the greens running nice and quick."

Ollard, who originally hails from Tasmania and completed his turf apprenticeship in Launceston, looks after a crew of seven which includes three apprentices. Assistant superintendent is Mick Cornish, who originally hails from Victoria's Cobram Barooga Golf Club, and also on staff is Ollard's wife Tina which makes for some interesting workplace dynamics. "I may be the boss here, but she is certainly the boss at home," laughs Ollard.

North Lakes boasts TifEagle ultradwarf couch greens and Wintergreen fairways and tees, with over 90 bunkers and extensive ponds and wetlands adding to the challenging layout of the course. TifSport is used on the practice driving range and around the practice green.

The TifEagle greens are de-thatched and dusted fortnightly during the summer months followed up by a liquid feed. They are also given an application of fungicide once a month and Ollard also uses Primo which he says works well. Ollard cuts them at 3mm during the summer months, but for the AGCSA Golf Championships expects them to be up around 3.5mm.

"TifEagle is the best greens variety I have worked with," says Ollard. "We have hardly any problems with the greens as far as disease and insect damage is concerned and they provide a nice tight, firm putting surface. We try not to spray too much insecticide anyway due to our environmental policy."

Ollard and his crew operate under a strict set of environmental guidelines from the Pine River Shire, with the course located in a highly sensitive environmental area. The course is the major catchment for the North Lakes residential development, is bounded by the


North Lakes superintendent Malcolm Ollard

sensitive Salt Water Creek, contains a healthy population of koalas and is home to the very rare and very small Wallum Froglet.

Through the efforts of previous superintendent Scott McKay, North Lakes is ISO 14001 certified, while a number of programs have been implemented to further improve the course's status as an environmental leader.

One of those is reducing wetland nutrient levels as water moves through the course's waterways. In doing so North Lakes is helping to reduce the risk of residual nutrients building up in wetland areas from fertiliser application, reducing the risks of leaks in the irrigation system leading to nitrification of waterways, and reducing the risk of nutrient build up from adjoining farming properties and construction activities.

North Lakes also proactively aims to reduce the amount of chemicals applied to the course, and spends a lot of time raising the awareness of the surrounding community and how the course plays an important role in the local environment.

Working on a resort course brings with it its share of problems for Ollard. With the course playing host to numerous corporate days, there is plenty of turf ware caused by golf carts.

Being surrounded by residential blocks also has its drawbacks and North Lakes suffers its fair share of vandalism. The 11th green is a favourite target while pins and bunker rakes are also fair game.

So what awaits superintendents as they stride out to tee up for the AGCSA Golf Championships?

Holes one and 18 are tough opening and closing holes, both par fours. The 420m 18th is the number one stroke hole on the course, while the first green is heavily bunkered and slopes steeply off the back.

The course's signature hole – number three – requires a shot across water to an elevated, heavily bunkered green, while at 537m (off the black tees) hole seven is a monster dogleg par five that rates as the number two stroke hole.

One unique feature of the course are the distance marker poles located on the fairways. A regular feature on American courses, the blue and white stripped poles mark 200m to the centre of the green, while the black and white markers are 150m out.

The last time the AGCSA Championships were held in Brisbane, Glenelg Golf Club superintendent Daryl Sellar triumphed at Royal Queensland by one shot from Trevor Ridge. Ridge, who has gone on to win the title on the last two occasions at Metropolitan and Rich River, is predicted to be up among the frontrunners again.

However, the big threat to Ridge's dominance of recent years will come in the form of Royal Perth Golf Club superintendent Michael Dennis. Dennis qualified for the 2005 Australian Open at Moonah Links and after firing an opening round one-over missed on making the weekend rounds with a two-round score of +11.

The usual suspects will again line up for the stroke, including past winners Allan Devlin, Martyn Black and Anthony Toogood, while a veritable line-up of burglars will contest the stableford trophy, including former winner Peter Jans. Even Avondale Golf Club superintendent David Warwick will make an appearance. No doubt the comedy value will be immense.

On a sadder note, this will be the first AGCSA Golf Championships without former Red Jacket winner Colin Cowden. The former Rossdale Golf Club superintendent, who won the championships in 1995, passed away in January after a long battle with cancer.

While the AGCSA Golf Championships are underway at North Lakes, a strong field will be vying for the AGCSA's Corporate Cup which will be played at Brisbane Golf Club (host superintendent Ben Cavanagh). The Corporate Cup is open to all who aren't eligible for the AGCSA Golf Championships.

The AGCSA Golf Championships will tee up for a shotgun start at 8.30am. Buses to North Lakes will depart from the Brisbane Convention Centre main entrance at 6.30pm. The AGCSA Corporate Cup will have a 7am shotgun start, with buses to Brisbane Golf Club departing from 6am outside the convention centre.


North Lakes' signature hole, the 3rd


The par 5 531m 15th, the second longest hole at North Lakes

GOLF COURSE MANAGEMENT STREAM

SUNDAY 16TH JULY

8.00am
AGCSA Awards Judging.

3.00pm
Conference registration desk opens

MONDAY 17TH JULY

6.00am
AGCSA Corporate Cup. *Brisbane Golf Club*

6.30am
AGCSA Golf Championships. TORO
North Lakes Golf Course

8.00pm BAYER Bayer Environmental Science
Welcoming Cocktail Reception. *The Gabba*
and
Scotts Pool Competition Scotts

TUESDAY 18TH JULY *Great Hall 1 & 2*

8.00-8.15am
AGCSA Awards presentation. Distinguished Service Award. Proudly supported by Scotts Australia Scotts

8.15-9.15am
Future trends in turfgrass weed management. Professor Fred Yelverton, North Carolina State University

9.15-9.30am
AGCSA Awards presentation Claude Crockford Environmental Award. Proudly supported by Syngenta syngenta

9.30-10.30am
Overview of the golf industry in the USA. Professor John Haydu, University of Florida

11.00-11.15am TORO
AGCSA Awards presentation Graduate of the Year Award. Proudly supported by Toro

11.15-12.15pm
Organic matter management in the rootzone. The fight for pore space. Dr Milton Engelke, Texas A & M Research Centre

12.15-12.30pm
AGCSA Awards Presentation Excellence in Golf Course Management Award. Proudly supported by John Deere JOHN DEERE

12.30-1.30pm TORO
Lunch and product launch – ***proudly brought to you by Toro Australia***

1.30-2.30pm
Economic impacts of the turfgrass industry in USA. Professor John Haydu, University of Florida

Irrigating sand profile golf greens. John Forrest, Challenger Tafe

2.30-3.30pm
From AGCSA Graduate of the Year to the British Open. James Dalton, 13th Beach Golf Links

Greenkeeping is a tough business. Billy McMillan, BIGGA

4.00-5.00pm *Mezzanine 1*
Plant growth retardants. Andrew Peart, AGCSATech

WEDNESDAY 19TH JULY

8.00-9.00am *Mezzanine 4*
AGCSA Claude Crockford Environmental Award and AGCSA Graduate of the Year Award winners' presentations

9.00-10.00am *Mezzanine 4*
Turfgrass research trials. John Neylan, AGCSA and Don Loch, QDPI

Plaza 3 & 4
Management of golf course weeds with new herbicides. Professor Fred Yelverton, North Carolina State University

9.00-12.00am *Mezzanine 3*
Disease diagnosis workshop
Syngenta, Alan Windham, University of Tennessee

10.00am-1.00pm
Trade Exhibition, morning tea and lunch

1.00-2.00pm *Mezzanine 4*
Communication is the key to success. Billy McMillan, BIGGA

Mezzanine 3
The use of turfgrass groomers on the health and persistance of grasses. Dr Milton Engelke, Texas A & M Research Center

2.00-3.00pm *Mezzanine 4*
AGCSA Distinguished Service Award and AGCSA Excellence in Golf Course Management Award winners' presentations

5.00-6.00pm *Hospitality Suite 1*
AGCSA Annual General Meeting

THURSDAY 20TH JULY

8.00-9.00am *Mezzanine 4*
Decision making based on course quality evaluations. David Howard, New Zealand Sports Turf Institute

Mezzanine 1
Managing aged trees in mature landscapes. Dr. Greg Moore, University of Melbourne

9.00-10.00am *Mezzanine 4*
Future directions in turfgrass maintenance. Barry Beckett, Toro Company

Mezzanine 1
Sand injection process. Keith Kensett, R & K Kensett Ltd

10.00-11.00am
Trade Exhibition and morning tea

11.00-2.00pm *Mezzanine 4*
The road of turf chemical development. Jyri Kaapro, Bayer Environmental Science

Mezzanine 1
Soil testing regulations. Associate Professor Neil Menzies, Australian Soil Science Society

12.00-2.30pm
Trade Exhibition, lunch and afternoon tea

2.30-3.30pm *Mezzanine 4*
Comparison of UK golf courses. Robert Savedra, Wesley College

6.30pm
The Syngenta Australian Turfgrass Conference and Trade Exhibition Dinner– Brisbane Convention and Exhibition Centre
syngenta

FRIDAY 21ST JULY

8.00am
22nd Australian Turfgrass Conference Turf Tour: Pacific Harbour Golf Club, Royal Queensland Golf Club, The Gabba, and Redlands Research Station, QDPI

SPORTSFIELD MANAGEMENT STREAM

MONDAY 17TH JULY

6.00am
AGCSA Corporate Cup. *Brisbane Golf Club*

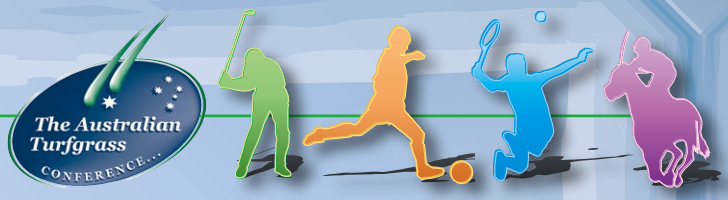
8.00pm BAYER Bayer Environmental Science
Welcoming Cocktail Reception. *The Gabba*
and
Scotts Pool Competition Scotts

TUESDAY 18TH JULY

8.00-8.15am *Great Hall 1 & 2*
AGCSA Awards presentation. Distinguished Service Award. Proudly supported by Scotts Australia Scotts

8.15-9.15am *Great Hall 1*
Future trends in turfgrass weed management. Professor Fred Yelverton, North Carolina State University

9.15-9.30am
AGCSA Awards presentation Claude Crockford Environmental Award. Proudly supported by Syngenta syngenta



9.30-10.30am
Overview of the golf industry in the USA. Professor John Haydu, University of Florida

11.00-11.15am TORO
AGCSA Awards presentation Graduate of the Year Award. Proudly supported by Toro

11.15-12.15pm
Organic matter management in the rootzone. The fight for pore space. Dr Milton Engelke, Texas A & M Research Centre

12.15-12.30pm *Great Hall 1*
AGCSA Awards Presentation Excellence in Golf Course Management Award. Proudly supported by John Deere
JOHN DEERE

12.30-1.30pm TORO
Lunch and product launch – ***proudly supported by Toro Australia***

1.30-2.30pm *Plaza 1*
Critical criteria for selection and utilisation of turfgrasses for sportsfields. Dr Milton Engelke, Texas A & M Research Centre

2.30-3.30pm *Plaza 1*
Management of sportfield weeds. Professor Fred Yelverton, North Carolina State University

WEDNESDAY 19TH JULY

8.00-9.00am *Plaza 1*
Irrigating sportsfields with effluent water. John Forrest, Challenger TAFE

9.00-10.00am *Plaza 1*
Determining the renovation requirements for sportfields. David Howard, New Zealand Sports Turf Institute

10.00-1.00pm
Trade Exhibition, morning tea and lunch

1.00-2.00pm *Plaza 1*
Changes to UK cricket wicket preparations. Keith Kensett, R & K Kensett Ltd

1.00-5.00pm *Mezzanine 3*
Disease diagnosis workshop
Syngenta, Alan Windham, University of Tennessee

2.00-3.00pm *Plaza 1*
Managing trees and predicting failure. Greg Moore, University of Melbourne

3.00-5.00pm
Trade Exhibition and afternoon tea

THURSDAY 20TH JULY

8.00-9.00am *Plaza 1*
Cricket wicket preparation in the United Kingdom. Robert Savedra, Wesley College

9.00-10.00am *Plaza 1*
AFL ground monitoring. Craig Henderson, QDPI

10.00-10.45am
Trade Exhibition and morning tea

10.45-11.30am *Plaza 1*
Environmental Management - A cost or investment? Terry Muir, EBS

11.30-12.15pm
Monitoring surface conditions at Suncorp. Don Loch & Matt Roche QDPI

12.15-2.00pm
Trade Exhibition, lunch and afternoon tea

2.00-3.00pm *Plaza1*
Sprayer calibration. Craig Day, WACS

6.30pm
The Syngenta Australian Turfgrass Conference and Trade Exhibition Dinner– Brisbane Convention and Exhibition Centre
syngenta

FRIDAY 21ST JULY

8.00am
22nd Australian Turfgrass Conference Turf Tour: Pacific Harbour Golf Club, Royal Queensland Golf Club, The Gabba, and Redlands Research Station, QDPI

TURF MECHANICS STREAM

MONDAY 17TH JULY

6.00am
AGCSA Corporate Cup. *Brisbane Golf Club*

8.00pm BAYER Bayer Environmental Science
Welcoming Cocktail Reception. *The GABBA and*
Scotts Pool Competition Scotts

WEDNESDAY 19TH JULY

8.00-8.50am *Hospitality Suite 1*
The role grinders play in the health of turf. Stephen Bernhard, Bernhard and Company

8.50-9.30am
John Deere presentation
JOHN DEERE

9.30-10.20am
Lubrimax Oils presentation

10.20-10.50am
Trade Exhibition and morning tea

10.50-11.20am
Toro presentation

11.20-12.10pm
Is my workshop on par environmentally? Terry Muir, Environmental Business Solutions

12.10-1.40pm
Trade Exhibition and Lunch

1.40-2.30pm
The mechanics' role in sprayer configuration. Craig Day, WACS

2.30-3.30pm
ATETA Meeting

3.00-5.00pm
Trade Exhibition and Afternoon tea

THURSDAY 20TH JULY

8.00-8.50am *Hospitality Suite 1*
CBC Bearings presentation

8.50-9.40am
Lanatec presentation

9.40-10.40am
Loctite presentation.

10.30-11.30am
Trade Exhibition and Morning tea

11.30-12.10pm
Jacobsen presentation

12.10-1.10pm
Trade Exhibition and Lunch

1.10-2.00pm
CR seals presentation

2.00-2.50pm
Communication is the key to success. Billy McMillan, BIGGA

6.30pm
ATETA Dinner - Riverside Hotel

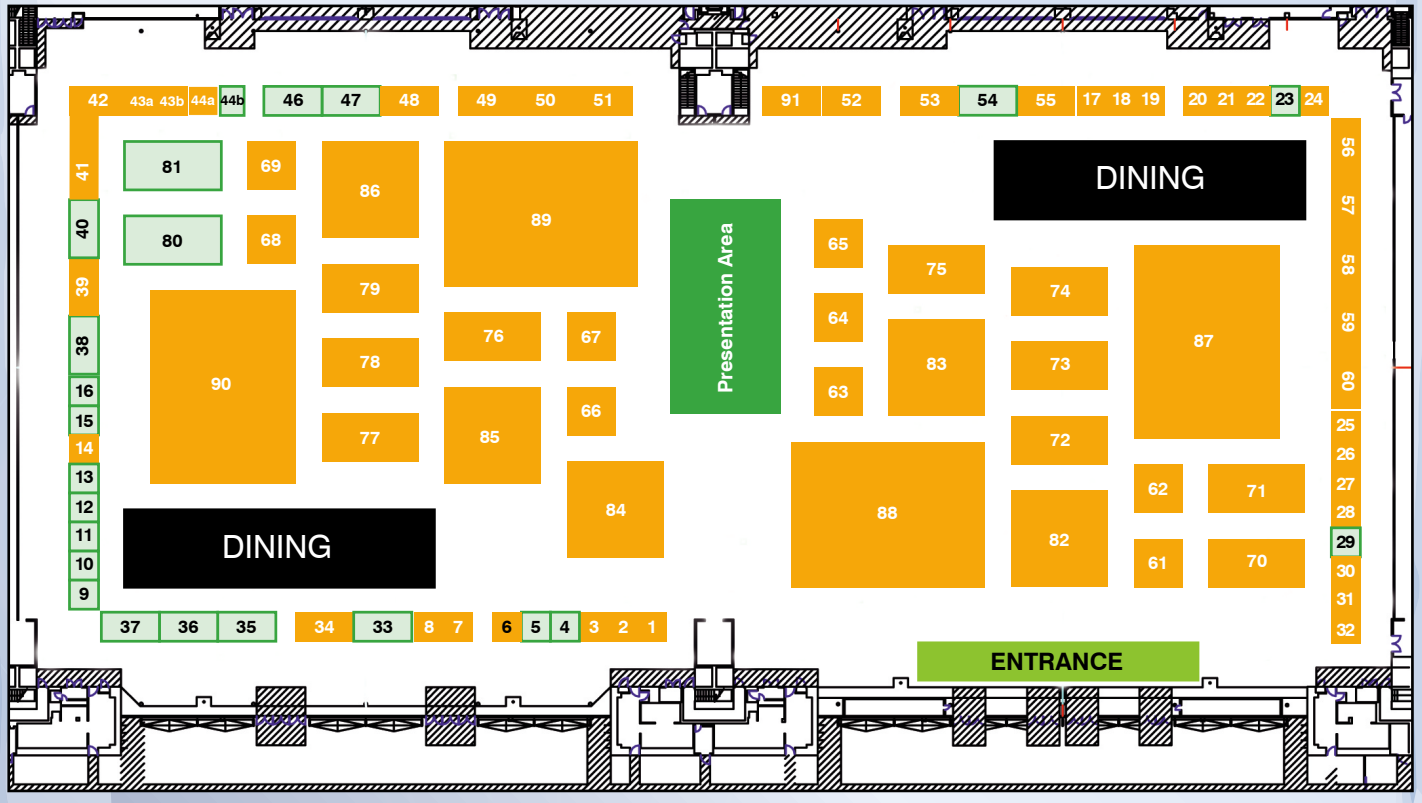
FRIDAY 21ST JULY

8.00am
Bus Tour - John Deere warehouse, Dick Johnson Racing.

TORO AUSTRALIA TAKES OVER THE PLOUGH INN TORO

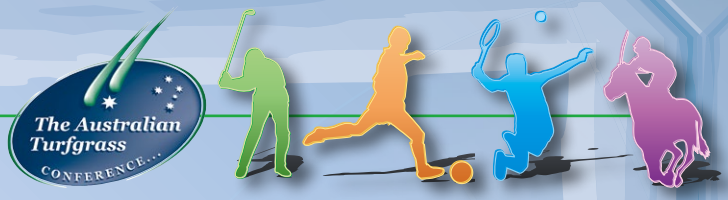
An invitation to all delegates
Location: Sportsman's Bar and front verandah of the Plough Inn at South Bank
Times:
Sunday, Monday, Tuesday 5.00pm - 7.00pm
Wednesday: 6.00pm - 8.00pm

Trade Exhibition Floorplan



FLOORPLAN AS AT 1 JUNE 2006

1.....Rural Buying Services
2.....Princess Turf
3.....Silvan Australia
6.....Turfcraft International
7.....Conquest Couch Growres Association
8.....Advanced Seed
14.....PGG Wrightson
17.....StrathAyr
18.....Geofabrics Australasia Pty Ltd
19.....Densal Pty Ltd
20.....Hunter Industries Australia
21.....The Groundsman Magazine
24.....Better Methods
25.....Evergreen Turf
26.....Triangle Filtration & Irrigation
27.....HydroPlan Pty Ltd
28.....Golf & Sports Turf
30.....Grovely
31.....Ohio University
32.....Profloor
34.....Patons Fertilizers
39.....Turf & Irrigation
41.....AGCSA
42.....AGCSA
43a.....TGAA
43b.....GMA
44a..Gold Coast Turf Managers Association
48.....Atom Industries
49.....Tru Turf
50.....Seaisle Australia Pty Ltd
51.....Wiedenmann GBH
52.....Simplot Pro Line
53.....Orica Watercare
55.....Legend Couch
56.....Namaway Environment Group
57.....Clearmake
58.....PJC Sportsturf
59.....Scotts
60.....Becker Underwood Pty Ltd
61.....Bayer Environmental Science
62.....Turfcraft Machinery Australia
63.....Brown Bros Engneering
64.....Graden Industries
65.....Dint Australia
66.....Grundfos
67.....Floratine
68.....JRM Inc
69.....Yamaha Motor Australia
70.....Kubota
71.....Nuturf
72.....Globe Australia
73.....Augusta Golf Cars
74.....David Golf
75.....ASPAC
76.....Turf Link Australia
77.....Twin View Turf
78.....East Coast Turf Renovations
79.....Redexim
80.....Toro
82.....ClubCar
83.....Toro Australia
84.....Rainbird
85.....Powerturf
86.....Greencare
87.....Syngenta
88.....Toro
89.....John Deere
90.....Country Club International
91.....Water Equip. Tech



Exhibitor Listings

ADVANCED SEED
BOOTH NO: 8

Advanced Seed is a leading importer and provider of turfgrass seed and related products for both the commercial and retail markets throughout Australia. Based in Melbourne, Advanced Seed operates nationally with a qualified team of salesmen and support staff. With close links to our key suppliers from both USA, NZ and locally, we are perfectly placed to deliver the very latest in turf seed technology.

Many of seed varieties come out of the Seed Research and Pickseed breeding programs and are well known to the turf market worldwide. Exciting new varieties including Tyee and 007 creeping bentgrass are being released in 2006 which will bring another new dimension to greens management in Australia. Along with turf seed, Advanced Seed is the national importers of the "Earthway" range of fertiliser spreaders. The range will be on display throughout the tradeshow.

Advanced Seed is a wholesale supplier servicing the market via a specialist network of distributors located across the country. Our product range covers all aspects of the market including golf, sportsfield, racetrack, bowls, turf farms and landscape. Throughout the conference we will be launching new products including our new "Evergreen" start cloth, a re-usable blanket to enhance the establishment of seed.

AGCSA
BOOTH NO: 41 – 42

The Australian Golf Course Superintendents' Association was formed in 1981 to further the profession of golf course management in Australia and the Pacific Rim. Since that time the association has grown steadily in size and now boasts over 700 members from all states of Australia, New Zealand and around the Pacific.

The AGCSA helps promote the profession of golf course management, provides continuing educational opportunities to members and provides support services and information for superintendents to assist them in their professional development.

Visit the AGCSA booth during the trade exhibition to find out more about joining the association and the benefits of being a member, surf the new-look AGCSA website and peruse the extensive range of turfgrass books and merchandise. Copies of the AGCSA's award-winning flagship publication, Australian Turfgrass Management magazine, will also be available.

AGCSATech manager John Neylan and technical officer Andrew Peart will be present to inform delegates of AGCSATech's ongoing work and help out with any queries about the host of diagnostic services AGCSATech offers. As well, delegates will be able to discuss the AGCSA new environmental initiative which was launched in May.

ASPAC GOLF AND TURF
BOOTH NO: 75

The evolution of the Dakota Turf Tender, Australia's most popular topdresser, continues with a range of new models, a larger number of options, impressive performance enhancements and a stunning new design.

The 2006 models will be on show for the first time in Brisbane, with the new LED controller with independent start/stop and throttle controls the most impressive and requested modification. Adding to the appeal of the 410 is the ability to mount a rear conveyor enabling clients to fill bunkers, or spread any manner of materials. Adding to its versatility, the rear conveyor can be fitted to all Dakota 410s so no client who already owns a Dakota is disadvantaged.

Also making its Australian debut will be the AERA-vator FT, a fine turf AERA-vator that is ideal for golf course fairways, roughs, greens and tees, particularly when incorporating amendments such as topdressing, fertiliser, organics or grass seed. Virtually eliminating losses attributable to run-off and mower loss, the AERA-vator FT is super quick and super effective and enables play to commence immediately following use.

Please stop by the ASPAC Golf and Turf booth and talk to us about your topdressing and aeration requirements.

ATOM INDUSTRIES
BOOTH NO: 48

The Atom bunker edger can trim bunkers in minutes, dramatically reducing the trimming time by up to eight times compared with other trimming devices, and without the backbreaking work. Its lightweight design means there is no carrying or bending required, so the operator doesn't get a sore back or fatigued. The bunker edger's manoeuvrable design also means it can trim around tight bends with ease.

The extra long 17¼" hardened spring steel blade cuts 7" deep, and also cuts grass runners underground which eliminates spading the runners……a time consuming job! The long blade also leaves a much sharper and neater edge, leaving the bunkers looking well manicured for members.

The Atom bunker edger is loaded with safety features such as a throttle trigger safety interlock, dead-man's handle, automatic centrifugal clutch, safety screen viewports, patented non-slip sideways rotating disc for sloping bunkers, fully enclosed blade guard, and a very large debris deflector which greatly minimises debris deflection.

Atom now exports the bunker edger to the USA, Europe, UK, Japan and New Zealand. Over a thousand units have been exported in the last 12 months. Atom also manufactures 2-stroke and 4-stroke professional cart-path edgers. For information visit www.atomindustries.com.au.

AUGUSTA GOLF CARS
BOOTH NO: 73

We will be displaying some examples of our product range of golf cars and utility vehicles that we believe are relevant to the members of the AGCSA. They include:

MPT 1200 G: Multi-purpose utility vehicle with crosslink polyethylene cargo bed; load capacity 1200lbs incl operator; 800 lbs max. bed load capacity; cargo bed 44.5in wide/36in long/12.5-15.5in deep. Electric or manual tilt.

MPT 800 E (petrol or electric): Multi-purpose utility vehicle with crosslink polyethylene cargo bed; load capacity 800lbs incl operator; 500lbs max. bed load capacity. Cargo bed 44in wide/30.5in long/8-10.5 in deep. Electric or manual tilt options available.

Shuttle 2 Electric (petrol or electric): People/cargo moving shuttle vehicle; two passenger incl driver; load capacity 1200 lbs; cargo bed 44in wide/68.5in long.

ST 350: Multi-purpose utility vehicle with crosslink polyethylene cargo bed; load capacity 800lbs incl operator; 500lbs max. bed load capacity; cargo bed 45in wide/36in long/13.75in deep.

ST 4x4: Multi-purpose 4WD truck with crosslink polyethylene cargo bed; load capacity 1500lbs incl operator; 1100 lbs max. bed load capacity; cargo bed 54in wide/42.75in long/11in deep.

EZGO TXT PDS Electric Fleet Golf (petrol or electric): Two-seater EZGO car with black utility; Bed tray fitted to rear (load capacity 200lbs)

BAYER ENVIRONMENTAL SCIENCE
BOOTH NO: 61

Bayer Environmental Science is a specialty division of Bayer Crop Science which is dedicated to the research and development of plant protection tools for the professional turf industry, in conjunction with our business partners Globe, Maxwell & Kemp, Nuturf and Oasis. Bayer Environmental Science is committed to providing environmentally sustainable and cost-efficient solutions to agronomical problems in the Australian professional turf industry.

This year we will showcase a range of new products including Gauntlet, a new generation synthetic pyrethroid insecticide. Additionally Bayer will be launching 3sixty5 turf fungicide which offers excellent broad-spectrum control of turfgrass diseases. We will also have a range of promotional material and technical data supporting Spearhead, Merit, Destiny and Signature as well as the rest of the Bayer range. We will also have our new Weeds, Pest and Disease Wall Poster for all delegates.

For any information regarding the Bayer Turf product range, please call Paul Jackson, Craig Wood or Jyri Kaapro on 1800 223 002.

BECKER UNDERWOOD
BOOTH NO: 60

Becker Underwood is excited to exhibit at the 22nd Australian Golf Course Superintendents' Association conference for the first time in its own right! As a leading supplier to the turf industry, Becker Underwood produces an innovative array of spray indicators, turf paints, lake and mulch colorants, and an ever-growing line of agronomic products that enhance plant health and root development.

Today, the company's list of innovative turf products is longer than ever. Becker Underwood's turf product line includes: Green Lawnger® - to permanently restore the bright green colour to damaged or discoloured turf; Turf Mark® - the first spray pattern indicator available in water-soluble packets; Bio-Gain® WSP® bio-stimulant – to energise turf and ornamental growth; LakePakTM WSP® biological lake clarifier and deodoriser that helps reduce sludge and organic sediment in ponds and lakes without causing harm to aquatic life, animals and humans; and Sprint® - our brand of chelated iron.

Come to Booth 60 and discuss the debut of Wettasoil® Ultra, our latest turf product which adds momentum to Becker Underwood's growth and leadership in the turf industry.

BETTER METHODS
BOOTH NO: 24

Better Methods is an Australian manufacturer of top quality hand tools for the greenkeeping industry. Our tools are sold both locally and all around the world wherever golf is played on well-maintained greens. We are also the Australian master distributor for Standard Golf Products of Ohio in the USA.

At this year's Australian Turfgrass Conference, BMS will exhibit a variety of new tools which we have designed to help greenkeepers fulfil their daily duties. These will include our new, improved hand aerator, our Divot Doctor repair tool and a couple of exciting and innovative new products to be launched at the show.

We will also display on our stand several new golf course accessories from the Standard Golf range including a good quality, but economical bunker rake, a bunker debris sieve and several other great products.

BROWN BROTHERS ENGINEERS
BOOTH NO: 63

Brown Brothers Engineers Australia Pty Ltd is an importer and distributor of Lowara pumps and pumping equipment, with sales offices in Sydney and Melbourne.

Lowara Pumps was established in Vicenza, Italy in 1968 and is part of ITT Industries, a global engineering and manufacturing company. Lowara specialises in the manufacture of premium quality pumps and fluid handling equipment and is recognised world wide for quality, efficiency and reliability.

Brown Brothers specialises in the design and fabrication of purpose built booster systems particularly for golf courses in both New Zealand and Australia. Many of these booster systems include a Hydrovar variable speed drive.

The Hydrovar is a microprocessor pumping system controller, but it does more than just change speed. It actually manages the performance of the pump to match a wide range of system conditions and requirements.

The Hydrovar software is designed specifically for centrifugal pump operation, control and protection. It can be set up to protect the pump from operating under various unfavourable conditions, eg: cavitation, operating against a closed head, low NPSH etc. The Hydrovar provides the golf course superintendent with flexibility of watering when required with substantial savings on installation, power usage and maintenance.

CLEARMAKE ENVIRONMENTAL EQUIPMENT
BOOTH NO: 57

Clearmake is a leading Australian manufacturer of wastewater treatment and environmental protection equipment. Products available include oil water separator systems, water recycling plants, gross pollutant traps (GPTs), rope mop oil skimmers, diversion and spill control valves, Quick Break cleaning products and a host of other equipment to support these components. With a nationwide distributor network and strong AHSCA and Australian Water Association affiliations, Clearmake is well placed to provide engineering services and equipment for all applications.

With equipment in use in over 2800 applications throughout Australia and overseas, from small workshops to large industrial sites, from automated 'plug and play' installations to custom engineered and manufactured specialty systems, we have the experience and technologies to meet your needs. Clearmake has supplied numerous solutions to golf courses.

For more information visit www.clearmake.com.au or email christian@clearmake.com.au. Phone (07) 5455 6822 or fax (07) 5455 6833.

CLUB CAR
BOOTH NO: 82

While Club Car has made its name and built a foundation on the golf car industry, it is staging a full-on blitz into the heavy-duty electric transportation and utility vehicle markets as well as the petrol and diesel 4x4 utility market. That charge is spearheaded by both its heavy-duty IQ electric models and the Carryall-294 diesel and petrol models.

The objective for the heavy-duty IQ electric vehicles was to leverage the golf IQ system and develop a more robust system for use in small wheel utility vehicles. Results: best-in-class useable range, hill climbing performance, load capacity, increased top speed of 27kph (adjustable and programmable), and enhanced programming/diagnostics capabilities.

The Carryall-294 four-wheel-drive vehicles not only have the hardware to tackle the terrain and tasks demanded by a wide range of outdoor pursuits, it does so with absolute simplicity. Operation is as simple as turning the ignition key, engaging the drive lever and stepping on the accelerator. It doesn't matter if the terrain is flat or a path filled with holes, mud, sand, logs or steep grades. Freecall 1800 680 088 for further information.

CONQUEST COUCH GROWERS ASSOCIATION
BOOTH NO: 7

Conquest is by far Australia's leading warm-season couch. A natural sterile selection, Conquest outperforms it competitors in a number of areas. A variety of industries are now seeing the benefits of Conquest including golf courses, sportsfields, bowling greens and passive recreational areas.

The benefits of Conquest include minimal irrigation requirements, greater colour retention and the ability to perform under low fertility conditions. These factors ensure Conquest looks better all year round and make Conquest a very economical and hard-wearing grass to maintain Australia wide.

Users of Conquest also benefit from its low thatch build-up allowing for a wide range of mowing heights satisfying most industry demands. Now you can mow your surface down as low as 5mm with less scalping. The ability of Conquest to establish rapidly and recover from wear also contributes to making this grass a manager's delight. You will no longer have those long waits for your surface to repair.

Make sure you stop by the Conquest stand at the show and talk to our representatives about how Conquest can and will cater to your needs. Remember, treat it mean, keep it green. Conquest – the professionals' choice.

COUNTRY CLUB INTERNATIONAL
BOOTH NO: 90

Environmental safety solutions will be the focus of Country Club International's biggest ever display at the year's 22nd Australian Turfgrass Conference and Trade Exhibition.

The latest Waterstax wash water treatment systems from USA will be launched at the show, including a more budget priced two-stage unit. On show will also be the Enpac range of chemical spill containment solutions.

Enviromist will be unveiling its new Hummingbird motorised walk-behind sprayer that has been developed for export to USA but will be available locally to complement Enviromist's now world-leading CDA technology turf spray systems.

Along with the universally acclaimed self-bunded reinforced concrete above-ground Convault fuel storage tanks, which are manufactured under licence by Miller Bros. in Ballarat, will also be exhibiting their new Waste Oil Recovery Units which are now available in 500, 1000 and 2000 litre capacities.

As Australian distributors for Par Aide USA on-course products, Range Servant Sweden golf range equipment, Redden high safety netting systems, Eagle One golf products, Flexitec rubber paving and many more top name products, Country Club International will be a major showcase in itself.

DAVID GOLF & ENGINEERING
BOOTH NO: 74

David Golf & Engineering is pleased to be exhibiting at the 22ns Australian Turfgrass Conference & Trade Exhibition in 2006. Our new golf course hardware catalogue is now available.

New Products that will be on show include the tournament ballwasher, the Big Ezee bunker rake, Razor bunker rake, tournament holecutter, new generation sprinkler head trimmer and Tuff Guy litter bin. Come and visit us on Booth 74 and find out about some great show specials. Contact us for all your golf course solutions. Sales Desk 1300 790 890, email dge@davidgolf.com.au or visit www.davidgolf.com.au.

DENSAL
BOOTH NO: 19

Densal specialises in golf course construction, maintenance and commercial landscape construction. Densal has proudly completed a number of large-scale 18-hole constructions from bulk earthworks to grow-in. Additionally, Densal has provided support and expertise to golf clubs undertaking smaller projects. With a large complement of small- to medium-sized construction equipment, operated by experienced shapers, Densal prides itself on its ability to produce quality finishes and structurally sound golf projects.

Together, Densal's golf construction team has over 125 years of specialist golf course construction expertise, with a long history of working on golf courses through Australia and South East Asia. This experience gives them a great understanding of working in a golf course environment and producing a quality golf product.

Densal is always willing to assist a client whether it be a large project, an expert shaper and plant to assist club-employed staff or advice and cost estimates for a project. Densal is currently constructing the new Sunshine Golf Club, Melbourne, and providing the Hua Hin Golf Club, Thailand, with expert shaper assistance. Densal maintains the Growling Frog Golf Course and Hidden Valley Golf and Country Club. Densal looks forwarding to seeing you in Brisbane and discussing your next golf course project.

DINT AUSTRALIA
BOOTH NO: 65

The last year has been another busy one for the team at DINT. The DINT Direct program, in particular, has seen DINT able to service many more golf courses and build substantially on its customer base, due to the fantastic work of Adam Dinte and David Atkins.

PR trips to Western Australia and Victoria in recent times have been an enormous success, with trips to all other states planned for the remainder of 2006. Our focus in NSW also remains strong, with Phillip Cooper, our newest team member, doing an excellent job after commencing in March.

DINT's display stand at this year's Australian Turfgrass Conference and Trade Exhibition promises to provide the best of both worlds. A focus on a number of new products and new initiatives will be balanced by an interactive element that will be fun for all. The DINT team looks forward to catching up with you at Booth 65 in July.

EAST COAST TURF RENOVATIONS
BOOTH NO: 78

Turf renovations are a necessary but often daunting time and have the tendency to tie up staff for prolonged periods of time. Why put yourself through the hassles of doing it yourself and wasting money on renovation equipment that sits idle for 350 days of the year. Talk to the professionals at our stand and learn just how efficient and effective our operations are. We can take the hassle out of your renovations period.

With over 60 pieces of renovation equipment at our disposal, ranging from broadacre to fine turf equipment, we can renovate or construct any turf playing surface. On display will be a small selection of our renovation equipment, such as the SR75 aerator, the latest and exclusive SR SUPER 54 greens aerator, and a new Groundsman greens aerator. We will also have on display a Dakota 410 topdresser and CD36 greens scarifier.

For any inquiries about turf renovation procedures, or if you want to know what other equipment we have, a full listing of our range will be at our stand, along with photographs and some video footage of equipment in operation. East Coast Turf Renovations - turf renovations made easy.

EVERGREEN TURF
BOOTH NO: 25

Evergreen Turf has been successfully producing quality turf since 1982 from our farm, located south of Pakenham in Victoria. We are building a reputation for providing the right advice on a wide range of turf products and back this up with excellent service. Instant turf provided by Evergreen includes Conquest Couch. This excellent couchgrass has been proven as a low input grass in VGA trials and is performing well in the sportsfield market.

Over the past three years, we have successfully branched into areas such as sports surface conversions. This section of our business focuses on converting cool-season sport surfaces to warm-season turf varieties. The specially designed machine shreds turf, plants stolons in rows and seals the material in the ground all in the one operation.

Completing the package, Evergreen Turf has its "StaLok" turf system – a 50mm thick cut reinforced turf for sportsfields and racecourses for immediate play. Turf Grids, a component of the "StaLok" system, has been used in many successful applications including York Park, Tasmania, and as part of the medium for drainage works at several Victorian country training tracks.

As you can see, Evergreen is more than just turf. Call us today on 1800 677 655.

FLORATINE PRODUCTS GROUP
BOTH NO: 67

Floratine Products Group (FPG) was founded in 1991 and today designs, manufactures and distributes a total of 52 products that are currently being utilised in 32 countries around the world. FPG, a 'true turf' company, is dedicated to delivering exceptional value and performance through their unique foliar and soil amendment products and service to their clients who seek quality and aesthetics of high use and intensively managed turfgrass.

Our focus is based on consistent, quality turf through plant strength. We are the industry leader in providing practical management strategies and materials to meet the growing challenges of providing superior playing surfaces with reduced use of pesticides and deteriorating water quality and supplies.

Due to the vast range of products in the FPG 'toolbox', we can recommend several products for specific situations. These may range from aerification recovery, pre-winter dormancy, spring start, tournament preparation and heat stress.

Floratine is rooted in the basics and helps the plant "do what it is supposed to do in the way it is supposed to do it". Its goal is to assist in producing turf strength and as a result, they are known as "The Turf Strength People" ™.

GEOFABRICS
BOOTH NO: 18

Geofabrics is an Australian manufacturer, with manufacturing plants located in both Albury and Southport. We employ over 150 people throughout Australia and New Zealand, and service the Australasian region as well as exporting around the globe.

Significantly, the majority of our products are manufactured in Australia and use recycled materials. These products will help maintain and improve your golf course. Our most widely used golf products include:

- BunkerMat™ bunker liner for sand retention in bunkers;
- Megaflo® flat pipe drainage for greens, bunkers, tees and fairways;
- bidim® geotextiles for filtration and drainage;
- BluSeala® pond liner for water features;
- Grassroots® permanent erosion control product; and
- Tensar® geogrids and gabions, for architectural retaining walls.

Our products have been used extensively in golf courses throughout Australia, New Zealand, the USA and other countries.

If you would like to know more about our products, come see us at Booth 18, fill out an information request form and be in the running to win a dozen bottles of wine to the value of $250. Entries close on the last day of the Australian Turfgrass Conference in Brisbane.

GLOBE AUSTRALIA
BOOTH NO: 72

A company that is truly Australian. Privately owned by John Peaty, Globe has been in the business of looking after turf managers for over 40 years. The strength of Globe in the Australian market has been recognised by leading international and local suppliers who have joined the Globe team over this past year such as Syngenta, Becker Underwood, Aquatrols, Envirotrend and Bear. Globe has a complete range of fertilisers, plant protection chemicals, selective herbicides, soil wetting agents, turf maintenance machinery, and analytical diagnostic services.

Maintaining turf is never easy. You will constantly be faced with factors that are beyond your control, such as the weather, disease pressures and even an increase in traffic. We have a sound knowledge of the various conditions you may be facing, as well as the products to provide sensible alternative solutions.

Globe's leading field consultants and product technical support can provide valuable information on prevailing conditions which can influence decision making, soil analysis, water chemistry, and disease diagnostic services, which all can be an important key to product selection and application.

The Globe Show is on its way, so come visit us at our trade stand. Globe Australia - truly Australian.

GOLF & SPORTS TURF AUSTRALIA
BOOTH NO: 28

Golf & Sports Turf is Australia's premier specialist subscriber-based national trade publication aimed at bringing the latest industry news and ideas to professionals in the turfgrass industry.

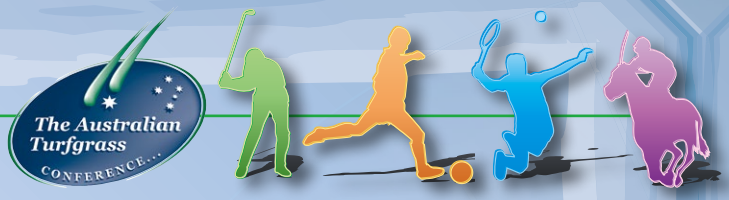
Its CAB audited circulation of 5050 reaches golf courses, resorts, racetracks, schools, parks and gardens managers of local councils and large scale landscapers and contractors. Golf & Sports Turf profiles new products, successful enterprises and personalities in the industry in its bi-monthly editions. It prides itself in bringing readers "the news they can use".

GRUNDFOS
BOOTH NO: 66

The Grundfos reputation for innovation is clearly evident in the extensive range of pumping solutions it produces for turf and golf course irrigation. Located at Stand 66 at the 22nd Australian Turfgrass Conference tradeshow, Grundfos will be promoting its Hydro pressure boosting systems, its extremely exact digital dosing systems and its monitoring and control equipment.

The Grundfos Hydro booster pump range offers a unique combination of control and adaptability. Every pump in the range can be customised to meet specific capacity requirements, and the logical control system enables a fast and flexible operation. Importantly, the Hydro system is reliable and extremely energy efficient.

To tailor a solution to meet your needs, contact one of our local Grundfos representatives. We look forward to seeing you in Brisbane.



HUNTER INDUSTRIES
BOOTH NO: 20

Hunter Industries is a leading manufacturer of irrigation equipment for the turf, landscape and golf industries. Hunter Industries is excited to be introducing a number of innovative new products at the 22nd Australian Turfgrass Conference trade exhibition, including our new TTS (Total Top Service) G990, another addition to our popular golf rotor range.

JOHN DEERE
BOOTH NO: 89

John Deere is proud to be a part of the 2006 Australian Turfgrass Conference. We look forward to hosting you on our stand, where we can introduce you to our comprehensive array of turf machinery, ranging from reel mowing equipment to specialty turf machinery and utility tractors.

This year we are proud to showcase the 2500E Tri-Plex Hybrid Greens Mower. As the industry's first hybrid greens mower, the 2500E is more than just an electric mower. It operates on a traditional engine that drives an alternator which powers electric reel motors to drive the cutting units. This industry-exclusive design eliminates more than 90 per cent of the most likely leak points while also reducing sound levels and increasing fuel efficiency. And because the 2500E is not dependent on battery power for run time, it can keep the same frequency of clip on every green.

We will also be happy to talk about how John Deere Credit can provide financial options for either purchasing or leasing turf maintenance equipment, and representatives from our nationwide dealer network will be on hand to outline our unmatched after sales support and also discuss our unique industry golf tournament, the John Deere World Championship.

KUBOTA
BOOTH NO: 70

Kubota Tractor Australia will be displaying a number of recently released products at the 22nd Australian Turfgrass Conference and Trade Exhibition, including the new F80 series front-mounted mower, the revolutionary 'Glide Steer' GR2100 diesel ride-on mower, the four-wheel-drive hydrostatic drive RTV900 utility vehicle and the 30hp B30 series compact tractor fitted with air conditioned cabin and a 60" mid-mounted mower. All of these machines are well suited to golf course and contractor applications. See us at Booth 70.

LEGEND COUCH
BOOTH NO: 55

The king of couches - Legend® - has continually proven itself as a top performer in commercial and sporting applications around Australia and New Zealand.

Legend® exhibits outstanding performance in a range of climates - Moonah Links, Suncorp Stadium, Eden Park, Telstra Stadium, Parramatta Stadium, WIN Stadium, Credit Union Australia, Aussie Stadium, Sydney Showgrounds, Bert Henham, Commonwealth Golf Club, Sandhurst Golf Club, Peregian Springs Golf Club, Box Hill Golf Club, Tennis Australia StrathAyr Portable Davis Cup Tennis Court, Royal South Yarra Lawn Tennis Club, Kooyong Lawn Tennis Club, and numerous cricket wickets and other venues around Australasia. Come by Booth 55 and see your local Legend® producer. Legend® – the grass of legends.

NAMAWAY ENVIRONMENTAL GROUP PTY LTD
BOOTH NO: 56

Namaway Environmental Group (NEG) is a brand new group of companies offering environmental solutions to a wide variety of problems encountered by every superintendent and greenkeeper. NEG has developed and will exhibit at the trade show several unique environmental technologies that are protected by various world-wide patent applications.

Two members of the group will have products on display. Aqua Z manufactures a range of organic products including liquid and granular fertilisers, a 100 per cent organic soil wetting agent – both as a liquid and a granule – and possibly most exciting is a unique natural sand amendment for golf greens which will significantly increase CEC and moisture retention capacity without affecting drainage of USGA spec sand. Aqua Z also offers a range of environmentally friendly cleaning solutions.

Namaway Filtration Systems (NFS) will also be in attendance. NFS has developed world patented technology for the treatment of wastewater and the removal of pollutants from drains and stormwater. NFS treatment systems use naturally derived ingredients to both filter and to treat waste water for recycling.

NUTURF AUSTRALIA
BOOTH NO: 71

Nuturf Australia will be displaying its comprehensive services and products at the 2006 Australian Turfgrass Conference in Brisbane. Nuturf offers the Australian professional turf manager a complete package including technical services, pesticides, fertilisers, wetting agents and seed. We understand the many facets of a turf managers' role and recognise their need for product technologies to move forward and provide true benefits in practical turfgrass management.

Nuturf has a strong focus on developing new technologies for the Australian turf industry, and again in 2006 have a number of innovations to introduce. The tradeshow stand will showcase the new additions to our product and service offerings. International guests, along with the Nuturf technical team, will be present to discuss new and old technologies alike and will be conducting brief informal presentations at our stand.

Importantly, the conference is a great forum for peers in the industry to catch up and share knowledge. In keeping with tradition, Nuturf will be offering coffee and tea at the stand with plenty of seating so please come in, have a cuppa and enjoy your visit to Booth 71.

Visit www.nuturf.com.au for a preview of what will be on show at our stand.

OHIO STATE UNIVERSITY
BOOTH NO: 31

The Ohio Program offers single 19- to 28-year-old apprentices excellent hands-on training opportunities in the USA. Many come back to work their way into top clubs in Australia after 12 to 18 months in the US.

Wages are generally good ranging from 10 to 12 dollars per hour with time-and-a-half for overtime or which there is plenty. Some of the clubs are discreetly offering free return flights and there may be scholarships available depending on the quality of the applications for a few candidates. Many Australians and New Zealanders are sought after by the top 10 clubs due to excellent foundation of skills once they finish their three-year apprenticeship.

Help with visas and insurance are provided by the program, housing is arranged by the individual courses and varies from course to course depending on location. A large percentage of the locations offer subsidised housing or totally free housing, but in some instances housing costs are offset by extra wages. Taxes are at the most 10 per cent.

Applicants are encouraged to apply before their third year of their apprenticeship is finished ideally in October for placement the following March/April, but we do place trainees year round.

ORICA WATERCARE
BOOTH NO: 53

Orica Watercare is Australia's leading supplier of water treatment products. Landguard™ OP-A is a risk management tool for pesticide clean-up that rapidly reduces organophosphate (OP) insecticide residues in water. Landguard™ is simple to use with no capital investment. It ideally integrates into any EMS.

Greenex Aqua is a natural product that efficiently removes excess nutrients resulting in clearer water. These nutrients cause algal blooms, including filamentous, microscopic, blue-green and red azolla.

These products are available from our distribution partners – Nuturf. For further information, contact Orica Watercare on 1300 550 036 ort visit www.orica-landguard.com.

PATON FERTILIZERS
BOOTH NO: 34

Paton Fertilizers is proud to announce that it will be showing the following innovative products which further support the claim of it not just being 'another fertilizer' company but being 'the' nutritional specialists.

Pedocare®: Innovative polyacrilamide technology that has huge potential for the turf market as a soil conditioner, tachifier and for dealing with high sodium soils.

Sirflor® SR Liquids: The highest analysis on the Australian market coupled with low burn potential and longevities of up to six weeks from one application.

Entec® DMPP inhibited Nitrogen: Since the recent introduction of this and Entec based custom blends onto the market the results speak from themselves. 1kg/100m2 giving five weeks response coupled with exceptional colour and no surge growth.

Paton Excel®: Low burn, no dust, excellent value for money, long-term nutrition coupled with moisture retention and soil conditioner plus no odour – organic based sports turf fertiliser specifically for use on council ovals or fairways. The 'all in one' solution.

Paton Green Grade Meth Ureas: 1.4mm prill coupled with three 'off the shelf' formulations and custom blending.

Come and speak to industry experts on the above products and also other services we offer. www.paton.com.au – the industry source for independent free technical advice.

PGG WRIGHTSON TURF
BOOTH NO: 14

PGG Wrightson Turf will launch its new turf seed product guide at this year's trade show. It will contain all the cultivars from both seed companies as well as the new updated 'Duraturf' seed blend range. With the recent merger between Pyne Gould Guinness Ltd and Wrightson Ltd and the subsequent coming together of the two plant breeding centres, it was decided to house the newly created turf division under PGG Wrightson Turf.

The new 'Duraturf' seed blend range will consist of 17 specially formulated seed blends for all aspects of turf requirements including golf, sportsturf, landscape and horse racing. PGG Wrightson Turf is now the largest breeder and producer of turf grasses in the southern hemisphere and has export markets into North America and Europe.

For our Australasian customers, our philosophy is simple – we breed and produce locally for our own unique conditions. As part of our commitment to breeding locally adapted cultivars we currently have a breeding program based at the Wrightson Research facility in Ballarat where perennial ryegrass, fine fescue and browntop bentgrass are being bred under local conditions. Come and say hello, pick up a seed guide and let's discuss your seeding requirements.

PJC SPORTSTURF
BOOTH NO: 58

PJC Sportsturf will be displaying the following Bernhard & Co machinery at the 22nd Australian Turfgrass Conference tradeshow: An Express Dual Cylinder grinder; an Anglemaster bedknife grinder; and a Rapid Facer 1000. We will also be introducing Macroscopes to the rest of Australia. On display will also be various samples of our turf products and brochures.

POWERTURF
BOOTH NO: 85

This year we celebrate 85 years of Jacobsen service in the turf industry. Jacobsen was founded on a commitment of providing world class products, responsive customer service and leading edge innovations. Jacobsen's industry firsts include the walking greens mower, riding greens mower and magnetic bedknives. PowerTurf strides alongside this foundation with Australian wide distribution for Jacobsen, Ransomes, Cushman, Ryan, Turfco and Daedong tractors. With commitment, dedicated and experienced staff and dealer network throughout Australia, PowerTurf is committed to providing top quality products to today's turf industry.

This year we will be launching a range of new products like the GPLEX III (greens) – Jacobsen comfort Plus Controls, ergonomic design for operator comfort; the all new TR3 (tees and surrounds) with its unforgiving traction control; the SLF1880 (surrounds and fairways) – productivity and quality finish; the GroomMaster II – the latest technology for bunker maintenance; and the outstanding HR6010 batwing rotary mower that has made rough mowing a joy not a chore!

Furthermore our stand will have Turfco topdressers with the revolutionary SP1530 and Daedong Tractors. Please come and join in our celebrations by visiting our stand and meet our international guests from Jacobsen USA and Ransomes Jacobsen UK.

PROFLOOR
BOOTH NO: 32

When rain, mud or soft soil can cause delays or discomfort, or when there's an important surface to protect (from grass and turf to polished timber flooring), Australia's leading venues, companies and event managers turn to Profloor® Portable Floor Sales and Eventfloor® Portable Floor Hire.

Profloor® Portable Floor Sales is the exclusive owner and distributor of Profloor® and Protrack®, and the exclusive distributor of Bravo Mat™ in Australasia, and the only company that can directly supply and deliver these proven, brand-name products in any quantity, to any location in Australia or the South Pacific.

Eventfloor Portable Floor Hire offers direct hire of Profloor, Protrack and Bravo Mat in Australia and NZ, giving you access to these products on a temporary basis (one day to several weeks) at a direct price.

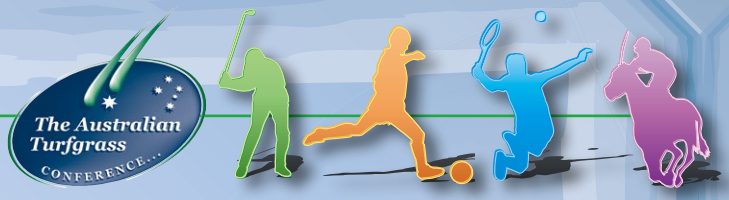
Eventfloor's hire services range from dry hire, through to a fast and reliable installation and removal service, provided by Eventfloor's team of specialist portable flooring and event experts. Eventfloor can hire portable flooring for any size of job – from a 30m2 back yard marquee to a 10,000m2 stadium.

Profloor Portable Floor Sales. Ph: +61 3 9804 3455. Web: www.profloor.com.au.

Eventfloor Portable Floor Hire. Ph: +61 3 9525 1955. Web: www.eventfloor.com.au

RAIN BIRD AUSTRALIA
BOOTH NO: 84

Rain Bird provides totally integrated irrigation solutions from reservoir to rotor. Complete confidence in your irrigation system gives



you peace of mind. Rain Bird understands your need to get the most from your irrigation system. Our industry leadership and sole passion is irrigation and we continue our commitment to providing innovative irrigation solutions every day. We are the world leader in irrigation expertise with a proven reputation for high quality products and pride ourselves on outstanding customer service. Our proven performance and ongoing innovation give you the peace of mind that you need, today and in the future.

See the latest in pump stations featuring Smart Pump™ technology, filtration systems, Otterbine Lake Management systems. Central control options, Rain Bird decoders with over 25 years of proven performance. An out of sight solution to central control leaves nothing exposed to the elements. Excellent for renovations, decoder systems make it easy to expand irrigation coverage using a minimal amount of wire and decoders. Rain Bird rotors for superior uniformity, outstanding quality and consistent reliability.

For further information regarding Rain Bird golf course irrigation system expertise, visit us at Booth 84 or contact Rain Bird Australia on 1800 424 044 or at www.rainbird.com

REDEXIM CHARTERHOUSE BOOTH NO: 79

Redexim Charterhouse has continually recognised and addressed the needs for smarter and more efficient turf renovation and associated equipment to suit all aspects of the turf industry around the world.

With the ongoing development of new models for deep tine aeration, coring, scarification, sweeping, seeding and topdressing, Redexim Charterhouse has established strong relationships within the golf course, playing fields, municipal establishments and contractors globally. This can be no more apparent than at the 2006 World Cup which is being played in Germany. Redexim Charterhouse machines were used at all 12 soccer stadiums to produce optimum playing surfaces to FIFA standards.

Late 2005 and early 2006 has seen strong demand for new models such as the Mustang 7110, VertiDrain 7120, Speed Seed 6000 and the Easy Spread self-loading topdresser together with the existing 60-strong model range which have established reputations for reliability, multifunctional applications, ease of use and high safety standards.

While keeping all of these needs strongly in sight, Redexim Charterhouse has also recognised the development of synthetic turf and its use around the world and consequently has developed machines to carry out the maintenance and cleaning of these surfaces. For more information call to Booth 79.

RURAL BUYING SERVICE BOOTH NO: 1

Rural Buying Service has been in business for over 30 years, in which time our head office at Lismore has expanded to eight branches extending from Coffs Harbour up to Arundel on the Gold Coast. With a total of over 50 employees, each branch has a team of highly qualified and experienced staff. Rural Buying Service, Arundel is doing what it does best - servicing the needs of the local turf industry including golf courses, bowls clubs, schools, local government, turf farms and landscape maintenance contractors. We specialise in seed, fertiliser and chemicals, and will be featuring at the show, products by Growth Technologies, Stoller Australia, Botanica and Lebanon Turf Products.

SCOTTS AUSTRALIA BOOTH NO: 59

Scotts Australia is part of the global Scotts Company. Locally, Scotts Australia has been servicing the professional turf market for over a decade in both Australia and New Zealand. Scotts is a recognised industry leader, producing and supplying specialty fertilisers, pest control products and wetting agents.

The Scotts range of slow-release and controlled-release fertilisers, such as Sierrablen® and Sierraform®, have become the benchmark for the industry. Recent releases in the Scotts turf plant protection product range, under the Sierracare® umbrella, include: Maxguard® 2G, Maxguard® 80 SC and Maxguard® NPK insecticides. Scotts' wetting agents are servicing the market as the ideal summer re-wetter and winter drainer. Included in the range is Hydraflo® G, Hydraflo® L and Hydraflo® NPK (combined wetting agent and slow release fertilizer technology).

The latest introduction from Scotts is Sierraron®, a pre-emergent herbicide offering total, season-long weed control for up to six months. Sierraron is a non-selective granular herbicide, now available in a convenient 5kg applicator pack.

Scotts is pleased to continue as sponsor of the 2006 AGCSA Distinguished Service Award. At Scotts we strive for excellence and quality from manufacture through to the end user. You can rely on the Scotts philosophy – A world of local knowledge™.

SEAISLE AUSTRALIA (JIMBOOMBA TURF GROUP) BOOTH NO: 50

Sealsle 1 and 2000 certified turfgrasses have been established with great success in various locations since its introduction into the Australian turf market four years ago. Along with many high-profile sports and golf situations, the greens-type variety Sealsle 2000 has recently been installed as an alternative and natural couchgrass encroachment barrier around the perimeters of cool-season putting greens. (Visit Booth 50 to view and discuss this new protection for your greens).

Throughout the past decade the Jimboomba Turf Group has been exporting turf varieties into various parts of the world including South Africa, Indonesia, Thailand, Singapore, Malaysia and the Middle East. If you have an interest in the international golf development market we are able to assist.

Also on display will be our 'New Inventors' episode award-winning STAYturf product, which can be supplied in a variety of turf species and, once installed, provides an instant erosion control.

SIMPLOT PROLINE BOOTH NO: 52

Simplot ProLine is proud to be supporting the 2006 22nd Australian Turfgrass Conference in Brisbane. Simplot ProLine prides itself on being specialists in BEST granular fertiliser and (Liquimaxx, Signature) liquid nutritional products, although this year we are adding Syngenta professional turf products to our range.

Also this year we will be launching our new catalogue and website. Information and technology is our tool to make your decisions easier.

Simplot ProLine will be running the same competition as last year, giving away a study tour of the Golf Show in Anaheim, USA, February 2007. Aaron Miller from Howlong Golf Club was last year's winner and went to Atlanta this year.

This is an experience of a lifetime and a great opportunity to network on a worldwide scale. The tour includes three days at the famous Farmlinks, the home of Polyon in Alabama. Talk to one of our territory managers to find out how to enter.

Also don't miss our Grass Roots Tour blues night featuring Kevin Borich Express. This will take place on Tuesday, 18 July. Contact your territory managers for the details. We look forward to seeing you all there.

STRATHAYR TURF SYSTEM
BOOTH NO: 17

StrathAyr® is a turf producer, a developer of natural turf technology and a world-leader in sportsfield and racetrack construction techniques. StrathAyr products include:

- StrathAyr® System – six National Rugby League grounds;
- StrathAyr® Track – Singapore Racecourse, Moonee Valley Racecourse;
- StrathAyr® ModulAyr System – Reliant Stadium (USA), Tennis Australia StrathAyr Portable Tennis Court;
- MegAyr Turf – immediate repair turf in use at Suncorp Stadium, Telstra Stadium, Singapore Racecourse;
- Drop-in portable cricket wickets – in use at Eden Park, Westpac Stadium, Telstra Stadium, Otago Rugby Football Club, Lords Ground;
- Legend® couchgrass – the king of couches;
- Bentgrass – Penn G2, A1-A4 mix;
- RTF® tall fescue – revolutionary self-repairing tall fescue;
- Sir Walter, EasiCare tall fescue, EasiGreen bluegrass/rye, Wintergreen, Santa Ana, kikuyu;
- BAyr Root Turf and Sprigs – superior soil free turf.

Please come by and see the StrathAyr® team at Booth 17.

SYNGENTA
BOOTH NO: 87

The Syngenta Turf Team is committed to being the leading provider of innovative products, new chemistry and services, knowledge and technical support for the turf industry. Our aim is to deliver tailored market-driven solutions, specialist excellence and trusted brands to ensure enhanced value for our customers.

Featuring technical product and application demonstrations, our stand will showcase our offering to the market and provide you with the latest in innovative technology and turf management information. We'll provide you with an insight into our strong suite of products in development while also informing you of our turf specific solutions and management tools already available.

Our innovative online resource, Greencast, developed specifically to give turf managers the competitive edge in turf management, will be available for use at the stand. We will also have an exciting new product demonstration to reveal! Local and international Syngenta experts will be on hand to provide advice and recommendations on your turf issues and queries.

There are prizes to be won, a wealth of information to be shared and giveaways galore. So don't miss out! Be sure to catch up with the Syngenta team in Brisbane for a chat about your turf.

TGAA
BOOTH NO: 43A

The Turfgrass Association of Australia (TGAA) is a non profit industry body that represents turf practitioners, curators, ground managers, superintendents and groundsmen. Our membership is also complemented by industry representatives from soil, seed, instant turf, industry consultancies and machinery supplies. In addition, we have special working relationships with cricket associations, TAFE colleges and universities in each state.

The TGAA's main objective is to offer quality personal development and educational seminars that will assist our members to keep abreast of new developments, maintain awareness of industry standards and promote and deliver OH&S regulation and training.

We look forward to welcoming you at our stand. Committee members from all states will be around, so come and have a chat. Find out about research that we are helping fund and give us a few suggestions on what your TGAA can do for you.

THE GROUNDSMAN
BOOTH NO: 21

At the 22nd Australian Turfgrass Conference in Brisbane, you will find The Groundsman at stand 21. Amber and Shannon will be there to help you with all your questions in relation to advertising and subscriptions.

The Groundsman will be giving away stacks of freebies, including pads, key rings, magazines, magnets, advertising vouchers and subscription specials. For those of you who are not fortunate enough to be on our subscription database already, we will happily supply you with the current issue.

On display we will have all issues of 'The Groundsman' produced over the past three years. On request, we will be able to supply these by mail on return from the conference. For those who are interested in advertising in, or subscribing to The Groundsman, you will find that Amber and Shannon will be able to accommodate your every need.

The Groundsman magazine is your premier resource for buying and selling new and used turf equipment. Why? Because The Groundsman is the first publication turf care professionals turn to when looking to buy equipment at the right price. The Groundsman, with a bi-monthly circulation of over 10,000 copies, is guaranteed of reaching your target market throughout Australia and New Zealand.

TORO AUSTRALIA – COMMERCIAL EQUIPMENT
BOOTH NO: 88

Commercial Equipment is pleased to announce the launch of several new products for 2006 at the 22nd Australian Turfgrass Conference and Trade Exhibition. At Booth 88 expect to see the latest additions to the Commercial Equipment range including:

The new Reelmaster® 5510 & 5610 - hundreds of improvements, one great result! Designed, tested and built to customer requirements, the new fairway mowers contain a multitude of improvements for the ultimate fairway mowing experience.

The new Sand Pro® 3040 & 5040 bunker rakes will change the way you maintain your bunkers. Introducing the first Quick Attach System (QAS), now anyone can switch from one attachment to another in less than a minute (no tools needed).

The new Groundsmaster® 7200 is our new rotary mower rugged enough to be called a Groundsmaster. Featuring the reliability and durability you expect from a Groundsmaster with zero turn steering. It will increase your productivity providing you with manoeuvrability around obstacles and quick turning.

Toro is proud to be a major sponsor of the 22nd Australian Turfgrass Conference and we look forward to seeing you at Booth 88. For a sneak peak at our new innovations, visit www.toro.com/innovations.

TORO AUSTRALIA - IRRIGATION
BOOTH NO: 83

Toro Irrigation will proudly showcase new and innovative products at Turfgrass 2006. With particular emphasis on efficient water management, our new and existing products demonstrate our ability to develop

new technologies, providing our customers with progressive and tailored irrigation solutions. The following products provide a glimpse of how Toro Irrigation is leading the response to industry focus on better resource management.

835/855 Series Sprinklers: With key features such as adjustable nozzle trajectory, ratcheting riser and full/part circle in one, you have superior flexibility to increase watering efficiency and performance.

GDC Decoder: This new decoder system enables long wire runs with smaller wire sizes and the ability to control more valves simultaneously. These durable decoders are available in 1, 2 and 4 station models. Available as a stand alone or Site Pro PC system they give greater choice and flexibility.

VP Satellites: Exclusive independent station programming allows you to apply water precisely where you need it. Also the only controller with three operating modes with the addition of 'grow-in' mode specifically created for turf establishment needs. We welcome you to visit us at Booth 83 to see these exciting additions to the Toro Irrigation range.

TRIANGLE FILTRATION AND IRRIGATION
BOOTH NO: 26

Triangle Filtration and Irrigation has been established for nearly 20 years as a major supplier of product and solutions to the turf, golf course and agricultural segments of the irrigation market. The company's traditional focus had always been as a specialist supplier of Filtomat® fully automatic self-cleaning screen filters.

Since introducing the range of ITC fertigation equipment, which includes the Multifertic electric positive displacement injection pump for proportional dosing, we have made significant advancement in the application of applying wetting agents, acids and fertiliser for turf situations.

Additionally, over time our product range and service has expanded to include plastic screen and disk filters, manual and semi-automatic steel filters/separators, hydraulic control valves, agricultural impact sprinklers, geoflow sub-surface drip irrigation systems, check valves, air valves and water meters.

Triangle Filtration and Irrigation is at 17 Hinkler Rd, Mordialloc, VIC 3195. Phone (03) 9580 2122. Email: triangle@filtomat.com.au Website: www.trianglefiltration.com.au.

Key personnel include Wally Menke (managing director), Fred Menke (engineering director), Gary Horton (national marketing manager), Jay Rousell (NSW manager), Ivan Sparrow (WA manager), Alan Turner (SA/NT manager) and Grant Harms (QLD/northern NSW manager).

Brand names include: Arag, Clemons, Cometal, Filtomat, Geoflow, Hidroten, ITC, Riegos Costa, Triangle Meters and Yamit.

TRU-TURF EQUIPMENT
BOOTH NO: 49

Tru-Turf Equipment is a major manufacturer, designer and exporter of golf greens rollers worldwide. We are also the only roller manufacturer that can claim the status of "Officially Licensed Product of the PGA Tour". In 2006, our rollers will be used on 64 PGA Tour, Champions Tour and Nationwide Tour tournaments in USA and Canada. You would also have seen the results of our world class roller at the recent US Masters at Augusta (April 2006).

With innovative design and superior engineering skills, our rollers have succeeded in becoming the leader in the art of golf greens rolling. Patents that date back as far as the 1950's attest to our knowledge, skill and reputation as the leader in this competitive field of turf maintenance.

TURF AND IRRIGATION
BOOTH NO: 39

Turf and Irrigation sell a large range of fertilisers (slow release and conventional), fungicides, herbicides and insecticides. On display will be various top quality soil conditioners and other turf products.

As Turf and Irrigation is a large supplier of irrigation there will be displays of well known irrigation product brands along with professional advice offered.

TURFCRAFT INTERNATIONAL
BOOTH NO: 6

TurfCraft is for turf professionals who want to keep up with the latest information about growing and caring for turf. TurfCraft has been serving all sectors of the turf industry for more than 18 years.

The magazine is aimed at turf professionals including golf course superintendents, sportsfield managers, parks and garden managers, bowling greenkeepers, racecourse managers, landscapers, turf growers, students and colleges, and industry allied traders.

TurfCraft's charter is to publish articles for its readers that are relevant, accurate, interesting and informative. At the same time it offers suppliers of goods and services to the turf industry a vehicle to convey their message to the whole industry.

TurfCraft has a stable of respected columnists including Peter McMaugh, David Nickson and Jon Scott (vice-president of agronomy for the US PGA Tour) as well as contributors with excellent turf technical and practical knowledge including John Forrest in Western Australia.

Editor Alastair Dowie and advertising manager Ed Kryskow have developed key contacts within the Australian turf industry and look forward to meeting as many readers and delegates as possible during the 22nd Australian Turfgrass Conference. TurfCraft will be located in Booth 6 and we welcome feedback on the magazine and a discussion about turf issues.

TURFCRAFT MACHINERY AUSTRALIA
BOOTH NO: 62

Turfcraft Machinery Australia is an importer of quality turf maintenance machinery and specialised equipment including:

Soil Reliever deep tine aerators from Southern Green, the only deep tine aerator made in the USA, provide solid and coring tines to make your turf breathe easier; Sisis Equipment provide seeders, hydraulic turf scarifiers, walk-behind scarifiers, hydraulic gang mowers, turf sweepers and topdressers; Smithco provide bunker rakes, greens rollers, tractor-mounted blowers and much more; Progressive Mowers, 'all mowers are not created equal', the world's best quality rotary contour mowers, 12' 15' 22' and 36' fine-finishing mowers; National Mowers, ride-on cylinder mowers and diesel-powered rotary slope mowers.

We also carry Spinner topdressing systems, Polaris utility vehicles and the 'Bunker Blaster' from Blaster industries. The Bunker Blaster can drain flooded bunkers in a flash giving you productivity where it is needed most on your golf course.

We have over 30 years' industry experience and know what our customer's needs are to save time, money and provide you with the most comprehensive range of turf equipment and specialist vehicles available.

'Better machines, better solutions, every application' is our slogan for a reason. We can provide you with reliable, tough and built-to-last equipment. See us at Booth 62.

TURF LINK AUSTRALIA
BOOTH NO: 76

Turf Link Australia Pty Ltd has celebrated its 10th year and is proud to be associated with the industry over this period. Turf Link's commitment to the industry is proven by the long association with international and local manufactured products such as Lastec Articulator mowers, Wiedenmann deep tine aeration equipment, Amazone debris collection and renovation equipment, Tru Turf greens rollers and Buffalo blowers and Turfmach renovation equipment.

Turf Link's past strengths opened the door in becoming the Sydney dealer for Jacobsen turf equipment and Daedong tractor range in 2002. Our commitment in providing quality after-sales support has made this a rewarding choice.

Featuring this year are: Lastec Articulator's new diesel zero turn mowers, featuring 72" width cut. These machines are becoming ever so popular on Australian courses.

New to the show will be Blec seeders. Blec is a popular name throughout the Northern Hemisphere. Seeders feature 1500 holes per square meter allowing a fantastic strike rate of the seed. Turf Link staff at the show will be happy to assist you.

TWIN VIEW TURF
BOOTH NO: 77

Twin View Turf is a supplier of quality turf varieties and services to the golf industry, commercial landscape, recreational sports and residential markets. Twin View Turf services the greater Brisbane area, Sunshine Coast, Gold Coast, Northern Rivers and Toowoomba areas. We also support the Sydney bowls market with TifEagle.

Twin View Turf is dedicated to customer service, the growing of quality turf products and providing the right advice. It is an industry leader for turf varieties grown and equipment technology used in production, harvesting and product delivery.

Twin View Turf is a turf producer of specialty turf varieties for the golf course industry. We are a major producer of 328 Tifgreen, Tifdwarf and TifEagle for golf greens and bowls greens. We also grow TifSport, 419, Wintergreen and Greenlees Park for golf course fairways, tees and roughs as well as Sir Walter and Empire zoysia.

Twin View Turf also provides the following services – site preparation, turf installation, maxi rolls, sportsfield renovation services and turf stolon planting.

WATER EQUIPMENT TECHNOLOGY
BOOTH NO: 91

Water Equipment Technology (WET) is a pond and lake management company using Aqua Master fountain and aeration products, and an irrigation company which sells and installs Toro and Rain Bird irrigation products.

Ben Chapman, the managing director of WET, has more than 25 years' experience and has been actively servicing the golf industry in Australia and South East Asia. Ben lived in Singapore working on golf courses in Singapore and Malaysia installing irrigation and offering pond and lake management services.

Neil Surman is the operations manager for WET. Neil has more than 20 years' experience in greenkeeping and was the superintendent at the Indooroopilly Golf Club in Brisbane for 13 years. Neil brings a wealth of knowledge and understanding of a superintendent's standards and requirements to every irrigation and pond/lake management project that WET undertakes

WET is proud to associate themselves with quality products such as Aqua Master, Rain Bird and Toro.

WIEDENMANN GMBH
BOOTH NO: 51

During the 2006 Australian Turfgrass Conference Trade Exhibition, Wiedenmann GmbH Germany, will show new products of the well known Terra Spike line and the brand new multi-functional turf care machine Super 500.

Of special interest for customers will be the new Terra Spike XF. This unique machine builds up new standards in the market of deep tining machines in terms of outstanding working speed, smooth run and robust construction.

The Terra Spike XF can be used in working speeds up to 4kph. Its amazing working speed gives you a perfect square hole pattern, in doing a side distance of 130mm and producing 20mm diameter holes to a working depth of up to 220mm.

The newly developed Super 500 is a turf care machine which is used universally. It can sweep cut grass and also gives you the opportunity to undertake de-thatching and flail mowing. The quality of work under any circumstances, like dry or wet conditions, hard or soft surface, is impressive.

Due to the big diameter of the rotating unit, its high tip speed and big wind paddles, the collecting action is brilliant. The Super 500 is a machine definitely built for professional turf work.

YAMAHA MOTOR AUSTRALIA
BOOTH NO. 69

Come and see Yamaha's U-MAX utility vehicle range and find out how these versatile, flexible, all-purpose machines are designed to offer outstanding performance and reliability for a multitude of uses.

You will be able to get up close to our flagship U-MAX Medium Duty II model, the heart of which beats with a reliable Yamaha built 357cc 4-stroke petrol engine. This produces a class-leading 11.4 horsepower, easily strong enough to handle the 500 pound payload capacity and 1000 pound tow capacity. So if you're in the market for a tough and dependable utility, check out the U-MAX Medium Duty II.

Also present will be both electric and petrol engined versions of Yamaha's U-MAX Medium Duty I. The former has a powerful 48 volt motor and a 400-amp motor control unit that features programmable speed and regenerative breaking (which feeds power back into the batteries while controlling downhill speed). The Yamaha U-MAX Medium Duty I petrol is packed with features like all-wheel sealed drum brakes, a DC power outlet, headlights and tail lights.

U-MAX utility vehicles are reliable, cheap to maintain and represent great value. Come and meet our consultants to discuss the product range and finance options available.

HG Turf's 3-Peat at the MCG

HG Turf recently finished relaying the MCG arena in time for the ANZAC Day AFL match between Collingwood and Essendon, witnessed by 92,000 spectators at the new look MCG.

The recent turfing of the MCG represented the third time in three years that HG Turf has successfully re-laid the arena with Motz Stabilised Turf. On each occasion an event loomed large requiring the newly laid turf to be ready for immediate play.

The arena (20,000m²) was first re-laid in December 2004 after the field was made flat for the Boxing Day Test between Australia v Pakistan.

Following the 2005 AFL Grand Final two thirds (12,000m²) of the turf was removed and the Commonwealth Games Athletics Track was installed. The track was then covered with turf for the 2005 Boxing Day Test between Australia v South Africa.

Shortly after the conclusion of the 2005 Boxing Day Test the turf was removed exposing the athletics track. It was taken back to HG Turf's farm at Alexandra and maintained for future use. The remaining turf (8,000m² inside the athletics track) was also removed in February of 2006 to make way for the Commonwealth Games Opening Ceremony stage.

Following the Commonwealth Games Opening Ceremony, HG Turf was responsible for reinstalling the turf inside the athletics track. The mandate was tight with HG Turf given only 40 hours to install and consolidate the 8,000m² of turf. The operation was completed in 36 hours working 24hours per day, two shifts of 12 hours with each shift having 15 workers. HG Turf and its product had successfully undertaken such a mandate previously, installing the turf for the Sydney 2000 Olympics in 36 hours, again after the Opening Ceremony and before athletics commenced.

As the new MCG shone in all it glory for the Commonwealth Games, plans were afoot to have the ground back for the ANZAC Day AFL match, one month earlier than originally planned. As a result, the program was accelerated and the turf (20,000m²) was installed over 10 days with works finishing over the Easter weekend. As sections of the track were removed, the sand was leveled and the turf was laid.

A benefit of Motz Stabilised Turf is that where a project like this one requires the turf to be installed and removed on a number of occasions it can be reused rather than scrapped thus realising significant cost savings to the project. On this occasion a saving of $826,000 was realised.

HG TURF


The green-brown algal growth has been identified as the cyanobacteria genera Nostoc

A slippery situation

In this instalment of Tech Talk, Andrew Peart investigates the appearance of an algal mass known as Nostoc, which some superintendents have been forced to contend with on their courses with the onset of autumn and winter.

With the arrival of late autumn rains, a number of golf courses have had to contend with the appearance of a slippery algal mass. Not only are these 'algal blooms' damaging to the turf in terms of competition, but a major problem appears to be safety, with a number of golf courses reporting that golfers are coming to grief after slipping on these masses.

The problem arises as superintendents must find control measures to overcome these infestations, not necessarily due to the damage to the turf but more to ensure golfers' safety. These growths can become so profuse that it is not just golfers that can fall foul, but they also present a significant hazard for groundstaff, particularly during the operation of machinery.


Late autumn rains has seen a proliferation of Nostoc on some golf courses. Its slippery nature creates a hazard for both golfers and groundstaff alike

IDENTIFICATION

The green-brown growth has been identified as cyanobacteria. Unlike true bacteria, cyanobacteria contain the green pigment chlorophyll which enables these organisms to photosynthesise.

Most bacteria are described as heterotrophs that must obtain their food from other sources, however cyanobacteria are autotrophs meaning they can produce their own food. Due to their ability to produce their own food it causes them to be dubbed "blue-green algae" though they have no relationship to any of the various eukaryotic algae.

Eukaryotes have a definite nucleus that is bounded by a double membrane whereas prokaryotes (bacteria and cyanobacteria) do not have membrane bound organelles.

The actual cyanobacteria genera that this growth has been identified is Nostoc, one of four common genera among cyanobacteria.

Members of the genus Nostoc have been referred to as 'star jelly', 'witches butter' and 'mare's eggs'. The 'balls' that are apparent if you look closely at the gelatinous mass are composed of an aggregation of numerous filaments of cyanobacteria, each with bead-like strands (trichomes) of prokaryotic cells.

RESEARCH

There has been minimal work conducted on trying to control this problem as it is believed cultural practices are the best remedy. However, in 2001 a paper was published on the effects of algicides on populations of eukaryotic and prokaryotic algae on a bermudagrass putting green.

The prokaryotic algae identified were the cyanobacteria Nostoc and Oscillatoria, while the eukaryotic algae were the divisions Chlorophyta (green algae) and Chrysophyta (golden brown algae). Measurements of control were made by microscopic counts due to the difficulties of identifying the different genera of algae by any other method.

Products evaluated in the trial were applied twice at three-week intervals and the product name and total amount applied over the two applications per square metre were;

- Chlorothalonil at 0.96g of active ingredient (ai)
- Hydrated lime (calcium hydroxide) at 24.4g
- Mancozeb at 0.92g of ai
- Quaternary ammonium salts at 0.135g of ai
- Untreated control

All treatments, with the exception of the hydrated lime, were applied via a carbon dioxide powered boom sprayer with a water volume of 359ml per square metre (3590 litres/hectare). The high water volume is considered necessary to increase penetration of the turf canopy and ensure a greater contact area. The hydrated lime was watered in by hand after application.

The results varied over the three years that the trial was conducted. The most favourable results were obtained in 1994 and can be seen in Table 1. Significant reductions in microscopic counts were observed with the treatments of chlorothalonil, mancozeb and hydrated lime. However, following the second application of hydrated lime, damage to the

turf was observed that resulted in an increase in the amount of cyanobacteria observed. If hydrated lime is to be used, more frequent applications at a lower rate may be required. Hydrated lime applications may also elevate soil pH favouring prokaryotic algae.

The 1994 study indicated that chlorothalonil, hydrated lime and mancozeb may have some cyanobactericidal effects upon prokaryotic algae. However, similar results were not observed in the first two years of the trial. Results indicate that chemical control could be short-term unless cultural practices that are conducive to algal proliferation are corrected.

TABLE 1. THE EFFECTS OF FIVE ALGICIDE TREATMENTS ON PROKARYOTIC ALGAE NUMBERS PER MICROLITRE OF SAMPLE SOLUTION FROM A BERMUDAGRASS GREEN IN 1994.

Treatment	Rate [1]	0 [2]	1	2	3	4	5	6
Quaternary Ammonium Salts	0.0024	179	139	127	101	107	107	97
Chlorothalonil	0.96	146	69	99	65	94	59	74
Hydrated Lime	24	157	106	113	74	89	76	142
Mancozeb	0.92	128	74	107	43	83	86	61
Control	-	168	141	141	89	109	106	103
LSD		NS	NS	NS	NS	NS	21	48

1. Treatments measured in grams of active ingredient per square meter.
2. Number of algae at 0-6 weeks after initiation.

CULTURAL PRACTICES

The areas that the dark green masses have been observed on are typically on sloping surfaces (eg: bunker faces) where grass cover is not full. Sloping surfaces may indicate that water movements across the surface are important in the proliferation of these organisms. The sloping surface also adds to the hazardous nature of these organisms and one of the major reasons for control.

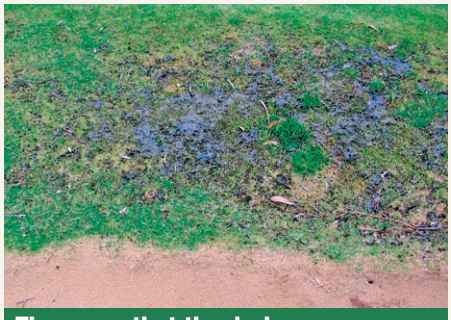
Drying the surface out with the use of spiking or sanding may give some relief. Spiking may encourage some air movement into the profile and help dry out the top couple of inches, while sanding may absorb some of the jelly-like substance.

The use of ferrous sulfate at reasonably high rates (20g/m^2) may help or in combination with ammonium sulfate and sand at a mixture of one part ferrous sulphate, three parts ammonium sulphate and 10 parts sand applied at 140g per square metre (14kg/100m2).

The use of the ammonium sulfate may be beneficial to alter the surface pH and give the turf some extra fertility, while the sand is mainly used as a bulking agent but also may help dry the surface. It would be advisable to conduct some test strips with these materials before applying them for large scale control.

CONCLUSION

The severity of this problem has caused many golfers to express concerns to their clubs in regards to hazardous surfaces rather than reduced turfgrass quality. However, the superintendent must not only produce excellent turfgrass quality but also excellent playing surfaces and the presence of the Nostoc sp. is jeopardising the quality of such surfaces.



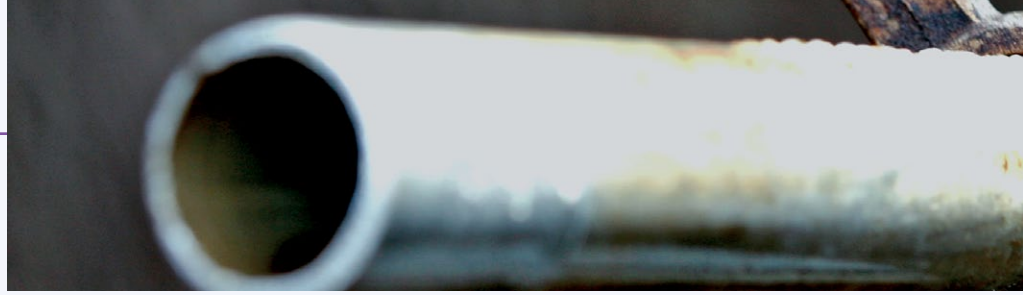
The areas that the dark green masses have been observed are typically on sloping surfaces, such as bunker faces

Once the amount of 'algae' present has become so severe that it is causing unacceptable surfaces, it must be controlled chemically and then cultural practices employed to reduce its severity in preceding years.

With the minimal amount of research that has been conducted, no one-off application of any material appears to give complete control. Mancozeb and chlorothalonil applications at high rates seem to show the best results, although multiple applications at weekly to 10-day intervals may be required. Other possibilities may include Kendocide® or dichlorophen as well as ferrous sulphate or even hydrated lime.

Due to the variability between sites and climatic conditions, test strips may be required to evaluate the most appropriate chemical and rate for each location.

Cultural practices should then be employed once control has been achieved or as part of the control program. These appear to be heavily reliant on improving the overall fertility of areas in which the Nostoc sp. is appearing, to help achieve a complete and healthy cover of grass.



THE PULSE

Sky-rocketing petrol prices have dominated headlines recently with prices having almost doubled in the past four years. And there appears to be no respite in sight. In this instalment of The Pulse, ATM's dedicated opinion section, we ask superintendents whether these price hikes are having an impact on the turf industry and golf course maintenance operations.

Gary Bass
Croydon Golf Club

Most golf clubs would be feeling the effects of rising fuel costs and flow on effects to maintenance and what we would like to do on our courses. At Croydon Golf Club the 2006 course maintenance budget was prepared on the basis of general course maintenance with very little capital input to the course due to the construction of a new 27-hole golf course.

The budget allowed for daily and weekly mowing programs and associated works programs to meet the club's syllabus and associated events for the year ahead. We have routine daily cutting programs for all fine turf areas and this is expected by our members whom all have high expectations on how a course should be presented.

Mowing of greens is daily and fairways are seasonal due to the couch, but during peak growing they are cut daily. With our course now over 80 years old most of the course infrastructure is tired and outdated and we use frequent cutting of all fine turf areas to improve and maintain presentation of the course.

Our machinery fleet is predominately diesel, some turbo charged, and with a lot of rough to be maintained fuel consumption is high. Our fuel usage does fluctuate throughout the year and we budget according to the season.

Over the past few years budgeting for fuel has become very difficult as the price of fuel has steadily risen and continues to do so. In 1999 the price of diesel was $0.79 per litre and we are currently paying $1.36 per litre. This is a rise of over 70 per cent, while the course budget for the same period (1999-2006) has risen only 20 per cent.

The word is we will be paying up to $2.00 per litre by the end of the year. All this makes it very challenging to maintain the quality of the course, hold on to and pay good staff and maintain a budget. The flow on effect from the cost of fuel has affected other areas of the business including transport costs and these costs are also passed on through sand and soil deliveries.

The club is aware of the rising cost of fuel and other associated costs but the club has in place a set budget for course maintenance and it is hard for the club to continue to bridge the gap to meet the extra charges. The club's groundstaff in 1999 was seven and grew to nine in 2001 and now runs with eight to keep course standards at reasonable levels and the downsize can be attributed to the rising costs associated with fuel and the increased costs of course maintenance in general.

We are constantly looking at ways to reduce costs while increasing course quality and one way has been using more growth retardants than before to reduce mower usage, while we have been forced to cut some weekend cutting programs freeing up funds throughout different times of the year.

We are constantly looking at alternatives including electric greens mowers and utility vehicles but feel the range and variety available to suit the club's needs is not great enough at this point in time.

Grass variety throughout the course is also a very important factor in setting course programs and budgets and we are now using the price of fuel as a tool on what grasses will be planted on the new course. The current course is over 80 years old and grass variety varies throughout the course with weed type grasses dominating rough lines and non-golf areas. This also creates extra work through cutting and maintenance, something we plan our schedules around knowing it is not ideal but work with due to the forthcoming move.

We hope the current trend of fuel increases will level out and return to a point where we can better utilise funds on our course.

David Scaife
Bonnie Doon Golf Club

At this stage the rising cost of fuel and its subsequent impact on industry has had little affect on our day-to-day golf course operations at Bonnie Doon. Fortunately I have been able to increase this year's budget so I have not been forced to make cutbacks in other areas.

Our budget for fuel and oil has been around $28,000 to $30,000 over the past four years, but this year has seen a rise of about 10 per cent, our biggest increase for many years. Any price increase obviously will be of some concern and with the rise in fuel costs I would expect price increases to impact on our operating budget.

I have also had two letters over the past 12 months from my oil/grease suppliers passing on small increases as well as sand suppliers passing on transport cost increases.

As an aside from golf course operations, rising fuel prices could have a serious impact on the ability of certain golf courses to attract staff that have to travel in order to work. I am reasonably lucky in that my course is close to public transport, but early morning starts can be a problem. Most of my staff lives within about 10-15 minutes from the course and a couple are able to ride pushbikes to and from work.

I think over the next couple of years everybody will be looking for a more economical way to maintain their course and maybe alternatives to petroleum oil based fuels will start to appear.

Next year we will be turning over five utilities and the possibility of purchasing electric-powered vehicles will be greatly considered. I think that alternative fuels may also be a way to minimise the cost of fuel. They are looking at ethanol for cars, so hopefully this can also be translated into use for small engines as well.

Dean Henderson
Sanctuary Cove

The recent increases in petrol and diesel prices have certainly been noticed here at Sanctuary Cove. To date, we are about 15 per cent over budget in our 'fuel and oil' expenditures and with the prospect of prices rising further this will impact on our budget.

Sanctuary Cove comprises of two 18-hole championship layouts (The Palms and The Pines), and in our general day-to-day maintenance, due to the large scale of the site we operate on, we burn a lot of fuel just travelling to and from job sites.

While the rising fuel costs haven't bitten hard, we will attempt to offset these extra costs by cutting back in other areas of the budget, but at this stage we will not be forced to reduce daily maintenance activities which could have a negative impact in terms of playing numbers.

While we will be trialling electric mowers here at Sanctuary Cove, this will be more so for their low noise emissions and any fuel savings on top of that would be an added bonus.

Looking forward to next season, I will obviously be increasing the fuel budget, particularly with talk that prices will climb as high as $2 by the end of 2006.

We are also planning to utilise plant growth regulators to a much greater extent than in previous growing seasons and can see that the cost of purchasing and applying these products will be quickly offset with the reduced mowing/fuel costs.

SYNGENTA VALUES THE OPINIONS OF THE TURF INDUSTRY AND RECOGNISES THE CONTRIBUTION OF SUPERINTENDENTS' RESPONSES WITH A $50 EDUCATIONAL VOUCHER

Stuart Laing
Royal Pines Resort

The recent hike in fuel prices have yet to make an impact on the maintenance operations here at Royal Pines Resort. Our focus is still on providing a high quality golfing experience for all of our hotel guests, members and visitors.

We are obviously monitoring fuel costs against our business plan and first-quarter figures show a 40 per cent increase in fuel costs against the budget. At this stage there is no planned expenditure cuts to absorb the fuel overspend as golf course operations must continue to deliver a high quality product to ensure there is no negative impact on hotel operations or residential sales.

Rising fuel prices are a concern from an operations standpoint, but operational budgets are only a general guide. If the overspend is monitored and justified it is generally accepted. Obviously when you do have a blowout in expenditure in an area of your operation, you monitor other areas of your operation to identify any possible opportunities to minimise budget overspend. In our case these opportunities would only be considered if they were not detrimental to the overall operation.

As for alternatives to fuel, Royal Pines Resort has certainly been looking at the options available, but with the business demands upon us (we maintain 27 holes) we have not been successful in finding electric counterparts that can fulfill basic business requirements.

There will certainly be more demand for electric-powered machinery in the future not only due to fuel costs but also with noise restrictions. More development of electric-powered equipment needs to take place, and hopefully that will come soon. We operate on a 500-acre property with high equipment demands, which currently are not met by those electric options currently available.

BY MARCUS HARTUP

Pacific Harbour Golf and Country Club on Bribie Island was opened in April this year

Bribie Island's new beauty - Pacific Harbour Golf and Country Club

During the 22nd Australian Turfgrass Conference, delegates will get the opportunity to visit one of the Sunshine State's newest golf course developments, Pacific Harbour Golf and Country Club. Here superintendent Marcus Hartup takes an in-depth look into the construction of the Ross Watson layout on the environmentally-sensitive Bribie Island and some of the challenges that have been overcome during construction and maintenance.

Pacific Harbour Golf and Country Club, which opened on 1 April, 2006, is situated on south east Queensland's beautiful Bribie Island. The golf course is part of a $500million golf and country club as well as a residential community accommodating over 600 properties, which is owned by QM Properties. Pacific Harbour Golf and Country Club is managed by Troon Golf, one of 185 golf courses the company manages across 15 countries.

Designed by leading Australian golf course architect Ross Watson, Pacific Harbour contains many unique features which have made its construction and subsequent maintenance a challenge. For a start, the course is nestled between major national and environmental parks.

The site provided a unique opportunity for Watson to create a high-quality links-style golf course maintained in an environmentally sustainable manner with low inputs of water, fertilisers and pesticides. Along those lines, turf management practices were adopted to produce superior playing surfaces with minimal and positive impacts on the environment.

The site earmarked for the course was a flat, featureless, degenerated pine plantation which required clearing

Watson's vision meets strict environmental guidelines for low impact and distinctive features include interconnecting bodies of water and beach bunkering, seaside-style shaping, mirrored lakes, wetlands, wildlife corridors and native flora. The course weighs in at a respectable 6402m (par 72), with two of the course's par threes – seven (140m) and 17 (205m) – set to quickly become Pacific Harbour's signature holes.

HUMBLE BEGINNINGS

The site which was earmarked for the golf course on Bribie Island was a flat, featureless, degenerated pine plantation. Following construction of the golf course the land now features 25 reflective lakes while the topography comprises of gentle undulations in a true links style.

The soil profile comprises sandy topsoil

One of Pacific Harbour's signature holes, the par three seventh

with low to moderate amounts of organic matter, which is overlaying white sand. Under this white sand is a dark brown humic layer of silty sand.

Underlying much of the site is a 'coffee rock', a type of brownish sand rock or soil pan formed where iron oxides and organic matter, which have leached through the soil profile, are precipitated at or above a fluctuating water table.

Drainage through the native sands is very good, however the golf course was required to be pushed into the surface to create enough fill for the 600-plus residential blocks surrounding the golf course.

The water table in some areas of the golf course is very high, therefore subsurface drainage has been required to direct the water flow into the lake system. All lakes are interconnected by a series of swales and overflow balancing pipes.

We have the ability to harvest all rain water that falls on site through these lakes and a lake transfer system in which we can pump water from the lowest lake (on the western side of the course) to our irrigation lake which also doubles as an aquatic driving range lake.

GREEN, GREEN GRASS

Grass varieties used on the golf course are TifEagle (greens), Wintergreen couch on tees, fairways and roughs, with Plateau couch used on bunker surrounds. TifEagle was chosen for the greens as it has proven to be a premier putting surface with a number of unique advantages for golf course superintendents. TifEagle has superior recovery from mechanical injury, has better colour and is cold-hardy, drought-tolerant and disease-resistant.

Tifgreen (328) and Tifdwarf become stressed when subject to reduced mowing heights, frequent verticutting, increased topdressing and minimal irrigation, while TifEagle has been created to withstand these common practices that are required for the control of thatch build-up.

Watson came up with the idea for Plateau couch around the bunker edges. His intentions were to use a warm-season grass but maintain a links-style effect. Also with our bunkers here at Pacific Harbour they are unique in the fact that they have a rough unmanicured appearance.

To achieve this in the warm climates of ▶

south-east Queensland was always going to be difficult, but I believe that we have achieved the desired look with the Plateau couch. The Plateau also gives us the ability on a time-saving factor, as we are not required to flymow the bunker edges.

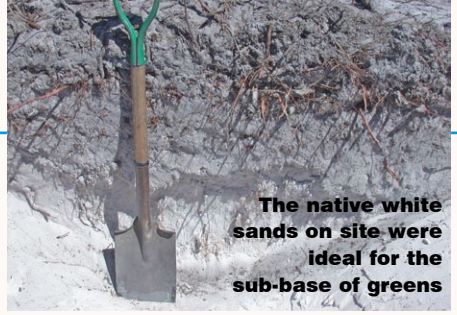
SHIFTING SANDS

Obviously with every new golf course construction there is a set procedure and routine from transforming the original site to the golf course which it is today.

The developers/owners of Pacific Harbour have been terrific in the fact that they are very environmentally-sensitive and have shown great initiative in preserving and maintaining a sustainable environment. As such, the Pacific Harbour development has the unique status of "champion project" demonstrating best practice sustainability from planning phases through to operational phases and beyond.

Environmental studies were conducted by HLA Envirosciences and provided an environmental management plan (EMP) that all contractors were to adhere to. All staff including contractors were also required to complete a course in general safety induction, which is referred to as a 'blue card'.

Golf course shaping began in May 2004 in which we experienced a very dry winter (just 70mm from May to the end of September). Dust proved to be a very big issue and with the northerly winds and existing residents to the south it was a continual battle to keep dust to a minimum. It was for this reason that we spent approximately $200,000 on temporary irrigation which included all piping



The native white sands on site were ideal for the sub-base of greens

and sprinklers, production bores, generators and power.

The construction team consisted of myself and Rick O'Loughlan (project and construction manager for Ross Watson Golf Design), irrigation technician Ryan Markwell (now at Sports City in Dubai), spray technician Brendan Hansard (now assistant superintendent at the new Twin Creeks Golf Club in Sydney), an Irish intern and a couple of labourers. Together we formed a team that worked well together and complemented Watson's world-class shapers Jeff Linderman, Eric Reidlinger and Gary Cox.

The importance of having an irrigation technician cannot be overlooked and Ryan did an exceptional job of overseeing the irrigation installation as well as ensuring that we complied with our EMP with the temporary irrigation to negate dust activity.

As the golf course progressed through the construction phase, additional staff were employed as required to maintain areas that were growing in as well as continue with the construction of the remaining holes. At the peak of the construction and grow-in our staff swelled to 16 which also included a United States intern.

Each hole at Pacific Harbour has its own theme with an overall foundation to represent the native endemic species of the area on the golf course, lakes system and the buffering edges of the golf course. Where possible areas were left untouched and form an integral part of the course with the native revegetation program. The landscape design came from Place design with Naturform implementing the design on the ground.

FROM TEE TO GREEN

The greens were constructed as follows. The sub-base of the greens is the native white sand which has a minimal infiltration rate of 500mm/hr. The base of the green is a minimum one metre above the maximum height of the mean piezometric level of the 'coffee rock'.

Drainage on the sub-base of the green consists of a perimeter ring drain with laterals were we deemed required. The rootzone sand is GTS 2000 supplied by Southern Pacific Sands and was the only sand to be imported to the site.

Amendments applied to the greens varied according to when the greens were stolonised, the reason being that each green was planted at varying times during the construction and we wanted to achieve a similar level of base saturation and organic matter in the profiles at the completion of the construction phase. Products used for amendments in the rootzone were Sandaide, TX10, Calrite, Dolomite, Steps Hi Mg, Poly Plus Starter and Envirorganics.

Once the greens were approved by Watson and the amendments applied and tillered in, the greens were stolonised with TifEagle supplied by Twin View Turf at a rate of 0.175m^3/100m^2. The stolons were applied by hand then rolled into the surface with a mechanical grooved roller. After this, greens were then rolled in again using a bunker rake.

Wintergreen couch was used on the fairways with Plateau couch chosen for the bunker surrounds.

Tees were constructed using the native white sands and are of a push-up variety. There is no subsurface drainage on tees with the white sand draining at approximately 750mm/hr. Tee tops were amended with Enviroganics and lime. All tee tops were shaped and laser leveled by Gary Cox with the assistance of the golf course construction team. They were then solid turfed with Wintergreen couch.

The fairways construction sequence was as follows. The topsoil was carefully stripped and Jeff Linderman formed the rough shaping of fairways. The topsoil was replaced and then drainage installed where required. After the installation of the irrigation system, Eric Reidlinger completed the fine shaping by dozer. Cox then completed the final trim with the Bobcat.

Watson would inspect the sites for approval, and after getting the all clear, amendments were added to fairways and roughs (Enviroganics 10 tonne/ha, lime 2.5 tonne/ha and gypsum 2 tonne/ha). Once amendments were applied, the fairways were stolonised with Wintergreen couch at a rate of nine percent by Twin View Turf and Ronstar Starter was applied at a rate of 3.6kg/100m^2.

TifEagle was chosen for the greens due to its superior recovery from mechanical injury, better colour, cold-hardiness and drought-tolerance

BUNKERS

Bunkers have been constructed using the native white sand. Although the sand is very free draining, drainage was required in all of the bunkers due to the high water table on which the golf course sits.

The back sides of the bunkers have been planted with native plants and appear as though they were here before the golf course existed. Because the bunkers are sand on sand we suffer very little wash which is important in Queensland where storms can be severe.

MANAGEMENT CHALLENGES AND PRACTICES

There have been many challenges during both the construction of Pacific Harbour and its subsequent maintenance. Being predominately a sandy site, the soils that we have to work with have little organic matter and nutrient levels are also very low. Combined with a pH of between 3.9 and 4.2 it hasn't made for ideal growing conditions.

The obvious answer would be to apply lime, however with our strict EMP and our ▶

The spectacular bunker complex which lines the par three 17th during the grow-in phase

acid-loving Wallum Froglet (Crinia tinnula) this was not an option to change our soils in one fowl swoop. Our aim is to gradually build the soils up with organics and build on our base saturations.

I have worked closely with David Nicholls, vice-president of science and agronomy for Troon Golf Australia-Pacific region, and Peter Scott, principle environmental scientist from HLA Envirosciences, in researching and finding that it is very much achievable to produce a product that is environmentally sustainable and provide great playing surfaces with soils and water that are in the less-than-ideal range.

Our water source is from an upper aquifer and a regional aquifer. The upper aquifer is derived from ground water. It has a pH of 3.8 to 4.2 and is low in all nutrient values, has a high pHc of 10.2 and therefore dissolving calcium and more prone to leaching.

Management of our water source is of utmost importance especially when we move through the winter months when rainfall is less prevalent. Helping us achieve that is the irrigation system which was designed by David Handby from Hydro Pumping & Controls and installed by Waterforce Irrigation. The system is a Toro LTC-plus with a SitePro Central Control system. All sprinklers are valve-in-head 800 series with back-to back 860s on the greens and surrounds. There are 22 satellite boxes located around the course.

With the course opening in April of this year, maintenance practices are still being fine-tuned. Soil testing is conducted yearly to determine nutrient levels and due to low organics and low nutrient levels in our soils our management practices are to increase organics and spoon feed at low rates in the form of foliar fertilising.

A typical foliar feed for greens would include potassium nitrate, iron sulphate, urea, Amino Grow, Kelpak as well as a monthly application of Revolution. This helps to supplement a monthly application of TX10, Calrite and Umaxx slow release fertiliser. The greens are dusted fortnightly.

On tees, organics are applied monthly to help build up the soil profile, as well as a monthly foliar spoon feeding program containing potassium nitrate, iron sulphate, urea and Amino Grow. We also give a monthly application of Stamina 30.

For the fairways, organics are applied four times per year to help build up the soil profile, and again we employ a monthly foliar spoon feeding program of potassium nitrate, iron sulphate and urea. The fairways are also treated with Dispatch through the injection system.

During the early stages of the grow-in process we suffered a breakout of disease on three of our greens. I would put this down to the fact that we did not have sufficient equipment at the time of planting and proceeding to perform normal, basic turf maintenance. This enabled thatch to build up and led to an outbreak of brown patch, fusarium and phythium.

Once we sorted out our lack of equipment all greens have performed well. It is a matter of constant inspection and ensuring that we are not stressing the plant and soil moisture is at an adequate level.

The Pacific Harbour maintenance facility, which was completed in April 2005, is stacked with Toro equipment, including two 6500D fairway units, two 3100D Sidewinders, a 3500D Groundsmaster, four 3250D triplex mowers, two 1000D Toro Greensmasters, two 3300D Workman utilities and two 3020 bunker rakes. Also part of the maintenance arsenal are two 5220 John Deere tractors, five Club Car Carryall vehicles, an Enviromist spray unit as well as the usual assortment of flymows, brushcutters, rollers and blowers.

At present, Pacific Harbour has a staff of 13. My assistant is Kelvin Nicholson and we also have three qualified greenkeepers, a groundsman and three apprentices on staff. Making up the contingent are a spray technician, irrigation technician, horticulturalist and mechanic.

Together we have a cohesive team which has come together well and we look forward to hosting those Australian Turfgrass Conference delegates who visit during the post-conference turf tour.

The Pacific Harbour maintenance crew

At a glance - Marcus Hartup

2004-Present: Superintendent, Pacific Harbour Golf and Country Club, QLD

2000-2004: Assistant superintendent, Brookwater Golf Club, QLD

2000: Greenkeeper, Pelican Waters GC, QLD

1997-1999: Assistant superintendent, Lismore Golf Club, NSW

1996-1997: Intern at Indian Creek Golf and Country Club and Bear Lakes Golf and Country Club, Florida, USA

1992-1996: Apprenticeship, Melton Valley Golf Club, VIC

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BY DR. MARCELLE STIRLING AND DR. GRAHAM STIRLING

In summer, two types of patch disease symptoms are often observed on golf greens in Queensland. In most cases, brown to straw-coloured patches will appear that range in size from 30cm to one metre in diameter and have both living and dead grass within the patch

The role of ERI fungi in couch decline in Queensland

Couch decline has proved to be a never-ending source of headaches for superintendents in Queensland and northern NSW in recent seasons, particularly during last summer. Here Drs Marcelle and Graham Stirling from Biological Crop Protection in Brisbane look at the role of ectotrophic root-infecting fungi in stress-induced root decline diseases of couchgrass in Queensland.

For many years it was thought that fungi such as *Bipolaris, Curvularia, Drechslera, Pythium, Rhizoctonia* and *Fusarium* were responsible for most of the root diseases of highly managed turfgrass on golf putting greens. However this situation has changed in the last 20 years, as research has shown that ectotrophic root-infecting fungi (commonly referred to as ERI fungi) are the principal factors responsible for the patchiness and poor root health that is commonly observed in golf greens.

In Australia, ERI fungi are particularly important on couchgrass (*Cynodon dactylon*) and its hybrids, which are the dominant grass species used for putting surfaces in warm climates such as Queensland.

ERI FUNGI

The term 'ectotrophic' refers to the fact that ERI fungi tend to be found on the surface rather than inside roots. These fungi grow extensively over the root surface before they eventually penetrate the cells and water-conducting tissues of the root. When roots are viewed under a microscope, darkly-pigmented fungal strands (known as runner hyphae) can be easily seen on the root surface.

TABLE 1. SOME OF THE ERI FUNGI ASSOCIATED WITH ROOT DECLINE OF COUCHGRASS (CYNODON DACTYLON)

FUNGUS	DISEASE	DISTRIBUTION
Gaeumannomyces graminis var. graminis	Couchgrass decline	Widespread in south-eastern USA, limited occurrence in Queensland
Gaeumannomyces graminis var. avenae	Take-all patch	Associated with a severe patch disease of Tifdwarf couchgrass in northern NSW
Ophiosphaerella korrae and O. narmari (previously *Leptosphaeria*)	Spring dead spot	Widespread in eastern USA, California and Australia
Gaeumannomyces incrustans	Not widely studied. Probably mildly or moderately pathogenic	Widespread in USA and Australia
Magnaporthe	Not widely studied. Probably mildly or moderately pathogenic	Widespread in USA

Note: Several ERI fungi, including *Gaeumannomyces* and *Magnaporthe*, have an asexual stage that is known as *Phialophora*. Species of *Phialophora* are common inhabitants of grass roots but are not thought to be very pathogenic on turfgrasses.

There can also sometimes be a mixture of green and straw-coloured grass, and definite patches with no grass at all

The term ERI fungi does not refer to a single fungus, but is a general term that encompasses a number of fungal species. These fungi have broadly similar characteristics but differ in their host range and the severity of the symptoms they produce on turf grasses. Because knowledge of these fungi is growing rapidly, some name changes have occurred in recent years and more changes are likely as taxonomic knowledge evolves.

Some of the more important ERI fungi that attack turfgrasses are listed in Tables 1 and 2. It is important to note that these fungi cannot be identified by quickly examining diseased roots. Specific fungal structures (e.g. hyphopodia) must be observed on roots, or the sexual stage of the fungus must be seen in laboratory cultures or on plant tissue.

ROOT DISEASES OF COUCH IN WARM CLIMATES

Couchgrass decline (or bermudagrass decline in the south-eastern states of the USA) is a disease that occurs during summer. The lower leaves become chlorotic and irregularly shaped patches up to one metre in diameter then start to appear. As the disease progresses, upper ▶

TABLE 2. IMPORTANT ERI FUNGI ASSOCIATED WITH ROOT DECLINE OF TURFGRASSES OTHER THAN COUCHGRASS

FUNGUS	HOST RANGE	DISEASE/ SYMPTOMS	DISTRIBUTION
Gaeumannomyces graminis var. graminis	Paspalum (*Paspalum*), kikuyu grass (*Pennisetum*), centipede grass (*Eremochloa*), zoysiagrass (*Zoysia*)	Patch and root diseases	Widespread in both warm and cool climates
Gaeumannomyces graminis var. avenae	Bentgrass (*Agrostis*), fescue (*Festuca*), bluegrass (*Poa*)	Take-all patch	Widespread in cool areas of the USA.
Gaeumannomyces wongoonoo	Buffalo/St. Augustine grass (*Stenotaphrum*)	Patches of unthrifty grass	Described from Perth, Western Australia
Magnaporthe poae	Fescue (*Festuca*), bluegrass (*Poa*)	Summer patch	Widespread in areas where host plants are grown

leaves are affected, roots turn brown, lesions develop on roots and the entire root system eventually turns black and rots completely. Symptoms are most likely to occur when the weather is hot and humid, rainfall is high and heavy cloud cover reduces light intensity and creates conditions that are not conducive to plant growth.

The main fungus associated with the disease is *Gaeumannomyces graminis var. graminis*, which tolerates temperatures above 25˚C and is therefore active throughout the warmer months of the year. ERI fungi such as *G. incrustans* and *Phialophora* are also found on roots of affected plants, but they are generally considered to be secondary pathogens. Thus couchgrass decline is a disease complex that involves a number of ERI fungi, with *Gaeumannomyces graminis var. graminis* generally the primary pathogen.

Take-all patch (caused by *Gaeumannomyces graminis var. avenae*) is generally restricted to cool climates and is mainly seen on bentgrass. However, it has been observed on Tifdwarf couchgrass in northern NSW, where root damage occurs in winter and above-ground symptoms are observed during spring and early summer.

Spring dead spot is another important disease that is manifested as patchiness in couchgrass. It is caused by two species of *Ophiosphaerella*, an ERI fungus that was formerly known as *Leptosphaeria*. These fungi grow best at 10-25˚C and are therefore most active when couchgrass is dormant or growing very slowly. Symptoms of the disease may occur following unusually cool days in autumn and winter, but they usually appear when dormant couchgrass resumes growth in spring. Above-ground symptoms are depressed patches of dead grass in roughly circular patches up to one metre in diameter.

ERI FUNGI ON COUCHGRASS IN QUEENSLAND

In summer, two types of patch disease symptoms are observed on golf greens in Queensland.

In most cases, brown to straw-coloured patches will appear that range in size from 30cm to one metre in diameter and have both living and dead grass within the patch (see photo page 68). However, there is sometimes a mixture of green and straw-coloured grass, and definite patches with no grass at all (see photo page 69).

When root systems from affected greens are examined during summer, root health is generally poor. At a time when the grass should be growing well, few roots are more than 6cm long and most are confined to the thatch layer or to a shallow zone about 1.5cm deep (see photo over page). Under a microscope, roots are brown and rotted or have scattered brown lesions on the surface. Dark-coloured fungal strands can be seen on the surface of roots that have not completely rotted (see photos page 72), and are also readily apparent on stolons.

Laboratory studies of the fungi associated with diseased roots of couch in Queensland have shown that most of them belong to the *Gaeumannomyces-Phialophora* group.

Many different isolates have been recovered from roots and tested for their potential to damage roots of couchgrass, and most were found to cause root rotting in glasshouse tests.

Ophiosphaerella (the cause of spring dead spot) is also commonly recovered, particularly if samples are collected in autumn, winter and spring. Although *Gaeumannomyces graminis var. graminis* (the cause of couchgrass decline) is present, it does not appear to be widespread. Nevertheless, it is clear that a range of ERI fungi capable of causing moderate damage to roots are associated with couchgrass at most times of the year.

SUSCEPTIBILITY OF COUCH CULTIVARS TO ERI FUNGI

In Queensland, Tifgreen 328 (*C. dactylon x C. transvaalensis*) is particularly susceptible to damage from ERI fungi when it is managed as a golf putting green, possibly because it does not tolerate long-term mowing heights of less than about 5mm. Tifdwarf seems to be more resilient to root decline problems, but ERI fungi will sometimes cause damage.

THE ROLE OF STRESS IN DISEASES INVOLVING ERI FUNGI

Observations in Queensland suggest that ERI fungi are almost always found on the roots of couchgrass that is managed intensively as golf greens. However, plants infested with ERI fungi generally remain reasonably healthy. Above-ground symptoms only develop when there is a decline in plant vigour caused by a range of stress factors.

Although the reasons for this phenomenon are not well understood, it is thought that defence systems in healthy, vigorously growing plants restrict colonisation of internal root tissues and ensure that ERI fungi grow mainly on the root surface. However, when host defence mechanisms are weakened by some external stress, infection proceeds without obstruction.

Stresses that weaken plants and therefore increase their susceptibility to ERI fungi include low mowing heights, heavy traffic, low light intensity, extremes of temperature or moisture and inadequate nutrition.

SURVIVAL AND DISSEMINATION OF ERI FUNGI

Since ERI fungi are capable of infecting roots, they survive best when living roots are present.

Most ERI fungi do not produce dormant structures that help them survive, and so in the absence of a host plant, they survive primarily in dead plant tissues that were previously colonised through parasitism.

ERI fungi do not compete well with saprophytic fungi (i.e. fungi that can colonise non-living organic matter), and so they are unable to use dead roots, leaves and stolons or organic materials in the thatch layer as a food resource. In situations where microbial activity is high, ERI fungi do not survive well because the root tissues harbouring them are soon destroyed by soil micro-organisms.

Although ERI fungi produce spores, they do not play an important role in disseminating the pathogen. Most spread occurs when healthy tissues (i.e. roots, stolons and leaf sheaths) come into direct contact with infected roots or colonised organic debris. Thus the most likely means of disseminating ERI fungi in turfgrass is through the movement of infected plant tissue during cultivation. The fungi are spread to areas with no previous disease history by core aerators and dethatching machines, and can be carried on the spikes and soles of golf shoes.

Diseased couchgrass roots

MINIMISING THE IMPACT OF ERI FUNGI

Since patch diseases caused by ERI fungi are stress-related problems, the key to disease management is to avoid the problem by minimising stress. It is vitally important to prevent diseases of this nature from taking hold, because once symptoms occur, it will take many months to restore greens to full health.

MOWING HEIGHT

The most effective way of preventing couchgrass decline is to raise the mowing height during periods when the disease is most likely to occur. Research has shown that regardless of mowing height, the root/shoot ratio of couchgrass remains constant at about 40 per cent roots and 60 per cent tops. Thus when grass is mown at low cutting heights, plants shed roots and this has the following consequences:

- Photosynthetic activity declines because the leaf surface area is reduced. This stresses the plant and affects its disease-defence mechanisms, allowing ERI fungi to invade roots and cause damage.
- Closely-mown turf has a low root biomass, which means that plants cannot withstand further root losses from disease. Thus when ERI fungi destroy roots, above-ground symptoms will be severe.

In Queensland, symptoms of couchgrass decline are usually observed in January and February, when conditions are usually hot and wet and there is often heavy cloud cover. Increasing the mowing height before and during this peak infection period increases the ▶

plant's photosynthetic capacity, encourages new root proliferation and enhances the disease-defence mechanisms that will help prevent infection by ERI fungi.

LIGHT INTENSITY

Light is a major environmental factor influencing the growth of couchgrass. When exposed to full sunlight, couchgrass grows well, but in cloudy or shaded situations (<70 per cent full sunlight) the grass responds by developing narrow stems, elongated leaves and internodes and weak rhizomes and stolons. Such plants are more susceptible to ERI fungi than vigorously growing plants receiving full sunlight.

Although the amount of cloud cover cannot be controlled, a limb pruning and tree removal program may help reduce the impact of ERI fungi in areas where shading reduces the amount of light reaching a green.

RENOVATION PRACTICES

It is important to ensure that greens are renovated well before summer stress periods occur. In recent years, some of the worst examples of damage by ERI fungi in Queensland have occurred when hot, wet or cloudy weather has occurred soon after renovation.

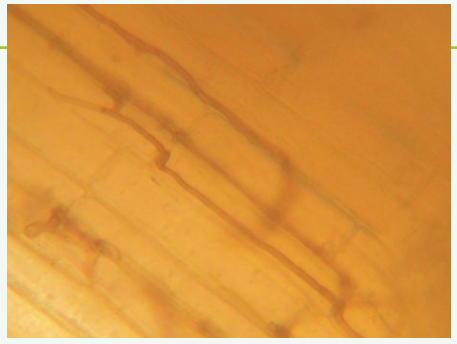
Although regular renovation is necessary to aerate the soil, reduce the thatch layer and eliminate compaction, plants are stressed by the renovation process and are susceptible to damage from ERI fungi during the recovery period. Scarification is more stressful than coring because it rips out roots and stolons rather than leaving plants relatively undisturbed.

TRAFFIC

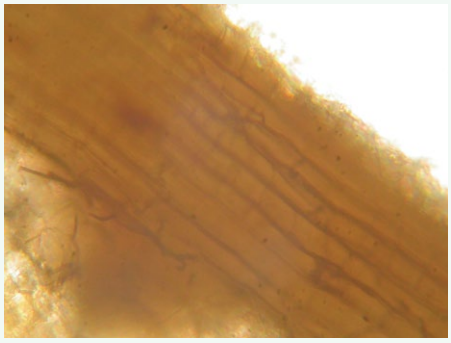
Excessive traffic is another stress factor that increases a plant's susceptibility to ERI fungi. Since it is often difficult to control traffic on golf courses, all that can be done is to minimise stress by giving heavily trafficked areas extra attention (through good nutrition, optimal water management, higher mowing heights etc.).

PLANT NUTRITION

Nutrition programs for couchgrass should be designed to keep swards healthy but not excessively vigorous, as excess vigour tends to increase a plant's susceptibility to ERI fungi. Particular attention must be paid to phosphorous, potassium and micronutrients, while excessive nitrogen inputs (particularly nitrate nitrogen) should be avoided. Slow-release fertilisers and organic sources of nutrients are best. When recycled water



Fungal strands on the root surface



is used, problems such as salinity, sodicity, alkalinity and low infiltration rates must be avoided, as these stress factors will exacerbate damage from ERI fungi.

It is important to note that once visual above-ground symptoms of patch diseases are apparent, root absorption is compromised because most of the root system will have been destroyed. Nutrients must therefore be applied to the foliage while plants are being nursed back to full health.

CHEMICAL CONTROL

Fungicides appear to have little direct effect on ERI fungi. However, it is questionable whether chemicals are the most appropriate control measure for a disease where fungal infection does not occur until after plants are stressed.

A more productive approach in such situations is to concentrate on improving plant health, as this will enhance the plant's defence mechanisms and lessen the chances of infection. Fungicides have a role to play in this process because good control of leaf diseases, for example, will minimise stress and therefore reduce the severity of root decline.

ACKNOWLEDGEMENTS

We wish to acknowledge the contribution of our colleagues in many countries who have helped improve our understanding of fungal pathogens with an ectrotrophic growth habit.

We also acknowledge the work of several American plant pathologists who have studied patch diseases of Cynodon and other grasses in the south-eastern states of the USA. Their observations have been used in compiling this article, and their conclusions are summarised in the publications of Clark and Gould (1993) and Smiley et al. (2005).

Because diseases caused by ERI fungi are usually induced by stress factors, it is important to understand how to manage couchgrass well and minimise stress. McCarty and Miller (2002) provide useful information on nutrition, cultural practices and pest management, and also include an excellent chapter on the stresses that affect couchgrass.

In Australia, we acknowledge the contribution of Dr Percy Wong, who has worked in NSW on root diseases of cereals and turfgrasses for more than 30 years. He was the first to report the occurrence of take-all patch (caused by *Gaeumannomyces graminis var. avenae*) on couchgrass in northern NSW, and has recently found a new species of *Gaeumannomyces* on buffalograss (Wong 2000; 2002).

Finally, we acknowledge the assistance of the course superintendents and consultants who are involved in the golf industry in Queensland. We also thank the Queensland Golf Union and Horticulture Australia Limited for funding our initial studies on ERI fungi. A report on this study is available from Horticulture Australia Limited (Stirling, 2002).

Dr. Marcelle Stirling and Dr. Graham Stirling are from the Biological Crop Protection in Brisbane. Email marcelle.stirling@biolcrop.com.au or graham.stirling@biolcrop.com.au.

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The salt-affect parkland at Birkdale before and after being turfed with salt-tolerant seashore paspalum

Converting salt-affected parkland with seashore paspalum

In February 2004, Redland Shire Council in Queensland planted a 2000 square metre demonstration area of parkland at Birkdale with seashore paspalum (*Paspalum vaginatum*). Dr Rachel Poulter and Dr Don Loch from the Redlands Research Station in Queensland examine the HAL project that led to this decision and detail their work into combating salt-affected sites using salt-tolerant species.

Urban salinity can arise for different reasons in different places. In inland areas such as southern NSW and the WA wheatbelt, the usual cause is rising groundwater which brings salt to the surface. In coastal sites, salt spray or periodic tidal inundation can result in problems.

In Redland Shire Council's case, the issue was compacted marine sediments (mainly mud) dug up and dumped to create foreshore parkland in the course of artificial canal developments.

At Birkdale, this had created a site that was both strongly acid (pH 3.3-4.7 surface, 2.9-4.4 subsoil) and saline (as measured by electrical conductivity: ECe 2.8-41.1dS/m surface, 4.2-46.7dS/m subsoil; for comparative purposes, seawater is 54dS/m). Not surprisingly, bare saline scalds were interspersed by areas of unthrifty grass and the problem posed was how to grass this to give an aesthetically pleasing area that locals and visitors alike would want to use?

RESEARCHING THE PROBLEM

Answers to that question have come through the Horticulture Australia Ltd (HAL) research project entitled "Amenity Grasses for Salt Affected Parks in Coastal Australia". The research was conducted by the Queensland Turf Research team from nearby Redlands Research Station, with financial support coming from HAL and Redland Shire Council.

Trial plots of a range of turfgrasses were planted on similar salt-affected parkland at Raby Bay. These studies identified *Paspalum vaginatum* (seashore paspalum) as the most salt-tolerant of the commercially available turfgrasses. Armed with this information, Redland Shire Council then set about grassing large park areas at Birkdale and later Raby Bay with seashore paspalum.

The selection of a salt-tolerant grass, however, is just the first step in what must be an integrated process of site preparation, establishment and management if saline areas are to be revegetated successfully. These various practices include annual slicing or coring in conjunction with gypsum/dolomite amendment and light topdressing with sandy loam soil (ca 1cm depth), adequate maintenance fertiliser, and irrigation scheduling to maximise infiltration and minimise runoff. Redland Shire adopted these practices from site preparation through to annual maintenance.

Prior to rolling out full sod, the ground was sliced to relieve compaction, gypsum applied to improve soil structure and calcium (Ca) status, and sandy loam (up to 5cm deep) laid under the turf. Regular leaching irrigation was applied to flush salts below the rootzone. The maintenance program on these revegetated parks now includes annual slicing, soil amendment and topdressing, plus regular fertiliser applications.

DETERMINING RELATIVE SALT TOLERANCE

Glasshouse trials were also carried out to determine the relative salt tolerance of 41 different turfgrasses. The salinity tolerance of turfgrasses (and other plants) is quantified in terms of their growth response to increasing levels of salinity.

This is usually defined by the salt level that equates to a 20, 50 or 80 per cent reduction in shoot yield, or alternatively the threshold salinity (at which point shoot yield starts to decline) together with the rate of yield reduction beyond that point.

Because of the uncontrolled variation in salinity levels even over very short distances in the field, critical determinations of salt tolerance are invariably conducted in controlled pot experiments in the glasshouse, and later related to the field.

A flood-and-drain hydroponic system was used to impose salt treatments (six levels x six replicates) on a range of grasses, beginning in experiment one with what were thought to be the most salt-tolerant group and then

progressively screening less and less salt-tolerant grass groups in experiments two and three.

The different grass cultivars in each experiment received complete nutrients in solution, as well as variable amounts of salt to impose the six different treatment levels, through a flood-and-drain hydroponic system operating once a day to avoid waterlogging.

Each experiment involved three phases: a salt-free 'settling-in phase' following planting of the pots (up to 4-6 weeks), a 'transitional phase' in which the different treatments were gradually applied by progressively raising salt levels (c. 3 weeks), and a 12- to 14-week 'experimental phase' during which measurements were taken on the grasses in the different salt treatments.

Sixteen grasses were accommodated in each of the three experiments, including three 'standards' which were present in all three experiments and a fourth standard which was dropped after the first two experiments. Species (with numbers of cultivars in brackets) that have been screened to date are:

Digitaria didactyla (blue couch) (1)
Eremochloa ophiuroides (1)
Distichlis spicata (saltgrass) (1)
Paspalum vaginatum (4)
Sporobolus virginicus (marine couch) (3)
Zoysia matrella (Manila grass) (5)
Pennisetum clandestinum (kikuyu) (3)
Stenotaphrum secundatum (9)
Cynodon dactylon (green couch) (14)

The six salt treatments in the first experiment (0, 8, 16, 24, 32, 40dS/m) covered a range to c. 75 per cent of seawater salinity levels. The second and third experiments, however, involved less salt-tolerant turfgrasses (nine *Stenotaphrum secundatum*, three *Pennisetum clandestinum*, and 14 *Cynodon dactylon* varieties), so the range of salinity covered by the six treatments was reduced in the two later experiments (0, 6, 12, 18, 24, 30dS/m).

All grasses were clipped to a constant height at the start of the experimental phase. Subsequent fortnightly clippings were collected and oven dried to quantify dry matter production. Leaf height (mm) was measured prior to each cut. Percent leaf firing was visually assessed fortnightly. At completion of both the second and third experiments, the grasses were removed from pots and crown and root material separated and washed prior to being oven dried at 60-70°C and weighed.

Salinity threshold levels for each of the species in the three screening experiments are shown in Table 1.

***Paspalum vaginatum* (Sea Isle 1) showing salt tolerance up to the maximum level of 40dS/m**

CONCLUSION

Turfgrasses range from extremely salt-sensitive to highly salt-tolerant, as do plants in general. For turf managers, this provides a variety of ready-made options by which different grasses can be matched to a range of 'real life' salinity levels and associated soil and water problems according to differences in their salt tolerance. Finding a salt-tolerant grass is no 'silver bullet' or easy solution to salinity problems, but it does buy time to implement sustainable long-term management practices.

This is demonstrated by the stable, complete grass cover of seashore paspalum that has now been established at the Birkdale parkland site in the Redland Shire. This has been achieved through the adoption of appropriate management strategies coupled with the proper choice of turfgrass based on scientific research.

TABLE 1. 80%, 50%, AND 20% THRESHOLD ELECTRICAL CONDUCTIVITY (EC) LEVELS IN dS/m FOR EACH SPECIES OF TURFGRASS SCREENED FOR SALINITY TOLERANCE.

Species	EC range at 80% productivity	EC range at 50% productivity	EC range at 20% productivity
Pennisetum clandestinum	2	4 - 5	7-9
Digitaria didactyla	2	6	11
Eremochloa ophiuroides	1	3	5
Cynodon dactylon	4 - 16	12 – 22	19 – 28
Stenotaphrum secundatum	3 - 17	9 - 21	16 - 25
Zoysia matrella	6 - 14	16 - 26	31 - >40
Paspalum vaginatum	4 - 25	15 - >40	all > 40
Sporobolus virginicus	3 - 23	14 - 35	all >40
Distichlis spicata	13	26	>40

While Redland Shire used seashore paspalum to good effect to revegetate their salt-affected parkland and have successfully turfed similar areas since their first demonstration planting, Table 1 shows that three other species from saline areas, *Distichlis spicata*, *Sporobolus virginicus*, and *Zoysia matrella*, are also highly salt-tolerant. This provides additional choices for saline turf sites, depending on the presence or absence of other issues such as shade, waterlogging, etc.

E-par founder Terry Muir

AGCSA LAUNCHES WORLD-FIRST ENVIRONMENTAL INITIATIVE

The Australian Golf Course Superintendents' Association (AGCSA) is meeting the challenge of environmental management best practice by committing to a national initiative that is set to revolutionise golf course environmental management in Australia.

The AGCSA initiative, which has been endorsed by newly appointed Golf Australia chief executive Tony Hallam, makes available to all golf clubs an easy-to-understand unique environmental management system (EMS) and free workshops to build and implement EMS programs.

The initiative revolves around a specially designed EMS program called e-par, which combined with development workshops and ongoing support will enable golf clubs to produce a robust EMS specifically tailored to their course.

E-par is a web-based program that guides the user through the introduction and development of a customised EMS for their operations. E-par is based on the international standard ISO14001 and is practical, useful and usable for any golf club. All the environmental management documentation required for clubs is provided.

E-par is the brainchild of Environmental Business Solutions founder Terry Muir. A former investigative officer with the NSW EPA for seven years who worked on the Warringah Golf Club case, Muir has been a long-time proponent of improving environmental management practices at golf clubs across Australia. His e-par system has been lauded by many environmental agencies and in 2005 was named the overall winner at the Newcastle and Hunter Environmental Achievement Awards.

"Clubs that join the proactive initiative will be in a significantly better position to identify, analyse, evaluate, treat, monitor and review their environmental performance," says Muir.

"Membership of the program will communicate to your local regulatory agency and other stakeholders that your golf club is committed to meeting its environmental responsibilities. The success of this initiative requires leaders of change and the participation of all golf clubs."

The AGCSA will offer EMS training development and implementation workshops free of charge to those who join the initiative. The workshops will provide participants with the basic information and skills to build and implement their own e-par EMS. At the completion of the workshops, superintendents will be able to:

- Understand the importance of environmental management for the protection and management of the environment;
- Have an understanding and knowledge of the International Standard ISO14001;
- Have the ability to build their own EMS;
- Know how to develop an environmental policy statement;
- Conduct environmental risk assessments and develop their own action plans;
- Be able to identify and locate relevant environmental legislation;
- Create and implement environmental standard operating procedures; and
- Report on environmental performance.

The main expected benefits of this world-first initiative include:

- The enhancement of public confidence in golf course environmental management;
- The fostering of Australian superintendents' reputation as world leaders in environmental management;
- Industry self-regulation, (the voluntary association of clubs to control their collective action);
- Increasing the environmental management skill base of golf course superintendents;
- Annual reporting on the environmental performance of the industry; and
- Establishing partnerships with regulatory bodies in a shared goal of improving the environment.

Those clubs which join the initiative will receive all e-par software applications which will enable the club to develop its own environmental policy, build an environmental register, document environmental targets and create environmental action plans among other things.

Included with the package are two full-day workshops facilitated by Muir which are scheduled for September. The workshops will help assist in the development of EMS documentation and getting the most out of the system for each course. The workshops will help superintendents control environmental documentation, publish standard operating procedures, maintain monitoring records and establish environmental emergency response systems, incident reporting procedures and internal environmental audits. As well, those who sign up for the initiative will receive monthly newsletters and software support.

For AGCSA members who want to join the program there is an initial one-off start-up cost of $1250 (plus GST). This includes the e-par EMS software package and the two workshops. Thereafter an annual fee, which includes administration and 24-hour phone support, will be applicable. For non-AGCSA members, the start-up cost is $1500 (plus GST) as well as the annual fee.

For more information about the AGCSA's environmental management initiative contact the AGCSA office on (03) 9548 8600.

CRAIG THOMAS BERWICK (1955-2006)

The Victorian turfgrass community is in mourning following the death of respected turf manager Craig Berwick. The long-time head curator at the high-profile Kooyong Lawn Tennis Club in Melbourne died on 2 May, three months short of his 51st birthday, after a long battle with cancer.

Many members of the turf industry attended Berwick's funeral in Frankston with members of the Kooyong groundstaff acting as pall bearers. Berwick was laid to rest at Bunurong. Among those who gave eulogies were former Moorabbin Golf Club superintendent Terry Fithal as well as Berwick's step-son Michael Brookes who worked alongside him at Kooyong.

Berwick, one-time former assistant superintendent at Moorabbin Golf Club in Melbourne's south east, was one of the founding members of the Victorian branch of the Turf Grass Association of Australia (TGAA) in 1990.

He was the association's inaugural vice-president and served on the original committee which included the likes of John Neylan (president), fellow lawn tennis curator Bill Turner (Royal South Yarra Tennis Club), Peter Semos, Bill Casimaty, Phil Ford and others.

"Over the years that I knew Craig, he never had a bad word to say about anyone regardless of what may have been happening," recalls Neylan. "In an industry that lets itself down from time to time with its rumour-mongering, he was a gentleman in the purest sense of the word.

"The turf industry is not renowned for its longevity of employment. It is a demanding profession and for Craig to have worked at the same venue for such an extended period is a reflection of his work ethic, experience and personality."

Berwick, who worked at Kooyong for over two decades, took over from Neylan to become the TGAA's second president and also served a second stint as president after the resignation of Scott Bolton. Berwick stood down from the president's role in 1998.

Berwick, known for his exemplary work ethic and affable nature, was diagnosed with cancer in late 2004. In 2005, at the TGAA's AGM he was awarded life membership of the association along with Turner. Berwick is survived by wife Marg and five children.

Kooyong Lawn Tennis Club

Avondale Golf Club superintendent David Warwick with the new sub-surface aeration unit

AVONDALE CLUB GETS SOME SERIOUS AIR

Avondale Golf Club has become the first golf course in Australia to install the Turfair sub-surface aeration unit for greens.

The Turfair system applies a vacuum to the subsurface drainage system of a USGA, California, or modified California spec golf green or sports field. This is done by a permanently installed unit or by portable units, whether petrol or electric powered. The Turfair units connect to the outfall drainage line and apply a vacuum ranging anywhere from 10-52 inches of water gauge scale of vacuum pressure depending on the unit used.

Once the vacuum is applied, the 'bubble' that has built up in the gravel and soil medium is broken, thus allowing the 'perched water' table to start flowing/draining. As this is taking place it is removing the excess moisture, surface tension keeping a film on the soil particles thus not "drying" out the green.

During this same process of removing the excess water, noxious gases (such as carbon dioxide, methane, and hydrogen sulfide) that build up in the soil are also removed. These gases increase during heat and stress times from plant respiration and microbial activity thus depleting the soil of oxygen.

As these gases are being removed fresh air is being pulled down into the rootzone whereby complete oxygenation and aerification of the soil profile takes place. This then stimulates microbial activity and plant uptake.

Avondale superintendent David Warwick says this type of sub-surface aerifying can help eliminate black layer in greens when used on a two- to three-week rotation.

MCG PROJECT COMPLETE

HG Turf recently completed one if its biggest assignments to date with the final laying of turf at the Melbourne Cricket Ground following the conclusion of the Commonwealth Games. With a short timeframe to get the ground ready for the AFL ANZAC Day clash between Collingwood and Essendon, over 20,000m^2 of turf was laid over 10 days following the Games' closing ceremony with works finishing over the Easter weekend.

The first turf to be laid was the Commonwealth Games turf which was relocated from the centre of the field to the Members wing of the arena (6,600m^2), minus the damaged turf from the hammer and shot put events. This turf had to be relocated because it was at a level above the long-term field design, a result of turf needing to be laid over the athletics track to accommodate the 2005 Boxing Day Test.

The next section of turf to be laid was the turf returned to HG Turf's Alexandra farm after the Boxing Day Test (11,400m^2). On the final day, new turf (2,056m^2) was laid to replace the damaged turf from athletics event and the small amount of turf lost through turf relocation within the stadium and turf returned from the farm.

The new size of the MCG arena is 20,056m^2. The turf varieties are CT2 couchgrass oversown with Omega fine-leaf ryegrass, mown to a height of 30mm.

HG Turf's Hamish Sutherland says that using the Motz Stabilised Turf, which can be reused after being installed and removed, helped realise significant cost savings to the tune of over $800,000.

LETTER TO THE EDITOR

Dear Editor,

Re: Your article in Australian Turfgrass Management Vol 8.2 '**Does your shed shape up? The upgrade and construction of maintenance facilities**'. The Ballarat Golf Club Implementation Committee requested an estimate on a typical golf course maintenance facility from the contracted golf course architect and was given a starting figure of $300,000. J. Powell (superintendent), as a key member of this committee, was given the brief to put together a proposed maintenance facility design, incorporating all relevant features, including EPA and occupational health prerequisites.

The estimate of $300,000 was only a starting point, and the proposed maintenance facility is a work in progress, with the final outcome to be based on J. Powell's recommendations, subject to the club's needs. Jeff is confident of the committee's and the developer's commitment to build a maintenance facility befitting the quality of the new championship golf course.

Jeff is an integral part of the club's implementation process and is working in close harmony with all members of the redevelopment sub-committee with an aim to provide the Ballarat Golf Club with a golf course and maintenance facility that will ensure the club is successful for the next 100 years.

ALAN BURNS,
PRESIDENT,
BALLARAT GOLF CLUB.

IN THE LINE OF FIRE

Superintendent Michael Waring and his groundstaff at Royal Canberra Golf Club crew can add firefighting to their resumes following the recent summer.

On Thursday, 27 December 2005 bushfires ravaged a small residential area at the entrance to the club, with one of the houses directly under threat Waring's. The blaze started suddenly at about 2pm, and fanned by strong, gusty winds, rapidly made its way from the local heritage protected brickworks parallel to the 19th fairway, through a gully towards the club and surrounding homes.

Local fire brigades responded rapidly, along with Waring and members of his staff who, with hoses and water buckets, fought to help save a few vulnerable properties, some of which belonged to members of Royal Canberra. There was concern also for Waring's own residence, just inside the club's boundary fence.

Despite the best efforts of all, some residences were destroyed or damaged, one being owned by ACT Brumbies fly-half Steve Larkham, and two others owned by Royal Canberra members. Thankfully Waring's was not among them.

The fire passed but winds were expected to change in the late afternoon which would have turned the fire back toward the main entrance. Luckily for the club fire crews had gained control before this happened and there was also time to set up sprinklers and wet down the entrance.

In a newsletter sent to all club members following the event, Waring and his staff were lauded for their efforts in helping fight the fires.

INTERNATIONAL HONOURS FOR AUSTRALIAN TURFGRASS MANAGEMENT

The ATM publications team (from left) Jo Corne (art director), Scott Petersen (manager) and Brett Robinson (editor)

Australian Turfgrass Management magazine (ATM) has cemented its place as Australia's leading turfgrass publication after picking up international honours at the recent Turf and Ornamental Communicators Association (TOCA) awards. ATM magazine collected four awards at the 1st Annual International Communicators Contest, picking up two awards each for writing and design.

ATM won a first place in design for "Moama 05" (design by Jo Corne), the official guide to the 21st Australian Turfgrass Conference (ATM Vol.7.3 June-July 2005), as well as a design merit award for "Evaluation of Reduced Chemical Management Systems for Putting Greens" (design by Jo Corne), a research article published in ATM Volume 7.1 Feb-Mar 2005.

In handing out the design awards, the judges commented that "Moama 05" was "an excellent conference guide" which contained a lot of information presented in a very clear and concise fashion.

In the writing category, ATM won a first place for its in-depth look at the 2005 Open Championships, "Inside the Open Championship - St. Andrews 2005" (written by James Dalton, Alistair Beggs, John Neylan and edited by Brett Robinson) and a merit award for the preview to the 2005 Australian Open, "Moonah Mk II" (written by Brett Robinson).

In making their decision, the judges commented that "Inside the Open Championship", which scored 27 out of a maximum 30 points, was "a great article" which weaved together historical aspects with contemporary practices well.

TOCA is a US-based association composed of editors, writers, publishers, photographers, public relations/advertising practitioners, industry association leaders and others involved in green industry communications. TOCA holds its awards programme each year and in 2006 launched the inaugural International Communicators Contest, sponsored by Syngenta International Professional Products, which attracted entries from around the globe.

MAKING SHORT WORK OF POA

Living Turf has introduced SHORTstop 200SC, a growth regulator designed specifically for turfgrass. SHORTstop offers the flexibility of a liquid formulation with a built-in surfactant package to quickly and selectively suppress wintergrass.

Benefits of SHORTstop include: suppression and control of *Poa annua* in bentgrass; growth regulation and enhancement in C3 grasses; reduces clippings and increases turf density; minimal surface disruption during treatment of *Poa*; liquid formulation; surfactant package to enhance root uptake; complete rate and nutritional flexibility.

SHORTstop 200SC turf growth regulator

The degree of wintergrass control will be influenced primarily by the rate and frequency at which SHORTstop is used. Most temperate research shows that a 'little and often' application strategy is the most effective means of suppressing wintergrass competition in a bentgrass green.

The TGR ingredient in SHORTstop is root-absorbed and must be watered in to take effect. After irrigation, the TGR binds to organic carbon and therefore settles at the very top layer of soil, where wintergrass roots congregate due to their shallow habit. Because bentgrass and other cool-season grasses (when healthy) produce deeper rooting, they display less sensitivity to TGR.

By maintaining sufficient levels of SHORTstop TGR in the surface of the rootzone during cool-season growth, wintergrass will be inhibited while other cool-season grasses grow unaffected.

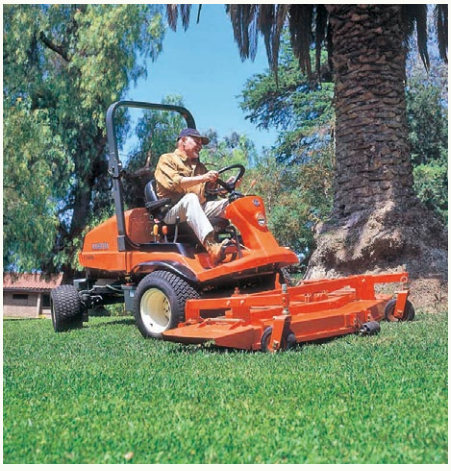
SHORTstop TGR is a tool to shift the competitive dynamics of a cool-season sward in favour of other more desirable cool-season species such as bentgrass, ryegrass or fescue.

Cultural practices, climate, soil types, turfgrass variety and wintergrass biotype also play a part in the degree of control achieved when using SHORTstop TGR.

A coordinate program that combines nutritional, cultural and mechanical aspects of turf maintenance will enhance the degree of control achieved.

After application of SHORTstop TGR, the growth and competitive ability of wintergrass will be reduced within one to two weeks. The degree of discolouration and growth reduction is directly related to the rate used. Very low rates can be used on a pure *Poa annua* surface to achieve turf density and seed head control, while heavier applications will discolour wintergrass severely.

For more information on SHORTstop, contact Living Turf on (02) 9667 4333.



KUBOTA OUT IN FRONT

Kubota has released its F80 series of front mowers which will be on display at the 22nd Australian Turfgrass Conference in Brisbane.

Featuring enhanced durability, easy maintenance and improved operator comfort, Kubota offers the new 28 horsepower F2880 and 36 horsepower F3680 which are powered by Kubota 3 and 4 cylinder diesel engines respectively. Both engines produce a high torque rise, less vibration, less noise and deliver top fuel economy.

An integrated radiator screen forms part of the engine hood to expand the size and effectiveness of the air intake port. This reduces the likelihood of overheating when operating in hot conditions.

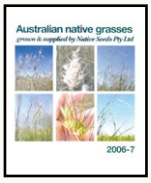
A choice of either a 1.5m or 1.8m side discharge mower deck is offered. Constructed from 7-gauge steel, these fabricated heavy duty decks are designed to provide reliable cutting performance even in harsh conditions. The 140mm deep deck efficiently handles long grass as there is enough room underneath the deck to cope with a large volume of grass. Cast iron pulleys and a multi-V belt drive system transmit power directly to the mower blades while the PTO smoothly transfers power from the engine to the deck.

In addition to a full 90 degree tilt angle for easy deck servicing, the F80 series has an improved deck lift capacity of 40 per cent for easier lifting of the heavier mower deck. For extended periods of mowing the fuel tank capacity has been increased to 61 litres.

Featuring a two range hydrostatic transmission with a top speed of 20kph, power steering and 'auto-assist' four wheel drive, the F80 series can quickly cover a large area of ground and comfortably mow uphill and in slippery conditions.

The layout of controls and instrumentation has been improved and the suspension seat with arm rests is positioned 100mm further back than previous models to provide more leg room. A tilt steering wheel not only facilitates a comfortable driving position, but also makes getting on and off easier.

For more information about Kubota's F80 series front mowers visit http://kubota.com.au



NATIVE SEEDS' NEW CATALOGUE

Melbourne-based Native Seeds has released its catalogue for 2006-07. Native Seeds is a privately owned company which specialises in the production and sale of selected species of warm- and cool-season Australian native grass seed.

Native Seeds monitors over 93 hectares of seed production on different farms throughout NSW, Victoria, and South Australia and holds exclusive licences to the production of the great majority of native grass varieties that have been developed in Australia.

For more information visit the Native Seeds website www.nativeseeds.com.au, email enquiries@nativeseeds.com.au or phone (03) 9555 1722.

PRECISION MANAGEMENT OF YOUR COURSE

South Australian based company Aquatek Irrigation has become the Australian and Asia Pacific agent for a new software package called Precision Course Management.

The system, which has demonstrated savings in the order of 20 per cent in chemical and fertiliser usage and up to 30 per cent savings in water management, works as follows:

1. An accurate Differential Global Positioning System (DGPS) of the golf course is produced. This is generally accurate to about 200mm in horizontal positioning.
2. The two DGPS surveys are broken into

BERNHARD'S SHARPENS ITS ACT

Bernhard and Company, manufacturers of Express Dual and Anglemaster grinders, has released two new products which will debut during the 22nd Australian Turfgrass Conference in Brisbane.

The Express Dual blade-thinning attachment is ideal for those golf courses that want to apply a relief grind without compromising the speed and ease of use of Express Dual.

The attachment allows for a relief grind to be carried out on the Express Dual without taking up any additional workspace. The attachment is mounted to the lift table and is easily positioned to allow for normal loading and unloading of mowers while still permitting normal use of the lift table.

The Express Dual blade-thinning attachment

Bernhard has also launched the new and improved Rotamaster 4000. With a new unique clamp mechanism and fast aligning jig bars, blade mounting is now easier and faster. Rotamaster ensures both ends of the blade are sharpened equally with the precision only an automated machine can deliver, so rotary blades have a superior edge with consistent balance for a better quality of cut.

two parts, one a base survey of the course layout and main features and secondly the assets such as irrigation and major utilities across the course.

3. A map from the survey is then produced for use with the Precision Course Management PCM software.
4. The PCM software then is a computerised business management system for managing chemical and fertiliser applications, machinery inventories and part usage, labour management. It provides activity reports of all applications and usages across the course.

For more information contact Darren Ferber from Aquatek on 1300 887 448 or email dferber@aquatekirrigation.com.au

INDICATOR BLAZES A NEW TRAIL DOWN UNDER

After being used in the United States over the past 20 years, spray pattern indicator Blazon is now available in Australia.

Manufactured by American chemical company Milliken Chemicals, Blazon will not stain equipment or staff when handled. It is a true concentrated solution, not a dispersion like other spray pattern indicators. It will not clog spray nozzles as it does not dry to a solid.

Along with being easy to handle, it is also highly compatible with most herbicide and pesticide formulations. It is highly 'fugitive', meaning that it rapidly dissipates after application, typically within 24 hours depending on conditions, leaving no trace that sprays have been applied. It is highly biodegradable and comes in two non-staining colours, blue and green.

Blazon and other Milliken products are being distributed in Australia by Albright and Wilson (Australia) Ltd. Contact Natasha or Hayley on 1800 814 730.

GET WET

Becker Underwood has launched an advanced new formula wetting agent - Wettasoil Ultra. Developed without any potentially harmful NPEs, Wettasoil Ultra provides increased safety for users.

Announcing the launch of Wettasoil Ultra, Becker Underwood's specialty products manager Andrew Doyle said that with its added safety and convenience, it is expected the enhanced formulation will be even more popular than the original product

"We believe Wettasoil Ultra is the most cost-effective wetting agent on the market," says Doyle. "It is so long lasting that it may only need to be used once or twice a season, programme dependant. This not only saves valuable money and time, it can also assist in reducing water consumption."

Wettasoil Ultra is proficient in reducing the incidence of dry spot, the occurrence of water repellency, increasing the ease in "re-wetting" soils, and helps to keep turf looking lush and green all year round. Suitable for turf, ornamentals, flowers and shrubs, Wettasoil Ultra is available in both a liquid and a granule form.

Wettasoil Ultra is now available through Globe Australia, Maxwell & Kemp, Nuturf and other local distributors. To find out more about the new formulation Wettasoil Ultra, talk to the Becker Underwood team at Booth 60 during the Australian Turfgrass Conference tradeshow.

GCSAQ

Here's hoping we are all enjoying the cooler weather that is now with us. For most the workload would have slowed down to allow us to get back on top of things around the course. Queensland superintendents are also looking forward to welcoming all delegates and partners to our beautiful state for the 2006 Australian Turfgrass Conference. I'm sure the weather will be as wonderful as it usually is and that you will all have a great time.

With the year nearing the halfway mark, it is great to see the continuation of excellent attendances at our field days. Our April day, sponsored by Nuturf, was held at the newly opened Pacific Harbour Golf and Country Club on Bribie Island.

Guests were treated to a talk on the construction of this course from superintendent Marcus Hartup and course designer Ross Watson, followed by Paul Spencer talking on chemicals and soil nutrition. On a lighter note, John Cartwright and Scott Satler talked about the Gold Coast Titans entry into the 2007 NRL. This was followed by the opportunity to play this wonderful new course which was thoroughly enjoyed by all.

May's field day took us to Oxley Golf Club thanks to Globe Australia. The main topic for the day was on ERI with Marcel and Graham Stirling speaking on this problem that is having a big impact throughout Queensland on 328 greens and some couch fairways and tees (***See Dr Stirling's research article on page 68 - Ed***). Peter Abel also had some interesting facts and photos on this problem. Paul Jackson of Bayer also spoke on new chemicals that the company has on the market.

Nine holes of golf followed in the afternoon and all enjoyed the condition of the course thanks to Ian Earp. Those who did play golf could see just how dry Brisbane is compared to the Gold and Sunshine Coasts.

The next couple of months are very exciting for us in Queensland with our annual bus trip to be held early June, the Queensland Golf Industry Conference at Royal Pines Resort in late June and then on to the national conference from 17-21 July.

We will also be running our Northern NSW Staff Golf Day to be held at MacLean Golf Club on 30 June. Clubs from this region play for the Super's Cup which has been held by Bonville Golf Club for the past two years (no thanks to their superintendent).

August is the AGM to be held at Nudgee Golf Club where we will have at least two committee positions vacated, so start thinking about doing your bit for the state and put your hand up to join the committee.

On a positive notice, from an education point of view, there has been no official word on the outcome of our apprenticeship in relation to the time it takes to complete, but unofficially it will stay untouched. See you all in Queensland in July.

RODNEY COOK,
PRESIDENT, GCSAQ.

VGCSA

Since the last edition of ATM, the VGCSA has held two very successful meetings, the most recent being the 79th annual general meeting in mid-May at The Victoria Golf Club sponsored by Toro.

A healthy field of 60 lined-up for an early-morning tee-off on the immaculately presented sandbelt course. A big thanks must go to superintendent Ian Todd for his assistance in organising a great day and for conducting a very interesting and informative course inspection. Also to Victoria's general manager Peter Stackpole, Gareth Irvine and the rest of the staff who ran a very smooth operation. Thanks also to our sponsor of the day for their giveaways.

Winner of the Powell Trophy for 2006 was Paul Robinson from Kyneton Golf Club with Michael Grant from Kooringal Golf Club runner-up. The Toro Cup (stableford) was collected by Andrew Casey (Churchill Park Golf Club) ahead of Robinson, while Mark Dougherty from Globe Australia again took home the Presidents Shield.

The VGA Apprenticeship Award winner was announced at the meeting with this year's recipient being Troy Shepherd from Thurgoona Golf Club. Other nominees were Shaun Arnott (Holmesglen TAFE, Kew Golf Club), Rodger Harkin (NMIT, Thirteenth Beach Golf Club) and Thomas Hogan (Chisholm TAFE, Moonah Links Golf Club).

After the AGM we introduced our committee which has one new addition for the coming year. Colin Foster (Ranfurlie Golf Club) has come on to the committee, replacing Darren Green who we thank for his contribution in the area of membership over the last 12 months. The new committee comprises:

President: Mark Prosser
Vice-president: Michael Freeman
Secretary/Newsletter: Peter Jans
Treasurer: Glen Davie
Committee: Brett Chivers, Adam Robertson Trevor U'Ren, Colin Foster

BARNBOUGLE DUNES

Earlier in March, some 50 VGCSA members and guests made the journey to the spectacular Barnbougle Dunes in Tasmania, the first official VGCSA meeting held interstate. On Sunday afternoon we had 50 tee off in a shotgun start and luckily time was on our side which afforded plenty of opportunities for photos. The weather was beautiful and the course is a real credit to the team.

On the Monday we had a very successful general meeting, which included the presence of five Tasmanian superintendents. A special thanks to Tasmanian president Tony Smith for encouraging these supers to attend.

Daryl Sellar, superintendent from Glenelg Golf Club in South Australia, was our guest speaker. We thank Daryl as he was generous with his time and gave up his weekend and Monday to discuss with us his thoughts on "working smarter not harder", a talk he presented to the NSWGCSA last year. We had heard some very positive feedback from NSW so we jumped at the chance to get Daryl as soon as we could. We also thank our sponsors Globe Australia for their assistance in organising a highly successful day.

The next VGCSA meeting will be the managers/superintendents day at Spring Valley Golf Club (superintendent Hayden Mead) on Monday, 21 August. The day will be sponsored by Active Safety,.

We are now allocating golf clubs to host our meetings for 2007. If you would like to request your club or suggest another club please do so by the end of June 2006 by contacting one of our committee members.

MARK PROSSER,
PRESIDENT, VGCSA.

GCSAWA

The GCSAWA has been tending to some extremely positive business of late which has kept us all excited.

The winner of the 2006 GCSAWA Best Indentured Apprentice Award was Blake Humble, formerly of Sun City Country Club. Blake is a worthy winner and will represent the GCSAWA and broader turf industry well as a finalist in the AGCSA Graduate of the Year Award which will be handed out at the 22nd Australian Turfgrass Conference in Brisbane. As well as completing his Certificate III in Turf and being awarded the Lecturers Award 2005 in turf, Blake also completed up to Diploma level in landscaping. He now holds the position of leading hand at Lakelands Country Club under Craig New.

Peter Beach, formerly of Melville Glades Golf Club and now at Gosnells Golf Club, was recognised for his achievements in Certificate III Turf by being awarded the 2006 Lecturers Award. Congratulations to both these guys for their hard work and achievements so far and I look forward to seeing them progress.

Nominations for the 2006 AGCSA Awards have been placed. All candidates are fine turf managers and have the full support and respect of the GCSAWA and we wish them the best of luck. We hope to see all of you up on stage in Brisbane at the awards ceremony.

- Excellence in Turf Management Award: Glenn Cross (Mount Lawley Golf Club)
- Graduate of the Year Award: Blake Humble (Lakelands Country Club)
- Distinguished Service Award: Norm Ashlin (Collier Park Golf Club)

I would also like to take the opportunity to congratulate Craig Webley from Lakelands Country Club and 2004 GCSAWA Best Indentured Apprentice for his selection into the Ohio State Internship Program. Craig will be based at Harbour Town Golf Club in South Carolina and we wish him all the best of experiences on his travels. Congratulations also to Tim Chape for his recent appointment as superintendent at Rockingham Golf Club as well as Ashley Howe who has taken over as superintendent at Hartfield Country Club.

In May, the 2006 Management Challenge was staged at Western Australia Golf Club. Attendance records were broken with 18 clubs supporting the day. A big thanks must go to all participating clubs and especially to our far away friends in Geraldton and Bunbury for putting in the big effort to attend. Thanks also to WAGC for their continual support of GCSAWA-sanctioned events.

I'm not a big religious person but on this day we all witnessed a miracle with Glenn Cross strapping on a glove and swinging the steel to do the impossible and steer his team to victory. As a kid I always dreamed to watch the pros in action and now we have one among our ranks – simply amazing.

On a lighter note we have a few births expected in July and I would like to take the opportunity to wish Eric and Bronwyn Dennis as well as Jeff and Jill Austen the best of luck and a fantastic time ahead.

BRAD SOFIELD,
PRESIDENT, GCSAWA.

NZGCSA

Greetings from across the Ditch, home of the Super 14 champions! Recent happenings in New Zealand have included the two Fine Turf Seminars in the North and South Islands. I was fortunate enough to be at both seminars, which were well attended and hit their target audiences.

The South Island seminar was held in Queenstown in the first week of May and we were fortunate enough to have the services of the AGCSA's John Neylan. John gave the delegates several informative lectures on topics ranging from plant growth regulators to the old debate *Poa* versus bent.

One highlight of the seminar was a field trip to international jeweler Michael Hill's own private course 'The Hills' just outside of Queenstown. Construction superintendent Ian Douglas gave us a tour and an insight into the construction of the course. It is still unsure at this stage whether it will be opened to the public, but we were certainly appreciative of the chance to inspect it.

Other speakers included local superintendents and David Howard from the NZSTI (David is the local agronomist for the Otago region).

At the dinner on the Tuesday night those present were given an insight into some of the lighter moments of the New Zealand cricket team of the early 80's by former wicketkeeper and local identity Warren Lees.

The North Island seminar was held in the last week of May with speakers of note including Andrew Peart, AGCSATech technical officer, and another name familiar to AGCSA members, Leigh Yanner, superintendent at Moonah Links. Both gentlemen were well-received and we thank them for sharing their experiences. As with the South Island seminar, a selection of local superintendents shared their knowledge with the delegates present. The dinner was also an 80s theme with Gary Braid, a former All Black and father of Blues loose forward Daniel Braid, sharing some of the lighter moments of his time playing rugby.

The NZGCSA AGM was held during the North Island Seminar, with myself being re-elected as president. Both John Spraggs (Royal Wellington Golf Club) and Peter Boyd (Pakuranga Country Club) were also re-elected to the executive.

Of special note was the awarding of two life memberships to recently retired superintendents. Both men are worthy recipients of the life memberships and it was an absolute pleasure to be able to present them to both gentlemen.

Delegates at the South Island Fine Turf Seminar inspect 'The Hills' golf course in Queenstown, NZ

The first went to Richard Warren who recently retired as superintendent at Remuera Golf Club in Auckland. Richard held the position for 26 years and has been involved in the golf turf industry for 38 years. In that time he controlled the finances of the Auckland association (AGCSA) for over 20 years, represented the AGCSA as a delegate to the NZGCSA management committee and was national treasurer for a period as well. Richard was also instrumental in helping set up the old apprenticeship system being part of the study group that set up the correspondence units.

The other life membership was awarded to Gordon Combe who recently retired as superintendent at Nelson Golf Club at the top of the South Island. Gordon is a past president of the NZGCSA, a position he held for a number of years. He also sat on the inaugural committees that set up both the Canterbury and Manawatu/Wanganui superintendents associations. Gordon also has dedicated his working life to the golf turf industry and is a regular supporter of conferences and seminars around the country.

Plans are underway for the 2007 Sports Turf Conference to be held in Wellington in July 2007. I will provide details in subsequent reports as they come to hand. I would like to take this opportunity to wish the AGCSA all the best for the upcoming Australian Turfgrass Conference in Brisbane in July. Unfortunately I won't be attending this year but know from previous experience it will be a well-run conference with something for everyone.

BRETT BURGESS
PRESIDENT, NZGCSA.

TGAA WA

Apprentice winner Leah Boxhall

Like many industries in Western Australia's booming economy, the turf industry is struggling with the shortage of skilled labour. Many TGAA WA members have indicated that the skills shortage is a restraint on their organisations and a major concern for the future of the turf industry. It will not be an easy task, but the association has decided to tackle this issue with a number of initiatives.

We have identified the need to attract more young people into the turf industry by promoting it as a good lifestyle choice. We see the need to raise the profile of the turf industry in the community, especially in schools, and to promote it as a viable career option. Therefore we will get involved in events such as careers expos, and many of our members are prepared to offer work experience opportunities for students.

Training is another important aspect of addressing the skills shortage and TGAA WA has established close links with Challenger TAFE to promote and support their training activities. The Primary Industries (Horticulture) task force is reviewing training and apprenticeships in WA and we have expressed the view that part-time courses at TAFE need to be retained to provide opportunities for up-skilling.

In terms of events, our annual irrigation workshop was held at UWA Sports Park in March. I'd like to thank Chris Marsh from UWA for hosting the event and for his support of the association. The spray application workshop was held at Burswood Golf Course in May. Our AGM and golf day will be on Wednesday, 12 July at Maylands Peninsula Golf Course.

Finally, I'd like to congratulate Leah Boxhall from UWA Sports Park for winning the Best Apprentice Award at this year's TAFE awards dinner.

PETER RUSCOE,
PRESIDENT, TGAA WA.

SAGCSA

Above-average rains in April and early May has seen the best opening to autumn in a long time, with some courses receiving up to 30 per cent of their annual rainfall in this six-week period. The dry spell which followed has been a concern, particularly for courses which need runoff to top up dams, so who knows what lies in store for winter.

To start off, it has been good to see Rob Millington (superintendent at the Vines of Reynella) up and about again after a serious respiratory problem which had him laid up for the last six months.

The last SAGCSA meeting was held at Mt Osmond Golf Club on 11 May (host superintendent Brian Cooper). The day's theme was drainage and with all the wet weather experienced in Adelaide in April and early May the timing could not have been better.

Daryl Sellar (Glenelg Golf Club) gave a great presentation on his recent trip to the Doak-Clayton masterpiece Barnbougle Dunes for the VGCSA meeting. The photos by all accounts do not do this new course justice, and it is certainly a great addition to the Australian golfing scene.

The SAGCSA AGM was held at Royal Adelaide GC on 8 June (host superintendent Jeff Kaines). There are two changes on the SAGCSA committee for the coming year with Kaines and Steven Newell (Kooyonga Golf Club) stepping down from the committee after three and seven years' service respectively. I would like to thank both gentleman for their invaluable contributions over the years, in particular Steven's as secretary/treasurer over the past three years.

Coming on to the committee this year are two new faces in Sam Sherriff (Mt Barker Golf Club) and Andy Blacker (Thaxted Park Golf Club). These young men bring with them plenty of enthusiasm, which can only be good for our association.

Also at the AGM, Heath Deer was announced as the SAGCSA Graduate of the Year for 2005. Heath is working at The Grange Golf Club under superintendent Chris Klei. This is an outstanding achievement by Heath and he will represent SA in the finals of the AGCSA Graduate of the Year Award which will be handed out during the 22nd Australian Turfgrass Conference in Brisbane.

At a recent committee meeting our subscriptions for next year were set. We have decided to maintain our sub at $65, and while this is not a large amount for association membership and all that goes with it, it is worth noting that there are still some members who have to pay for such membership out of their own pockets.

This is an unfortunate situation for some individuals who have to take this amount on themselves so as they can benefit not only themselves but their employer with greater industry networking and information gained from our regular meetings.

PETER HARFIELD,
PRESIDENT, SAGCSA.

NSWGCSA

The extreme weather conditions of summer continued into autumn in NSW. Basically it has been very warm and dry in most areas with no significant rain for months. Courses that have struggled through the harsh summer have had no relief rainfall and the Sydney area is approximately 200mm below its average rainfall for the year. Due to restrictions, watering greens and tees only has become the norm for many clubs.

BOARD NEWS

The NSWGCSA Board is in the final stages of appointing a contractor to carry out book-keeping and financial duties on behalf of the Association. The coming AGM will involve the required triennial election with three positions made vacant on the board.

The AGM will be held at Castle Hill Country Club on Monday, 28 August. This year is an election year with nomination forms soon to go in the mail. The AGM will be followed by a presentation from Martyn Black on his experiences in India, with golf available after lunch on the magnificent Castle Hill layout.

FIELD DAYS

The NSWGCSA field days started late this year with our first event the Rube Walkerden Trophy Day at NSW Golf Club on 9 May. A maximum field of 80 players enjoyed the magnificent NSW layout which superintendent Gary Dempsey and his staff had in tournament condition. It was even more amazing when considering that Gary has not been able to water fairways since November.

On what was a kind day at La Perouse, only the real golfers held their own. Poor scores did not worry the field who thoroughly enjoyed playing such a world-class facility with breathtaking views. Golf was preceded by a very interesting tour of the new $2 million maintenance facility.

The NSWGCSA Championship Presidents Trophy was won by Mark Johnson from Hawks Nest Golf Club with 74. The Rube Walkerden Trophy was won by Dave Sommerville from RAE Golf Club on 36. The Patons Cup was won by Martyn Black and Mark Johnson (45 points). Ted Baker from Globe won the Peter Ingram Trophy for best rep. Sponsors of the day were Golfshapes, Patons, Maxwell and Kemp and Bayer.

Greg "Mahatma" Ritchie joined us for the day and spoke over dinner of some of his memorable experiences playing for the Australian cricket team back in the 80's, particularly in the sub-continent. A great day was had by all, especially Scott Hinwood from Bayview Golf Club who holed out on the 11th. Thanks again to Gary Dempsey, general manager Dave Burton and all the staff at NSW Golf Club. Thanks to Scott Riley for a very well organised day.

The stunning fifth at NSW Golf Club

RETIRING MEMBERS

Pat Henry, who served as course superintendent for 32 years, has retired from his position at Shortland Waters Golf Club in Newcastle. Pat has been a stalwart of the association, hardly missing a field day for many years. Pat has taken a position with Buchanan Turf Supplies at Maitland. I am sure Pat is enjoying his weekends off and would not be missing the committee meetings and irrigation system!

Another industry stalwart, Bruce Kemp, has retired after almost 30 years supplying greenkeepers across the state. Bruce started greenkeeping at Grandview Bowling Club before moving to St George Bowling Club. Bruce then joined Jack Griffith Greenkeeping Supplies where he later became partner with Bill Maxwell. Maxwell and Kemp have been strong supporters of the NSWGCSA for many years. The NSWGCSA would like to thank both gentlemen for their support and extend an ongoing welcome to all our field days.

MICHAEL BRADBERY,
PRESIDENT, NSWGCSA.

TGAA VIC

It's hard to believe we are already half way through the year! One great thing about that though is that the Cricket Wicket Seminar is not far off – 5 July.

This year we return to the MCG, the home of cricket, where Tony Ware will speak to us about the trials and tribulations of all the goings-on in recent times. This will include the preparations before and after the Commonwealth Games. A tour of the MCG will follow Tony's presentation where we will look at the pros and cons of the new redevelopment.

Sam Russell from the City of Casey will speak about their two-year construction of the Casey playing fields. Progressive photos will be proof of how you can turn a paddock into elite playing fields, and create a landscape that looks like it has been there forever.

Les Burdett will speak of his experiences at the Adelaide Oval and abroad. I am not sure how he will fit his 37 years' experience into a 45 minute time slot, but no matter what topics he chooses from it will be a presentation not to miss.

Former TGAA president Rob Savedra from Wesley College will speak on the challenges they have faced over the last four years preparing turf wickets in September for Cricket Victoria. He will also speak of their experiences with the ICC World XI and the Bushrangers.

Toby Lumsden, curator at the Junction Oval and MCC employee, will speak about the changes they have made to the oval in recent times, and what it was that enabled the Bushrangers to record their first outright win at the ground in 15 years!

Last but not least, a representative of Cricket Victoria and the TGAA VIC will give an update on proposed industry trials, upcoming events and also wicket programs. Overall it will be a great day with fantastic guest speakers, a tour of the MCG, relevant trade displays and a good feed for all.

To all members, please don't forget to bring your membership cards to use as name tags, and hang around for a drink and a chat afterwards in the Olympic room.

There will be another TGAA day organised in spring this year but details are yet to be finalised. The Celebrity Dinner in August will most probably be an evening function to allow more people to attend. We are hopeful of making it on a day when people do not have to get up and go to work the following day. This will allow us to party on afterwards and create more stories for me to write about. Until the next issue, try some training, work hard, and stay warm.

MATT HANRAHAN,
COMMITTEE, TGAA VIC.

TGAA ACT

Some of the more recent news likely to effect local turf managers throughout the district is the review and remodeling of training packages. Data from a recent survey carried out within local industry should give a good indication of what the real requirements are for education and training. Let us hope that this revised edition will enhance the format of the previous curriculums.

If there are any greenkeepers out there, or if you have recently completed a trade certificate in turf management, you may be interested in continuing your studies and improving your qualifications. The Canberra Institute of Technology (CIT), School of Horticulture in Weston is considering offering various courses at the certificate and diploma level. The future of these courses is dependent on the number of enrollments. Expressions of interest by anyone thinking of furthering their skills in turf management should be forwarded to CIT.

The Turf Grass Association of Australia, ACT region, and its sponsors, are holding a one-day seminar on 'Recycled Water in Turf Management – Methods and Problems', in Canberra on Tuesday, 25 July. The seminar has been tailored to meet the requirements of a wide range of turf situations, many of which are integral to sports grounds management. With water being such a finite resource these days, no turf manager can afford to miss out on this. For details please contact Gary Dawson on (02) 6207 4605.

JUSTIN A K HASLAM,
COMMITTEE, TGAA ACT.

TGAA NSW

TGAA NSW recently held a seminar for turf managers of regional NSW at Kurri Kurri TAFE. The day was a big success with 115 people attending from all over northern NSW. Great speakers covered a variety of topics and our thanks go to Scott Egan (Newcastle Knights), Terry Muir (Environmental Business Solutions), Brent Redman (Buchanan Turf), Gary Dempsey (NSW Golf Club), Dr Mike Shenouda (Sportsturf Medicos) and guest speaker Wayne Pearce. All speakers provided a great insight into their work and produced very professional presentations.

Special thanks must also go to our great sponsors of the day and to the staff at Kurri Kurri TAFE who provided great support of the event. On that matter, what a great facility Kurri Kurri Campus is.

Due to the success of this event, we are now considering continuing the event each year or every second year, as we feel it is a much needed resource for regional turf managers.

We are now focusing on our annual Sydney Seminar to be held on 15 August at the Sydney Showgrounds.

GRAEME LOGAN,
PRESIDENT, TGAA NSW.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LOWARA

"At Kingston Heath the pump house has a flooded suction so it was decided to use end suction pumps because of their long term reliability and ease of maintenance. By fitting Lowara Hydrovar variable speed controllers to the pumps I am also assured of energy efficient operation and reliable on course water pressure. With the pump set now a couple of seasons old the system has been 100% reliable and extremely straightforward to use."

Martin Greenwood,
Golf Course Superintendent
Kingston Heath Golf Club

How the Hydrovar reduces energy consumption.

Most applications involve the pump operating either along its full speed performance curve or the pumps performance is throttled or regulated by a valve. The Hydrovar eliminates these operating methods by regulating pump speed and hence output to match the system demand. This saves wasted energy traditionally lost in these conventional pump systems. Energy savings of up to 70% can be realized. (figure 1)

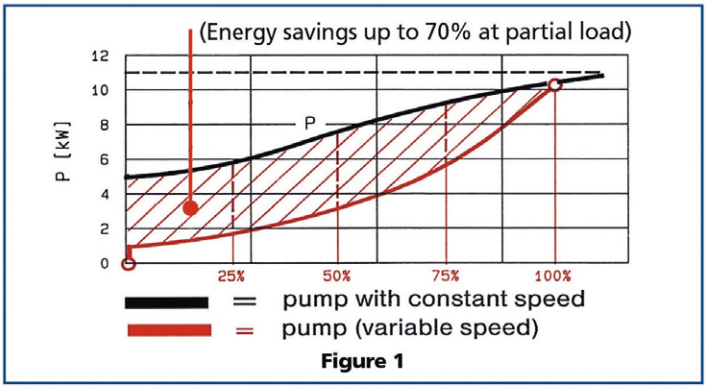

Figure 1

What is a Hydrovar?

Hydrovar has gained a reputation as the pump mounted, microprocessor pumping system controller. But it does much more than just change motor speed.

It actually manages the performance of the pump to match a wide range of system conditions and requirements.

Hydrovar is fully programmable on site as it incorporates the microprocessor and the variable speed drive in one compact and unique package.

How the Hydrovar reduces maintenance cost.

Hydrovar software is designed specifically for centrifugal pump operation, control and protection. Hydrovar can thus be setup to protect the pump from operating under various unfavourable conditions eg. cavitation, operating against closed head, low NPSHa or operation past a pumps maximum flow rate. Hydrovar will automatically shut down and alarm if adverse conditions occur.

Hydrovar provides the Golf Course Superintendent with the flexibility of watering required with substantial savings on installation, power usage and maintenance. For details about the experience of some of Australia and New Zealands most prestigious Golf Clubs who have installed Hydrovar pumping systems, contact the Lowara distributors nearest you.

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