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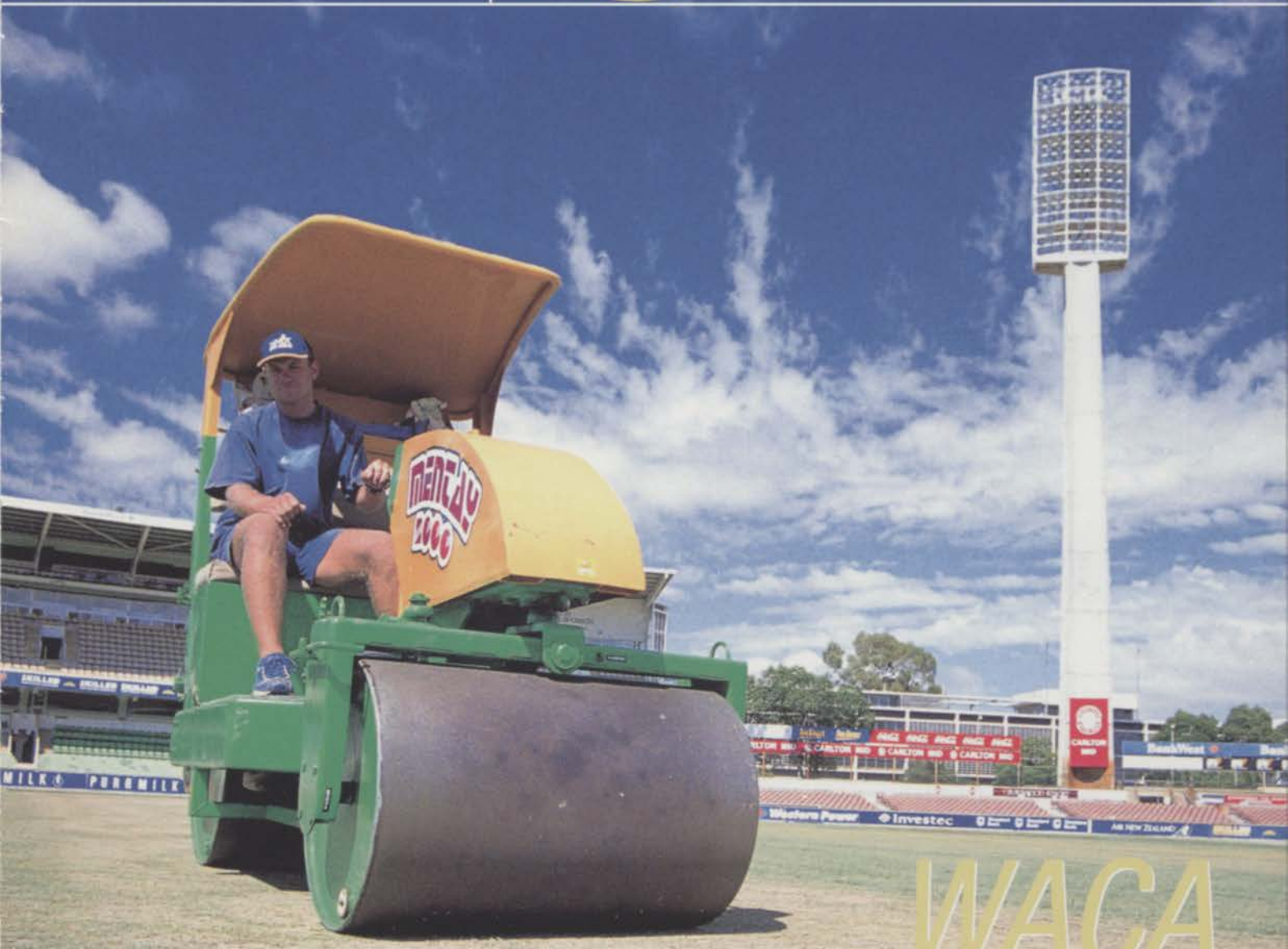

WACA

- Fox Hills - Planning For Change
- Buying Groups
- Moveable Crossings for Racing

volume 4.2
April - May 2002

Floorplan and Program Inside

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"Colin Thorsborne at The Glades"

12th Green at The Glades

Meandering through the surrounding native wetlands in its Robina setting on Queensland's Gold Coast, The Glades golf course leaves first-timers mouths open in awe. Designed by Greg Norman, and bought by Ian Baker-Finch, two of Australia's most well-known names in golf, The Glades was destined for greatness.

Magnificent bent grass greens and lush gn1 couch fairways are maintained in spectacular tournament-like condition every day of the week, and the many bird and wildlife species that abide around the course make this idyllic setting even more so.

As always, the amazing condition of the course is a testament to the Golf Course Superintendent and the rest of the maintenance team. When Paul Bevan was promoted to the Facility Operations Manager, his shoes as Golf Course Superintendent, were ably filled by Colin Thorsborne in June 2001.

Colin was originally employed as assistant Golf Course Superintendent to Paul Bevan in September 1997, during the construction phase of the golf course. Colin manages seventeen staff, and a fleet consisting almost entirely of John Deere equipment.

According to Colin, such diversity in the course surrounds, presents a number of challenges. The golf course consists of eight different grass species: Greens - A4 bentgrass, Tees – santa-anna couch, Fairways – GN1 couch, first cut of rough – Zoysia Japonica and outer roughs were an original mix of sheeps fescue, tall fescue, red grass and wallaby grass. The Zoysia Japonica grass used in the rough is definitely the biggest challenge to maintain. With the Zoysia seed being imported by the original developers of the Glades there was very little known about the growth of the grass or the tolerance to commonly used herbicides. Colin says that this all became a very quick learning experience for both himself and Paul - "Four years on and we are still learning."

During the construction phase of the project there were many trialling times for everyone on the team. One such occasion which Colin remembers, occurred when the irrigation mechanic (Darren) went down the irrigation suction well which was about 20 feet deep to carry out some routine maintenance. It wasn't until he had climbed through a manhole and down a ladder to the platform at the bottom of the well that he realized he'd passed a 4-5 foot brown snake on the way down. Colin remembers Paul yelling that he would get the snake and Darren yelling something back which we can't print. Colin says he has never seen anyone scale a ladder and come out of a manhole so quickly before in his life.
The Glades opened for play in January 2001, and was the highest ranked Australian resort course on debut in "Golf Australia" magazine's Resort Courses review, 2001. Today The Glades is Queensland's number #1 golf course, ranked number #14 in Australia. Managed by Troon Golf, worldwide leader in golf course management, The Glades facility is testimony to that fact.

In his relatively new role as Facility Operations Manager, Paul Bevan has not been sitting on his laurels either. As well as a world-class golf course, The Glades also boasts what must be described as the most stunning water feature and clubhouse location in Australia.

In December 2001, the icing was put on The Glades cake. The awe-inspiring clubhouse was officially unveiled at a function involving Greg Norman hitting off a fairway in the darkness, and setting off a spectacular fireworks display to mark the beginning of the evenings festivities. The size of the party hosted that evening showcased The Glades as a premier venue for corporate functions, as well as national and international tournaments.

The Glades has also welcomed it's first citizens to the first residential release, EastHill Residences, but that's only the tip of the iceberg. The Lodge, completed this month, offers luxurious self-contained executive apartments, along with a modern health spa. The Lodge also features tennis and volleyball courts, as well as a lagoon pool for the ultimate in relaxation.

Amazingly, The Glades is a pay-as-you-play course, yet as those of you who have already experienced The Glades hospitality are aware, all guests receive the utmost in VIP treatment during their stay.

John Deere is grateful to Paul, Colin, and the rest of the staff at The Glades for their invaluable assistance in hosting the John Deere Team Championship final in October last year, and is pleased to announce that the event will be hosted once again at The Glades in October this year.

John Deere thanks Paul Bevan and Colin Thorsborne for their wonderful contribution to the golf industry in Australia. The bar has just been raised a notch!

5th Hole at The Glades

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If there is one topic that comes up at every gathering of Racetrack Managers it would be Trainers, but closely behind is how to build and maintain racetrack crossings. This article from the STRI's Head of Sportsturf Construction, Rob Everett, covers an innovation at Ascot Racecourse that could offer a solution to many.

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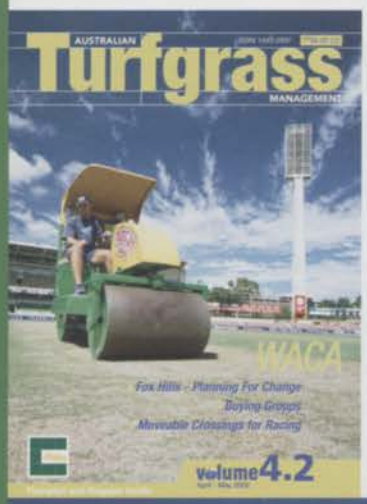
Western Australian Icon, The WACA is undergoing a $12 million upgrade aimed at recreating a more family atmosphere and bring crowds back to this marvelous ground. Wicket Curator, Richard Winter is excited about the job ahead and it shows.

research

Remote Sensing of Brown Patch and Dollar Spot on Creeping Bentgrass and Annual Bluegrass Turf Using Visible and Near-Infrared Spectroscopy 32

It has been talked about for years but it looks as though a group of hard working turf researchers in the United States have finally made disease identification using remote sensing equipment as a definite reality.



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In this edition, Business Consultant Terry Wills-Cook presents one side of what has become a controversial topic. Food for thought, what do you think?

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Autumn

They say that 'what's old is new again' and in this months cover story, Richard Winter, Curator of the The WACA ground discusses the clubs planned $12 million facelift, a key component of which will be the reintroduction of over 5000m² of turfed viewing areas. The majority of sporting stadiums seem to be focused on deducing configurations that will allow them to squeeze more sardines into the can but the WACA is determined to bring back 'atmosphere' in the expectation that crowds will follow. Lets hope they do because it will be sad for all of us if they don't.

While we are talking about facelifts, Kenton Boyd, Superintendent at Fox Hills Golf Club has almost finished a course rebuild that follows a Master Plan designed to address issues such as safely, strategy and environmental improvement. The full story starts on page 8.

In REVIEW, Business Consultant, Terry Wills-Cook outlines the affirmative side of the controversial debate surrounding buying groups in the turf industry and in RESEARCH, we look at how remote sensing equipment can be used for disease identification.

Also included in this edition is the Conference program and Trade Show floorplan for the Brisbane Conference and we take a look at a 'moveable crossing' that has recently been installed at the Ascot Racecourse and which could if successful, offer a solution to the Racetrack Managers perennial nightmare.

Best regards,

Phil George

PHIL GEORGE
EDITOR

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President's Pen

Mark Couchman, AGCSA President

With Easter and the first round of school holidays upon us again, there has not been time to take breath yet this year.

I certainly take my cap off to all the Superintendents who have had to endure tournaments and the like this year. Supers in Melbourne and Adelaide have had to contend with the "coolest" summers on record whilst other parts of the country are dealing with little or no rain on top of record hot summers.

The AGCSA workshops will take to the road with Dr. Jim Moore who will discuss issues relating to the USGA greens construction methodology. I'm sure Jim will be giving us a very informative discussion relative to the pros and cons as well as some real life examples of success and failures.

The early bird registration cut off for the 18th Australian Turfgrass Conference is fast approaching and I hope that Queensland can keep the weather "up" for all to enjoy, although for our Victorian delegates there may be some thought going into how many pairs of board shorts will need to be packed. Just remember in Queensland that the saying goes "Slip, Slop, Slap, Wrap and Slurp".

I hope that members have had the chance to see the advertisement that the AGCSA ran in some of the golfing publications promoting our profession and our professionalism. The history project for the AGCSA and some of the state associations is nearly at the first draft stage. The Sportsturf Protection Manual (TPM) is out, looks great and works fantastically well so get your order in as stocks are already running low.

I certainly hope that members are putting pen to paper for the other Awards that are on offer for recognition of Superintendents who excel in their positions. Don't be afraid to nominate someone that you think is worthy for the Awards that are on offer. We certainly thank the sponsors of all the AGCSA Awards and I certainly look forward to the presentation in Brisbane.

The AGCSA Board will also be meeting with the national executive of the Golf Club Managers Association in the next couple of months to help foster better relationships between the two associations. The meeting will also give us the opportunity to inspect facilities for future conferences.

Lastly, education and I have no doubt that people will cringe when told that the National Training Package is set for further change. However, people should be aware that the AGCSA, through Rob Macdonald, as our Education Officer, is out there representing what we feel is the best interests of all those in the turf industry.

I hope you enjoy the magazine and don't forget to get those early bird registrations in.

Good Reading.

Mark K. Couchman

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FOX HILLS - PLANNING FOR CHANGE

Installation of Drainage on the 13th Tee.

In July 2000 Fox Hills Golf Club, a division of Seven/Hills Toongabbie RSL Ltd located in Western Sydney, engaged the services of Ross.C.Watson Golf Course Design to prepare a Golf Course Master Plan. The Golf Course Master Plan was adopted to provide the club with a strategic approach to the upgrading of the golf course that addressed the following issues:

- Improve safety for local residents using adjoining boundaries through the redesign and reconfiguration of the existing layout.
- Redesign and reconstruction of all greens, tees and bunkers on the existing layout to improve golfing strategy, visual appeal and ease of maintenance.
- Redesign and regrading of fairway and rough areas to maximise stormwater run-off whilst not impacting on the storage capacity of the retention basin within the course.
- Rehabilitation of Greystanes Creek and improvement of water quality through regrading and stabilisation works of the existing creek line.
- Increase water storage capacity and maximise catchment opportunities.

The adoption of the Golf Course Master Plan in November 2000 was based on the complete rebuilding of all greens, tees and bunkers, water storage enlargement, stormwater installation and fairway shaping over five stages.

Pre-Construction Planning

Prior to the commencement of Stage One, Master Plan Works pre-development meetings were held with the two local councils that regulate development on the site. The purpose of these meetings was to ascertain the necessary requirements for development approval. Meetings were also held with representatives of the Department of Land and Water Conservation and the local Catchment Trust who provided advice and feed back on issues associated with creek line rehabilitation and storage.

Construction Materials

A blended sandy loam soil mix was chosen as the greens and tees construction mix. The soil mix had a hydraulic conductivity of 860mm/hr and was further amended (off-site) with 7.5% Coconut Fibre by volume. Further soil testing indicated that amendment reduced the saturated hydraulic conductivity to between 700-800mm/hr, which was still well within acceptable levels. Moisture retention rates varied between 11 and 15% and bulk density measured at between 1.4 and 1.49t/m^3.

The construction mix has performed well and even during consistent heavy rainfall, no surface water has been evident. Moisture and nutrient retention has also been excellent.

A 'premium white bunker sand' was chosen for the bunkers. This material had a hydraulic conductivity of 830mm/hr, the particle shape was angular and the particle distribution fell within the ideal ranges. Ball penetration and surface crusting ratings were also acceptable.

Turfgrass Selection

Following demonstration trials that were carried out on the practice putting green, Penn-G2 Creeping Bentgrass was selected to provide a surface on the new greens. The Penn-G2 variety had demonstrated excellent disease and heat tolerance during the trials and also displayed a degree of salt tolerance, which was very important as during dry periods, the clubs irrigation water can be quite saline.

In an attempt to 'shade out' encroaching warm season grasses, a Perennial Ryegrass / Creeping Red Fescue Mix was sown into the collars which were approximately 1.5-2m wide. The "Striker Blend" of ryegrass varieties, 'Pleasure' (40%) and 'Premier II' (30%) and 'Cindy' Creeping Red Fescue (40%) was sown on collars at a sowing rate of 10kg/100m^2. These were relatively quick to establish and look to be up to the task.

Legend couchgrass was chosen as the surface for tees, greens surrounds and bunker surrounds. An alternative species to the existing Kikuyu Pennisetum clandestinum was investigated in an attempt to reduce cutting

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frequency and maintenance costs.

In an attempt to reduce cutting frequency and maintenance costs associated with the existing Kikuyu (Pennisetum clandestinum), variety trials were established on the 17th Tee to evaluate grasses that could be selected as a replacement. In our trials, Legend Couchgrass Cynodon dactylon var "Legend" exhibited good recovery, a short dormancy period, high density and uniformity and excellent winter colour retention and was eventually selected as the replacement. Another significant factor that influenced the selection of Legend was its tolerance to herbicides such as glyphosate, which is important to us in the control of any Kikuyu regrowth.

STAGE 1

Design and Construction

Stage 1 of the Golf Course Master Plan involved the construction of six new greens, five new tees, surrounds and fairway reshaping, stormwater drainage, nineteen new bunkers and the installation of over 500 linear meters of concrete pathways. The average size of the new greens is approximately 475m² and teeing areas average 400-450m² per hole.

The bunkers are sand faced and were designed and shaped so all stormwater run-off was shed away from the bunkers to minimise 'washdown' of faces.

The new design work has been well received and has added a new dimension to the golf course.

The six new greens were all built to a specification similar in principal to USGA specifications with a 100mm drainage layer of 5-7mm crushed river gravel overlying the compacted clay sub-base and drainage network. Drainage spacings were approximately 4m with a ring drain around the inside of the constructed bowl. 100mm slotted Agricultural Pipe was installed in all sub-surface drains and a 300mm layer of specified construction mix was then spread and consolidated over the area. A 300mm deep plastic root barrier was also installed between the Ryegrass/Fescue collar and Legend Couchgrass to help slow encroachment.

The five tee complexes were all built to a University of California Method of Construction with drainage spacings of 3m. A 300mm layer of the construction mix was then spread and consolidated over the constructed sub-base and drainage network to form a rootzone. All tees were laser levelled prior to turfing with washed Legend 'Maxi-Rolls'.

Shaping of the 18th Green

Bunkers were all shaped to minimise stormwater run-off onto the faces. A constructed vertical lip was shaped to provide the maximum contrast between the sand and bunker edge. The couchgrass is being grown down the lip and trimmed with a reciprocator to retain a grass edge. To facilitate drainage, a herringbone drainage system was installed in all bunkers with 3m spacings. In addition, a number of high wear areas around greens had a network of sub-surface drainage installed.

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Construction of greenside bunkers on the 11th hole.

Turf Establishment and Grow In

Prior to seeding, all greens were amended with Dolomite, Poultry Fines, Agricultural Lime and 'Starter Fertiliser'. The first of the putting greens were hydro-seeded with 'pre-germinated' Penn-G2 Creeping Bentgrass at a rate 500g/100m² in September 2001 and the last two went down in around the middle of October 2001. Establishment was fairly rapid with a full cover being achieved in 4-5 weeks.

"Lesco Turfstarter Elite" was applied every 4-6 weeks during the grow in period at a rate of 2.1kg/100m² with supplemental liquid feeds of "Nutrafeed" 23 at 1.0kg/100m², Epsom Salts at 1.0kg/100m² and Iron as required.

A slow release potassium (Lesco, Super K-Elite) was applied at 1.6kg/100m² around the middle of December to strengthen the plant during consistent 35-38 degree temperatures and hot westerly winds. A liquid fertiliser (Natrakelp 12:3:12) was applied in early January to stimulate micro-organisms and strengthen plant roots.

All greens were brought into play at the start of February 2002 at a cutting height of 3.5mm and a program of light dusting and rolling is gradually improving the putting surface.

Tees, surrounds and fairway approaches were all amended with gypsum at 20kg/100m², a poultry manure/'starter fertiliser' blend at 20kg/100m² and agricultural lime at 20kg/100m² to improve soil structure, adjust the calcium/magnesium ratio and raise the pH levels.

Tees were fertilised once with "Lesco Turfstarter Elite" at 2.1kg/100m² during early establishment along with Dynamic Lifter at 20kg/100m² to promote leaf growth, density and micro-organism activity. Maintenance applications of a granular custom blend 31:1:8 + Fe at 1.5kg/100m² twice during the summer period has provided a dense uniform surface on the Legend tees and surrounds.

Row planted fairway areas were fertilised every 4 weeks with granular custom blend 31:1:8 + Fe at 2kg/100m² until a full cover was achieved. The fairway approaches were also topdressed in January to smooth out any surface irregularities and aerated.

A herbicide (Ronstar), was applied at 1.5kg/100m² on green surrounds and tees in an attempt to prevent the emergence of annual weeds such as Wintergrass, Crabgrass and Summergrass during the grow in period. Pendimethalin was also applied to fairway approaches at 4L/ha to achieve some pre-emergent control at a lower cost and results were pretty good.

My staff applied all the amendments, layed all the turf, stripped down and rebuilt existing sprinklers, levelled trenches and overall, played an integral role in the grow-in and success of Stage One works.

Irrigation Modifications

A Toro LTC Irrigation System was installed by the club in 1997 and the Master Plan aimed to maintain the existing mainlines, sprinklers and satellites where possible.

Stage One involved the upgrade of two of the existing 32 station LTC satellites due to the need for an extra 40 stations in the Stage One Design. The existing satellites were upgraded to 64 Station LTC Plus satellites. The extra station requirements were brought about by the upgrading of tees irrigation from S2001 Sprinklers to Toro VIH 734 Gear Drive Electric Sprinklers. The redevelopment and upgrade of the clubhouse also required stations for landscape irrigation. The upgrade was required to ensure quick uniform irrigation coverage on the new sandy loam based tees. The new sprinklers have a precipitation rate of approximately 15mm/hr compared to 6mm/hr for the existing S2001 sprinklers, which were more suited to the existing 'push-up' type constructions.

One section of mainline was moved and upgraded to 100mm in diameter to accommodate the construction of the new 18th and Putting Green. Existing laterals were upgraded to 63mm polypipe around greens, tees and fairways. All greens, tees and fairways are irrigated with Toro 734 EVIH sprinklers with dual rows on fairways and tees. Narrower sections of fairway are irrigated with Toro EVIH 754 sprinklers.

The existing central computer was also upgraded to meet the requirements of the new satellites and Field Interface Unit that provides central communication with the field satellites.

STAGE 2

Design and Construction

Stage 2 Design has been fully documented by Ross Watson and is scheduled to start in February 2003. Stage 2 involves the construction of three new greens, five new tees, bunkers, fairway reshaping and drainage, concrete pathway installation and the enlargement of current water storage to approximately 40 megalitres. An existing entrance road from the eastern perimeter of the golf course will also be redirected around the perimeter of the course so there is no longer any traffic crossing golf holes.

Clubhouse Upgrading

The Clubhouse is also currently undergoing a major upgrading program. Merlot Constructions were engaged by the Seven/Hills Toongabbie RSL management during 2001 to redesign and upgrade the existing facility. The new work involves the construction of a new façade, function facilities for 200 people, al fresco verandah areas overlooking the course, cart storage, new entrance and lift, poker machine and TAB facilities. Carparking is also being upgraded as well as the landscaping around the perimeters.The work is expected to be completed in April 2002 and will provide the club and its patrons with a premier facility.

ACKNOWLEDGEMENTS

Flowline Civil Contracting was engaged as the construction contractor for Stage One Works and preparation of the Development Application based on their previous reputation and experience. Don Matheson and his team carried out a first class job of the earthworks shaping and drainage installation on the new holes. A relatively dry winter saw the bulk of the contract completed within 22 weeks.

M.Collins and Sons were awarded the contract to supply the Legend couchgrass, soil construction mix, drainage gravel and the bunker sand.

Lowlands Lawn Turf supplied some Legend couch when supplies were running low.

Footprint Green Horticultural consultants were engaged to prepare a Landscape Replanting Plan, which aimed to improve the environmental amenity and biodiversity of the site.

John Neylan from AGCSATech was engaged to provide technical support, testing of construction materials and recommendations on the construction methods and turfgrass selections. A comprehensive report prepared by John enabled all greens, tees and bunkers to be constructed to recognised standards.

Matthew Wilson from Total Irrigation Designers documented irrigation modifications associated with the overall Golf Course Master Plan. Matthew also prepared Stage One detailed design and tender specifications for the selection of an irrigation contractor.

M.Collins and Sons also supplied the majority of the Legend couchgrass and when supply ran short, some was supplied by Lowlands Lawn Turf.

Row-planting was carried out by Qualturf Pty Ltd.

Bob Ashley, Hugh Leicster and the team from Hydrotechnics Irrigation did an excellent job and provided a smooth transition through the Stage One Construction.

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BUYING GROUPS -

It has been said a million times before "Globalisation means that business must become increasingly competitive " and it is true.

Becoming competitive means reducing costs, increasing productivity and being totally driven by the customer's perception of needs. Whether we like it or not there is a fundamental reality in all arms of business as a result of this globalisation. There are fewer and fewer customers because they are either taken over or join groups and there are fewer and fewer suppliers because they in turn are taken over or because they are either not large enough or not specialised enough to survive.

The early examples of the enormous pressures of competition in Australia came in the retail area when small family businesses in the hardware, grocery and electrical industries faced overwhelming competition from large corporate enterprises with lots of buying power and big promotional budgets. They soon realised that they could not survive unless they could find ways to compete and thus were born organisations like Mitre 10, Composite Buyers and Retravision which have proven to be great success stories.

Despite the fact that golf club managers have been involved in some buying group activity for a number of years the golf industry managed, for many years, to avoid these issues because it was largely composed of member owned and publicly (usually Council) owned facilities. Of recent times this has changed dramatically, corporate ownership of facilities is growing monthly, peoples lifestyles have altered and the old order has to face change or go under. Today golfers can select from a number of top courses, book a spot, pay their fees

Globalisation means that business must become increasingly competitive.

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THREAT OR FUTURE REALITY?

BY TERRY WILLS-COOK

around $50 or $60 and go and enjoy their golf with no further thought or responsibility and play around the same number of times as they would as a member of a club.

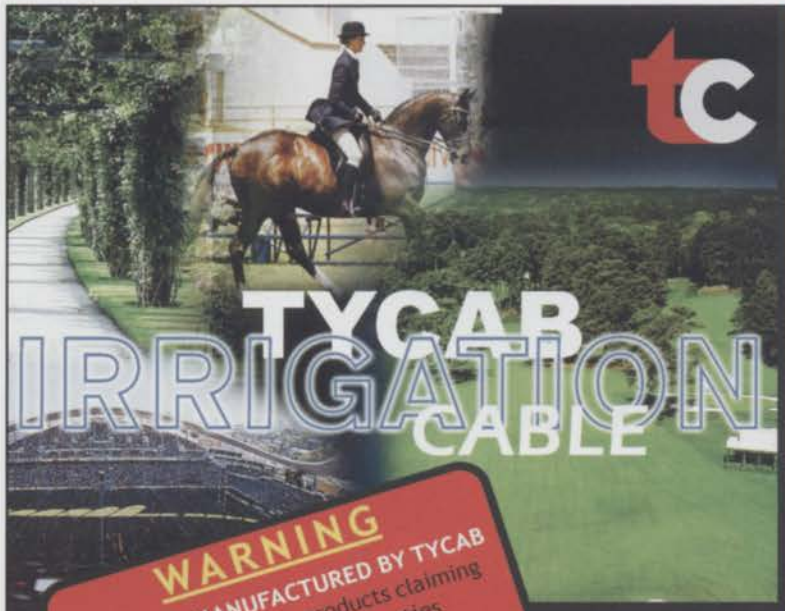
As a result golf club managers are under ever increasing pressure to build membership and to hold fees down while maintaining the highest standards on the course itself. Thus there are consequent demands on golf course superintendents to raise the standard of their professionalism, to avoid "buying from mates" without regard to price, service and value and to reduce the costs of their day to day activities while at the same time substantially raising the presentation of their courses.

I have spoken to a number of Superintendents on the subject of buying groups and their views broadly fit into for and against groups.
The "against" group's view is that the concept in some way undermines their role, that many things are purchased on issues of suitability for their particular course rather than price, that it is an integral part of the job to buy well and professionally and that the methodology makes the function of the Superintendents Association redundant. The contrary view is that competition is an established and existing fact, that buying power is absolutely essential to cost reduction, that Managers and Boards demand, and are entitled to, cost reduction and productivity improvement and that those who do not embrace change lack professionalism and will simply not survive.

Recently we have seen the formation of a group (which is essentially more than a buying group) of a number of golf clubs in Victoria. Some of the benefits as participants saw them were.

- "I have saved enough money in the first couple of months to pay my share of the costs of the secretariat"
- "We hold monthly meetings for where we can discuss a range of issues which affect us, it is short and to the point as I don't have time to devote a full day"
- "We pool resources for mutual benefit, whether it be labour or equipment, this results in dramatically increased productivity with a commensurate lowering of cost."
- "We can leave the negotiations to the secretariat and thus gain more time for the major functions of course management".

Some suppliers too, have welcomed the advent of the concept. One supplier had recently conducted a study of his costs and established that every sales call cost him $82. "If I call on one person representing a group of eleven it represents a saving to me of $820, most of which can be passed on in price reduction", another remarked "of course we will give lower prices for guaranteed higher volume" and a third "buying groups have been hugely successful in Australia for more than 30



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years, I wonder what took golf so long to recognise the benefits available"

So what about a pure buying group which has only one function - that of amalgamating the volumes for commodity and capital product requirements for golf courses which have a level of commonality across the membership and which has the role of negotiating bulk purchases at lower costs?

For such a buying group to be a long-term success, experience shows that there are just a few fundamental criteria

- Someone or some organisation must start the process and have the will to drive it forward.
- An absolute necessity for the group to be controlled by the end beneficiaries and not by any commercial organisation.
- A REAL commitment of members to the concept with a preparedness on some occasions to accept a deal which is in the group's best interest rather than their own - "cherry pickers" make bad members.
- A professional secretariat, properly resourced, which is independent of the influence of individual members.
- An openness by members to expose their product needs to the group rather than trying to get the best of both worlds, buying from the group only when it suits them. (However in the turf world the fact that different courses have different conditions, soils and micro climates would make it essential that members had the right to opt in or out of some particular bulk purchases if it didn't suit their particular needs and this without criticism from their fellow members.)
- An understanding that there have to be substantial benefits to suppliers.
- A preparedness of the members to put "seed funds" up front to enable the establishment of the secretariat.

What then is the future? In my opinion the absolute realities of competition will dictate that cost reduction will ensure that buying groups will grow, first in Melbourne closely followed by Sydney and then Queensland. The smaller market sizes in the other three states may create some delay but there is an inevitability about this which will not be pushed aside.

The threat? The threat is that those who don't get on the bus will become irrelevant.

Terry Wills-Cook is a private Business Consultant.

The views expressed in this article are the views of the authors alone and in no way must they be interpreted as the views of the AustralianGolf Course Superintendents Association (AGCSA). Those with other views or comments should contact the Editor in writing.

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Toro Turf Tour

Location: The Golf Club Kennedy Bay

Toro has helped Bruce achieve the desired high quality using low inputs.

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Paul Willmott (Toro) with Bruce Coleman (GCS).

Located just 40 minutes south of Perth and hard against the magnificent Indian Ocean, the Golf Club Kennedy Bay is buffeted almost constantly by the famed 'Fremantle Doctor' and is characterized by some 115 pot bunkers and large undulating putting surfaces that give the course a true Scottish Links feel.

Designed by former British Open winner Ian Baker Finch, Roger Macay and Michael Coate and built by well know Superintendent Trevor Strachan in 1998, the course has found favor with the golfing public as is evidenced by its 'with a bullet' charge into tenth place in the Australian Golf Digest 'Top 100 Australian Courses for 2002', just edging out Lake Karrinyup Country Club as Western Australia's best golf course.

Under management of IMG, Golf Course Superintendent Bruce Coleman says that the small team at Kennedy Bay are aiming to 'build demand' one day at a time and do their best to make sure that everyone who plays the course has the best golfing experience possible at the 6,429m 18-hole layout.

Bruce's management style is to keep things simple and basic, he feeds the turf 'little and often' and likes to keep greens and fairways lean and tight to make the best use of the courses natural feel and character.

His objective is to "achieve the desired high quality by using the least level of inputs possible" and this is one area where Toro Australia has been able to help Bruce reach his goals.

The golf course is located in a very environmentally sensitive area and preservation of this fragile ecosystem is of the utmost concern and is integral to the success of the golf course as a tourist attraction and as a contributing member of the local community.

Due to the very sandy nature of the site (coastal dune) and the delicate balance that the native vegetation has struck with such a marginal zone, it was important that the water was managed with the highest level of precision possible.

The native sand drains like a sieve so to avoid the leaching of any plant nutrients (nitrates and phosphates), not only is Bruce frugal with his fertilizer use but requires the capacity to water with 'millimeter accuracy' to ensure that water is not leaching below the rootzone or spraying out onto the native vegetation.

For these reasons, Toro Network 8000 Satellites with a Site Pro irrigation control system was installed to feed Toro 760 Electric Valve in Head (EVIH) sprinklers, many fitted with 180 degree nozzles to limit over throw into sensitive areas. The Toro 760 (EVIH) sprinklers have a stainless steel sleeve over the riser, which was of critical importance as the high winds and sandy site at Port Kenney would have meant that a plastic turret would have been scored (sand blasted) during construction.

Storage Dam at Kennedy Bay.

The system is totally integrated with a system of 'site codes' and a state of the art weather station that allows Bruce to have total control of his irrigation practices. Bruce has codes set up that allow the system to recognize which sprinkler heads are in low or high points or are in areas where turf generally requires a little more or less water than would normally be required and all of these are linked through to evaporative transpiration rates (ET) that overlay the whole system to make adjustments at a more 'macro' level. However, can intervene at any point so if he feels as though his turf is traveling well or if he wants to 'harden' it up a little, he can override the system and irrigate to a level that is below the ET rate.

This is particularly important for Bruce because he is required to run the course on a very strict 'water budget' that is allocated and managed by the Environmental Protection Authority (EPA). Bruce is allocated 320,000 m³ per year to look after the 27 hectares of fairways, tees, roughs and greens which is probably only 75% of what he really needs so for this reason, Bruce needs to be able to keep a very close eye on how much he is using and needs to be able to conserve water at every opportunity. This he has been able to do with the Network 8000 and even though only 7mm of rain has fallen since January 1st, Bruce is already over 17,000 m³ under budget since September last year, (see table below).

The System is toatally integrated with a system of site codes and a state of the art weather station

DATE	ACTUAL	PROJECTED	UNDER/OVER
27/9/01	2526	5306	2780
25/10/01	17260	33293	16033
29/11/01	66134	79918	13784
27/12/01	103858	120373	16515
31/1/02	162418	183175	20757
28/2/02	210627	228359	17732

Key: Red represents water saving

Continued next page

Toro Turf Tour

Toro 6500-D, an "excellent machine"

The irrigation system is only one half of this successful equation, as Port Kennedy Bay also run a fleet of Toro Machinery that is maintained by Mechanic Brian Chapman.

The SR 1019 bentgrass greens are mowed four times per week at a cutting height of 3mm with two Greensmaster 3100's that are ably assisted by three Greensmaster 500's and 2 Greensmaster 1600 walk-behind mowers. Windsor Green fairways are cut atleast once per week at a mowing height of 7mm with a Reelmaster 6500 D that delivers superb productivity and reliability.

The green surrounds are maintained with a Reelmaster 2300 D, fringes are cut with a Reelmaster 3100 D and the 'MX 86' Fescue Mix roughs are cut with a 325 D fitted with a 'recycler deck' that Bruce says does an amazing job on the Fescue because it 'stands it up' before cutting which gives a very even finish. Bruce also has a Sandpro 5000 but the design of the bunkers is such that the only bunker it fits in is "Hell". Why would you have one then? Bruce said, "it is an ideal machine to have on hand for any construction jobs such as new tees etc".

All the machines are owned outright and serviced by the Kennedy Bay staff and the fleet does seem small for a course of this quality and reputation but as Bruce said, they are gradually building on the number of rounds through the course and a second 18-holes is on the drawing board.

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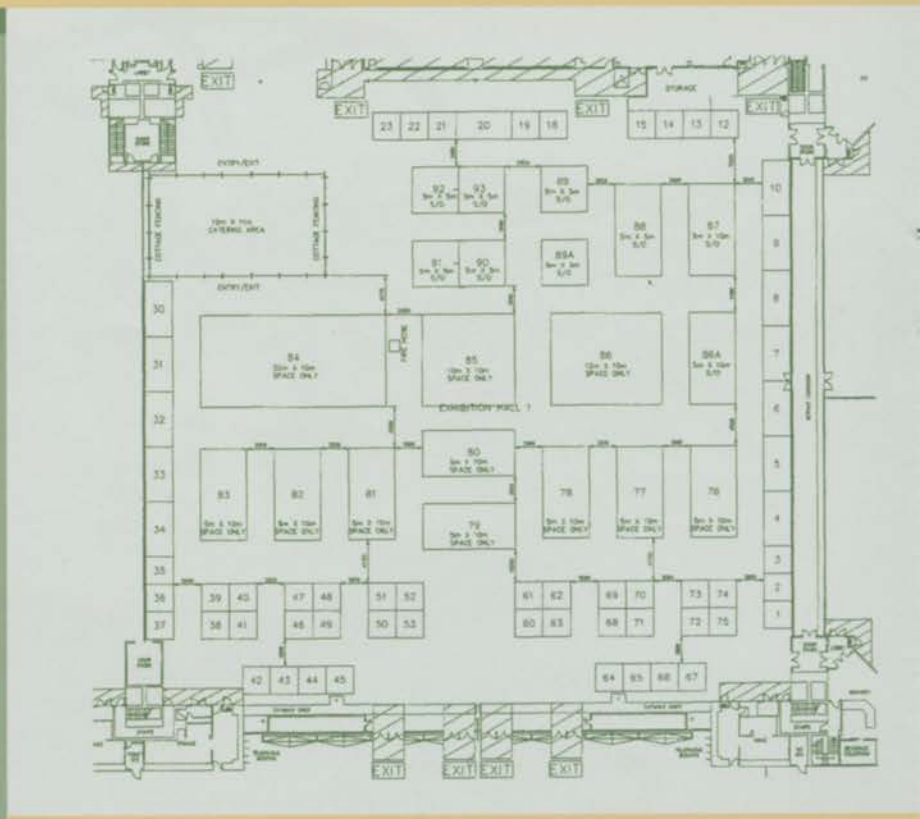
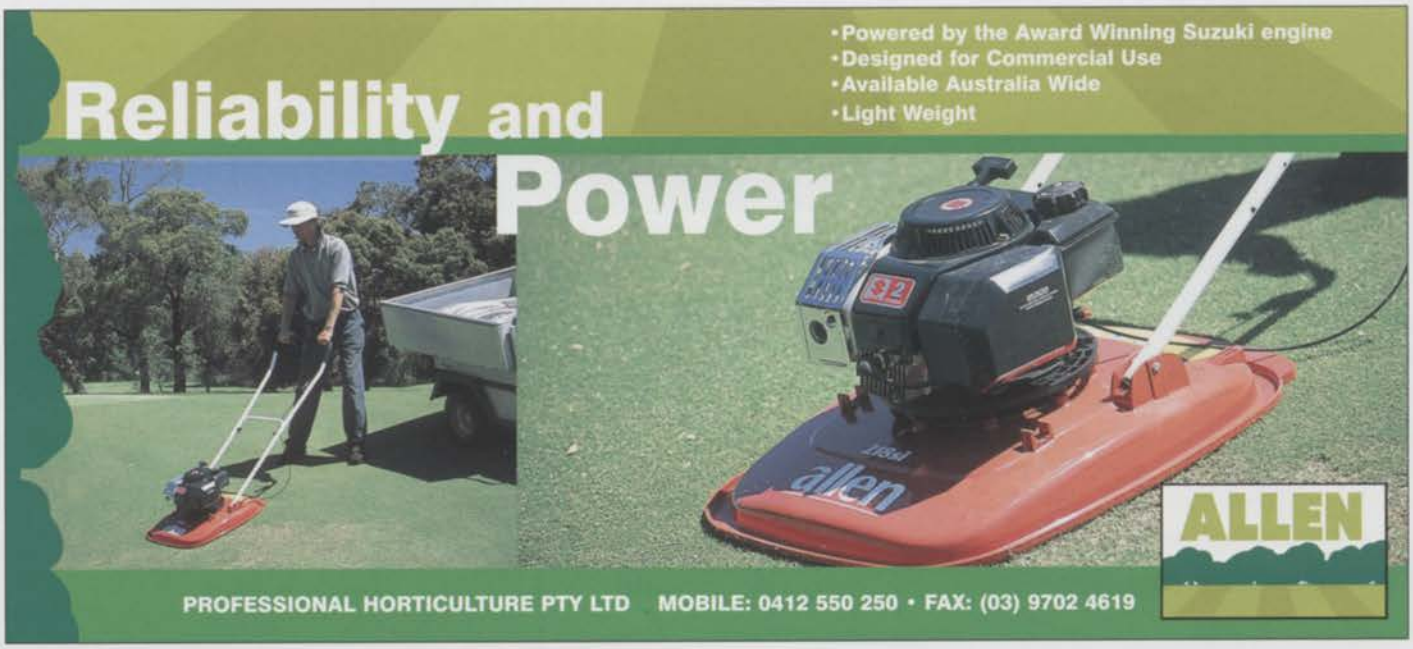
18th Australian Turfgrass Conference Floor Plan and Exhibitors List

COMPANY	EXHIBIT #
Aventis	52+53
Antonio Carraro Pty Ltd	62+63
Aspac Golf and Turf	39+40
BSF Golf Management	18
Club Car	82
Country Clun International	86 (a)
Croplands Equipment Pty Ltd	92
David Golf and Engineering	80
Dint Greenkeeping	64+65
Drake Extrusion	30
Evergreen Turf	33
Foley Grinders	45
Globe Aust.	31+32
Graden Industries	89A
Greencare Industries	88
Hardi Spraying Equipment	83
HG Turf	51
Hunter Industries	60+61
Industrial Mowers	71
JFB Agencies	22+23
Jimboomba Turf	2
John Deere Limited	86
JSB Equipment	3+4
Nuturf Pty Ltd	79
Parklands Trading Company	38+41
Rain Bird Golf	78
Redexim bv	76
Scotts Australia	47+48
Silvan Pumps and Sprayers	72-75
ATT / Simplot	77
StrathAyr	87
Textron Turfcare Group	85
The Ohio State university	49
Toro Australia	84
Toyota Industrial Equiptment	6
Trelleborg Tyres	68
Triodia	46
Tru-Turf Equipment	8
Turf & Irrigation Pty Ltd	81
Turf Force	34
Turf Link Australia	91
TurfCraft International	69
Turfgrass Association of Australia	44
TurfMach Australia	90
Twin View Turf	1
Tyco Flow Control Pumping Systems	93





CONFERENCE PROGRAM

GOLF COURSE MANAGEMENT STREAM

SUNDAY JUNE 16TH

7.00am **Pre Conference Tour (Nth Lakes QDPI)**
8.00am **AGCSA Award Judging**
Rydges Southbank Hotel
3.00pm **Registration Desk Opens,**
Plaza Room 5, Brisbane Convention Centre
7.00pm **AGCSA Golf Champions Function**
Sponsored by Toro Australia
Rooftop Terrace, Rydges Hotel, Southbank Brisbane

MONDAY JUNE 17TH

6.00am **Buses Depart for AGCSA Championships**
Rydges Southbank Hotel
7.00am **AGCSA Toro Golf Championships**
Royal Queensland Golf Club
1.00pm **AGCSA Golf Championships Presentation Luncheon**
5.00pm **AGCSA Awards Presentation Ceremony**
Plaza Room 6, Brisbane Convention Centre
Followed immediately by the Welcoming Cocktail Reception sponsored by Chipco. The WCR is to be held in a secret location. Attend the Awards Presentation Ceremony and you will be transported to the Welcoming Cocktail Reception.

TUESDAY JUNE 18TH

8.00am **"New and Emerging Turfgrass Diseases"**
Presented by Joe Vargas, Michigan State University
8.45am **AGCSA Award Winners Presentations**
9.00am **Trade Show Open**
10.15am **Trade Show, Morning Tea, Lunch**
1.30pm **"Greens Surface Preparation- A World of Ideas"**
Panel Members include: Dr. Joe Vargas, Dr. Richard Gibbs, Dr. Earl Elsner, Martin Gunn, British and International Golf Greenkeepers Association and three of Australia's leading Golf Course Superintendents
3.00pm **Trade Show and Afternoon Tea**
5.00pm **AGCSA Annual General Meeting, Sponsored by Rainbird Golf**
5.00pm **Trade Show Close**

WEDNESDAY JUNE 19TH

8.00am Workshop 1A
"Golf and the Environment- An Audubon experience"
Presented by David Warwick, GCS, Avondale Golf Club, Andrew Baker, GCS t at the Sanctuary Cove Resort and Martin Gunn, BIGGA
Workshop 1B
"Poa annua for Greens"
Presented by Dr. David Huff, Penn. State University
Workshop 1C
"The new hybrid dwarf couchgrasses, their breeding and management"
Dr. Earl Elsner, Georgia Seed Development Commission
9.00am **Trade Show Open**
10.00am **Trade Show and Morning Tea/Lunch**
1.30pm Workshop 2A
"Turf root health, an interaction between nematodes, fungi and beneficial organisms"
Presented by Dr. Graham and Marcelle Stirling
Workshop 2B
"Making a case - public speaking and negotiation skills."
Presented by Terri Clemenston, Reardon Rothbard
Workshop 2C
"Get it right the first time, application technology to maximise the performance of your pesticides."
Presented by John Kent, Charles Sturt University and John Neylan, AGCSATech
2.30pm **Trade Show Close**
6.00pm **Conference Dinner**
Band: *Lush*

THURSDAY JUNE 20TH

9.30am Workshop 3A
"Getting the best deal - preparing estimates, quotes and tenders."
Presented by John Neylan, AGCSATech
Workshop 3B
"Harnessing the power of data and information collection to produce effective decision making in turfgrass management."
Presented by Professor Peter Martin, University of Sydney,
Workshop 3C
Tour of Redlands Research Facility of the QDPI (baser depart 7.30am)
11.30am **Lunch**
12.30pm Workshop 4A
"Maintain, monitor and evaluate irrigation systems"
Presented by the IAA
Workshop 4B
"Human Resource Management"
Presented by Stephen Marsden, Course Superintendent, Lakelands Golf Club and John Odell, Course Superintendent, The Royal Sydney Golf Club.
Workshop 4C
"Does it really work?- How to undertake your own product trials"
Presented by John Neylan, AGCSATech
2.30pm **Afternoon Tea**
3.00pm **Thinking Superintendent Sessions**
"Waste Management for Scariflyings"
Presented by Robert Macdonald
"Converting Penncross to Suttons at the Royal Melbourne Golf Club"
Presented by Jim Porter, Royal Melbourne Golf Club

FRIDAY JUNE 21ST

9.00am **Open Forum "Greens Construction -What are the essential elements"**
Panel members include John Neylan, Dr. Joe Vargas, Dr. Richard Gibbs, Gary Beehag, Martin Gunn
10.30am **Morning Tea**
11.00am **"The Effect of Rootzone Composition and Cultivation Treatment on Soil Physical Condition and Rootgrowth."**
Presented by Dr. Richard Gibbs, New Zealand SportsTurf Institute
11.40am **"Topdressing and black layer development"**
Presented by Dr. Joe Vargas, Michigan State University
12.30m **Lunch**
1.30pm **"Leadership in a small team environment"**
Presented by Terri Clemenston
2.30pm **Afternoon Tea**
3.00pm **Summary of papers and review**
Chaired by Professor Peter Martin, University of Sydney.
4.00pm **Close**

GENERAL TURF MANAGEMENT STREAM

SUNDAY JUNE 16TH

2.00pm **Registration Desk Opens**
Plaza Room 5, Brisbane Convention Centre

MONDAY JUNE 17TH

5.00pm **AGCSA Awards Presentation Ceremony**
Plaza Room 6, Brisbane Convention Centre
Followed immediately by the Chipco Welcoming Cocktail Reception to be held in a secret location. Attend the Awards Presentation Ceremony and you will be transported to the Chipco Welcoming Cocktail Reception

TUESDAY JUNE 18TH

8.00am **"Leadership in a small team environment"**
Presented by Terri Clemenston
8.45am **"Preparing estimates, quotes and tenders"**
Presented by John Neylan, AGCSATech
9.30am **Trade Show, Morning Tea, Lunch**
11.00am **"Sportsfield construction and drainage - Case Studies and Forum"**
Panel members include Peter McMaugh, Trevor Siviour
12.15pm **"Reducing Soil Compaction in Sportsfields"**
Dr. David Aldous, University of Melbourne
12.45pm **Trade Show**

WEDNESDAY JUNE 19TH

8.00am **Trade Show**
10.00am **"What's around the corner - new turf for the new century"**
Presented by Dr. David Huff, Penn. State University
10.40am **"Getting it right the first time, application technology to maximise the performance of your pesticides"**
John Kent, Charles Sturt University
11.20am **"Eco-Efficiency for turf - the triple bottom line"**
John Neylan, AGCSATech
12.15pm **Lunch**
2.30pm **"Key performance indicators for sportsfields"**
Speaker TBC
3.30pm **"Cricket Pitch Research - the latest "**
Presented by Dr. Richard Gibbs, New Zealand SportsTurf Institute
4.00pm **Summary, review and close**

SPEAKERS

Never before has an Australian Turfgrass Conference been so blessed with the line up of top turfgrass presenters. Keynote speakers include:

Dr. Joe Vargas,
Michigan State University, USA

Joe will discuss new and emerging turfgrass diseases, black layer development and topdressing and will sit on greens construction and surface preparation panels in the open forums.

Horticulture Australia

Dr. David Huff,
Penn. State University, USA

David will discuss his work with Poa annua breeding for use in turfgrass situations, take a look at what grass types will be available in the not too distant future and will focus on turf varieties for sportsfields.

Dr. Earl Elsner,
Georgia Seed Development Commission, USA

Earl will discuss the breeding and management of the new ultra dwarf couch grasses soon to be released in Australia.

Dr. Richard Gibbs,
New Zealand Sports Turf Institute

Richard will discuss his latest research detailing the effects of soil aerification on root growth and soil physical conditions

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AGCSATech : Update

By John Neylan

Daryl Sellar from Glenelg GC with David Huff

Stephen Newell from Kooyonga GC with David Huff

DR. HUFF VISIT

At the 2001 International Turfgrass Society Research Conference, Dr. David Huff presented one of the most interesting papers of the conference. The paper related to his Poa Annua collection and breeding program. David is a plant breeder from Penn State University and has become a specialist in Poa Annua. I later found out that he was to undertake a sabbatical in Australia at Latrobe University and Burnley College.

Since David arrived in Australia in late January, the AGCSA hosted a trip to Adelaide to collect Poa Annua plants from a hot, dry climate. Collections were made at Glenelg Golf Club, Mount Lofty Golf Club and Blackwood Golf Club. Visits were also made to Kooyonga Golf Club and Royal Adelaide Golf Club. Over 150 plants were collected and these have been added to plants collected from Barwon Heads Golf Club and Werribee Park Golf Club.

As well as his work with Poa Annua, David is also working at Latrobe University undertaking sophisticated gene identification and analysis work.

In early April, David will be participating in a seminar at Burnley College on Poa Annua where he will speak on; reproductive biology of Poa Annua; cultural development and seed production of Poa Annua. Also, topics will be provided on; Control of Poa annua in cool – season grasses and weed population dynamics and the seminar will also feature Superintendents discussing Poa control and management of Poa surfaces.

David is to participate in a seminar in Tasmania in April and the AGCSA will sponsor his attendance at this event.

The AGCSA will also have David at the 18th Australian Turfgrass Conference and Trade Show in Brisbane where he will talk on the wider topic of grass identification.

POA ANNUA IDENTIFICATION PROJECT

A cooperative project is being put together between David Huff, David Aldous (Burnley College) and myself to look at the diversity of Poa Annua in Australian putting greens.
The project will initially be to collect plants from putting greens, to grow them out and then to measure their morphological characteristics (i.e. leaf width, tiller density, height, etc.). These are to be established in a glasshouse at Burnley, then planted out into field plots. The purpose of the project is to demonstrate the diversity of the Poa Annua population in any given green.

As a longer-term objective, I would like to relate these morphological characteristics to the plants susceptibility to Poa control herbicides such as; endothal, propyzamide, glyphosate and paclobutrazol. What I hope to confirm is that particular Poa types will have different levels of susceptibility to herbicides. This has certainly been a common observation in the field.
If a link can be demonstrated, then I would see this being a valuable diagnostic tool. That is, plants can be collected and grown out and then compared against a 'susceptibility chart'.
This would assist in selecting the most efficient herbicide or even whether or not a herbicide program will even be appropriate.

As we have come to learn in recent times with insect control, the greater knowledge we have of the biology of the pest, the better chance there is of developing an effective control strategy.

EFFLUENT WATER REUSE ON GOLF COURSES

Each summer, the availability of a good quality water supply becomes an issue for many golf courses. Treated sewage effluent is being more widely used and Water Authorities are now actively encouraging reuse.

Melbourne Water (Victoria), have the task of achieving 20 percent effluent reuse by the year 2010. They are investigating the feasibility of pumping treated effluent back from the treatment plant or alternatively to treat on-site. This is unfortunately termed "sewer mining". As part of the reuse strategy golf courses along with councils have been identified as potentially large users of treated effluent.

A recent workshop to discuss the issues of reuse on turf areas raised some interested points;

- The availability of a good water supply varies from course to course even when in the same general vicinity.
- The nutrients in the effluent are of doubtful value to golf courses.
- Few golf clubs have made any analysis of the long-term availability of their current water supply and what may have to be done to secure water in the future.

Because of the importance of effluent reuse on the quality of golf course turf, the AGCSA in conjunction with Barwon Heads Golf Club and Horticulture Australia are undertaking a project to monitor the impact of effluent reuse on turf quality and soil chemistry.

The project has two components;

(i) Monitoring soils, water and sward composition at selected locations on the golf course.

(ii) A nursery green will be built where half will be irrigated with potable water and half with effluent water.

There will be different grass types established including bentgrass and Poa Annua and these will be monitored in terms of surface quality, thatch accumulation, disease, green speed and root growth.

The nursery green will be established this Autumn / Winter and we are grateful for the support of Rainbird who are supplying the irrigation equipment. Monitoring will commence next irrigation season.

Poa Annua selections at Burnley College

BENTGRASS VARIETY TRIAL

In the last issue of ATM the results of bentgrass trials were provided. There has been a query related to the green speed measurement and the following clarifications are provided.

The cutting height is 3mm and the trial is cut 5 days per week. This cutting height is considered to be appropriate and typical for normal play at most golf courses.

After inspecting greens established to the new bentgrass (eg. Penn – A and G series) and discussions with the USGA agronomists and USA Superintendents, indications are that the cutting heights are being kept at 3-3.5mm. While some of the new bentgrass can be maintained at lower cutting heights, giving higher green speeds without necessarily stressing the turf, most Superintendents prefer to maintain the turf at about 3mm to as to improve the stress tolerance.

Green speed is a selection criteria for choosing a new cultivar, however, often factors such as turf density, disease resistance and heat tolerance are equally as important (if not more so). Information from USA Superintendents indicates that the key selection criteria for the new bents have been tolerance to high humidity, high turf density and resistance to Poa invasion.

Selecting any new cultivar requires a lot of homework, reviewing data from local and overseas trials and assessing 2-3 of the better types on your golf course under your conditions of climate and maintenance.

GROUND MOVING TECHNOLOGY

The First Mobile Turf Crossing for Racing

The presence of road crossings on many racecourses in the UK is recognised as one of the major factors affecting the quality of the racing surface

STRI working with Consulting Engineers, Sinclair Knights Merz (formerly Modus SKM) and a Sheffield Engineering company, Street CraneXpress (SCX) have successfully developed, tested and installed the world's first Mobile Turf Crossing on behalf of the Ascot Authority as the first step to improve the track.

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The presence of road crossings on many racecourses in the UK is recognised as one of the major factors affecting the quality of the racing surface. These crossings provide access for vehicles and pedestrians and are covered with a range of synthetic materials for racing in an effort to create a safe surface compatible with the adjacent turf. Inevitably there is some variation in the surface and even the different appearance and colour can cause horses to adjust their stride with implications for safety and possibly the race results.

Acknowledging this, Ascot commissioned STRI to investigate systems which would overcome these problems. It was quickly established that natural turf was essential to produce a surface which was compatible in appearance and performance. The next step was to develop a moveable turf system capable of meeting all of the stringent requirements for horse racing. The system had to provide the structural rigidity and safe jointing with the adjacent track necessary to withstand galloping horses. In addition accuracy, reliability and speed of operation were critical to the development of the mechanical and control systems by SCX.

After rigorous testing, a prototype of the revolutionary system was installed on the Newmarket gallops for a series of trials. Horses galloped over the turf tray without detecting it and the turf itself successfully withstood the impact of the horses' hooves. More importantly, the trials demonstrated that tightly fitting joints in the turf could be achieved quickly to such an extent that they were barely visible even at close range. The speed of operation and effectiveness of the jointing

converted many sceptics to the potential of a moveable turf crossing. The Ascot Authority was sufficiently confident to commission the construction of a full size tray to replace the existing Kennel Gate crossing. This was built in two stages for National Hunt and Flat racing. At times, working in very difficult weather conditions, the civil engineering contractors, E. P. Keogh, prepared the base construction and Steven Pask (Sportsground Contractors) formed the turf profile and reinstated the surrounding track.

The moveable turf crossing is now fully commissioned and the first flat racing took place over the new system at the 2001 Royal Meeting. The system allows a complete section of the racetrack, measuring 54 x 4.5 metres and weighing 200 tonnes, to be moved to reveal the road beneath, enabling traffic to pass without damaging the turf. When the section is replaced it fits precisely into position so that the joints are almost invisible with no adverse effect on galloping racehorses. Moving smoothly on rails the turf tray can be moved into place in just 15 minutes after minimal preparation allowing easy access for car parking before and after the race meeting. Having constructed a system to work effectively in such an exacting situation, SCX are confident that the technology used at Ascot could be applied successfully to other sports such as football, cricket or athletic stadiums.

"The poor growing environment in many modern stadia severely restricts the quality and durability of the turf playing surface and this system offers tremendous opportunities", confirms Rob Everett, STRI's Head of Sportsturf Construction.

The system allows a complete section of the racetrack to be moved to reveal the road beneath, enabling traffic to pass without damaging turf.

"By developing an effective system for moving the pitch out of the shaded stadium this problem can be overcome and the turf quality and consistency can be vastly improved", comments SCX's Technical Sales Director, Andy Whitworth.

Managing Director of SCX, Simon Eastwood adds;

"The concept of moving a pitch completely underneath the stadium and into the car park is not impossible. This would create a multipurpose arena and increase capacity for concerts and other spectator events without impinging on pitch quality. The payback from investing in this type of technology could be vast."

Research is now underway to find new applications for this ground moving technology. Ascot, meanwhile, confident of its future marketability, has invested heavily to secure the patent rights to the system.

Rob Everett is head of Sports Facility Construction
This article first appeared in the October edition of International Turfgrass Bulletin (STRI) and was reproduced with their kind permission.

Ascot Racecourse. Horses racing towards the mobile turf crossing at Kennel Gate. Firmly in place, the moveable turf crossing forms a seamless match with the racecourse.

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What A Class Act!

One Day International, Australia v's South Africa, Feb 3rd 2002.

Long considered the epicenter of Western Australian sporting culture and located just minutes from the heart of Perths CBD, development of the WACA ground began in 1892 and was opened the next year by the then Mayor, Alexander Forrest.

Most of the grounds infrastructure was in place by then but the playing surface itself was still developing. The ground was in play by the summer of 1894 but in these formative years, an inferior wicket soil and poor drainage of the ground produced wickets that were slow and unpredictable and took a deal of spin!

Anyone who knows the WACA or for that matter cricket, would understand that conditions out in the middle are much different today but it wasn't until the introduction of wicket soil from the Harvey River region (south of Perth) in 1923 that the ground began to develop legendary bounce and pace and started to churn out a succession of skilled 'back-foot' players and temperamental fast bowlers.

Including the likes of Claughton, Abbott (Roy), Maley, Long and Crane, a list of now legendary wicket curators soar the ground right through until the middle of the 1980's when, one hundred years after its opening, the ground underwent a complete redevelopment.

The existing turf surface was removed and replaced by a sophisticated perched-water system incorporating extensive drainage, an efficient watering system and sand layer of consistent depth. To ensure that the finished surface was above the 100-year flood level of the Swan River, the finished surface was raised 300mm above its original height.

In the May of 1998 I took over from David Crane who was a fastidious wicket maker, a patient educator and a wonderful motivator of staff. Since that time, myself and my staff of six have been committed and focused on maintaining truly world-class wickets and top quality turf surfaces that have been used for cricket, soccer, baseball, AFL and rugby.

In addition to the 2 hectares of playing surfaces that includes a 10-strip wicket table, a 2000m² practice facility and another hectare of grass banks and garden beds, we also prepare and maintain the center and practice wickets at a suburban ground that is used for 3rd and 4th grade fixtures.

My management philosophy is one of 'getting back to basics' and this is evidenced in our efforts and ambition to reintroduce the original native couchgrass that the great Roy Abbott fashioned into the memorable tracks of the 1970's.

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Our goal each year is to not only provide excellent conditions for our international commitments (2 x One Day Internationals and one Test Match), but to also provide a consistent environment and base from where the Western Warriors can launch their assault on the domestic competition. Their performance has a huge bearing on the success of the whole organization so all of our endeavors are geared towards providing a stage to allow the team to perform at the highest level.

The WACA pitch is renowned for its exceptional pace and bounce. This is due mainly to the physical and chemical characteristics of the soil used. The clay content of the soil is up around 80% and it is a montmorilinite clay, renowned for its ability to drain when saturated and to set very hard when prepared as a cricket wicket. These characteristics, along with Perth's hot, dry climate and grass type allows the pitch to bake hard, which promotes bounce and produces an excellent shine, which creates pace. The downside to this is that under extremely hot conditions, cracking can become quite prominent, resulting in uneven and erratic bounce that can be quite dangerous. The key ingredient to controlling this risk is to maintain a vigorous turf root system and to monitor soil moisture very closely.

The soil used at the WACA is the same as that used by all turf wickets in WA and the WACA actually serves as the sole supplier. This has been a service that the WACA has provided to the cricket community for as long as anyone can remember and goes a long way to ensuring that all cricketers, juniors in particular, are able to play under the best conditions possible. It is an excellent service that has many benefits but the cost of sourcing sites with adequate and suitable deposits, negotiating contracts with land owners, liasing with earthmoving contractors, excavation, bagging, delivering, taking orders and processing payment is certainly not insignificant. It has been ten years since the original site ran dry and securing a long-term site to fulfill our needs for the coming decades remains our goal in this area.

April 2002 will see the commencement of a $12 million facelift for the WACA. The emphasis will be to create a comfortable family environment with improved viewing, dining and atmosphere for all patrons to the ground including public, members and corporate guests.

The playing surface will take on a new shape with the east and west ends coming in approx 15m to get spectators closer to the action. A new concourse will surround the ground at an increased pitch that should provide for better viewing and access around the ground. New shade covered grass banks at the east and west ends of the ground will be reintroduced to help generate a comfortable picnic atmosphere and there will be a new players pavilion built on the northeast side of the ground. This pavilion will feature improved facilities for viewing, dining, meeting and will also include conference rooms and drug testing facilities.

The Farley Stand was pulled down as stage one of a $12 million facelift.

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* Depending on tyre configuration.

The WACA Turf Team (Richard Winter in Front)

Approximately $4 million will be spent on the existing Bank West Lillee Marsh Stand and the Prindiville Stand on the southern and northern side of the ground respectively. The corporate facilities will be upgraded and the members will be relocated there. The old Farley and Players Stands have been demolished (see picture) and will make way for a flexible open space that may be utilized for functions, expo's or for corporate entertaining, and will be ideally suited for marquees or temporary structures. This area is 2000m² and will require some reinforcing in the profile to handle the possibility of trucks and forklifts traversing it regularly.

Overall, the estimated amount of new, turfed areas will be over 5000m², a trend reversed by most stadiums these days?

Issues relating to some of these areas will be shade and traffic (foot and vehicle) and this will obviously have a large bearing on the turf variety selected. At this stage in our planning, *Plateau* couchgrass is the preferred variety as it has a demonstrated history of performing well under shade and is now available in Perth. Its prostrate growing habit is appealing from a maintenance aspect and will be welcomed by some of my staff who trudge behind a mower weekly on the existing banks. Presently, all maintenance equipment has to be forked into areas such as the grassed banks so improved access to these areas will be a high priority in the new design. A heavy emphasis is also placed on softening the look of the venue with increased garden and landscaped areas.

Project completion date is for the end of October, which will be just in time for our Ashes Test in November. However, with time already getting away from us it is unlikely that all the work will have been completed.

During April we also plan to replace 4 wickets on our table. This will involve removing the original soil to a depth of 200mm then re-leveling the subbase. A fresh 200mm layer of wicket soil will be introduced and will create a fantastic growing medium for the 'Original' WACA couch which has been tested on 2 wickets this season with great results. This couch was part of Roy Abbotts successful formula from 20 years ago and there is no doubt it performs better than any other couch I have seen in this soil. The ability for it to produce a good shine is remarkable and its recovery is outstanding. This native variety of couch is now grown commercially under an agreement with Turf Farms WA and is available for all to use.

High on the WACA's priority list for the future needs of the WACA ground is the appointment of a permanent winter tennant. One thing for certain is that we are concentrating our efforts on creating one of Australia's best venues designed solely for playing and watching cricket without losing the possibility of hosting other sports. The WACA is committed to this purpose and with the pending redevelopment due for completion later this year it will be achieved.

Richard Winter is the Curator at the WACA ground. Photogarphy courtesy of the WACA.

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TAJ 70202

research

Remote Sensing of Brown Patch and Dollar Spot on Creeping Bentgrass and Annual Bluegrass Turf Using Visible and Near-Infrared Spectroscopy

Scanning Monochrometer

ABSTRACT

Brown patch (*Rhizoctonia solani Kuehn*) and dollar spot (*Sclerotinia homoeocarpa Bennett*) diseases are common to cool season turfgrass, especially on golf courses. As governmental and public scrutiny of golf course maintenance practices increases, superintendents must balance playability with fewer fungicide inputs.

The objective of this study was to determine if an association exists between canopy reflectance using visible and near infrared spectroscopy and brown patch and dollar spot severity on creeping bentgrass (*Agrostis stolonifera L.*) and annual bluegrass (*Poa annua var. reptans Hausskn*) turf.

Spectral reflectance from the turf canopy was acquired with a NIRSystems (Silver Spring, MD) Model 6500 Online scanning monochromator. Spectral data weree obtained every 2 nm from 400 to 2100 nm and expressed in microabsorbance units as the log (1/reflectance). Categorical disease symptom severity ratings of brown patch and dollar spot were taken in association with reflectance measurements. Discriminant analysis of the data yielded classification accuracy.

In the dollar spot study, 20 out of 193 samples (10.3%) were classified incorrectly and, in the brown patch study, only 29 out of a total of 337 samples (8.6%) were classified incorrectly. First derivative spectra indicated that the greatest spectral differences between categories existed at 700, 1400, and 1930 nm. These wavelengths correspond to the visible red, the O-H functional group, and the N-H functional group regions of absorption, respectively.

These results suggest the possibility of developing a visible/near-infrared sensor for the detection of disease severity as part of a site specific turfgrass management program. Future research should address investigation of how various stresses interact to affect the spectral reflectance of turfgrass.

INTRODUCTION

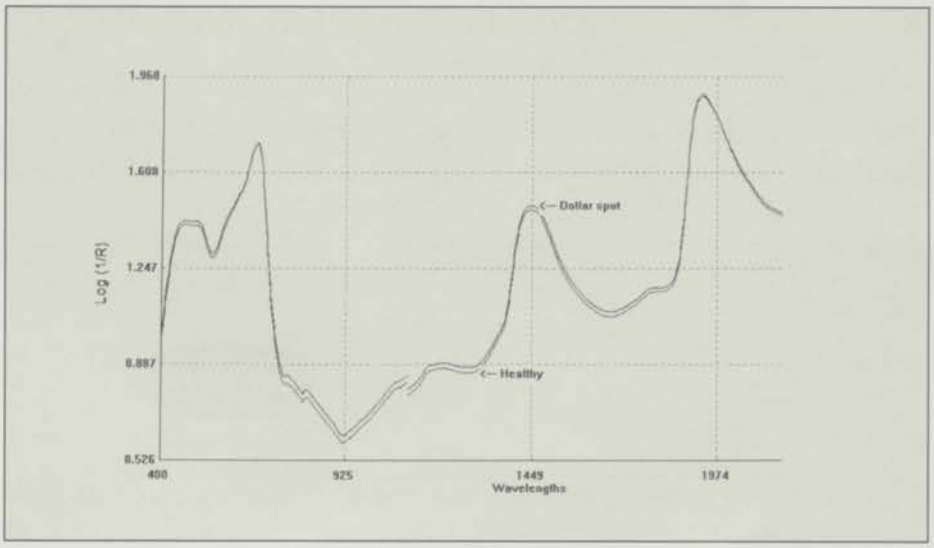
Increasing governmental regulation of pesticides and growing public scrutiny of golf course management practices are leading to the development of improved methods to decrease chemical inputs on golf courses. As golf courses continue to fill the role of urban green areas and are the subject of increasing public and governmental scrutiny, a premium is placed upon superintendents to balance environmental impact and playability. Although modern chemistry has led to advances in fungicide efficacy with lower active ingredient rates, typical management practices involve widespread "blanket" applications of fungicides during periods conducive to disease development. Site specific application of fungicides has the potential to save money, provide an efficient means for effective disease control, and reduce the amount of fungicide applied. Since disease incitants are dynamic and can infect plants quickly in an environment optimized for pathogen infection, a sensor capable of attaining a rapid, real-time assessment of disease status is necessary for incorporation into a site specific management program.

Typically, stress can reduce photosynthetic capability and causes an increase in reflectance in the red and blue portions of the spectrum and decreased reflectance in the near infrared (NIR) region due to deterioration of leaf tissue (Nilsson, 1995) and leaf structural changes (Raikes and Burpee, 1998). Several methods of assessing plant reflectance properties have been evaluated including infrared thermography (Nilsson, 1995), multispectral radiometry (Green et al., 1998; Trenholm et al., 1999), and near infrared spectroscopy (Shenk and Westerhaus, 1993). Indices such as the Leaf Area Index (LAI) (IR reflectance/Red reflectance) and Normalized Difference Vegetative Index (NDVI) [(IR-R)/(IR+R)] have been correlated with the presence of green biomass and provide a quantitative estimate of general stress on a plant; however, it is often difficult to determine the exact nature of the stress (Nilsson, 1995).

Table 1.
Qualitative category prediction accuracy using discriminate analysis to predict each dollar spot sample as an "unknown"

	PREDICTED CATEGORY				
Actual Category	Front	Diseased	Healthy	# Samples	% Error
Diseased Front	56	6	6	68	17.6
Diseased	5	58	1	64	9.3
Healthy	2	0	59	61	3.3
Totals	63	64	66	193	
Misses for Category	7	6	7		

Figure 1.
Average reflected spectra from all dollar spot"diseased" and "healthy" category samples from similar swards. Wavelengths are presented in nanometers; Log 1/R numbers are presented in microabsorbance units.



Infrared aerial photographs have been used with moderate success to remotely sense sugar cane rust fungus (*Puccinia kuehnii* Kuehn) (Karteris et al.,1980); sugarbeet blackroot disease (*Rhizoctonia solani* Kuehn) (Schneider and Safir, 1975); and southern corn leaf blight (*Helminthosporium maydis* L.) (Safir et al., 1972). Contrary to others, Safir et al. (1972) found that visible reflectance changes preceded infrared reflectance changes.

The objective of this study was to determine if an association exists between canopy reflectance using visible and near infrared spectroscopy and brown patch (*Rhizoctonia solani* Kuehn) and dollar spot (*Sclerotinia homoeocarpa* Bennett) severity on creeping bentgrass (*Agrostis stolonifera* L.) and annual bluegrass (*Poa annua* var. *reptans* Hausskn) turf.

MATERIALS AND METHODS

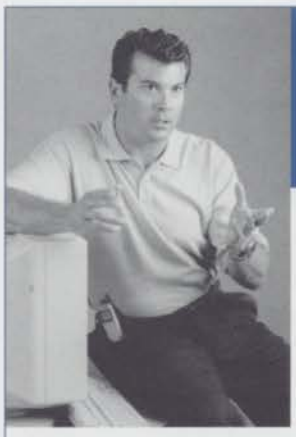
Two experiments were conducted at the Michigan State University Hancock Turfgrass Research Center (E. Lansing, MI). The first experiment was conducted to assess dollar spot on swards consisting of mature annual bluegrass grown on an Owosso sandy loam [fine-loamy, mixed, mesic Typic Hapludalfs], 'Providence' creeping bentgrass grown on an Owosso sandy loam, and 'Penncross' creeping bentgrass grown on a 90:10 (v/v) sand:peat mix that conformed to United States Golf Association (USGA) recommendations (Moore, 1993). The former two swards were maintained as fairways and mowed at 14 mm and the latter maintained as a putting green and mowed at 5 mm. Spectrometer readings were obtained from 16-19 June 1999 from portions of the sward naturally infested with dollar spot. Spectra measurements were categorized qualitatively by visual assessment as exhibiting disease symptoms ("diseased"), close in proximity to the disease but visually healthy ("disease front"), and visually healthy within the same sward, but not close in proximity to disease symptoms ("healthy").

The second experiment was conducted to assess brown patch on a mature sward of 'Penncross' creeping bentgrass grown on a USGA 90:10 (v/v) sand:peat mix maintained as a putting green and mowed at a height of 5 mm. Spectrometer readings were conducted during 2-9 Sept. 1999 from areas within a separate curative fungicide screening study. Spectra measurements were qualitatively categorized by visual assessment according to disease severity as "severe", "moderate", and "light." Qualitative categorization of the spectral data in both experiments attempted to characterize and distinguish different levels of disease severity based upon the symptoms present.

Spectrometer Measurements

Spectral reflectance from the turf canopy was acquired with a NIRSystems (Silver Spring, MD) Model 6500 Online scanning monochromator. Spectral data were obtained every 2 nm from 400 to 2100 nm and expressed in absorbance units as the log (1/reflectance).

The spectrometer was adapted for field use by mounting onto the rear of a garden tractor. The acquired spectral signal was sent to the spectrometer via a fiber-optic cable that was connected to a 30-cm by 15-cm metal box mounted onto four 15-cm diameter wheels. The box was kept stationary and suspended approximately 13 cm above the surface of the turf canopy and collected radiation from a 3.5-cm by 12-cm area. The box was designed to minimize



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	PREDICTED CATEGORY						
Actual Category	Healthy	Light disease	Medium disease	Severe disease	# Samples	% of All Samples	% Error
Healthy	68	0	0	0	68	20.2	0.0
Light disease	0	42	19	1	62	18.5	32.2
Moderate disease	0	28	73	14	115	34.2	36.5
Severe disease	1	3	21	67	92	33.3	27.2
Totals	68	73	113	82	337		
Misses for Category	1	31	40	15			

Table 2.
Qualitative category prediction accuracy using four categories in discriminate analysis to predict each brown patch sample as "unknown."

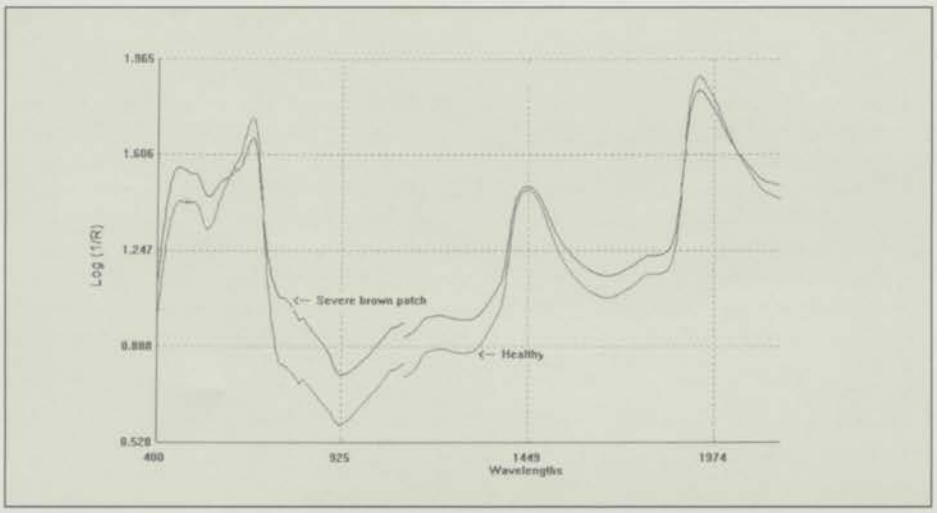

Figure 2.
Average reflected spectra from all brown patch "severe" and "healthy" category samples grown on similar soil and containing the same turfgrass cultivar. Wavelengths are presented in nanometers; Log I/R numbers are presented in microabsorbance units.

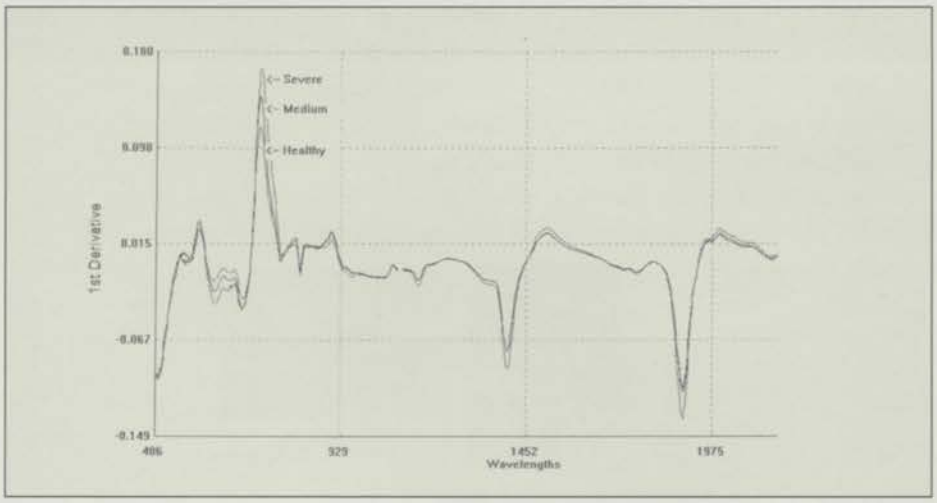

Figure 3.
Average reflected derivatized spectra from all brown patch "severe", "medium" and "healthy" category samples, respectively. Wavelengths are presented in nanometers; first derivative numbers are derived from Log I/R measurements and are presented in microabsorbance units.

the effects of incident solar radiation by shading the area where reflectance measurements were taken. Furthermore, direct light was provided from the box to the measured area using a tungsten-halogen bulb.

Measurements were taken from different locations within each plot during each sampling time and obtained between the hours of 0730 and 1830 h when disease symptoms were present.

Diagnostic tests were conducted prior to sample readings to insure instrument repeatability and photometric accuracy. A Coors ceramic reference plate, which is 80% reflective, was scanned once as a reference and again as a sample to measure repeatability. A noise test was conducted by obtaining 32 scans of the reference and 32 more scans using the reference as a sample. The repeatability noise was plotted as the difference between those two sets. The root mean square (RMS) of noise errors across the entire spectra was used to gauge repeatability. The RMS values were deemed acceptable at a level of 160 microabsorbance units or less when corrected for instrument bias. Accuracy tests were conducted with a tolerance range of ± 0.02 nm using a polystyrene standard with known peaks at 1143, 1681 nm (Foss NIRSystems, 1993).

In order to maintain accuracy and repeatability with the instrument over time, the ceramic plate was scanned as a reference before each sample. The spectrum for the scan was then subtracted from that of the reference. In this regard, the NIRS Online 6500 performs similarly to a double beam spectrometer in which a reference and sample spectrum are obtained simultaneously and the differences plotted on the output.

Data Analysis

Data were analyzed by multivariate discriminant analysis as described by Morrison (1990) using software provided by Infrasoft International (Port Matilda, PA). The three qualitative dollar spot categories were discriminated in the first analysis. For the brown patch experiment, the three qualitative categories from the experiment and a set of spectra obtained from a reference library of healthy 'Penncross' bentgrass grown on a 90:10 sand:peat medium (four categories) were used in the discriminant analysis.

The variables used for classification assumed that each population was characterized by a multivariate normal distribution and had a common correlation variate. Following these calculations, cross validation was conducted so that the entire group of spectra was divided into eight subsets. Each subset was in turn used alone to create a prediction equation. These equations were subsequently used to predict the remaining spectra as unknowns and classified spectra categorically. This procedure continued until all subsets were used to create a prediction model and all samples from other subsets had been predicted. Analysis was conducted using the default settings for the DISCRIMINATE program of the Infrasoft Software using wavelengths within the scanning range from 400-1000 nm and 1100-2100 nm at 4 nm increments and a math treatment of 1,4,4,1 (derivative, gap, smoothing factor 1,

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Table 3.
Qualitative category prediction accuracy combining "light" and "moderate" categories and using three categories in the discriminate analysis to predict each brown patch sample as an "unknown."

	PREDICTED CATEGORY					
Actual Category	Healthy	Medium disease	Severe disease	# Samples	% of All Samples	% Error
Healthy	68	0	0	68	20.2	0.0
Moderate disease	0	175	17	192	57.1	8.8
Severe disease	1	11	65	77	22.9	15.6
Totals	69	186	82	337		
Misses for Category	1	11	17			

smoothing factor 2) without scatter correction (Shenk and Westerhaus, 1993). Because of instrument noise associated with the instrument range from 1000-1100 nm these portions were not used in the analysis. Eight cross validation groups were used in creating the prediction equation. A 10% error rate for prediction of the samples was deemed acceptable in the results evaluation.

RESULTS AND DISCUSSION

Dollar spot experiment

Table 1 presents the number of samples contained in and predicted for each category when each sample was predicted as an "unknown." Comparisons of the underivatized spectra are presented in Fig. 1. In the dollar spot study, 20 out of 193 samples (10.3%) were classified incorrectly (Table 1).

Attempting to identify the spectra obtained from the "disease front" resulted in the highest percentage of misclassified samples.

One limitation of the instrument used in this study was the relative small area of dollar spot lesions; thus a single scan may have contained both healthy turf and afflicted plant tissue, resulting in misclassification. This discrimination suggests the possibility of using information from the VIS-NIR portion of the electromagnetic spectrum to develop a sensor designed to apply variable rates of fungicide preventatively or curatively for dollar spot.

Brown Patch Experiment

Comparison spectra for the underivatized and derivatized data are presented in Figs. 2 and 3, respectively. Table 2 presents the number of samples actually contained in each category, the number of samples predicted for each category when each sample was predicted as an "unknown," and the percent of samples in a particular category in relation to all samples. Using four categories, 87 of a total 337 samples (25.8%) were misclassified (Table 2). Misclassification was most prevalent as "severe" spectra were misidentified as "moderate," and "moderate" spectra mistaken for "light." In an effort to improve prediction accuracy at the expense of reduced prediction precision, the "light" and "moderate" categories were combined to form a "medium" category and the data analyzed using three categories for discrimination. Prediction accuracy improved greatly as there were only 29 misses out of a total of 337 samples (8.6%) (Table 3).
It is unclear whether subjectivity of qualitative severity ratings results in a subsequent broad overlap of populations classified as "light" and "moderate". For practical applications, the three categories of "healthy", "medium", and "severe" may prove sufficient for effective specific applications and subsequent savings in fungicide use.

CONCLUSIONS

These results indicate that VIS-NIRS is a viable method for assessing brown patch and dollar spot severity. According to the data presented, the spectrometer can qualitatively categorize disease severity with a suitable degree of accuracy. Unlike previous experiments involving the association of turfgrass disease severity with reflectance at discrete spectral wavelengths, the discriminant analysis described above used continuous portions of the visible and near infrared spectrum for analysis. Previous research indicates that reflectance values measured at 660-, 710-, 760-, and 810-nm and subsequent mathematical combinations of these provide for the best correlation between spectral data and disease severity ratings on brown patch and gray leaf spot (Raikes and Burpee, 1998; Green et al., 1998). The underivatized data (Fig. 2) illustrate spectral differences at these wavelengths and throughout the NIR portion of the spectrum, notably at 1448-nm and 1932-nm.

First derivative results (Fig. 3) illustrate the greatest differences between categories at 700-, 1400-, and 1930-nm. These wavelengths represent the red visible, the O-H functional group, the N-H functional group regions of absorption, respectively (Hatchell, 1999). Because of the various physiological effects produced by pathogens as they degrade leaf tissue, it is difficult to focus on one particular portion of the spectrum for differences in reflectance.

For practical integration into a site-specific management regime, threshold levels of disease need to be developed for proper fungicide treatment. Moreover, one of the caveats of this technology is the limited amount of data that has been collected. Studies such as these have been conducted on one anomaly of interest and experimental procedures seek to exclude other extraneous factors that could affect the reflectance pattern of the turfgrass. However, any interaction effect of multiple anomalies (i.e. water stress, disease, insect damage, chlorosis, etc.) on plant reflectance patterns and subsequent interpretation is relatively unexplored. To further assess the feasibility of VIS-NIRS technology in site-specific management, experiments need to be conducted exploring interactions among various anomalies.

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ABBREVIATIONS:

NIR, Near Infrared; LAI, Leaf Area Index; NDVI, Normalized Difference Vegetation Index; USGA, United States Golf Association; RMS, Root Mean Square; VIS-NIR, Visible-Near Infrared.

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GENTLEMEN START YOUR MOWERS

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Its huge in the States (what isn't), but now ride-on mower racing has its own national association and a dedicated bands of grass racers all over Australia.

Mark Ricketts, Vice President of the A.R.O.L.M.R.A., says that ride-on mower racing originated in Queensland and New South Wales but seems to have found a home in Victoria where Mark is holding the Australian Titles on the 4th and 5th of May 2002 at the Geelong Motor Sports Complex, situated on the the Princess Freeway at Avalon.

There are four categories of ride-on mower racing in Australia;

- Standard: just your basic ride-on mower that you pull out of the shed and go racing.
- Modified class: Altered chassis and a 'tweaked' motor.
- Super modified A: Fully modified chassis with a motorcycle engine, 200cc to 400cc.
- Super modified B: As above, with a motorcycle engine 80cc to 200cc.

Mr. Ricketts said the mowers could reach up to 80km/h, but racing speeds were usually 60km/h. Grass tracks are preferred but the cutting blades are usually removed.

If you have something in the shed that might be competitive and you want to get involved, contact:

Mark Ricketts at westcoast Mowers on (03) 5248 6810.

BURRIED LIE

Jarrod Boyce displaying the handy haul

You generally only find one flag in a golf hole these days but Jarrod Boyce, Assistant Superintendent at Lake Karrinyup Country Club managed to uncover no less that 91 golf flags and poles whilst reshaping a fairway bunker on the ninth hole in preparation for the $2 million Johnnie Walker Classic.

Jarrod said, "I saw a bit of cloth sticking through the sand and thought I had better take a look, next thing you know I am knee deep in flag sticks"

This twisted tale began on Boxing Day last year when 18 flags were taken from the Championship Course and all 9 flags were ripped out of the short nine but when they were cleaned out in February and again in early June it was clear that this was no school boy prank and the Clubs patience was flagging.

Clearly this was the work of a serial stick stealer but it would seem that his conscience got the better of him.

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LETTER TO THE EDITOR - SCOTT, ON THE ROAD TO RECOVERY

ATM readers my recall that Scott Carruthers, winner of the 2001 AGCSA Graduate of the Year Award was involved in a serious car accident only weeks after receiving the award. The following letter is from Scott's father and highlights the inner strength of our industry.

The Editor,

On behalf of my family, myself and especially my son Scott, I sincerely thank you, Euan, directors and the staff and members of the AGCSA for the most genuine support and good wishes that were extended to us ensuing Scott's accident. Your furtherance was one of the instrumental factors that enabled my family to maintain strength and unity during the critical period immediately after Scott's hospitalisation.

I am elated to inform you that Scott has made an outstanding recovery from the horrific injuries he suffered in the accident and is now at home with his family after being discharged from hospital on the 30th of November 2001.

At this point in time, Scott has a little way to go before he can put this interruption to his life behind him. Fortunately, he has retained the determination and stubbornness that was paramount in his achieving all of the goals that he had set out for himself prior to the accident. It will be these characteristics that will lead him to overcome these minor problems and resume his career.

Scott has received wonderful support from all his family, friends, rehabilitation therapists and doctors and they have all been exited by the speed of his recovery. We are optimistically looking at March 2002 as the month for his return to the career that he is so passionate about and to reaffirm the camaraderie of his very good workmates and employers at Pennant Hills Golf Club.

I would like to thank Richard Kirkby, Superintendent of Pennant Hills Golf Club, his assistant Paul Gumbleton and the committee and management of the club for the incredible compassion that they extended to my son during his convalescence.
Their support has been a principal component of Scott's rapid recovery. An extension of that support was made available to my family at a time when it was most needed and for that I will be forever grateful.

My family has received so much moral support since Scott's accident from so many people in the golf course industry that it would take an eternity to write to every person individually and with my memory, I would probably inadvertently forget someone. So to all of my peers in the golf course industry, executive of the NSWGCSA and the many fine people from the trades supplying out industry, I also say thank you all for the thoughts extended to Scott and my family immediately following Scott's accident.

I have been an outspoken supporter of the golf course industry since 1975 when I was first appointed as a Golf Course Superintendent and I have since then extolled the virtues of this industry to young people seeking a career in golf course maintenance.

It was only after Scott's accident that I reflected on some of the attributes that create a definity between the golf course maintenance industry and the many other industries that I have been involved in during my working life.

The prominent difference is a genuine benevolence and support amongst associates of the AGCSA that is neither politically nor financially driven. The benevolence is not only afforded to close neighbours, state or regional affiliates, but indeed to any member from any part of this great nation and indeed offered to peers from other nations whenever they require assistance or support.

I consider my son and myself fortunate to be part of this great industry and am honoured to have as my associates the diversity of characters that are the foundations of the AGCSA.

The practitioners in this field that are equal of nay worldwide. The academically brilliant who are consistently improving our knowledge through research and education. TAFE teachers who struggle with bureaucracy and ridiculous budgets yet still manage to produce results.

Representatives from various trade suppliers that continually support our industry and finally the characters in our industry whose humour and gregarious behaviour epitomises the Australian larrikinism that most of us are quietly proud of.

Again I sincerely thank the people of this industry for their support and thoughts that were offered to my family and myself and their magnanimity will never be forgotten.

I would also like to thank Phil George for his generosity in publishing this letter in the Australian Turfgrass Management magazine.

Yours sincerely,

Bruce Carruthers
General Manager
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In this context the GT package eliminates the risk of over watering which in turn means that you can be instrumental in helping to cut running costs, reducing your club's water and electricity bills. Used in conjunction with a weather station, the GT update package will take your water management skills onto an even higher level of precision control, even when you are 'off-site' for a day, a weekend or overseas on holiday.

In terms of installation, this new Toro GT control system contains another bonus, its compatibility with most existing systems does away with the need for time consuming, expensive recabling.

For further information contact Paul Willmott on 0417 985 260. See page 27 from Vol 3.6.

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The Sandbelt - Melbourne's Golfing Heaven

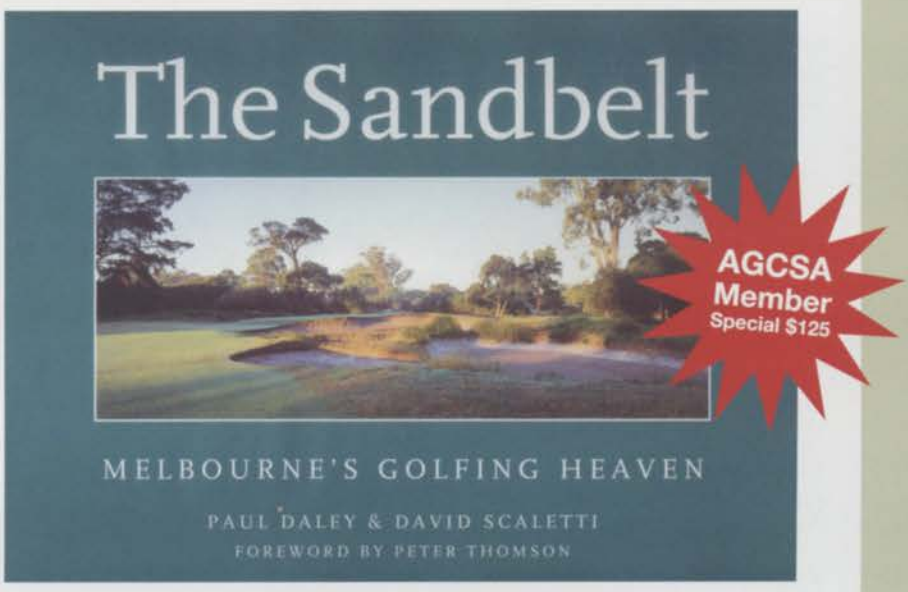
by Paul Daley & David Scaletti

Review by Peter Schumacher, GCS
Elanora Country Club

The Sandbelt is a beautifully presented book that is a must for any serious golf library on Australian golf course history. It tells a story through pictures in a deeper more mystical way than any words could ever hope to do. That's not to say that the editorial quality is low, in fact the opposite is true.

However, the book does jump from one course to another with almost every turn of the page and relentless changes in topic make it difficult to read in one go. There is no real story just short sharp commentary on different aspects of the sandbelt courses and some history about their arrival and development in the area.

Some notable golfing identities and golf club employees provide their take on why the courses of the Melbourne sandbelt have flourished (which I not only found to be entertaining but also educational) and there is the usual (unfortunate) chapter on what holes from what courses are considered the best in the eyes of one person.



The Sandbelt is the ultimate in coffee table books for the person interested in golf and the history of these unique courses and it leaves the reader questioning just which courses are truly on the Melbourne sandbelt and what exactly is this sandbelt

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FNQGCSA

After one of the driest tropical summers on record, some much-needed rain has fallen during March. With sweltering temperatures and high humidity since late October the far north has not been a pleasant place to work outdoors. No cyclone so far is probably the only good news in this sauna like atmosphere. Hopefully the rest of March and possibly April will produce some much needed heavy rain to rejuvenate the rain forests and water supplies.

The dry conditions however have meant for good numbers on the golf courses and tourism in general for the struggling north.

The heat and humidity has taken its toll with summer decline, ERI Fungi and Pythium all being reported around the north, though not to the extremes of previous years.

Our annual general meeting has yet to be organised, hopefully we can hold it in May to elect a new committee and move on into 2002.

Paul Earnshaw
President, FNQGCSA

GCSAQ

The weather is once again the big talking point with a prolonged drought over the State being broken in some areas with good falls and other areas still seriously deficient in the rainfall department. The figures for Gainsborough Greens show we have had 57% of the annual expected rainfall since this time last year. For the last 3 months we have received 25% of what would fall in an average year and for February we have had 30mm compared to an average of 175mm for this month. Obviously we are hoping for some decent rain before we go into the dry season.

Eric Rickman from Mackay Golf Club was in a similar situation until they decided to stolonise some areas of the course, they prepared the ground, ripped out the stolons and got 6 inches of rain in 6 hours to turn things around. David Scutts, having left Coffs Harbour Golf Club for Bonville International, spent the first two weeks in his new position trying to figure out where to get some water before the area got 12 inches of rain and went underwater to solve their drought problem. Meanwhile, patchy rain has continued to elude some areas.

Other Superintendents on the move are Peter Newman who is leaving Gailes Golf Club to return to Windaroo and replace Sid Podesta. Stuart Poole has been appointed to the position of Superintendent at Gailes after some years with Country Club International and David Golf. Frank Paul has left Royal Pines after many years of loyal service to go to Capricorn International Resort; Neil Gardener has left Capricorn to take on the North Lakes job. Drew Linkins is now at Wantirna Golf Club after Aspley Pin High closed its doors, Barry Harkin has returned from retirement to become the State Manager of Controlled Sprinkler Supplies (CSS) who have now moved from Southport to Wacol to give Barry a bit more time on the road. Peter Smith has been selected for the job of Coffs Harbour Superintendent from a large field of applicants keen to move to that beautiful part of NSW. Hyait Coolum and Twin Waters are now both recovering after successfully surviving the CHOGM in March, congratulations on not getting blown up!

Code of Practice for noise is due for it's next round of alterations an March after some further input from the EPA and the Ministers Department. Hopefully some conclusions will result from this next meeting. The AGCSA has commissioned some research into the history of the state associations; Doug Robinson or I will be contacting members who may be able to help with some information.

The February field day at the Fire Ant Research Station and at Brookewater Golf Club was a great success with a very good turn out of members interested in both topics. It was good to see George Roy back on his feet after some time on the sick list and Les Austin up and about and still as enthusiastic as ever. The fire ants seemed to get everyone's attention and they are certainly something you don't want in your backyard.

Our March workshop sessions were held at three venues, Horton Park on the Sunshine Coast, Royal Queensland and Graften Golf Club. The topic was Workplace Health and Safety for your Maintenance Facility and involved a tour of the compound and facilities at each of the clubs with a representative of the division of WH&S on hand to answer questions and clear up some of the grey areas that exist in the regulations.

Plenty of interest was shown and the sessions were very enlightening. It does seem difficult to get some managers and directors to understand that the responsibility for WH&S runs right up the management tree, the Queensland Branch of the Secretary Managers Association is taking a pro – active approach to the situation by putting together a workplace Health and safety Manual with the intention of making the implementation of a WH&S policy for each club much simpler to achieve. They are to be commended on their efforts as, with some collaboration, we should all end up with a template to guide our way through the process.

With all this cutting edge activity taking place up here it's hard to write a short news report, until next time pray for rain.

Martyn Black for Governor General!

Jon Penberthy
President GCSAQ

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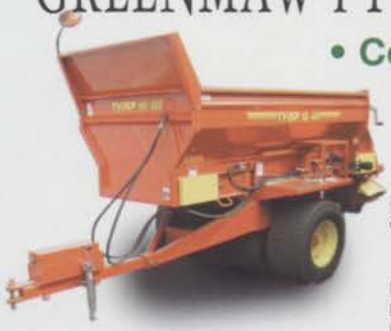

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GCSAWA

Many other superintendents in the west are glad to see those cooler spring mornings and the gradual reduction in irrigation. We have been very lucky here in the west though with one of the mildest summers ever recorded. If it had been any warmer I doubt whether my golf course and a few other would have got through the summer.

Many guys are busy preparing their courses and tidying up for opening days and the start of the golf season.

The 2002 John Deer Super Series opened in great style in February at El Caballo Resort. Super, Jeff Austin, presented a great course for us considering the huge water problems the El Caballo course has had this summer. The winner of round 1 was Andrew Newman from Rainman with a score of 2 up. Round 2 was held at Royal Fremantle and "Stormin" Norm Ashlin charged home 2 up for his first ever series victory. It was great to see Norm receive his prise, as he is a good supporter of the series and all other association events.

A busy calendar of events has been organised for all the members with many of the regular days plus a few new ideas. One of the highlights this year will be the State Conference to be held in August at Margaret River. This area of Western Australia is beautiful and those members who have not ventured down to the south West should take advantage of this opportunity. A 3 day, full programme has been planned for this event with some interstate guest speakers and some interesting local ones. The content is diverse and I'm sure it will be a worthwhile experience for all those who attend. It would be great to see some interstate visitors attend and anyone who is interested or is in the west in August should give us a call for more details.

I urge all the GCSAWA members to the 18th Australian Turfgrass Conference in Brisbane in June. The programme includes some interesting and varied topics with a good mix of speakers from around the world. It would be nice to see a large contingent from the west attending. It would also be nice to field a competitive team from the west for the golf championships, as it is a while since we worried the scorer in this event.

Allan Devlin
President GCSAWA

NSWGCSA

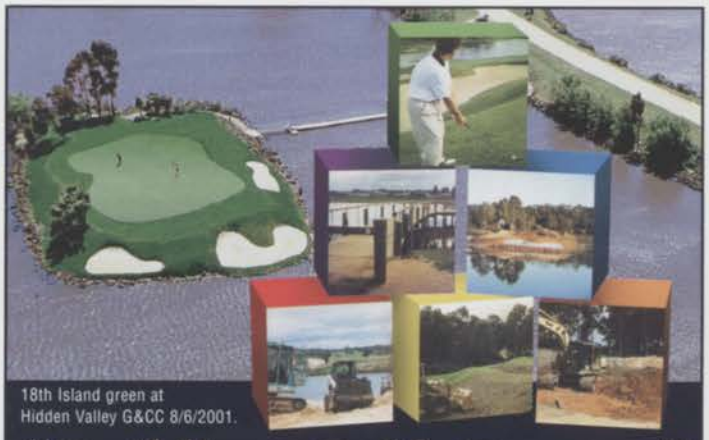
Since my last report much of NSW has gone from bushfires to floods and very destructive storms, featuring winds so strong that Eucalypts in excess of 2.5 metres high have been plucked out of the ground like a carrot.

There is an old saying "no matter how bad you are going there is always someone worse off"!

Mark Crittenden Course Superintendent at Cumberland Golf Club in Sydney suffered the worst in a freak storm that hit Saturday 16th February at 6.30pm.

There were 300 trees either uprooted or snapped off half way up the trunk, the roof of the clubhouse was torn off and deposited on the 1st fairway some 50 metres away, a car was blown out of the carpark and deposited in a neighbouring backyard!

Along with the wind, the course received 250mm of rain in 20 minutes and 3 weeks later the bunkers are still out of play, Mark and his team managed to get the course open in 2 weeks after the storm, with the help of 21 volunteers out of the a membership of 1200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people, he informed me that his crew were less than impressed with the many "sticky beaks", who instead of offering to help for an hour or so, would watch those working away and ask "when do you reckon we will be able to play?"

Oatlands Golf Club ran 2nd in this little episode with 70 massive eucalypts destroyed, Fox Hills Golf Club 3rd and Castle Hill Golf Club 4th with only 8 large trees blown out of the ground (I was "going crook" until I heard what happened to the other!)

Now that we are officially into autumn we look forward to some familiar weather and say goodbye to a summer that will be remembered for a long time. Congratulations to any superintendent who survived the last 3 months with his course and sanity intact.

We wish Gary Smith every success in the future after retiring from Bonnie Doon Golf Club where he did excellent work for 15 years.

Good luck to Dave Scutts who has been appointed as superintendent at arguably the most picturesque golf course in Australia, Bonville Golf Club is some 10km further from the Queensland boarder than was his beloved Coffs Harbour Golf Club and there is pressure on Dave to become a "blue"; we would welcome him.

Martyn Black
President NSWGCSA

VGCSA

The formation of what is today know as the Victorian Golf Course Superintendents Association took place in 1927 when a group of golf course curators first came together. The object of the Association was to "help one another in the art of greenkeeping, to discuss our various problems, to promote golf matches and to arrange social functions as may be determined." Over the years a great deal has changed however today's Association still emphasises the above core values, these being the need to exchange goodwill, information and education.

2002 represents a significant milestone in the history of the VGCSA as its 75 years since our inception in 1927. The focal point of our 75 year anniversary will be this year's Annual General Meeting to be held on Monday, April 29 at the Metropolitan Golf Club. Invitations have been sent to all Life members, past President's and to a number of active past members. Our guest speaker on the day will be Mr John Scarth, author of the recently published book on the life and times of the legendry Melbourne greenkeepers Mick and Vern Morcom, entitled "A round Forever". Hopefully we will also be able to entice some older members to a microphone to retell some yarns about their time managing golf courses.

As is the custom at the A.G.M. the VGCSA Golf Championship known as the Powell Trophy along with the Toro Cup and Presidents shield are all on offer. Please note that the field is strictly limited to 72 players. If you intend playing golf make sure you get your reply slip in early to avoid any disappointment.

The high esteem in which Victorian golf courses has always been held is not only a testament to the know how and dedication of past and present golf course turf managers but to the VGCSA itself. Over the past 75 years the VGCSA has been invaluable in providing a forum where Superintendents can meet with their peers to discuss topical issues whilst being exposed to new technologies and the latest in education. This years Annual General Meeting will be a celebration of these achievements and I would like to extend an invitation to all members to come along to this important day and share in our history.

The venue for this years Turf Research Golf day has been confirmed as the Heritage Golf and Country Club. The day will be held on Tuesday the 28th of May with a 7.30 am shortgun start. Anyone interested in playing, please contact Brett Balloch on 0409 834 939. The cost for the day which includes golf and lunch is $110.00 per person.

The VGCSA's first meeting for the year was held at Anglesea Golf Club with an excellent crowd in attendance of over sixty. The meeting theme was "Watering. When and How Much" Guest speaks Kevin Handreck and John Neylan were well received while the panel discussion created plenty of debate. Thank you to Anglesea Golf Club and our host Super in Brett Balloch who had the course in fine shape. Thank you also to Ian Perryman and Turfcare Supplies for providing the Morning Tea at short notice.

John Geary
President, VGCSA

SAGCSA

Well, what a summer we have just had, not that you would call it a summer, as it was the coldest ever recorded in South Australia, with an average temperature of just 25°C. I don't think it would have worried too many Superintendents after the long, hot, dry summer we had last year, although some who are trying to establish couch fairways would have liked more heat.

At the time of writing this, Steve Newell is hosting the Jacob's Creek Classic at Kooyonga Golf Course. This has replaced the Ford South Australian Open. Good Luck to Steve and his staff and I am sure the course is in excellent condition.

On a sad note, it is with regret that we say farewell to Gil Shepard, the ever – smiling sales rep. from Metropolitan Machinery. Gil, you will be missed by all in the turf business. We wish you and your wife Mandy all the best on your trip around Outback Australia – have a great time!

Also, I say farewell to one of my workers, Peter Foreman, who is about to go to the US for a 12 – month internship at Westchester Country Club, 90 miles north of New York City. I wish Pete all the best and having heard from others who have been, it will be a great experience.

Our next SAGCSA meeting will be held at Tea Tree Gully Golf Course on Tuesday 9th April, followed by the AGCSA workshop on 17th April.

Our AGM will be held at the Glenelg Golf Club on Tuesday 6th June. There will be vacancies on the Committee, my position included, so if you have an interest in the further development of the golf and turf industry, now is your opportunity to do something about it.

Shawn Standfield
President SAGCSA

TGAA (VIC)

The TGAA (Vic) is pleased to announce the following dates for forthcoming events

OHS Morning – Machinery Safety – Slopes, Maintenance and Regulations May 14th

This is a no charge gathering for members to refresh themselves regarding safe machinery use. Things to consider every time you get on a machine and the legal obligations of user and provider. A good chance to catch up with each other and still time to get back to work for the afternoon. Cricket Wicket Seminar — Cracking Clay Soils an in depth look July 17th. Keith McIntyre will be elaborating on issues of Pitch Preparations raised in his book on Cracking Clays. There will be a questions session on any topic relating to the TGAA, Wickets and Turf in General, a presentation from a well traveled turf manager, door prizes and much more.

A reminder about booking early for the Turfgrass Conference in Brisbane. There is a General Turf Stream that proves to be very

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We would like to see as many if not more TGAA members in Brisbane than in Sydney last year. Thinking about a break? This is a great destination to relax and incorporate some turf into your holiday.

Robert Savedra
President, TGAA (Vic)

TGAA (ACT)

Although it may be hard to believe, it is almost mid – year and we are already dreaming of spring. We are also drawing closer to the much anticipated ACT Turfgrass Association Mid – year Seminar. This year's seminar will cover different aspects of turf nutrition such as the needs of different soil types, plants nutritional requirements, fertiliser, make – up & chemistry, application techniques & release methods of nutritional elements in different fertilisers. These are just a few topics, which will be discussed during the seminar.

Speakers at the seminar will include Professor Peter Martin, Dr. Louise Barton from the University of Western Australia, Simon Leake from Sydney Environmental & Soil Testing Labs & Robert Cooper from Scott's. With such a wealth of knowledge present on the day, it will be another seminar not to
be missed.

The seminar will be held on Wednesday the 24th of July at the Hellenic Club in Woden, Canberra. Entry will be $80.00 per head & includes unlimited tea / coffee & a full buffet lunch. The seminar will start at 8.00am and conclude at 4.00pm. To ensure your spot or for any information relating the seminar please call Bruce Davies on (02) 6207 4623 or Fax: (02) 6207 4605 or email Keith McIntyre at: hortengineer@netinfo.com.au

Don't leave it too late or you might miss out.

If there is anybody who is interested in attending other Turfgrass Association Seminars in Melbourne, Sydney or Corowa please contact Paul Janssens on (02) 6277 5616 ASAP.

Justin Haslam
President, TGAA (ACT)

TGCSA

Bellerive Oval was the venue for our recent Turf Industry Seminar. Nuturf and Serve – AG P/L in conjunction with the TGCSA would be very pleased with the support shown on this joint seminar.

The quality content of the day kept all delegates enthusiastic and keen to participate at question times.

Matthew Bywayter – Nuturf Technical Manager addressed on:
- Fertiliser structure and analysis
- Soil analysis – planning turf management strategy

Bruce Stephens – Nuturf National Seed Specialist / Manager addressed on:
- Grass species for sports turf
- Austep seed trial review

Mark Dougherty – Nuturf Account Manager addressed on:
- Pest / Fertiliser plan – an effective planning tool for turf managers

Adam Churchill – (TAFE Tasmania)
- Chemical handling – OH&S Issues

David Nickson – Ecogrow
- The use of entomopathograic nematodes for control of scarab larvae in sports turf.

The TGCSA committee will be meeting again in April to consolidate plans for the mini – conference in August.

All Superintendents attending the 18th Australian Turf Conference in June will be keen and ready to consume the wealth of knowledge on tap at this premier event. See you there.

Phil Hill
President TGCSA

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BEST WOOLAWARE K	13	0	24	Fe	Standard	TRIKOTE	57%	22.7kg	2.5-3.5kg	A high Potassium fertilizer with 5% Iron for use on Fairways, Tees and Sportsfields
BEST UFLEXX STD	46	0	0	S,Ca, Mag	Standard	UFLEXX	100%	22.7kg	0.5-1.0kg	Stabilized Urea Nitrogen highly soluable. Can be applied as Granular or Liquid form
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BEST N K GREENS	20	0	20	Fe,S	Mini	UMAXX	80%	22.7kg	1.5-2.5kg	A soluble mini sized slow release greens fertilizer with a 1:1 N to K ratio
BEST HI K GREENS	15	0	28.6	S	Mini	UMAXX	98%	22.7kg	2.5-3.5kg	A high potassium mini sized slow release greens fertilizer
BEST HIGH N GREENS	30	1.3	6	+TE	Mini	UMAXX	80%	22.7kg	1.0-1.5kg	A high nitrogen mini sized slow release greens fertilizer for general maintenance.
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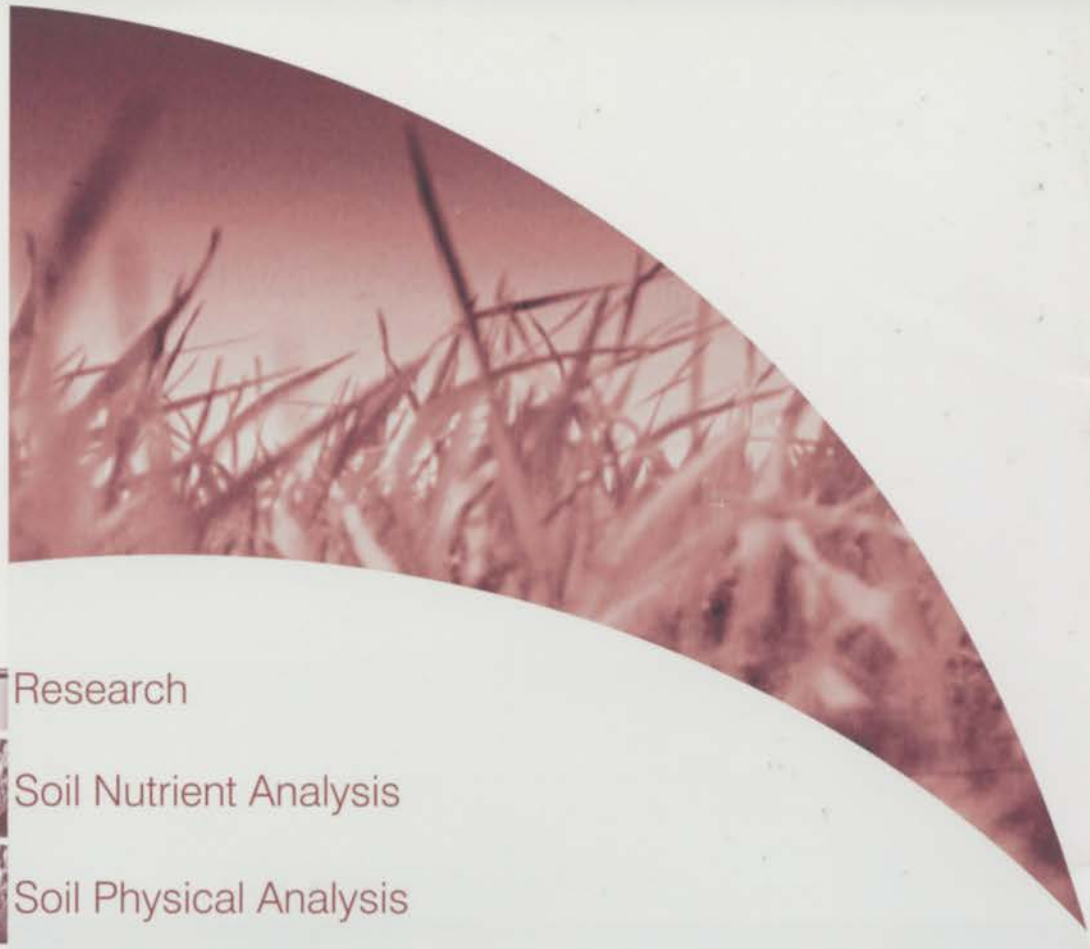

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