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# Turfgrass

MANAGEMENT



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Turfgrass research goes under the microscope  
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Photo: Brett Robinson

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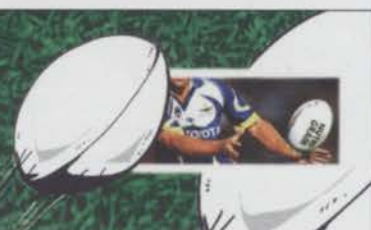


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## Some light reading



BRETT ROBINSON  
EDITOR

As the great Greek philosopher Aristotle once muttered, 'All men by nature desire knowledge'. Well, if it's knowledge you want, then this edition of ATM won't disappoint. Pull up a sofa, bang the kettle on and prepare to immerse yourself in the world of turfgrass research!

With autumn now in full swing and winter just around the corner (let's pray the rains come in abundance), ATM has brought together Australia's leading researchers from major universities and turfgrass research facilities to provide an up-to-date snapshot of their current and wide-ranging work.

We peruse the gamut of Horticulture Australia Limited funded projects, examining research currently in the pipeline at major facilities such as Redlands Park in Queensland through to localised contract trials in Victoria.

University of Western Australia researchers Louise Barton, Tim Colmer and George Wan kick off a series of articles by providing an update of their work on the effects of irrigation and fertiliser regimes on turfgrass growth and quality.

Chris Menzel from the Queensland Department of Primary Industries presents two pieces of research, the first looking at recycled water for irrigation while the second examines the effects of drought on the performance of warm-season grasses.

Phil Ford outlines a number of projects the Victorian Golf Association's research and advisory board has on the go, while David Aldous presents his research into the effects of elevated salt concentration on the growth and development of marine couch.

Complementing this body of research is this edition's AGCSATech Update where John Neylan provides the latest data from the extensive bentgrass variety trials which have now been in progress since 2000.

The research theme continues into the news section where we look at the issue of AFL playing surfaces which has again come to light in the lead up to the 2004 season. Our report delves into two major research initiatives, one out of Redlands Park and the other from Melbourne.

Elsewhere in this edition we report on the GCSAA conference held in San Diego where Steven Potts, Mark Couchman and John Neylan headed an AGCSA delegation. Turn to page 34 for a review of the conference and International Summit.

So there you have it! Consider your thirst for knowledge sated!

Brett Robinson  
Editor

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# President's Pen

Welcome to this edition of Australian Turfgrass Management which focuses on turfgrass research. Editor Brett Robinson has coordinated an extensive portfolio of Australia's leading turf researchers who have compiled reports on their latest research initiatives. As well, AGCSATech manager John Neylan furnishes us with the latest information to come from the AGCSA's bentgrass variety trials. Plenty of interesting reading for all superintendents and turf managers.

The clock has well and truly started counting down towards this year's 20th Australian Turfgrass Conference. Already the event is starting to generate plenty of interest and the AGCSA's business development manager Scott Petersen reports that the tradeshow is a complete sell out! A fantastic achievement.

Combined with this and a number of new features at this year's conference, a top group of international guest speakers has been gathered. Delegate registration brochures have been mailed out to members and I urge everyone to get their forms in early in order to get the discount.

Once again the AGCSA awards ceremony will be held during conference week, with nomination forms being mailed out soon. Be sure to get in early and nominate your peers for these most prestigious awards.

Outside of the conference, the other big talking point around the traps is the kick off of the much anticipated AGCSA footy tipping competition. There is a combined \$12,000 cash

to be won in the respective AFL and NRL competitions and I can say from my shed's perspective it has generated some pretty healthy competition.

See page 48 for a full rundown on the competition or log on to the new-look AGCSA website [www.agcsa.com.au](http://www.agcsa.com.au). No doubt everyone will be trying to get one up before the conference and with this year's Welcoming Cocktail Reception bearing the theme 'Footy Colours' there should be plenty of bragging going on.

In February, I was fortunate enough to join AGCSA chief executive Steven Potts and John Neylan as part of an AGCSA delegation to the Golf Course Superintendents' Association of America conference and tradeshow.

This was a fantastic opportunity to meet with industry peers from around the world and to renew old acquaintances and make new contacts. The fact that the event was held in San Diego was just an added extra – just like Brisbane in the middle of winter.

The educational content of the conference was first class with the only complaint being that there was so much to choose from that you could not physically attend all the workshops. As a practitioner, the week is worth every cent for the education on its own.

The tradeshow, as you are all aware, is just huge but from a purely Australian perspective our own tradeshow has far more relevance. In the US you are looking at a lot of things that are either not available here or are cost prohibitive given that the size of our market may not justify the expense of offering a particular item or product. It was great to see



Mark Couchman, AGCSA President

many of the corporate supporters of the AGCSA in the US looking at developments and products for potential commercial opportunities here in Australia.

To all the staff of the GCSAA, I take this opportunity to thank them for their great camaraderie, and the AGCSA looks forward to working with them in the coming years.

Following the conference, Steven, John and I attended the International Summit which involved golf course superintendent associations from around the world. The summit provided a forum to discuss global issues affecting golf turf maintenance and how the respective associations can work together to tackle these issues.

There was plenty of common ground and it was interesting to see how similar issues have affected other associations. The meeting determined to form a working group to report back to the next summit which will be held in England in January 2005. Enjoy the magazine. 🏌️

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

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- Prof. Ron Duncan - Professor Crop Sciences - Turf Ecosystems
- Mr. Jim Moore - Director Construction Education - United States Golf Association
- Mr. Terry Muir - Director - Environmental Business Solutions
- Mr. Ray Young - Director - Young Consulting Engineers

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- Cutting edge strategies for water conservation
- Seashore paspalum • Climatic based irrigation systems
- Environmental risk assessment
- Application of systems based environmental management
- Influence of management practices on turfgrass diseases

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Conference Dinner:  
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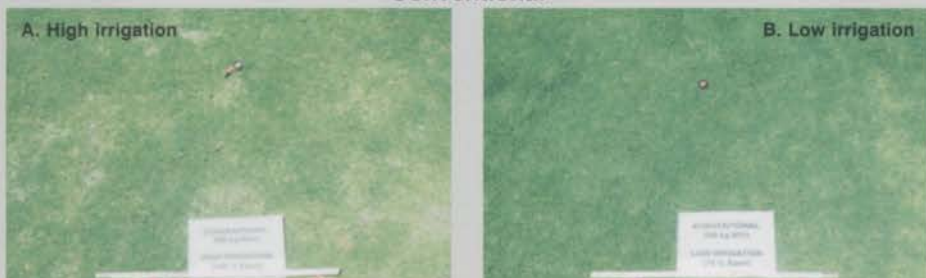
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# Turfgrass Production on Sandy Soils - Irrigation and Fertiliser Management

## Conventional



## Pelletised Poultry



PLATE 1: Turfgrass colour for conventional fertiliser and pelletised poultry treatments (200kg N/ha at high (A) and low (B) irrigation treatments after 10 weeks

The University of Western Australia has evaluated the effects of irrigation and fertiliser regimes on turfgrass growth and quality, as well as nitrogen leaching, during turfgrass production on sandy soils.

The contributions of turfgrass systems to nitrogen leaching is increasingly being scrutinised by communities and environmental regulators. Turfgrass generally requires regular irrigation and fertiliser applications and is often perceived to be a source of nitrogen leaching. Nitrogen leaching is problematic as it can degrade surface and ground waters resulting in eutrophication and non-potable water supplies.

Applying nitrogen fertiliser is an integral part of turf management and is needed for maintaining turf growth and ensuring turf is aesthetically acceptable. Ideally, nitrogen fertilisers should be applied at a rate that the turf is able to assimilate or utilise the applied nitrogen.

Fertiliser applications may be better matched to turf growth demand by splitting 'soluble' fertiliser applications, or using fertilisers that slowly release nitrogen, such as resin-coated inorganic fertilisers or organic fertilisers.

The ability of turfgrasses to utilise applied nitrogen will also be affected by the rate that dissolved nitrogen moves through the soil profile. Turfgrass nutrient uptake often occurs at greater rates in the topsoil, where the majority of the turfgrass roots are located, than in the subsoil. Therefore irrigation management practices that maintain nitrogen fertilisers in the

topsoil should increase the opportunity for plant uptake and decrease nitrogen leaching.

Developing irrigation and fertiliser management regimes that maximise turfgrass growth while minimising nitrogen leaching is required for the sustainable development of the turfgrass production industry in Australia.

Optimising fertiliser management strategies so that nitrogen leaching is minimised is particularly challenging for managers of turfgrass grown on sandy soils, as these soils are often conducive to nitrogen leaching due to their low biological fertility and free-draining nature.

Most field-based studies investigating nitrogen leaching from turfgrass grown on sandy soils have been conducted in North America using turfgrass species not widely grown in Australia. Furthermore, these previous studies have mainly evaluated nitrogen leaching from established turfgrass, rather than turfgrass grown for turfgrass roll (sod) production.

The University of Western Australia (UWA), in partnership with Horticulture Australia Ltd and industry groups, has evaluated the effects of irrigation and fertiliser regimes on turfgrass growth and quality (Wintergreen couch), as well as nitrogen leaching, during the production of turfgrass on sandy soils.

In this article we focus on the effects of irrigation and fertiliser regimes on turfgrass growth and quality. In a future article, we will present the findings from our nitrogen leaching study.

## Fertilisers Trialed

The study includes four fertiliser types (conventional (water soluble), control-release, pelletised poultry manure and pelletised biosolids), three application rates (100, 200 and 300 kg N/ha per 'crop'), two irrigation rates (70 per cent and 140 per cent daily replacement of net evaporation), and three replicates in a randomised split-plot design.

Irrigation and fertiliser treatments were applied over 16–28 weeks, after which the turfgrass was harvested and then allowed to re-grow from the remaining rhizomes. Four crops were grown and harvested between October 2001 and August 2003.

Treatment plots (10m<sup>2</sup>) were established at the UWA Turf Research Facility after pre-planting fertilisers (except control-release which was applied after planting) to 10mm, and incorporating turfgrass stolons into the soil surface using discs. Previous studies have shown the soil to be free-draining, have low chemical and biological fertility and a low phosphorus retention index (PRI).

Irrigation occurred daily from October–April each year; and then every second day from April–September when daily net evaporation was less than 5mm; and then occasionally from May–August when weekly net evaporation exceeded 5mm.

Fertilisers were applied at different frequencies depending on the type. For example, conventional fertiliser was applied every three weeks, the control-release was generally applied every six weeks, while the two organic fertilisers were applied every four weeks.

## Turfgrass Growth and Quality

Turfgrass growth and quality were generally unaffected by increasing the irrigation rate from 70–140 per cent daily replacement of net evaporation. Instead, turfgrass growth and turfgrass colour mainly depended upon fertiliser type and rate.

Applying inorganic fertilisers (i.e., conventional and control-release) promoted greater growth than organic fertilisers (i.e., pelletised poultry and pelletised biosolids). For Crop 1, growth decreased in the order: conventional > control-release > pelletised poultry > pelletised biosolids.

For Crop 1 there was a significant interaction between irrigation rate and fertiliser type, and consequently for the high irrigation treatment





(140 per cent replacement) pelletised poultry produced similar growth to the pelletised biosolids, whereas for the low irrigation treatment (70 per cent replacement) pelletised poultry produced less growth than the pelletised biosolids.

For the remaining crops, the fertiliser types were ranked: conventional = control-release > pelletised poultry = pelletised biosolids. For all crops, increasing the fertiliser application rate generally increased growth.

Turfgrass colour appeared greener in the low irrigation plots than the high irrigation plots for the first 5-10 weeks after planting (Plate 1). However, by the time the first crop was harvested the chromameter results showed irrigation did not have a significant effect on turfgrass colour. Instead turfgrass colour at harvest was mainly dependent on fertiliser type and rate (Figure 1).

Greater colour was recorded for inorganic fertilisers than organic fertilisers, especially when applied at the higher rates. For crops harvested during summer (Crops 1 and 3) turfgrass colour was similar for conventional and control-release treatments. However, for crops harvested in winter (Crops 2 and 4), turfgrass colour was greater for control-release than conventional treatments.

For Crop 1, turfgrass colour was similar for pelletised poultry and pelletised biosolids. For Crops 2-4, pelletised biosolids treatments were greener than pelletised poultry. Only inorganic fertilisers applied at 200 or 300 kg N ha<sup>-1</sup> produced turfgrass with colour that met WA industry standards (Figure 1).

Inorganic fertilisers produced more residual rhizomes (i.e., rhizomes remaining in the ground after harvesting sod) than organic fertilisers. Increasing application rates also increased residual rhizomes. Irrigation rate only affected residual rhizomes in Crop 1, where increasing the irrigation rate decreased residual rhizomes.

### Concluding Comments

Optimising irrigation regimes not only maintains turfgrass growth, but maximises water use efficiency. Furthermore, high irrigation rates can be detrimental to turfgrass growth and colour during turfgrass establishment.

For turfgrass produced on a sandy soil, conventional (i.e., water-soluble) and control-release fertilisers produced better growth and colour than the pelletised poultry manure and pelletised biosolids. Furthermore, the rhizomes remaining in the soil for the next crop were also greater for the plots supplied with inorganic than the organic fertilisers.

### Acknowledgements

Louise Barton, George Wan and Tim Colmer hail from the Faculty of Natural and Agricultural Sciences, University of Western Australia  
<http://www.fnas.uwa.edu.au/turfresearch/index.htm>

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Michael Blair and Chris Marsh are thanked for assisting with plot maintenance. Challenger TAFE staff and students are thanked for assisting with turfgrass harvests. Members of the UWA Turf Industries Research Steering Committee are thanked for their support and advice throughout the field trial.

Figure 1. Colour (hue angle measured by chromameter) of turfgrass rolls at harvest. Increasing hue angle value indicates increasing "greenness". Graph includes maximum and minimum values measured from six turfgrass farms at time of harvests.

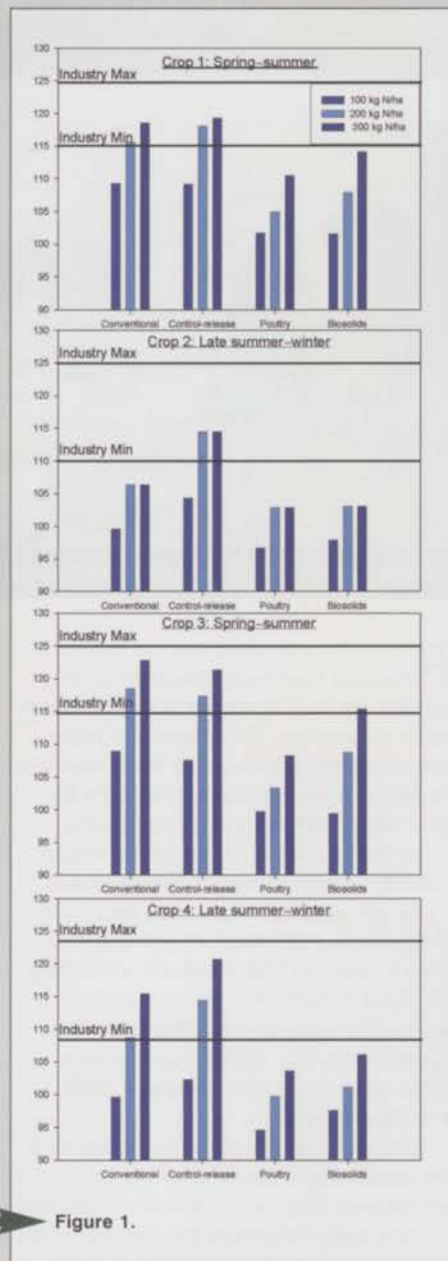


Figure 1.

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# Irrigating With Recycled Water in Queensland



Twenty grasses were grown in 100 litre bags for the effluent water study

Turf researchers in south-east Queensland have evaluated the use of recycled water or treated effluent to irrigate golf courses, sporting fields and council parks over the past three years. The research demonstrated that turfgrasses can be grown satisfactorily on tertiary-treated effluent, supplemented with nitrogen, with savings to sporting clubs and the environment.

Recent droughts along much of eastern Australia have forced governments to consider the long-term sustainability of current water use practices. The Queensland Water Recycling Strategy, managed by the Environmental Protection Agency, encourages recycling by government, industry and the community.

In Queensland, 15-20 per cent of treated effluent is used for irrigation compared with 11-14 per cent nationally and 60 per cent in California. In 1999, about 75 golf courses in Queensland used treated effluent, accounting for about 45 per cent of the municipal wastewater being recycled. There were also approximately 60 schemes irrigating sports fields, parks and gardens using over 5000 megalitres per year.

One of the factors adding to this debate is the increasing pressure to avoid the discharge of effluent into rivers, oceans and other waterways. In many parts of Australia, the discharge of this waste has exacerbated the decline of river ecosystems and estuaries and contributed to blooms of toxic blue-green algae.

In south-east Queensland, the Luggage Point Wastewater Treatment Plant (WWTP) near the mouth of the Brisbane River, along with the other WWTPs release 8.2 tons of nitrogen each day and 4.2 tons of phosphorus into Moreton Bay. These discharges will increase by 25-50 per cent over the next 30 years, leading to a further deterioration of the environment.

## The Use of Recycled Water

Municipal effluent is ideal for the irrigation of turfgrasses because many areas in northern Australia permit the continuous growth of tropical species, allowing year-round use of the wastewater.

These grasses also have dense shoot and root systems that can remove nutrients and other pollutants from the water. Many species

have high water and nutrient requirements and so can utilise a large volume of wastewater and the accompanying nutrients. There are also fewer concerns about health issues compared with the use of effluent on food crops.

The use of wastewater represents a saving to turfgrass managers, with the cost of effluent about half that of potable water. The nutrients in the water also mean that less fertiliser is needed. The price of water is likely to increase substantially in the next few years, putting added pressure on the Australian turfgrass industry. In some areas of the USA, such as California, it is mandatory to use wastewater if it is available.

Wastewater can contain various salts and toxic ions (Na, Cl, B, CO<sub>3</sub> and HCO<sub>3</sub>) that need to be managed before they begin to affect the quality of the turf and soil. This needs to be assessed when considering the economic benefits of using effluent. Depending on the quality of the water in terms of human health, there may be restriction on the use of the golf course or park at certain times. Sporting clubs and other groups using effluent must also develop environmental plans to manage the effluent so that there are no impacts off-site.

## The Trials

These trials examined the performance of the major turf types in northern Australia, including bermudagrass, Queensland blue couch, buffalograss, carpetgrass, zoysiagrass, paspalum and natives.

The effects of fertilisers and wastewater on the performance of 20 grasses growing in 100 litre bags were studied in Murrumba Downs in Pine Rivers Shire just north of Brisbane. From May to August 2001, control plots were fertilised every month, while unfertilised plots received no fertiliser (Experiment 1). From April to

August 2002, control plots were irrigated with potable water and fertilised, while effluent plots received no fertiliser (Experiment 2).

In Experiment 3 from December 2002 to June 2003, control plots were irrigated with potable water and fertilised, while effluent plots were fertilised only with nitrogen. A field experiment also compared plots with potable water and mixed fertilisers, plots with effluent and mixed fertilizers, and plots with effluent and only nitrogen.

Information was collected on clipping weights, leaf nutrient concentrations and water quality. The data on shoot weight and leaf nutrient concentration were used to calculate the amounts of nutrients taken up by the various species. This was then related to the amounts of nutrients applied in the effluent and chemical fertilisers.

## The Results

At the end of the first experiment, unfertilised plots were only 10 per cent of the weights of fertilised plots, with turf quality and colour declining as clipping weights were reduced. Centipede, buffalo, Japanese lawngress and kangaroo grass were the best grasses among the unfertilised group.

Leaf nitrogen concentrations fell by 50 per cent in the unfertilised plots (3.3-1.6 per cent N), along with phosphorus, potassium, sulphur and magnesium. Maximum uptake of nutrients per hectare over a year was 324 kg N, 48 kg P and 238 kg K compared with typical applications of 500-800 kg N, 50-200 kg P and 250-800 kg K ha for tropical turf species. This data suggests that many sporting fields are being over-fertilised.

In Experiments 2 and 3, the electrical conductivity, EC<sub>w</sub>, of the effluent (0.7 dS per m) along with sodium (87 mg per L) and chloride (78 mg per L) were at the low end of the toxic





range. The sodium hazard for the soil as determined by the sodium absorption ratio, SAR (3.8) and EC<sub>w</sub> of the effluent was low.

The residual sodium carbonate (RSC) indicated a slight excess of bicarbonate compared with calcium and magnesium (0.4). Concentrations of nitrogen (7 mg per L), potassium (18 mg per L), calcium (24 mg per L), and magnesium (10 mg per L) were in the low range for irrigation waters, while phosphorus (5 mg per L) was high.

At the end of the second experiment, the average clipping weight of the effluent plots (without fertilisers) was 15 per cent of that of the potable plots. Carpet, centipede, buffalo and kangaroo grass were less affected by the low nutrient supply than the other species.

Leaf nitrogen concentrations fell by 40 per cent in the effluent plots, along with phosphorus, potassium and sulphur. Nitrogen concentrations were below the optimum for turfgrasses (1.8 per cent), while phosphorus (0.46 per cent), potassium (1.6 per cent) and sulphur (0.28 per cent) were in the optimum range. The effluent supplied 13 per cent of the nitrogen required for maximum shoot growth, 70 per cent of the phosphorus and potassium, and 300-500 per cent of the sulphur, calcium and magnesium.

In Experiment 3, the average weight of the effluent plots (with nitrogen fertiliser) was close to the weight of the potable plots, suggesting that the grasses performed similarly on potable water or effluent. Leaf nutrient concentrations were also similar, suggesting that fertiliser applications (effluent plus chemical fertilisers) were optimum for plant growth.

In the field experiment, mean clipping weights and leaf nutrient concentrations were also similar in the three treatments (potable plus fertilisers, effluent plus fertilisers and effluent plus nitrogen), indicating that the grasses could be grown on effluent, supplemented with nitrogen.

### Implications

When properly fertilised, the growth of the turfgrasses was similar on potable water or effluent. Low concentrations of nitrogen reduced the growth of the effluent plots when they were dependent on the wastewater for their nutrients. In contrast, the effluent supplied large amounts of phosphorus, potassium, sulphur, calcium and magnesium that could be used by the plants. The salinity and sodium hazards in the effluent were low.

There are significant benefits in the use of effluent for sporting clubs and the environment. The use of effluent represents savings in irrigation and fertiliser costs to turf managers, and reductions in the discharge of nitrogen and phosphorus to local waterways.

Effluent is currently about 50 per cent the cost of potable water, with a saving of about \$8000 per hectare per annum in water costs for a typical sporting field. Specific recommendations for the use of recycled water include:

- Check the quality of the effluent to determine whether it is suitable for irrigation, especially in terms of salinity (electrical conductivity or total dissolved salts), and concentrations of specific toxic ions such as sodium, chloride and boron.

- Tertiary-treated effluent has inadequate concentration of nitrogen for most turfgrass species, and must be supplemented with chemical fertilisers.
- Effluent contains high concentrations of phosphorus, potassium, sulphur, calcium and magnesium that can be used to support plant growth. These nutrients represent savings in fertiliser costs.
- Fertiliser applications should be based on the results of regular leaf tests.
- Data on nutrient uptake indicate many examples of over-fertilisation, with reductions in fertiliser applications of 30-50 per cent appropriate in many situations.
- The salinity and sodium hazards in effluent need to be monitored and appropriate amendments applied to maintain long-term soil and turf quality. This will add to the cost of using effluent.
- Do not over-water, as this leads to increased growth and mowing costs, and the possibility of nutrients being leached off-site into rivers and waterways.

### Acknowledgements

This project was funded by Horticulture Australia Limited, Lensworth and Lend Lease, Jimboomba Turf, Twin View Turf, Pine Rivers Shire Council, Townsville City Council and Calliope Shire Council.

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# Victorian Golf Association - Turf Research Trials



The entomopathogenic nematode species *Heterorhabditis zealandica* has proven to be an excellent controller of Winter Corby grubs (above)

## NMIT's Phil Ford outlines research conducted by the Victorian Golf Association's Research and Advisory Board, including the use of entomopathogenic nematodes for insect control.

Over the past eight years the Victorian Golf Association Turf Research and Advisory Board has conducted a wide range of trials including low input fairway grasses, couchgrass establishment methods, insect control with entomopathogenic nematodes (ENs), dusting of greens and other topics.

The board tries to tackle issues that are not being investigated by other organisations (eg: US research), and of immediate relevance to its member clubs. It also concentrates on the more environmentally sensitive issues, and has contributed greatly to the widespread adoption of couchgrass fairways, dusting programs and the use of ENs for insect control at Victorian golf clubs.

### Entomopathogenic Nematodes

The VGA is very keen to promote the concept of 'insecticide-free golf courses'. All currently used chemical insecticides are nerve toxins, and therefore present a hazard to any organism that has nerves (eg: birds, fish, golfers and superintendents!).

Entomopathogenic nematodes (ENs) have no off-target hazard, and offer an environmentally

friendly solution to most insect problems.

Previous research by the VGA had shown excellent (near 100 per cent) control on Argentine Stem Weevil and African Black Beetle, with the Black Beetle data being presented at the International Turfgrass Conference in Toronto, 2001. The turf industry now routinely and successfully uses ENs to control these two pests as well as Billbugs, Red Headed Cockchafers, Argentine Scarab and various cutworm pests.

A more recent trial (October, 2003) compared the EN species *Heterorhabditis zealandica*, *Steinernema feltiae* and the insecticide cyfluthrin for control of the webworm pest *Oncopera rufobrunnea*, commonly known as Winter Corby grub. In the final assessment, not one living Corby grub was found alive in the *Heterorhabditis* replicate plots, indicating a 100 per cent kill rate on all three replicates.

The report for this trial hasn't been finalised yet, but will be distributed to Victorian clubs and posted on the VGA website in the next few months. The authors intend to present this data at the International Turfgrass Conference in Wales, 2005.

### Evaluation of New Warm-season Grasses in Victoria

As well as reducing the need for insecticide use, the other big topic for Victorian golf courses is water. The single biggest gain in reducing turf water use is by switching from cool-season to warm-season grasses, so the promotion of couchgrass has been a high priority. But it's pretty clear that many of the 'standard' couchgrasses used in Victoria had been around for many years. Were there new cultivars to challenge the standard ones?

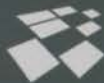
In 2002 the VGA began a collaborative project with Dr. Don Loch to evaluate many new grasses and cultivars in our climate.

In October 2002, turf students from Northern Melbourne TAFE planted replicated plots of 16 couchgrass varieties on a nursery area kindly offered by Richard Forsyth and Metropolitan Golf Club. They also planted single plots of the new ultradwarf couches, and various zoysias and seashore paspalums.

Very few of these grasses had been grown in Victoria before. This research is ongoing, but within the first summer it was obvious that several breakthroughs had been made, including:

- The emergence of three new couchgrass varieties (Conquest, CD and No.9) with extremely high quality and good winter colour retention in our climate. The 2003 winter was quite cold in Melbourne and the colour retention figures in comparison to Santa ana and Wintergreen were excellent. Santa ana and Wintergreen, grown in Melbourne since the early 1980's, were still in the top group.
- The excellent performance of the seashore paspalums in our climate. Sea Isle 1 and Sea Isle 2000 were good, but the Western Australian variety 'Velvetene'™ (PBR TFWA02) performed even better. Its establishment rate was faster than any couchgrass, and its winter colour retention and turf quality were superior as well. This species has a remarkable salinity tolerance, but its performance here on normal town water show it to be a high quality turf species in its own right, with the salt tolerance a bonus.
- A hint of possibility for zoysias in our climate. Their establishment rate is extremely slow, although the varieties GGR and Zoyboy show some inclination to grow. But many varieties kept good colour over the winter, so it may be useful for a golf club to import zoysia turf from northern Australia for use in heavily shaded 'niche' areas.





The VGA couchgrass plots at Metropolitan Golf Club in Melbourne

The Metropolitan Golf Club trial will run for another two years, at which time a full report will be prepared. The excellent performance of Velvetene™ has led to the establishment of this grass at other locations last summer.

In October 2003, NMIT students planted a practice putting green and a fairway area at Kerang Golf Club. These plantings have two purposes – to evaluate the potential for seashore paspalum (Sea Isle 2000 and Velvetene) and the dwarf couches (MS Supreme, TifEagle, Tifdwarf and Santa ana) as a putting green surface at 3mm or so, and to compare the salt tolerance of seashore paspalum (Sea Isle 1 and Velvetene) and couch (Santa ana) in a highly saline area of fairway.

Another planting was done on the small fairway (the 'betting hole') at the Shearwater

Resort (Cape Schanck). Velvetene™ was line planted. In that deep, alkaline sand and using effluent water, this planting should present the seashore paspalum in its best possible light.

Superintendent Chris Grumelart reports that the grass is growing in well, and has used Kerb for Poa control in the establishment phase with excellent results and no injury to the paspalum.

More Velvetene™ plots were planted at Ballarat Golf Club. No offence to superintendent Geoff Powell, but the Ballarat site puts this variety in a much more challenging environment, exposed to winter frosts, compacted clay soil and some shaded areas. Geoff reports that establishment has been slow, with January and February being very cool. Will Velvetene survive a Ballarat winter? It will be interesting to see.



The VGA putting green plots at Kerang Golf Club. The Velvetene plot is on the left.

Many of the larger VGA projects have attracted dollar-for-dollar support from Horticulture Australia Ltd. Their ongoing support is currently under a cloud, however, as the turf industry doesn't have a formal levy system in place and Horticulture Australia's funding will increasingly favour levied industries (eg: strawberries, grapes etc).

Other funding sources are around, however – a submission has recently been made to Melbourne Water for some 'Smart Water' funded projects for next summer. The Victorian golf industry has already demonstrated a proactive approach to water saving, but there is no doubt further work on water issues has the potential to save many thousands of megalitres of potable water in the state.

The success of the board's research has led the VGA to increase its turf research budget for 2004. This will allow the board to consider some larger and longer term projects into the future, continuing to focus on grass roots issues of immediate relevance to Victorian clubs and their superintendents. ■

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# Effects of Drought on the Performance of Warm-season Grasses



*Zoysia macrantha* - highly drought tolerant

Scientists from the Turf Research Group at the Department of Primary Industries and Fisheries in Queensland have been studying ways to conserve water in irrigated parks and gardens. Potential savings of 50 per cent of current water applications were indicated by the trials over three years.

The effects of drought on the performance of warm-season turfgrasses were investigated over three experiments in Brisbane. Information was also collected on water use in sporting fields in Pine Rivers Shire. The main objectives of the project were:

- To study the impacts of drought on the performance of the grasses, and indicate their relative drought tolerance;
- To study the relative water use of tropical turfgrasses;
- To develop irrigation strategies for turfgrass managers;

The major contributors to the irrigation project were Horticulture Australia Limited (HAL), Lensworth and Lend Lease, Jimboomba Turf and Twin View Turf. Pine Rivers Shire Council, Townsville City Council and Callopie Shire Council also collaborated in the various experiments.

## Water Use

Cool-season grasses in the USA use 65-80 per cent of the evaporation from a Class A pan evaporimeter, while warm-season species use 55-65 per cent. Average water use varies from 2.5-7.5mm per day, with maximum values as up to 12mm per day.

In Western Australia, the minimum daily irrigation required to maintain the growth and colour of cool-season turfs growing on sand was 80-100 per cent of evaporation, and 50-60 per cent in nine tropical genotypes. The lower irrigation requirement of the tropicals was associated with lower evapotranspiration and deeper roots.

Research on bermudagrass in the USA showed that transpiration in humid regions was 50-60 per cent less than that recorded in arid areas. Bermudagrass had lower transpiration than Japanese lawngrass, and seashore paspalum lower water use than bahiagrass or paspalum.

While variations exist between hybrids of bermudagrass, limited differences have been observed within Japanese lawngrass and buffalograss cultivars. Species with low transpiration generally have low plant water conductance and small leaves.

## Drought Tolerance

Variations in drought tolerance have been found amongst different species. Paspalum is more tolerant than bermudagrass and Japanese lawngrass. The relative order of increasing drought tolerance in the USA is carpetgrass < buffalograss < Japanese lawngrass < bermudagrass < bahiagrass. In southern Australia, kikuyu

(*Pennisetum clandestinum*) and bermudagrass have excellent drought tolerance, while buffalograss is fair.

Grasses can use various mechanisms to grow and survive a drought. Some species try to avoid the drought for as long as possible by having relatively low rates of water loss or transpiration, or by having deep root systems capable of withdrawing water from the subsoil.

Other plants survive by maintaining photosynthesis and growth at relatively low levels of soil or plant water. Such responses usually involve changes in cell chemistry. Plant adaptations to drought are wide, and usually involve more than one mechanism. The ability of most species to grow during dry weather usually involves both "drought tolerance" and "drought avoidance".

## The Research

Drought experiments were conducted on 19 grasses growing in 100 litre bags of sand at Cleveland in Brisbane.

The grasses included *Axonopus compressus* (broad-leaf carpetgrass), *Dactyloctenium australe* (sweet smother), *Paspalum nicorae* (Brunswick grass), *P. notatum* (bahia grass), *Cynodon dactylon* and *C. dactylon* x *C. transvaalensis* (bermudagrass), *Digitaria didactyla* (Queensland blue couch), *Bothriochloa pertusa* (Indian bluegrass), *Stenotaphrum secundatum* (buffalograss), *Zoysia japonica* (Japanese lawngrass), and Australian natives *Pseudoraphis spinescens* (spiny mudgrass), *Sporobolus virginicus* (marine couch), *Themeda triandra* (kangaroo grass) and *Z. macrantha* (prickly couch, native zoysia).

'Wet' plots were watered every three days, while 'dry' plots gradually dried out over several days. Total available plant water in the pots was 50 mm, with the grasses using 2-5 mm per day.

Species were scored on the effects of drought on canopy height and dry matter production, and time taken to wilt and turn brown. Data was also collected on plant water use, plant water content and leaf physiology in selected species.

## The Results

Drought-sensitive species wilted and turned brown after about 12 days in summer and after 34 days in winter, whereas drought-hardy plants showed symptoms after 21 days and 45 days (see Table 1). The plants recovered within a week of re-watering, with no signs of permanent injury. Species with high water use under well-watered conditions droughted earlier than those with low transpiration.





There was only a small visible effect of drought after seven or 10 days in summer, with the dry plots two per cent shorter than the wet plots. The only exceptions were Windsor Green, Plateau, Indian bluegrass, bahiagrass and sweet smother where the dry plots were 10 per cent shorter.

Average shoot dry matter production per day was 17 per cent lower in the dry plots (0.88g per plot per day) compared with the wet plots (1.07g per plot per day). Greenlees Park, Wintergreen, Legend, Tifdwarf, buffalograss, marine couch and prickly couch were the least drought sensitive with a relative dry matter production (dry value/wet value) of 0.85 or greater (equivalent to a 15 per cent reduction or less in growth).

Tifgreen and Windsor Green were the most sensitive with a relative dry matter production of 0.6 (equivalent to a 40 per cent reduction in growth) followed by carpetgrass, blue couch, sweet smother and Japanese lawngrass (dry value/wet value of 0.7 or a 30 per cent reduction in growth).

Sweet smother, carpetgrass, Windsor Green and bahiagrass were relatively less drought tolerant (score of 3 or 4 for drought tolerance out of 9); blue couch, Indian bluegrass, Brunswick grass, Japanese lawngrass, Plateau, Tifgreen, kangaroo grass and spiny mudgrass

were intermediate (score of 5 or 6); while Greenlees Park, Wintergreen, Legend, Tifdwarf, buffalograss, marine couch and prickly couch (native zoysia) were more drought tolerant (score of 7 or 8).

Total water use for buffalograss during a 12-day drought in summer was 47mm or 4mm per day. During the first few days of the experiment, the crop co-efficient, kc (ETc/ETo) or relative water use was 1.4-1.6, indicating that plant water use (ETc) was greater than potential evapotranspiration (ETo) estimated by the weather data. In other words, the turf was over-watered.

At the end of the experiment, plant water use was only 50 per cent of potential evapotranspiration. A similar analysis in blue couch showed that kc declined from 1.2 in wet soil on day one to 0.2 in dry soil on day 12. This species had lower relative water use than buffalograss under both irrigation and drought.

Droughted plants had lower relative leaf water contents (RWCs) and higher leaf temperatures towards the end of the experiments. This is because water evaporates from the leaf surface and cools the plant.

Differences in water content between the well-watered and droughted plants did not translate into large differences in canopy height (see above). In other words, shoot extension was not affected by the drought until the plants wilted.

In the pot experiments, plant water use declined when the grasses had used about 30 per cent of the water available in the sand. This value extended to 50 per cent in a clay loam in the field (see Figure 1).

### Implications

The results show that there would be difficulties growing most of the species in dry areas in northern Australia, without supplementary watering. Broad-leaf carpetgrass and sweet smother were relatively drought sensitive, while marine and sand couch were relatively drought tolerant. Bermudagrass, blue couch and buffalograss were intermediate.

The grasses growing in sand with well-developed roots did not show symptoms of drought for two to three weeks in summer and for four to six weeks in winter.

Average water use ranged from 1-2mm per day during the cooler months to 3-4mm per day during summer. Most of the species extracted soil water to 75 cm or below in the sand (pot experiments) or clay loam (field experiments). There was no loss of turf quality with a long irrigation cycle (weekly), suggesting that many turf managers are over-watering.

Water use varied by a factor of two with the different species and irrigation cycles, indicating potential savings to park managers. ■

	Days to wilt and turn brown		Relative water content (%)		Difference between leaf and air temperature (°C)		Relative canopy height (dry/wet)	Relative dry matter production (dry/wet)
	Winter	Summer	Wet	Dry	Wet	Dry		
Brunswick grass	12-14	34-39	95	76	-0.3	7.1	0.90	0.79
Bermudagrass	13-17	39-45	91	71	0.2	6.3	1.07	1.19
Buffalograss	13-18	39-45	95	80	-1.5	6.1	0.99	0.92
Common blue couch	15-18	>45	95	70	1.0	5.2	1.08	0.74
'Aussieblue'	14-19	>45	93	64	0.4	11.4	-	-
Marine couch	13-19	>45	89	68	5.1	11.0	1.06	1.14

Table 1. The effects of drought on tropical grasses at Cleveland. Relative canopy height is final height of dry plants/final height of wet plants. Relative dry matter production is daily dry matter production of the dry plants/daily dry matter production of the wet plants.

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# Australian National Turfgrass Evaluation Program (ANTEP)



MICHAEL ROBINSON



The tall fescue plots at Government House in Canberra. The trials include examining the performance of tall fescue under dryland conditions.

Michael Robinson from SportsTurf Consultants outlines two research projects the organisation is conducting.



Horticulture Australia

**T**all fescue (*Festuca arundinacea*) is one of the most drought tolerant cool-season turfgrasses available and is used in sportsfields, racetracks, passive recreational areas, home lawns and is also an important component of seed mixes. It is primarily grown along the south eastern seaboard of Australia (South Australia, Tasmania, Victoria and the lower half of New South Wales).

The ANTEP tall fescue trial is following a similar protocol to the perennial ryegrass trials which concluded in December 2000 (see Australian Turfgrass Management, Vol 3.1 - Feb/Mar 2001) but is also examining the performance of tall fescue under dryland conditions.

The two trial sites are located at Government House in Canberra and Chisholm TAFE at Rosebud on Victoria's Mornington Peninsula. There are 22 tall fescue varieties (including Demeter tall fescue) under trial. For comparison purposes four fine fescue varieties (Victory II Chewings fescue, Spartan hard fescue, Jasper creeping red fescue and Azay sheep fescue) and Victorian perennial ryegrass have been included.

At each trial site there are 432 plots under evaluation (27 turfgrasses, by two mowing heights by two irrigation regimes by four replicates).

Trial maintenance is based on a low to moderate level of nutrition and there are two mowing height treatments, 20mm and 40mm. The irrigated

trial is irrigated to prevent wilt and the dryland trial was only irrigated during establishment.

The trials were set up in 2002 and were assessed during establishment for seedling vigour and rate of cover. Once full cover was attained quarterly assessment of colour, density, shredding and seasonal growth commenced. Full sward assessments are undertaken for a period of two years and the trial will finish early next year.

Full results will be available on the Seed Industry Association of Australia's web site ([www.sia.asn.au](http://www.sia.asn.au)) after the two years of assessment are completed. Field days are planned for both sites later in this year.

This trial is funded by the Seed Industry Association of Australia with matching funds provided by Horticulture Australia Limited.

## Rhizoctonia Control Project

The Victorian Greenkeepers Association, in conjunction with Sport Victoria, commissioned a research project to investigate the incidence and control of Rhizoctonia patch in bentgrass bowling greens. This disease has been shown to be a significant problem in the preparation and provision of fast-running bowling surfaces.

The project has involved surveying Victorian greenkeepers to establish the nature of their greens in terms of soil type, grass type, incidence of disease, cultural procedures used in maintaining the greens and success or otherwise in controlling the disease.

Two field trials have been conducted to determine the efficacy of chemical control. One trial investigated the use of a range of fungicides as a curative application, while the second trial investigated the use of fungicides as a preventative application at renovation of the green.

Final assessment and reporting is in progress. ■

## TRANSITIONAL RYEGRASS TRIALS

**D**avid Nickson, together with the TGAA Victoria and the City of Dandenong, is in the process of conducting a 12 month trial of transitional ryegrasses in Melbourne.

Couch and kikuyu will be the base grasses as it is anticipated that there will be different results from each species.

Three or four transitional ryegrasses – a turf type perennial ryegrass selected from the recent AUSTEP trial, a semi-pasture type ryegrass and possibly an annual type ryegrass will constitute the treatments as

well as a non-overseeded control. Each plot measures 4x2m with four replicates set out on a randomised block design.

The plots were established at a time that gave the ryegrass a chance to establish before subjected to winter sport wear.

At the end of the winter sport season, Nickson will spray out half of each plot and monitor and measure the couch and kikuyu cover in each treatment and also record the time it takes for each treatment to reach 90-100 per cent cover from the warm-season grass.

The remaining overseeded areas will be monitored to determine if the transitional grasses thin out and, if so, by how much. During late summer it is envisaged the remainder of the plots will be sprayed and warm-season grass coverage recorded compared to the sections sprayed earlier and the control plot.

Nickson is also hoping to start a grass variety trial for racing in southern Victoria over the next couple of months. Nickson was also heavily involved in research with Phillip Ford into the use of entomopathogenic nematodes for the control of Winter Corby grubs and the VGA turf trials (See Ford's report on Page 10-11). ■





# LOWARA

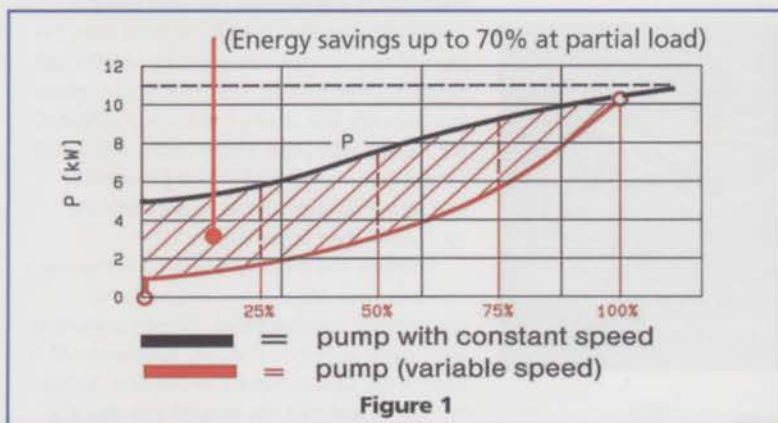


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# Effects of Elevated Salt Concentration on Growth and Development of Marine Couch

University of Melbourne's Dr David Aldous outlines his research into comparing the growth responses of four marine couch grass accessions from southeast Queensland to elevated salt concentrations.

Increasingly, golf course architects and superintendents are called on to design and manage saline environments particularly when in association with new course and sports field development.

In addition there has been an increasing need to make better use of alternative water sources (effluent, waste, recycled, grey) in establishing and managing grassed areas (3,6,7). In recent years there has also been an increasing interest in the use of salt-tolerant grasses for many sport and recreation areas (3,9).

Three coastal zone grasses that have shown promise, particularly under northern Australian conditions, include *Paspalum vaginatum* Swartz. (Seashore paspalum), *Zoysia macrantha* Willd. (Prickly couch), and *Sporobolus virginicus* (L.) Kunth (marine couch) (4,7). Seashore paspalum and marine couch have been observed growing under extreme saline environments with an electrical conductivity ( $EC_e$ ) between 25-50  $dS.m^{-1}$  (1). Salt water has an  $EC_e$  between 43-54  $dS.m^{-1}$  or ~32,000 ppm of dissolved salts (3).

Coastal sand dunes, mudflats and salt marshes are the principal natural habitats of marine couch around Australia (4) and the plant has demonstrated considerable morphological plasticity in adapting to elevated salt concentrations (2,13).

The objective of this greenhouse investigation was to compare the more significant growth responses of four marine couch grass accessions from southeast Queensland to elevated salt concentrations.

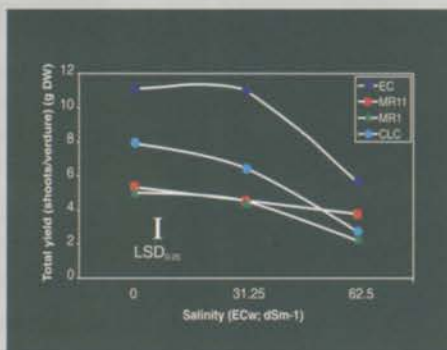


Figure 1. Total yield (shoots/verdure)

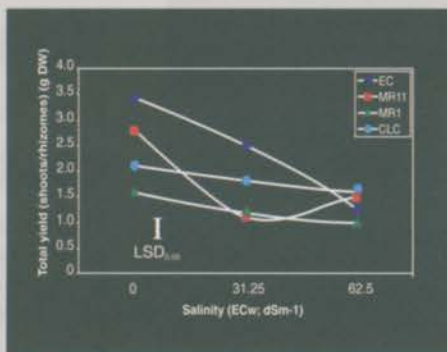


Figure 2. Total yield (shoots/rhizomes)

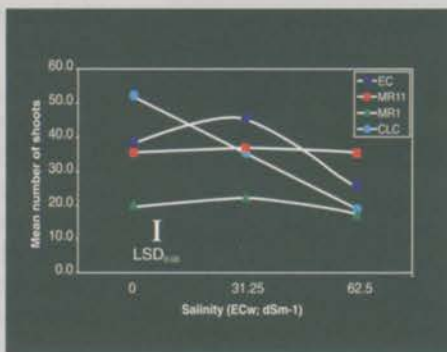


Figure 3. Mean number of shoots

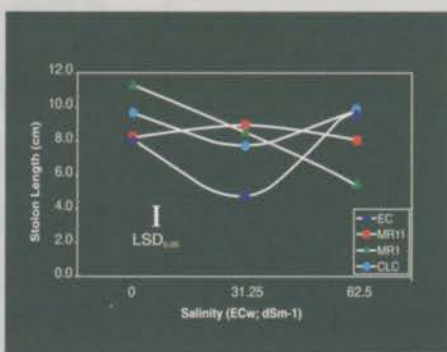


Figure 4. Stolon length

## Materials and Methods

Four accessions of marine couch were collected from three coastal habitats in southeast Queensland:

- Coombabah Lake Catchment (CLC) on the Gold Coast, a region of high salinity;
- Mooloolah River (MR1 and MR11) on the Sunshine Coast, a region of medium salinity;
- Eli Creek (EC) on Frazer Island, a region of low salinity.

marine couch sprigs were grown in plastic containers for five weeks in a greenhouse. These containers were then placed onto a felt pad and sub-irrigated with saline treatments of 0, 31.25 and 62.5  $dS.m^{-1}$  ( $EC_e$ ) for 14 weeks.

The experimental design was a randomised complete block of three treatments and four replications. On the 31st, 63rd and 95th day measurements were taken on stolon length, tiller and leaf number. At the conclusion of the project total dry weight of leaf, verdure (crown included), roots, rhizomes, and plant height were taken.

## Results and Discussion

Total plant dry weight of all accessions was negatively correlated with elevated salinity treatments. Increasing tolerance to these elevated salt concentrations ranged from the EC and CLC accessions through to the MR accessions.

The research confirmed the work of Naidoo and colleagues (10) that concentrations of 20-80 per cent seawater would significantly reduce total biomass and growth of roots and shoots of marine couch.

This work suggests that the growth of marine couch can be sustained at salt concentrations of 31.25  $dS.m^{-1}$ , with growth commencing to decline at ~40.00  $dS.m^{-1}$  and rapid decline occurring at a salt concentration of 62.5  $dS.m^{-1}$ .

Results also confirm the work of Naidoo and Naidoo (11) and Rozema (12) that found a relationship between the salt secreted from the grass at low to moderate salinities, and the salt solution of the habitat. The EC accession grows in a naturally low salinity habitat and exhibited the highest total plant weight, while MR 1, MR 11 and CLC were found growing in medium and strong salinity habitats respectively and total yields were lower (Figure 1).

Rhizome and root dry weights and rhizome numbers were negatively correlated with elevated salt concentrations. When comparisons were made with their controls, accessions MR 1 and 11 and CLC showed a 26 per cent decline in rhizome and root dry weights and only a 3



per cent decline with the ER accession at the 31.25 dS.m<sup>-1</sup> salt concentration. At 62.5 dS.m<sup>-1</sup>, all accessions recorded a decline in rhizome and root dry weights (Figure 2).

Figure 3 shows that, with the exception of the CLC accession, mean shoot numbers were sustainable at a 31.25 dS.m<sup>-1</sup> salt concentration, but declined when the accessions were grown in solutions maintained at 62.5 dS.m<sup>-1</sup>.

All accessions recorded an improvement in stolon length (Figure 4), as well as leaf emergence and tiller number after 31 days at 31.25 dS.m<sup>-1</sup>, but recorded reduced growth in these growth characteristics at the higher salt concentration. There was a lack of significance in both these growth characteristics after 63 and 95 days.

### Conclusions

Considerable potential exists in selecting appropriate *Sporobolus* R.Br. accessions for use in salt affected turf areas, or where recycled water is to be used as an irrigation source. Accessions from low salinity habitats such as Eli Creek (EC) were sustainable at 31.25 dS.m<sup>-1</sup> salt concentration, whereas accessions originating from medium (Mooloolah River, MR1 and 2)

and high (Coomabah Lake Catchment, CLC) salinity habitats had lower yield data.

Results indicate that total yield of shoots and verdure, roots and rhizomes, as well as tiller number, stolon length, new leaf growth and plant height for all accessions were sustainable at salinity levels of 31.25 dS.m<sup>-1</sup>. However salinity levels of 62.5 dS.m<sup>-1</sup> do not appear to be conducive for growth and development.

Characteristics exhibited by marine couch growing under elevated salt concentrations are a lowered shoot and rhizome/root dry weight, reduced numbers of rhizomes, an increase in plant height, and the presence of salt secreted onto the leaf surface.

### Acknowledgements

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# VGA Lawn Bowls Surfaces Study



The newly constructed surfaces at the Darebin Bowling Club which will host lawn bowls at the 2006 Commonwealth Games

With the rise in popularity of synthetic surfaces, the VGA recently conducted a major survey of lawn bowl surfaces in Victoria. ATM looks at the main findings of this wide-ranging project.

On February 18 at the Bentleigh Bowling Club, the Victorian Greenkeepers' Association (VGA) launched its long-awaited study into lawn bowls surfaces in Victoria. With funding from Sport and Recreation Victoria, the project report released concerns and issues regarding lawn bowls surfaces and the benefits of each, including:

- Lifetime cost analysis of natural and synthetic greens (costs of construction of new natural turf and synthetic greens and resurfacing; cost of maintenance of synthetic greens compared to maintenance expectations)
- Life expectancy and depreciation of natural turf and synthetic greens.
- Construction and maintenance of natural turf and synthetic greens.
- Preferred surface underlay of synthetic greens.
- Type of surface preferred by bowlers in various age groups.
- Number of days (on average) a synthetic green and natural turf green can be used.
- Good practice models for clubs with more than one bowls green regarding maintenance, usage, and types of greens.
- Provision of access and usage issues for people with a disability on natural turf and synthetic greens.
- Issues of concern regarding safety/vandalism for natural turf and synthetic greens.

- Benefits of alternative types of natural turf not currently used in Victoria.
- Chemical use on natural turf and synthetic greens and long-term environmental impact.
- Use of recycled water on natural turf and synthetic greens.

As part of the project 100 greenkeepers, 300 bowlers, and 50 club secretaries throughout Victoria were interviewed as well as suppliers of synthetic bowls surfaces.

## CONCLUSIONS & RECOMMENDATIONS

There are a total of 543 bowls clubs registered with the Royal Victorian Bowls Association and these clubs have a total of 1017 greens (687 country, 330 metropolitan). The majority (852 or 83 per cent) of greens are natural turf and 165 (17 per cent) are synthetic.

### Distribution of Synthetic Greens

Climate appears to play a role in whether clubs have synthetic surfaces with more than 95 per cent of greens being turf north of the Great Dividing Range.

### Player Preferences

Eighty five per cent of bowlers prefer to play on natural turf. While the quality of newer synthetic greens is better than even five years ago, surface hardness of synthetic greens is a big issue, as is glare and heat.

Players also mentioned a number of other issues they have with synthetics, although many of these reflect older products or perhaps greens that may have been poorly laid or maintained. These issues include sand (too high) scratching bowls, susceptibility to tracking and playing oddities such as 'straighteners', variable draw and pace.

### Management of Greens

The report found that there are a number of issues related to clubs moving to and managing synthetic greens. These include:

- Many clubs have moved to a synthetic surface primarily because they could obtain assistance to do so, but can't for the restoration of natural turf greens.
- A number of small clubs go to synthetic surfaces for the wrong reasons due to desperation and use all available cash when this may not be viable in the longer term.
- There is a major lack of information and advice about maintenance of synthetic greens and perhaps about new base construction techniques and species, and managing turf for the long term.
- Issues related to the number of greens clubs have, the number of members and club management, are key issues exacerbated by a change of green surface
- The technology in synthetics is increasing which is leading to better quality surfaces that will be easier and more cost effective to maintain.
- There appears to be a considerable variation in the advice provided to clubs about maintenance requirements and no suppliers provide standard maintenance regimes with product specifications.
- More research and more rigour is needed in maintaining synthetic greens to ensure the quality of surfaces are maintained. There seems to be a lack of information and expertise among clubs and greenkeepers in maintaining synthetic surfaces, and this needs to be addressed.

The report recommended that clubs should ensure they have an endorsed maintenance schedule from suppliers for their synthetic surface before accepting a quote, or plan to pay for a buy-in service to ensure the product is maintained to manufacturer's specifications. The VGA could also work with the industry to provide training for its members in the maintenance of synthetic bowling greens.



It also suggested the RVBA and the VGA could work with suppliers to develop some basic principles concerning management of synthetic greens for each club, as well as a checklist of things to ask a supplier, budget for works and the like.

#### Costs

- Synthetic greens are not maintenance free, as many clubs expect. However, they may be cheaper to maintain than a natural turf green if human resources are limited and clubs have personnel with skills to do it themselves.
- Synthetic greens are more expensive to install and replace and will not be viable for many clubs.
- Overall the probable costs of natural turf and synthetic greens are likely to be much the same over a 10 or 20-year life cycle.
- The cost in the order of \$20-30,000 pa that clubs with a synthetic green would have to raise is substantial.
- Clubs need to address costs, average player age etc. Surfaces are not a solution to poor financial and turf management.

Recommendations regarding costs included councils and the RVBA helping clubs with financial and business planning and ensuring that prior to resurfacing works a plan is in place to address the cost of surface replacement.

#### Greenkeeping Expertise

The quality of the club's greenkeeper is likely to directly correlate with the quality and longevity of the both a natural turf and synthetic surface. Clubs need to invest in more strategic turf management advice, but feel that they can't afford to. Many clubs are not in the best position to make strategic decisions about greens resurfacing, development or management.

The report's recommendations included that clubs should be encouraged to call on the services of a trained greenkeeper if only for strategic advice or to contract such a service on an "as needs" basis.

It also commented that the VGA should address the low level of professional guidance sought by many clubs, through marketing, and by providing more cost benefit information about such advice.

#### The Installation and Performance of Synthetic Greens

There appears to be a considerable variation in the quality of installation and the performance of synthetic surfaces (as there is with natural turf). There are no Australian standards concerning the manufacture, installation and performance of synthetic green products.

The RVBA should encourage clubs that have multiple greens, not to have a synthetic green unless they have a sound membership base, and a financial plan that shows they can raise at least \$30,000 per annum.

Bowls Australia and the RVBA should investigate the development of a set of standards for the installation and performance of synthetic greens that can be benchmarked against standards worldwide.

A full report on this project, comprising the 52-page Lawn Bowls Surfaces Study: Issues and Actions document and the 77-page Appendices can be downloaded from the Victorian Government's sports and recreation website: [www.sport.vic.gov.au](http://www.sport.vic.gov.au)

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**TransEze** Ryegrass in Kikuyu fourteen days after sowing.

**TransEze** Ryegrass oversown into couchgrass. Pymble Golf Club, NSW.

Natural transition of **TransEze** in Kikuyu. Oct 2002.

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# Turf Research at Queensland's Redlands Park



Shade tolerance of different grasses grown under 50 per cent sunlight at the Redlands turf research facility

**Dr Don Loch from the Redlands Park Turf Research Group provides a snapshot of the facility's ongoing research work.**

In the short period since moving into turf, Redlands researchers have built up a strong portfolio of projects. Prior to September 2003, a number of major projects received matching funding from Horticulture Australia Limited (HAL). However, with the subsequent hiatus on HAL funding of voluntary contributor projects in turf and other non-levy horticultural industries, there is now greater emphasis on developing contract research projects with full cost recovery. Some form of industry research levy would seem essential if turf research is to continue to advance strongly in Australia.

## GENETIC IMPROVEMENT

Genetic improvement is a core activity in the Redlands research program, which in time will include the breeding of new varieties supported by DNA analysis, tissue culture and other modern laboratory techniques.

Initially, however, the priority has been to assess the current range of cultivars and how well these meet the needs of Queensland and Australian turf managers.

## Redlands Turfgrass Collection

One of our first steps at Redlands was to develop a comprehensive collection of warm-season turfgrass cultivars. A maximum of 138 different vegetative and seeded warm-season turfgrass varieties can now be accommodated in unreplicated demonstration plots.

The Redlands collection also contributes to research and education elsewhere in Australia. For example, a subset of green couch (*Cynodon dactylon*) and zoysia (*Zoysia japonica*, *Z. matrella*) varieties have been provided for a collaborative project with the Northern Melbourne Institute of TAFE and the Victorian Golf Association to evaluate these new grasses at Metropolitan Golf Club.

## Breeding

The considerable amount of 'spade work' already done in the area of genetic improvement is finally leading to the development of a three-way collaborative turf breeding program involving the University of Queensland (Dr Chris Lambides), QABC and Redlands Park.

## PHYSIOLOGY AND MANAGEMENT

A major research focus in the Redlands program has been the adaptation and management of warm-season turfgrasses: how the different species and cultivars respond to environmental and user-related stresses including water, salinity, shade, temperature, nutrition, wear, and chemical use.

## Salt-Affected Sites

The use of salt-tolerant turfgrasses has been a major focus in two projects, the first looking at re-vegetation of a bare eroded roadside site with the Queensland Department of Main Roads on the Sunshine Coast. Despite high salt levels (up to 22.5 dS m<sup>-2</sup>) and high acidity (pH 3.4-5.2) in the soil, seashore paspalum (*Paspalum vaginatum* – both Sea Isle 1 and Sea Isle 2000) established and thrived once soil fertility was improved.

To date, seashore paspalum has also been the main salt-tolerant species used in a second project 'Amenity Grasses for Salt-Affected Parks in Coastal Australia', which is funded by HAL and Redland Shire Council.

We are also trialling marine couch (*Sporobolus virginicus*), which appears to be even more tolerant of salinity, waterlogging and drought than the seashore paspalums, and future trials should include saltgrass (*Distichlis spicata*) as well.

In other trials, we have found that seashore paspalum and marine couch will grow well with little or no topsoil over the compacted mud profile – a few centimetres at most compared with at least 10cm of topsoil for green couch, blue couch, kikuyu, and buffalo grass.

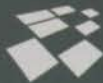
Because of the variation in salt levels in the field, we are also characterising the relative salt tolerance of a wider range of turfgrasses in a series of glasshouse screening experiments, starting with the most salt tolerant species and working progressively through less tolerant species in future runs. In each experiment, plants are being subjected to six levels of salt in hydroponic solution from zero up to a maximum of 40 dS m<sup>-1</sup>.

## Soil Fertility

Different turfgrasses vary considerably in level of fertility required to maintain them in acceptable condition, but all require more than is currently applied to many areas of public open space.

Under the salt-affected parks project, an experiment with eight different turfgrasses has been established to determine minimum maintenance fertiliser requirements for low level parks and for high profile parks.





Salt-affected Sunshine Coast site 16 weeks after planting Sea Isle 2000 seashore paspalum. The site was bare prior to planting

### Chemical Tolerance and Use

Redlands Park manages a chemical phytotoxicity testing site with commercial partners Nuturf and Bayer Environmental Science under the HAL-funded project 'Chemical Phytotoxicity Testing Facility for Warm-season Turfgrasses'.

The aim is to assist in the registration of new chemicals for turf use by generating supporting data on possible phytotoxic effects across a representative range of 28 warm-season cultivars from 16 turfgrass species in replicated plots.

Since mid-2002 when it was first established, the Redlands Park site has contributed to the registration of a number of turf herbicides and fungicides now on the Australian market. These include:

- Bayer's Spearhead herbicide, Verdant herbicide, and Rovral GT fungicide; and
- Nuturf Millennium herbicide, Monument herbicide, Heritage fungicide, and Subdue Pro fungicide.

### Turf Diseases

Although we do not currently have a dedicated turf disease project, diseases seen in the various research and variety plots at Redlands Park and on community sports grounds across southeast Queensland are monitored by plant pathologist Kaylene Bransgrove.

Symptoms and fungi isolated from diseased turf are compared with records in the literature and in the Queensland fungal herbarium. The next step will be to inoculate warm-season turf varieties with known and suspected pathogens to investigate their pathogenicity and disease symptoms under Queensland conditions.

### SPORTSTURF MANAGEMENT

#### Greens Grass Management

The range of new putting green grasses now reaching the Australian market is creating a predictable mixture of interest, excitement, confusion and consternation because nothing is known of their performance and requirements under Australian conditions.

In conjunction with the AGCSA, Redlands Park is initiating a project to assess the adaptation and management requirements of the range of new generation hybrid green couches and seashore paspalums.

This will involve two-way communication (coordinated by John Neylan) between researchers carrying out formal experiments on a test green on Redlands Park and superintendents managing replicated plots of the same grasses according to their own ideas on golf courses from Melbourne through to Cairns.

### FUTURE RESEARCH DIRECTIONS

The turf industry and its component sectors must identify their needs and set clear priorities if future research is to remain relevant. But in the final analysis, it is the availability (and unavailability) of funds that will dictate which of those competing needs can actually be addressed. Scientific research these days is a business like any other – it will go where the money is.

Research priorities without the necessary funding support to be able to address them are nothing more than a wish list. The current challenge to all sectors of the turf industry is to develop long-term funding streams to support a growing capacity for Australian-based research as is now standard in more mature industries like wheat, beef, and wool. 🐾

### ACKNOWLEDGEMENTS

Dr Don Loch is turf research leader at Redlands Park and can be contacted on (07) 3286 1488 or [Donald.Loch@dpi.qld.gov.au](mailto:Donald.Loch@dpi.qld.gov.au).



The stormwater sampler at Manly Golf Club

### STORMWATER RESEARCH AT MANLY GOLF CLUB

By Bruce Simmons

A new national Cooperative Research Centre for Irrigation Futures (CRCIF) has been created to help save Australia's water resources. As a part of this

national research centre, the University of Western Sydney (UWS) will lead a key research venture to investigate efficient urban irrigation and the many possibilities of urban, industrial and rural communities sharing and re-using water.

UWS is combining with Manly Golf Club (superintendent Michael Bradbery) and Manly Council to research the sustainable use of harvested stormwater for groundwater recharge and irrigation onto the course.

This will have application for the more than 1500 golf courses throughout Australia, as many of these, particularly in urban areas, rely fully or partially on potable water supplies for irrigation of fairways and greens.

The project will also investigate the practices required to restore and sustain the local hydrology such that irrigation needs and environmental goals are met. UWS will investigate the potential for all urban golf courses to 'live within' their own hydrological

cycle thus contributing to the reduction of competition between urban supplies and peri-urban agriculture.

The main activities over the next three years will be:

- Developing an understanding of ground water resources in the area for quality and capacity for supply;
- Evaluating stormwater quality and quality for irrigation and groundwater recharge;
- Understanding (in concert with engineering designers) requirements for stormwater capture, storage and use for irrigation;
- Investigating water requirements for local wetland ecology and environmental flows;
- Developing a suitable decision support system and guidelines for best practices in the use of stormwater for golf course irrigation.



## ASSOCIATE PROFESSOR PETER MARTIN



Progeny testing advanced lines of brown top bentgrass. Mated with the same male parents, line 243 has given vigorous offspring (left) while the offspring of line 331 (right) are variable and weak

### Peter Martin outlines turf research initiatives at the University of Sydney's Plant Breeding Institute at Camden.

In 2001 the University of Sydney's turf research group relocated from cramped quarters on the main campus in the inner city to the university's Plant Breeding Institute at Camden, about 80km southwest of the Sydney CBD.

In a rural location with extensive laboratory, greenhouse and field facilities, the institute offers an ideal setting for research into breeding and cultural management of turf.

There are numerous turf farms in the Camden district as well as a wide range of turf based sporting facilities with whom the institute maintains regular contact and undertakes co-operative research.

The environmentally sensitive Nepean River flows through the institute's land, which helps to keep us focussed on one of our major breeding aims of developing turfgrasses with reduced requirements for water, pesticides and fertilisers.

The graduate turf management programme, which offers a graduate Diploma and a Master's degree in turf management by a combination of external studies and block attendance, also relocated to Camden.

In the second year of their course students carry out a research investigation and write a thesis. Research done in this way greatly extends the range of turf topics in the institute's research programme and also provides a geographic spread which we could not otherwise afford.

Graduates of the turf program have recently formed, with the approval of the vice-chancellor, a Sydney University Turf Management Alumni Association, with Robert Cooper as foundation president.

#### STAFF RESEARCH

The staff research programme is conducted on a full-time basis by the professional staff and

full-time doctoral (PhD) research scholars, assisted by technical and field staffs.

Within the institute's Amenity Horticulture Group, turf research comprises the newest but most rapidly expanding research area.

Closely related to the turf area is the institute's program on landscape grasses and grass-like plants.

Turf breeding activity from 2001 to 2003 concentrated on the bentgrasses (*Agrostis* spp.), with advanced selections being made in brown top and creeping bentgrasses for the parental lines of new 'synthetic' cultivars which should be ready for release to the seed-increase growers in two or three years.

Work continued on the identification of superior lines in ecotypic populations of the lowland Australian native bents and in some introduced and local types of red fescue (*Festuca rubra*).

Other turf investigations included continuation of the work on the causes of varietal differences in the phosphorus requirement and the efficiency of phosphorus acquisition in bentgrass and couchgrass (*Cynodon dactylon*), expansion in the number of salt-tolerant lines of several species in the germplasm collection and a significant expansion of the kikuyu (*Pennisetum clandestinum*) collection as a prelude to major investigations in that species in 2004-2006. Fieldwork on local turf farms on sustainability issues such as phosphorus and salinity management has also been launched.

The institute's work on landscape grasses and grass-like plants has generated interest among many visiting golf course superintendents seeking to develop more natural looking areas to set off their closely clipped turf.

Current work is centred on the tall ornamental species of *Poa* and *Lomandra*, the primary aim being to develop economical and efficient methods of vegetative mass-reproduction of superior forms arising from our breeding programmes. Industry interest in this area is strong and an expansion of the number of species being worked with is imminent.

#### STUDENT RESEARCH

There is insufficient space to enumerate in detail the 18 investigations undertaken by students in the course in the period 2001-2003, but the following grouping by topics will give a fair idea of the scope of this work.

##### Cultural practices

Timing of renovation; The effect of verti-draining on root growth; Management of ultra-dwarf couches; Propane flame method of weed control.

##### Growth regulators

Primo and alternative growth regulators as management tools for kikuyu in golf and horse racing.

##### Nutritional and pesticide programmes

Assessing sustainability of pesticide programs by monitoring soil biology; Sustainability of nutritional programs monitored by soil biology; Nitrogen and phosphorus responses of bentgrass; Iron and manganese deficiency in *C<sup>+</sup>* grasses.

##### Thatch management

Varietal factors; Nutritional factors; Topdressing practices.

##### Salinity management

Survey methods; Effects of saline inundation.

##### Breeding and Cytology

Ploidy levels in bentgrass accessions; Alternative species studies.

#### CONCLUSION

Turf research at the University of Sydney is characterised by a concentration of effort on a few major projects at the staff level and by a great diversity of topics in the student research program.

In the past relatively little of the turf research done at the university has been published. A high priority for the next few years will be the dissemination of the findings of this considerable body of work through both formal scientific publication and contributions to conferences and industry magazines. ▀





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# Shifting Sands –

## A Spotlight on Western Australian Golf Course Projects

### COTTESLOE GOLF CLUB

**Project:** Ongoing course reconstruction

**Superintendent:** Alan Redmayne

**Location:** Swanbourne, Perth

**Time Period:** 1998-2008

#### Comments:

During its recent history Cottesloe has been subject to several alterations and in 1980 Thomson, Wolveridge and Perrett were commissioned to carry out major alterations brought about by the reclaiming of land by the State Government on two of the club's boundaries.

Wanting to get away from ad hoc design, in November 1994 Graham Marsh was appointed course architect and commissioned to prepare a course master plan. The plan was approved in 1998 and the club immediately began construction with a view to the improvements being completed in time for the club's centenary in 2008.

The summer of 2003/04 was pretty quiet for superintendent Alan Redmayne and his staff compared to previous years which has seen the reconstruction of eight holes – 1, 9, 10, 11, 14, 16, 17 and 18.

Next summer will be a different kettle of fish with a number of holes undergoing major reconstruction work. At the time of publication Redmayne was uncertain which holes they would be.

During the summer months Redmayne rebuilt the putting and chipping greens while the first tee and surrounds were reshaped and returfed.

As an aside, Cottesloe ranked 73rd in the Top 100 Australian Golf Courses list released by Australian Golf Digest magazine in March. ♣

### HARTFIELD COUNTRY CLUB

**Project:** Hole reconstruction, winter planting

**Superintendent:** Tim Chape

**Location:** Forrestfield, Perth

**Time Period:** December 2003 – March 2004

#### Comments:

Located in the Perth foothills in the shadow of the Darling Ranges, Hartfield Country Club superintendent Tim Chape is gradually working through a course master plan which will see the reconstruction of a number of holes.

The past summer saw the complete reconstruction of the troublesome par 3 12th which carried a number of safety issues and problems with grass encroachment on the green.

The existing 12th green was very close to the 13th tee and in recent years had become a serious safety issue with a number of golfers on the 13th tee becoming unsuspecting victims of wayward tee shots from the 12th.

Grass encroachment on the green had also progressively worsened, so much so that when the old green was removed it measured just 220 square metres.

Working with newly acquired architect Michael Coate and Trevor Strachan, the new green was constructed 10m to the right of the existing green, which not only eliminated any safety concerns but also improved light filtration to the green from the overhanging canopy.

The new green, which is now a much healthier 500sqm, was seeded with Putter bentgrass, which has proved successful on several greens, while the small fairway was stolonised with Santa ana in February/March.

With the green now a generous size, greenside bunkering has been bumped up with three large bunkers constructed to take the total number to four. Bunker perimeters were solid turfed.

As a result the new hole is a lot tougher and has been modelled on one of the par 3s at Melbourne's Kingston Heath.

The hole was also fitted with a new irrigation system with Rainbird 750 valve-in-head sprinklers installed on both the green and fairway. Incidentally, it is the first fairway on the course to boast valve-in-head sprinklers.

The works are part of an overall master plan for the club agreed to five years ago and depending on finances at least another green, possibly two, will be reconstructed come the 2004/05 summer.

"We're looking at the older greens, the ones with safety and size issues," says Chape. "Next year we're hoping to start work on the 3rd."

Chape has been able to cut costs considerably from previous reconstruction programs, reducing the budget from around \$50,000 to just over \$30,000. This was achieved by doing most of the work in-house and utilising the services of a member who gave the club use of heavy machinery free of charge.

As part of the works already completed, Chape and his staff have also extensively pruned and removed a number of trees on the course and last winter planted a mammoth 2700 tress (sheoaks, banksias) as part of the Western Australia Government's Bush Forever program. This winter a further 1000 trees will be planted on site. ♣

### NEDLANDS GOLF CLUB

**Project:** Bunker construction

**Superintendent:** Bill Kilmurray

**Location:** Nedlands/Dalkeith, Perth

#### Comments:

After instituting a major bunker renovation project in the 1990s, Nedlands superintendent Bill Kilmurray has been at it again, constructing five new fairway bunkers on the unique nine-hole course. Despite having nine holes, the course boasts 18 tees and is situated in one of the oldest suburbs in Perth.

New bunkers were constructed on the 2nd, 4th and 9th last summer, while the two practice putters adjacent to the clubhouse were merged to form one large green and the first tee was taken back 15 metres.

"We've gone to natural sands (in the bunkers) and I would say we've got more bunkers in nine holes than most 18-hole courses do," says Kilmurray. "The par 5 2nd now boasts nine."

Kilmurray is also in the process of winding down an extensive kikuyu eradication program which has reduced kikuyu in the

native couch fairways from 70 per cent to less than five per cent over the past six years.

Superintendent at Nedlands since 1975, Kilmurray, is now looking ahead to next summer and is hopeful of starting work on a new 4th green which is currently being redesigned by Michael Coate. ♣



**PORT BOUVARD GOLF COURSE**

**Project:** Construction of a new 18-hole golf course

**Superintendent:** Darryl Outhwaite

**Location:** Port Bouvard

**Approximate Cost:** \$9.5 million

**Comments:**

Part of huge residential development on the coast near Mandurah, the Port Bouvard golf course is half completed and construction of the second nine was due to start in late February/early March.

Trevor Strachan, superintendent at Lake Karrinyup Golf Club has been involved in this project for the past four years as project manager, while Darryl Outhwaite has recently taken over as construction superintendent following the departure of Geoff Osbourne in February.

On the drawing board as far back as 12 years ago, the course was only given the go ahead after extensive environmental research was carried out due to its location on the Indian Ocean coast and proximity to

the Dawesville Channel, Peel Inlet and Harvey Estuary.

Costing \$7 million to build, with a further \$2.5 million set aside for the clubhouse development, construction of the first nine began in January 2003 and if all goes to plan with the second nine, Strachan envisages an opening time of autumn 2005. The completion of the second nine is expected to coincide with the finish of the clubhouse.

Designed by Jim Wilcher from NSW-based Golf By Design, the course is located on the Southport development. The overall Port Bouvard development is divided into three sections – Northport, Eastport and Southport.

The front nine weaves its way through part of the Southport residential development, meaning an extensive revegetation program is also being undertaken, while the back nine is situated within dense bushland. All wintergreen couch fairways on the front nine were solid turfed while the tees are Santa ana.

The biggest issue confronted to date has been the germination of the L93 bentgrass

greens, a problem exacerbated through the use of on-site bore water which has an extremely high salt content (2000 parts per million).

Strachan says that the salinity of the bore water was known at the time construction commenced, however, treated effluent from a nearby wastewater plant which was supposed to be available has not come on line.

The plan was to 'shandy' the treated effluent and bore water, which will still go ahead once an \$8 million upgrade of the treatment facility has been carried out.

To remedy the problem, then-superintendent Osbourne overseeded one of the greens with seashore paspalum.

Such has been the success of the salt-tolerant strain, Strachan says they will continue to evaluate it and will most likely overseed the remainder of the first nine, while all second nine greens will then be seeded wholly with seashore paspalum. ■

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## Shifting Sands – A Spotlight on Western Australia Golf Course Projects



The new-look 1st fairway at Mt Lawley



Old 16th hole looking from men's tee.



The new 16th hole looking from men's tee.

### MT LAWLEY GOLF CLUB

**Project:** Fairway conversion, bunker renovation

**Superintendent:** Glenn Cross

**Location:** Mt Lawley/Inglewood, Perth

**Time Period:** December 2001 - ongoing

#### Comments:

When superintendent Glenn Cross moved to Mt Lawley Golf Club some four and a half years ago it was partly on the premise that he wouldn't have to do any more construction work.

Isn't it funny how circumstances change? Since then Cross has kicked off a complete fairway conversion program, is undertaking a major bunker renovation project and has renovated 15 tees.

The summer of 2003/04 has been another busy one with a further four

fairways converted from common couch to Santa ana. Starting in early December 2003, Cross and his staff converted the 1st, 2nd, 15th (par 3) and 16th fairways and solid turfed 3000 square metres around a number of bunkers.

"The Santa ana has taken brilliantly and the first four fairways are fantastic. There has been very little isolated dry patch," says Cross.

The fairway conversion project started back in December 2001 with fairways 6, 8, 11 and 12 converted before being put on hold the following year due to the hosting of the Australian Amateur in March 2003.

Ten holes are still to be converted – five each on the front and back nines – and the club was due to make a decision around the time of this edition's deadline whether to

continue the program later this year or hold it over for another year.

With all work being done in-house, Cross has been able to keep the costs down and the four holes converted last summer cost just \$45,000, with all turf harvested on site.

The club has also employed the services of course designer Michael Coate who has been given a brief to look at bunkering, particularly those on fairways.

"The course is 75 years old a lot of them (the bunkers) are in the wrong place for modern play," says Cross.

"With the ones already done, we've increased the size of them, pulled some right in close to the greens and in general made them more relevant for current play." ■



Approach to the new 2nd at Wanneroo

### WANNEROO GOLF CLUB

**Project:** Greens, bunker and fairway reconstruction

**Superintendent:** Jon Carter

**Location:** Wanneroo, northern suburbs Perth

**Time Period:** November 2003 - ongoing

#### Comments:

Wanneroo superintendent Jon Carter and his staff look set to have a busy seven to 10 years ahead of them after members accepted a new master plan for the golf course late last year.

After spasmodic alterations during his 13-year reign at Wanneroo, Carter was able to encourage the club to make a long term commitment which will see a number of greens and bunkers reshaped and fairways contoured.

The first stage of major works began in November 2003 with the reconstruction of the 2nd and 3rd greens, greenside bunkers and approaches. Completed in March, the second green was seeded while the third was returfed with Providence.

The third fairway also underwent a considerable makeover with the opening 150 metres in front of the tee gouged out and contoured to create a better outlook from the tee. A pot bunker has also been replaced while one of the greenside bunkers has been removed and replaced. Subtle changes have also been made to the fairway bunker on the 2nd.

The club has yet to give an indication of which holes will be next in line for modification, but Carter is hopeful another three greens will be worked on next summer. ■



## Shifting Sands – A Spotlight on Western Australia Golf Course Projects

### LAKE KARRINYUP

**Project:** Greens reconstruction

**Superintendent:** Trevor Strachan

**Location:** Karrinyup, Perth

#### Comments:

Lake Karrinyup superintendent Trevor Strachan reports that he is in the process of evaluating the sand profile of greens with

the view to undertake a full greens reconstruction program over the course of the next five years.

In February he seconded the services of AGCSATech to investigate compaction, drainage, particle size distribution and porosity of the current greens. From this information the club will decide whether to proceed with a full conversion.

Lake Karrinyup ranked 7th in the latest Top 100 Australian Golf Courses list compiled by Australian Golf Digest magazine.

Strachan has also been heavily involved with the major Port Bouvard 18-hole resort course development further down the WA coastline. To read more about this project see page 25. ■

*The next edition of Australian Turfgrass Management magazine will highlight projects in Queensland.*

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## Keeping with the research theme of this edition of ATM, AGCSATech manager John Neylan provides an update of the latest results from the AGCSA's bentgrass trials.

In October 2000 the AGCSA established bentgrass variety evaluation trials at Kingston Heath followed by sites at Glenelg (SA), Castle Hill (NSW) and more recently Lake Karrinyup (WA). The project objective has been to evaluate the performance and maintenance requirements of the new strains of bentgrass compared to the established industry standards.

The results to date demonstrate the superior turf quality and density of the new cultivars compared to the industry standard (Pennncross). Green speed has also been measured, with Pennncross often having a significantly greater green speed. The greater green speed appears to be related to the lower turf density and therefore reduced resistance to ball roll, particularly during winter. However, over the nine assessments there have been five non-significant results, indicating that the differences are inconsistent and marginal.

Thatch depth has been measured, with the most recent measurement showing that Pennncross had significantly less thatch than all other cultivars with no difference between the remaining cultivars.

At the Glenelg site the trial has been subjected to heat and drought stress resulting in turf damage. While some plots have demonstrated good turf recovery others have been slow to recover and the resultant variability is reflected in the statistical analysis. Consequently, while the averages may indicate a difference, statistically this is not the case.

The following data is provided as a guide as to what may be considered as a suitable variety for use. It is recommended to select 3 – 4 varieties for evaluation in a turf nursery under your conditions of climate and maintenance before making a final selection.

Continued page 30

Table 1 - Kingston Heath GC – Turf Quality #

VARIETY	06/03	07/03	08/03	09/03	10/03	11/03	12/03	01/04	02/04
Pennncross	6.5	5.7	5.7	5.7	6.0	6.3	6.0	6.2	6.2
Egmont	7.0	6.5	6.5	6.5	6.0	6.7	6.3	5.7	6.3
Penn A1	7.0	6.5	6.5	6.7	7.3	7.3	8.1	8.5	7.7
Penn A4	6.8	6.7	6.3	6.5	7.0	7.0	7.3	7.7	7.3
Penn G2	7.1	6.5	7.0	6.3	6.0	6.8	7.0	7.0	7.2
Penn G6	6.8	6.2	6.0	6.0	6.5	7.0	6.7	6.8	6.7
Cato	7.0	6.5	6.3	6.2	5.7	6.7	6.5	6.3	6.5
Pennlinks	6.3	5.8	5.5	5.7	5.7	6.7	6.5	6.3	6.5
L93	7.3	6.3	6.0	6.3	6.7	7.0	7.0	6.8	6.7
Dominant	7.0	6.3	6.2	6.0	6.7	7.0	6.7	7.3	6.8
SR7200	5.8	5.7	5.2	4.8	5.2	6.5	5.8	5.3	6.0
LSD (P<0.05)**	0.6	0.5	0.6	0.8	0.7	0.6	0.6	0.8	0.7

# 0 = worst, 9 = best

\*bw = before wear, aw = after wear

Cutting height = 2.5 – 3mm

\*\* When examining the data users of this data should be aware that cultivar differences are based on use of Least Significant Difference (LSD) statistics for mean separation. To determine whether a cultivar's performance is truly different from another, subtract one entry's mean from another entry's mean. If this value is larger than the LSD value, the observed difference in cultivar performance is significant and did not happen by chance. Please remember that results can vary from year to year and from location to location. Therefore, always reference the LSD value when interpreting test results (sourced from the National Turfgrass Evaluation Program – USDA).

Table 2 - Kingston Heath GC – Green Speed (m)

VARIETY	08/01	10/01	02/02	04/02	05/02	07/03	02/03	08/03	01/04
Pennncross	2.02	1.91	2.13	2.41	2.37	2.58	1.93	2.25	2.16
Egmont	1.89	1.65	1.96	2.19	2.07	2.12	1.74	1.90	2.09
Penn A1	1.95	1.92	2.11	2.24	2.28	2.31	2.05	2.09	2.06
Penn A4	1.91	1.89	2.00	2.26	2.17	2.24	1.95	1.99	2.09
Penn G2	2.07	1.88	2.13	2.27	2.20	2.36	1.92	2.18	2.06
Penn G6	2.02	1.86	2.05	2.25	2.24	2.38	1.96	2.16	2.10
Cato	1.96	1.81	1.96	2.19	2.14	2.32	1.86	2.09	2.04
Pennlinks	2.06	1.86	2.16	2.42	2.35	2.41	1.99	2.30	2.15
L93	2.03	1.93	2.12	2.25	2.29	2.36	1.96	2.25	2.03
Dominant	2.08	1.86	1.99	2.14	2.16	2.34	1.97	2.07	2.02
SR7200	2.01	1.81	2.11	2.23	2.20	2.45	1.97	2.12	2.11
LSD (P<0.05)	0.08	0.11	NS	NS	NS	0.2	NS	0.15	NS

Fig.1: Kingston Heath GC  
Long-term Average Oct 2000 - Feb 2004

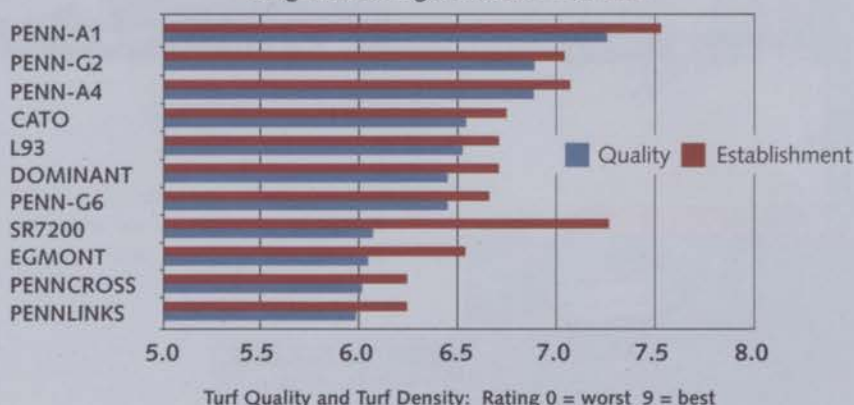






Table 3 - Castle Hill CC – Turf Quality #

VARIETY	11/02	02/03	04/03	05/03	08/03	12/03
Penncross	3.0	4.8	3.5	3.2	3.2	3.0
Penn A4	4.3	5.0	4.8	3.7	3.8	4.3
Penn A1	4.8	5.0	5.0	4.7	3.8	4.5
Suttons	3.5	3.0	3.5	1.3	2.2	1.2
Grand Prix	4.5	4.9	4.5	4.0	3.5	3.8
Dominant	3.0	4.5	4.0	3.5	3.2	3.3
Pennlinks	3.0	4.8	4.0	3.3	3.1	4.0
Penn G2	4.5	5.0	4.5	4.0	3.5	3.8
Blend	4.0	4.6	4.0	3.3	3.2	3.5
L93	3.7	4.5	4.0	3.8	3.4	3.7
LSD (p<0.05)	NS	0.12	0.17	0.87	0.45	0.6

# 0 = worst, 5 = best  
Cutting height = 3mm

Table 5 - Glenelg GC – Turf Quality #

VARIETY	06/02	07/03	09/03	10/03	12/03
Penncross	5.3	5.0	6.0	5.0	5.0
Penn A1	7.7	8.0	8.0	8.0	8.3
Penn A4	6.3	6.3	7.3	6.0	5.7
Penn G2	7.0	6.7	7.7	7.7	7.3
Mix	6.3	7.0	7.3	5.3	5.3
Cato	6.3	6.0	6.7	6.3	6.3
Pennlinks	6.0	6.3	6.7	6.0	6.0
L93	6.7	6.3	7.0	6.7	6.0
Dominant	6.3	6.3	7.0	6.7	6.3
RA1	6.5	6.5	7.5	7.5	7.0
RA2	7.0	7.0	7.0	7.0	7.0
Mariner	5.3	5.3	6.7	6.7	6.7
LSD (p<0.05)	0.9	1.1	NS	NS	NS

# 0 = worst, 9 = best  
Cutting height = 3mm

Table 4 - Castle Hill CC – Turf Density #

VARIETY	11/02	02/03	04/03	05/03	08/03	12/03
Penncross	3.0	4.8	3.0	3.2	3.0	3.0
Penn A4	4.3	5.0	4.8	3.8	3.8	4.3
Penn A1	4.8	5.0	5.0	3.8	4.0	4.5
Suttons	3.5	3.0	3.5	2.2	2.6	1.2
Grand Prix	4.5	4.9	4.5	3.5	3.7	3.8
Dominant	3.0	4.5	3.5	3.2	3.3	3.3
Pennlinks	3.0	4.8	3.3	3.1	3.1	4.0
Penn G2	4.5	5.0	4.5	3.5	3.8	3.8
Blend	4.0	4.6	3.5	3.2	3.3	3.5
L93	3.7	4.5	3.5	3.4	3.4	3.7
LSD (p<0.05)	NS	0.12	0.17	NS	NS	0.6

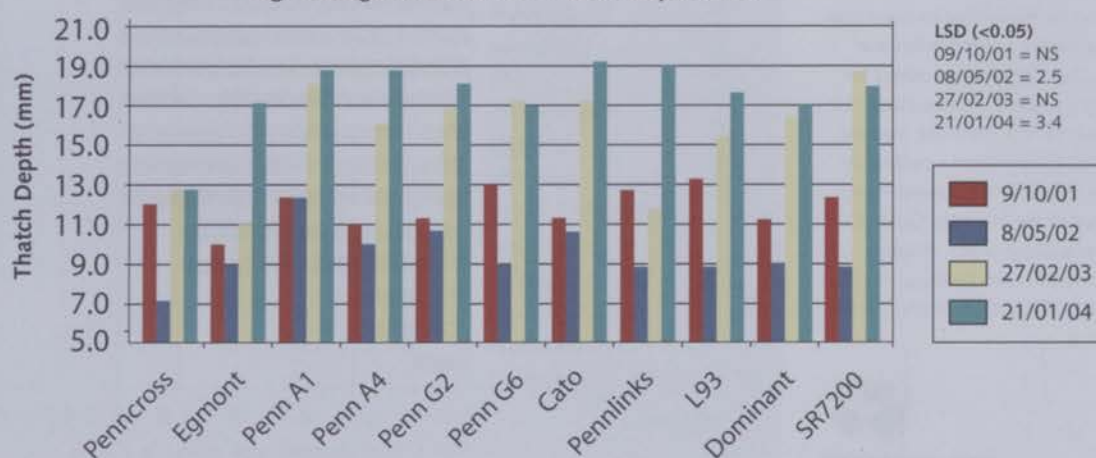
# 0 = worst, 5 = best  
Cutting height = 3mm

Table 6 - Glenelg GC – Turf Density #

VARIETY	06/02	07/03	09/03	10/03	12/03
Penncross	5.3	5.3	6.0	5.0	5.0
Penn A1	8.0	8.3	8.0	8.3	8.3
Penn A4	6.7	6.7	7.0	6.0	6.0
Penn G2	6.7	7.3	7.3	7.3	7.3
Mix	6.0	6.0	6.3	5.3	5.3
Cato	6.0	6.0	6.3	6.7	6.7
Pennlinks	6.0	6.0	6.3	6.3	6.7
L93	6.7	6.7	6.7	6.3	6.3
Dominant	6.7	6.7	6.7	6.7	7.0
RA1	6.5	6.5	7.0	8.0	8.0
RA2	7.0	7.0	7.7	6.7	7.0
Mariner	6.0	6.0	6.3	6.3	6.3
LSD (p<0.05)	NS	NS	NS	NS	NS

# 0 = worst, 9 = best  
Cutting height = 3mm

Fig. 2: Kingston Heath GC - Thatch Depth (mm)





### BENTGRASS COLLECTION PROJECT

The project objective is to select off-types from old bentgrass putting greens that have exhibited segregation, with the long-term aim of developing a bentgrass variety that is suited to growing in Australia.

To date there have been over 400 types collected with about 350 planted into a spaced plant nursery at Kingston Heath GC. In the autumn of 2003, the best 100 selections with two replicates were planted into a nursery green maintained as a putting surface, at the Rosebud campus of Chisholm TAFE.

The following data (Figure 3) is from the assessment of the putting green trial and represents the top 10 per cent for turf quality and also includes several commercial cultivars. The data collected to date indicates that there are several ecotypes collected that are equal to or superior to the available cultivars.

The AGCSA is currently in discussions with companies that have placed an expression of interest in the bentgrass collection, with the aim of utilising it in future breeding programs.

### COUCHGRASS COLLECTION PROJECT

The couchgrass collection and evaluation project is continuing with the selected ecotypes being maintained at Lakelands Golf Club. Of the original 75 selections the best 6 have been selected to be planted into larger field plots for further evaluation under putting green maintenance.

### ACKNOWLEDGEMENTS

The AGCSA is grateful for the funding received from Horticulture Australia Limited and the Professional Golfers' Association. The NSW bentgrass project has also been funded by the Monash, Toukley, Castle Hill, Strathfield, Mollymook, Elanora, Muirfield, Maitland and Bathurst golf clubs. These projects would not be possible if not for the support of the superintendents and their clubs at each of the trial sites; Castle Hill (Martyn Black), Glenelg (Daryl Sellar), Kingston Heath (Martin Greenwood), Lake Karrinyup (Trevor Strachan) and Chisholm TAFE, Rosebud (Barry Fraser and Bruce McPhee).



Horticulture Australia

Lake Karrinyup GC Bentgrass Trials

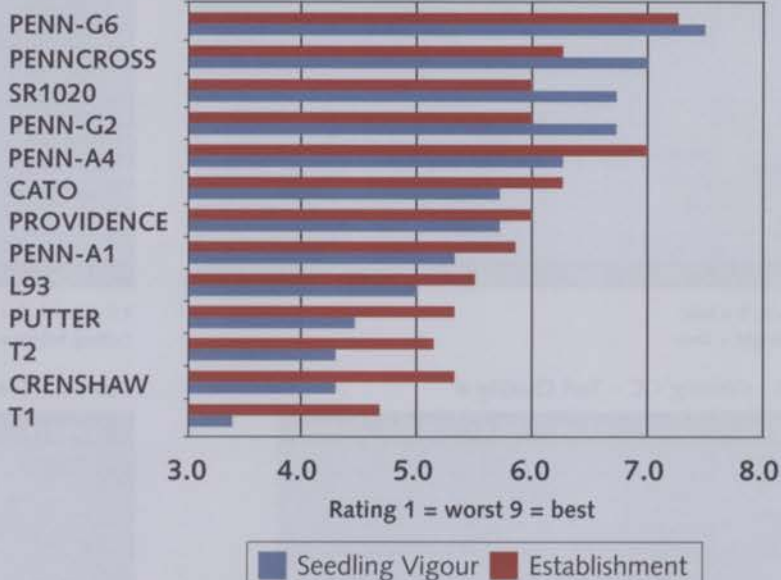
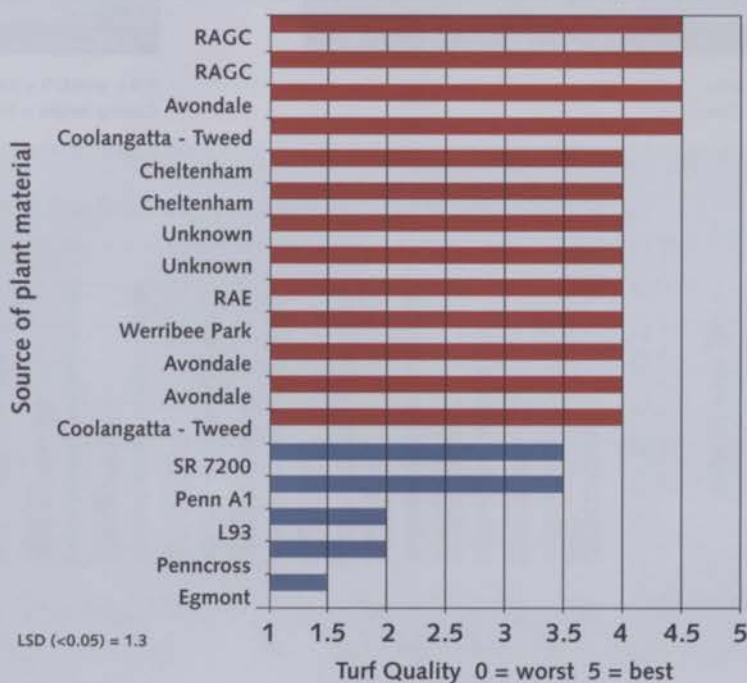


Fig 3: Bentgrass Collection - Turf Quality best 10%







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# Overseeding Warm-season Grasses

TECH TALK



Young ryegrass emerging through Legend couchgrass

With autumn now upon us, AGCSATech technical officer

Andrew Peart examines the overseeding of warm-season grasses.

The use of cool-season grasses for overseeding couchgrass or other warm-season varieties is a practice undertaken not only to enhance winter colour but also improve playing surface quality and protect the couchgrass from winter wear.

The practice is undertaken extensively on resort golf courses in the United States as to present green playing surfaces year round in transitional zones where warm-season grasses go into dormancy during winter.

Simply defined a transition zone is neither a northern region where warm-season grasses are best adapted nor a southern area where cool-season grasses prosper. Therefore, the use of one of these grass types is compromised for a period of the year.

The practice is not restricted to golf courses but is often undertaken on couchgrass playing fields in transitional zones. The major advantage in overseeding playing fields is the ability for wear recovery during the winter months when cool-season grasses have been oversown. The addition of a cool-season sward not only protects the warm season understorey from excessive wear but provides some cushioning for players.

The objective for successful overseeding is being able to get the seed close to the soil where conditions are more favourable for germination and the likelihood of seed movement from wind or water is reduced.

In couchgrasses that produce a dense canopy, verticutting is usually required to enable seed migration into the sward. While verticutting is disruptive to play, it can provide a great benefit in the success of the overseeding program. However, the timing and severity of the verticutting is important.

As the temperature cools and the day length shortens, the couchgrass begins to store

carbohydrates for the cooler months and to provide a source of energy to aid its recovery when temperatures again become more favourable in spring.

If severe verticutting is undertaken to not only open the canopy but also reduce thatch while the couchgrass is still actively growing, the grass will expend carbohydrates to recover from the verticutting and therefore reduce couchgrass hardness in the spring, leading to poor transitioning.

The main objective for the oversown variety is for a quick establishment phase and a minimum transition period when the couchgrass is coming out of dormancy.

## TEMPERATURE

The optimum time for overseeding is late enough into autumn so the couchgrass growth has been slowed by lower temperatures but early enough that temperatures are still favourable for germination of the oversown variety.

If seeding is done too early there is an increased likelihood for seedling diseases as well as competition from the couchgrass, while too late will slow the coverage of the oversown species due to a drop in temperature. Beard 2002, states that the best time is when daily mean soil temperature at a 100mm depth is between 22-26°C.

While monitoring soil temperatures to determine the optimum planting time is more effective than setting a convenient calendar date, it can be quite impractical. The best option therefore would be to set a date based on historical soil temperatures.

Chunhua et. al (1999) reported that the percentage germination in a growth chamber of *Poa trivialis* exceeded 80 per cent on day

seven with day/night temperatures of 25/15°C. However, at temperatures of 10/0°C germination was delayed by two weeks and the final germination percentage never reached 70 per cent.

## SPECIES USED

The species chosen for overseeding is dependant on the type of playing surface and environmental conditions. For example overseeding of golf greens is usually restricted to either bentgrass (*Agrostis palustris*) or rough bluegrass (*Poa trivialis*), while tees are generally oversown with either rough bluegrass, perennial ryegrass (*Lolium perenne*) or creeping red fescue and chewings fescue (*Festuca rubra commutata*).

Fairways are generally oversown with perennial ryegrass, intermediate ryegrass or fine fescues, while playing fields are normally oversown with some variety of ryegrass. The following points are made regarding aspects of each species used for overseeding.

### Perennial ryegrass

- Fast germination;
- Good cold tolerance;
- Good wear tolerance;
- High quality;
- Dwarf growth habit; and
- Slow to transition out due to high heat tolerance.

### Rough Bluegrass

- Relative small seed for ease of canopy penetration;
- Reasonable establishment time;
- Excellent turf quality; and
- Poor wear tolerance.

### Annual ryegrass

- Germinates quickly;
- Inexpensive;
- Poor heat and cold tolerance;
- Rapid growth; and
- Poor turf quality.

### Creeping bentgrass

- Small seed size;
- Slow establishment;
- Excellent turf quality; and
- Poor to transition.

### Chewings fescue

- Slow to establish;
- Very good quality;
- Performs well in drier climates;
- Low fertility requirement; and
- Good transition.



## INTERMEDIATE RYEGRASS

In the past decade intermediate ryegrasses have been developed by plant breeders as an alternative species from perennial ryegrass for overseeding.

As the name suggests intermediate ryegrasses are a hybrid species between perennial ryegrass and annual ryegrass. The reasoning behind the hybrid cross was to keep the turfgrass quality of the perennial ryegrass but to incorporate the poor heat tolerance of the annual ryegrass for a quicker transition.

Early breeding of intermediate ryegrasses proved difficult due to the annual ryegrass part of the hybrid quickly dominating and the dark green colour, finer texture and slower growth characteristics of the perennial ryegrass being lost.

This breeding dilemma was solved through several cycles of top crossing select perennial ryegrasses with the first intermediate ryegrass allowing the perennial characteristics to become a stable part of the genetic makeup (Schmitz, 1999).

Heat tolerance of perennial ryegrass is one of the major problems in its ability to transition successfully from couchgrass. Richardson and Warner (2000) conducted an overseeding trial to evaluate the heat tolerance of three perennial ryegrasses, two intermediate ryegrasses and two annual ryegrasses to evaluate their respective heat tolerances.



Overseeding will improve surface quality

The trial assessed heat tolerance by measuring changes in the relative transpiration rates of the different ryegrass varieties under increasing temperatures within a growth chamber. As leaves transpire the evaporative cooling effect will generally lower the leaf temperature below the air temperature. However, as plants reach lethal high temperatures the photosynthesis/transpiration process will shut down and leaves will heat up beyond air temperatures. Figure 1 illustrates the difference of the varieties in their heat tolerance.

The trial showed that as temperatures rose above 35°C the annual ryegrass leaves started to heat up and show severe signs of heat stress whereas the perennial varieties were able to maintain adequate transpiration and thus canopy temperatures as air temperatures exceeded 43°C.

## TRANSITIONING OUT

Horgan and Yelverton (1998) suggest superintendents can conduct the following

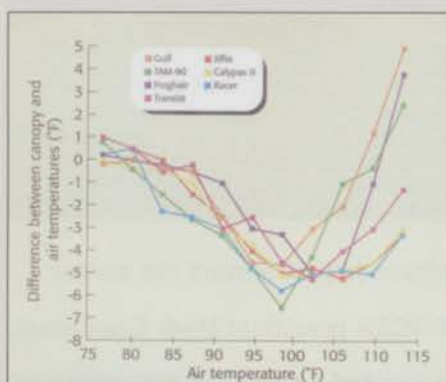


Figure 1: Differences between canopy and air temperatures (°F).

cultural practices to aid the transition of perennial ryegrass from couchgrass fairways:

- Lower the mowing height to scalp out perennial ryegrass and allow light to penetrate the turf canopy for couchgrass growth;
- Verticut to stimulate couchgrass at the expense of the overseeding;
- Core cultivate to warm the soil and stimulate lateral growth of couchgrass;
- Apply high rates of ammonium nitrate to burn perennial ryegrass; and
- A combination of these methods.

However, their research indicates that cultural treatments transition perennial ryegrass out at the same rate as no treatment at all. Ultimately, superintendents who use cultural methods to remove perennial ryegrass from overseeded couchgrass are relying on temperature and relative humidity to expedite transition. These are the key conditions that dictate when perennial ryegrass will transition (Horgan and Yelverton, 1998).

While overseeding of playing surfaces in transitional zones may improve playing surfaces in their playability and aesthetics, the ability to return to a monostand of warm-season grass is far from easy.

Ultimately the success of an overseeding program is not just the establishment of the oversown variety but also the transitioning out. The breeding of species to better transition and the formulation of new chemicals may provide smoother transitions for those turf managers that believe overseeding is a necessary management tool.



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# Doing it the American Way

## 2004 GCSAA Conference Review



One of the picturesque par 3s at The Bridges at Rancho Santa Fe

With the 20th Australian Turfgrass Conference just around the corner, AGCSA chief executive Steven Potts, AGCSA president Mark Couchman and AGCSATech manager John Neylan headed an AGCSA delegation to the GCSAA conference in San Diego. Here, John Neylan gives an overview of their week-long fact-finding trip.

Over the past eight months the AGCSA has been in regular contact with the Golf Course Superintendents' Association of America (GCSAA) to strengthen ties between the two associations.

Following discussions with senior GCSAA staff, including chief executive Steve Mona,

we were invited to attend the 75th GCSAA conference and tradeshow in San Diego. This afforded Steven Potts, Mark Couchman and myself the opportunity to meet with the GCSAA and to experience the conference and tradeshow.

During the conference week we had the opportunity to meet with key GCSAA staff members including Steve Mona, chief operating officer Julian Arredondo and Hannes Combet, director of membership and professional development.

It was most interesting to note that while the GCSAA is obviously a much larger organisation, the issues affecting both organisations and golf course superintendents in general are very similar. As a result of meetings with the GCSAA it is hoped that we will be able to share resources and to benefit from the education and research programmes that the GCSAA has in place.



AGCSA chief executive Steven Potts addresses the International Summit

### INTERNATIONAL SUMMIT

As part of the conference week, an International Summit involving golf course superintendent associations from around the world was held. The summit provided a forum to discuss global issues affecting golf turf maintenance and how the respective associations can work together to tackle these issues for the benefit of association members.

Nations represented at the summit included Australia, America, Canada, Germany, Ireland, Slovenia, The Netherlands and Sweden while there were representatives from Asia and the Federation of European Golf Greenkeepers' Association (FEGGA).

The meeting included an update from all nations on their current situation and some background information regarding their various associations. This highlighted the similarities of all associations and strengthened the belief that by addressing some issues from a global perspective we can benefit the professional lives of all of our members.

Some of the major issues identified during the summit included the general public's lack of awareness regarding the environmental management advancements which have occurred in golf course management, a standardised global education pathway and enhancing the recognition of golf course management globally.

The meeting determined to form a working group to move forward on several of the issues identified and report back to the next summit which will be held in England in January 2005.

### GCSAA CONFERENCE SEMINARS

During the conference several seminars were attended including:

#### Bentgrass Rootzone Management in a Transitional Environment.

This was a highly informative and detailed seminar that examined the environmental factors affecting root growth and the cultural practices required to maintain maximum root mass during summer conditions.

#### The Management of Seashore Paspalum.

This eight hour seminar provided a very detailed examination of the characteristics, uses and maintenance of seashore paspalum. It was particularly useful given the increasing interest in this grass species in Australia. This grass is a niche grass that under the correct management will produce a very high quality playing surface.

Seminar instructor Dr. Ronny Duncan, who incidentally will be a keynote speaker at this



year's 20th Australian Turfgrass Conference in June, emphasised the particular maintenance requirements of this grass, which is quite different to other warm-season grasses. He particularly emphasised that while this grass has incredible salt tolerance, as the water quality becomes more saline greater efforts have to be put into soil conditioning, soil amendment and leaching.

#### **Best Management Practises for Irrigating Turf.**

This full day seminar was part of a three-tier program that provided participants with the skills to produce a water management plan. Most developed countries including Australia, USA and Europe have developed water management strategies for the future. Golf courses, being water users and as an obvious part of larger catchments, must demonstrate best management practices and that water is being used efficiently.

#### **GCSAA TRADESHOW**

The tradeshow was huge and certainly took up a lot of the floor space. All the main turf product suppliers were present as well as a

myriad of the smaller industry product suppliers and distributors.

At the most basic level the products are the same as what is available in Australia, however, the difference is that there are more manufacturers and variations on a common theme.

#### **SEMINAR FIELD TRIPS**

As part of the field trip seminars, two golf courses, Del Mar racetrack and the new San Diego Baseball Stadium were visited. This provided a spectrum of conditions under which southern California turf is managed and some of the challenges that are faced.

#### **Fairbanks Ranch Country Club**

The Fairbanks Ranch Country Club was established in 1984 on the site of the Olympic equestrian venue and is close to the coast just south of San Diego. The golf course is in a valley that creates a relatively mild but dry (about 250mm rainfall a year) climate with maximum temperatures rarely exceeding 27°C. Because the golf course is low-lying it is also subjected to frosts and has experienced 22 this year.

The original 18 holes feature *Poa annua* greens, non-overseeded seashore paspalum fairways and overseeded seashore paspalum roughs. A new nine-hole golf course scheduled to open in March/April 2004 features creeping bentgrass greens, Tifway II fairways and bluegrass/tall fescue roughs and surrounds. The expectation is that the greens will be allowed to revert to *Poa annua*.

The irrigation water is of high salinity with 1800-1900 mg/l total salts. This water is used on fairways with potable water on the greens. Because of the salts, this course was one of the earlier adopters of seashore paspalum (variety Excalibur).



The Fairbanks Ranch Country Club was one of the earlier adopters of seashore paspalum

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# Doing it the American Way

2004 GCSAA Conference Review

Originally it was overseeded with ryegrass because of its strong dormancy, however, over the past three years this has not occurred and *Poa annua* and bentgrass have been allowed to come in during winter. The *Poa annua* and bentgrass transition out once irrigation commences due to the salinity.

Because "Excalibar" is sensitive to herbicides, alternative grass species were explored for the new course by trialling couchgrass and other seashore paspalum varieties. Tifway II was selected because it exhibited as good a salt tolerance as the paspalums, had better winter colour, quicker spring green up and was less sensitive to herbicides.

The greens were presenting a high quality playing surface with Primo and Proxy used to provide a tight surface with good seedhead control. Primo is used monthly depending on the weather conditions (under high stress conditions it is not used).

To assist in the control of sodium, gypsum injection is used with about 25-30 tons/year used over the golf course. Winter rainfall is necessary for the leaching of salts.

## The Bridges at Rancho Santa Fe

This course was designed by the Robert Trent Jones II Group and is a 6400 metre, par 71 course that plays host to the internationally televised Battle of the Bridges Tournament.

The course is set on about 230 hectares consisting of deep canyons, streams and wild but beautiful terrain. There are 200 housing allotments with a membership of 200-250.

There are 20,000 rounds of golf a year with the course closed on Mondays.

The greens are Penn-G6, fairways are non-overseeded Tifton 419, and the tees are Tifton 328 overseeded with *Poa trivialis*. The bunker faces have been sodded with zoysiagrass to reduce couchgrass encroachment.

One of the features of the greens is the extraordinary effort put into the repair of pitch marks. As with many of the new bentgrasses, the Penn-G6 is slow to grow in when damaged. Therefore, 40 hours a week is put into repairing pitch marks by removing a 25mm diameter turf plug and replacing it from the edge of the green.

## Del Mar racetrack

The racetrack was built in 1937 through the efforts of Hollywood legends Bing Crosby and Pat O'Brien. The track is close to the ocean and constructed on fill with kikuyu as the predominant turf species with a high proportion of couchgrass throughout.

The turf is irrigated with recycled waste water that has high salinity and sodicity. On a variable soil profile, with an irrigation system that has poor distribution uniformity, the leaching of salts is a constant challenge.

In fact the salinity of the water has adversely affected the kikuyu and encouraged a high proportion of couchgrass. The inside 4-5 metres of the track have been sodded with GN-1 couchgrass as a result of the water quality.

The racing program is from July to September with six race-days a week and 2-3 races per day on the turf track.

## San Diego Baseball Stadium

At the time of our inspection, the final touches were being made to this new baseball stadium which is the home pitch of the San Diego Padres. It is typical of modern stadia with the emphasis on providing excellent viewing so that spectators are close to the action. The stadium has a seating capacity of 42,000.

The construction of the field involved the incorporation of an historical building into the stands and moving a second heritage-listed building. It cost \$US3 million dollars to move this building and is the largest brick structure ever moved in one piece (it was moved about 50 metres). It was moved to allow for the construction of a public baseball facility.

The playing surface is a USGA profile and was sodded with couchgrass and overseeded with ryegrass. As with most modern stadiums, shade is an ever present issue and this is overcome in part with the use of moveable grow lights.

The field has 81 games a season that also involves up to five hours practise per game. Home games are usually played in six game blocks. The key issues in preparing both the turf and the dirt surfaces are;

- Safety.
- Playability: consistency is very important.
- Keeping the game on; in-field (dirt) areas must be covered in the lead up to games to protect against rain. To lose a game will cost the club around \$US2 million.
- Aesthetics: must look good. 🏈



Groundstaff go to extraordinary lengths to repair pitch marks at The Bridges

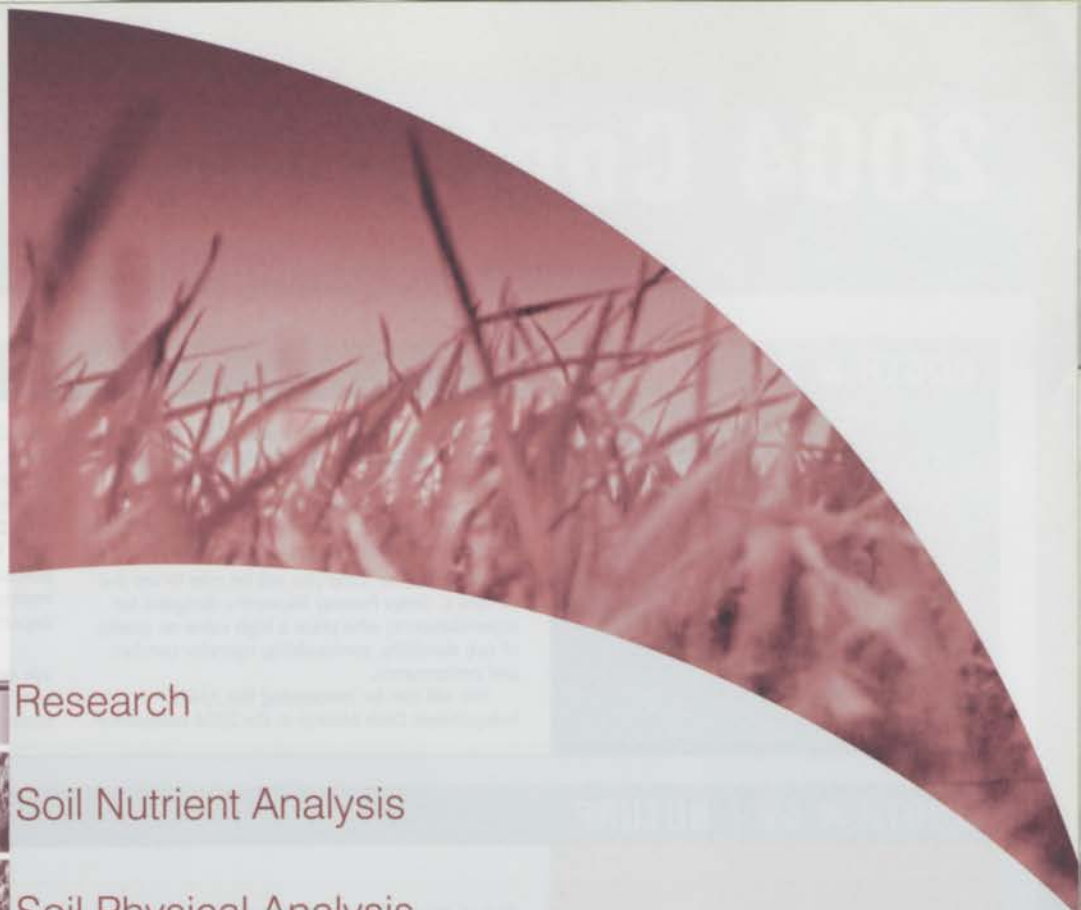


Zoysia bunker face at The Bridges



The USGA spec turf at the recently constructed San Diego Baseball Stadium





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# 2004 Conference Showcase

## BOOTH # 70

## JOHN DEERE



John Deere is proud to be a part of the 2004 Australian Turfgrass Conference. We look forward to hosting you on our stand, where you will be able to see our comprehensive array of turf machinery, ranging from reel mowing equipment to specialty turf machinery and utility tractors.

While on the stand you will be able to see the all-new C Series Fairway Mowers – designed for superintendents who place a high value on quality of cut, durability, serviceability, operator comfort and performance.

We will also be introducing the 3245C Independent Deck Mower at the 2004 conference.

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We look forward to seeing you on the tradeshow floor.



## BOOTH # 69

## NUTURF

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### IRRIGATION PRODUCTS:

- 835 S Part Circle Rotor
- 855 S Part Circle Rotor
- 810 G Rotor

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## BOOTH # 7

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Orders can be placed on the stand and there are prizes to be won.



Bayer Environmental Science

## 2004 - 20th Australian Turfgrass Trade Exhibition



The 2004 20th Australian Turfgrass Trade Exhibition to be held in the Melbourne Exhibition Centre on June 23-24 is shaping up to be an entertaining showcase of the latest and greatest in turf equipment. An impressive contingent of 25 companies will be exhibiting in Melbourne for the first time!

During the trade exhibition, six new products will be launched. As well, Speakers Corner will enable delegates to have one-on-

one sessions with conference speakers. For those who like a bit of competition, there will also be a golf chipping area, AFL handball and NRL pass competitions, and a turf quiz.

An Internet café will enable delegates to surf the net, in particular the new-look AGCSA website, while the Turf Mechanics Challenge will also keep everyone entertained.

The aim of this year's trade exhibition has been to gather the whole turf industry

together in the one location at the same time. We have achieved this goal and are providing a platform for delegates to expand their knowledge and see what's new in the turf industry, in order for turf managers to make sure that their next purchase is the right one.

We look forward to seeing you from 9am, Wednesday, 24 June. It's set to be a show-stopper!

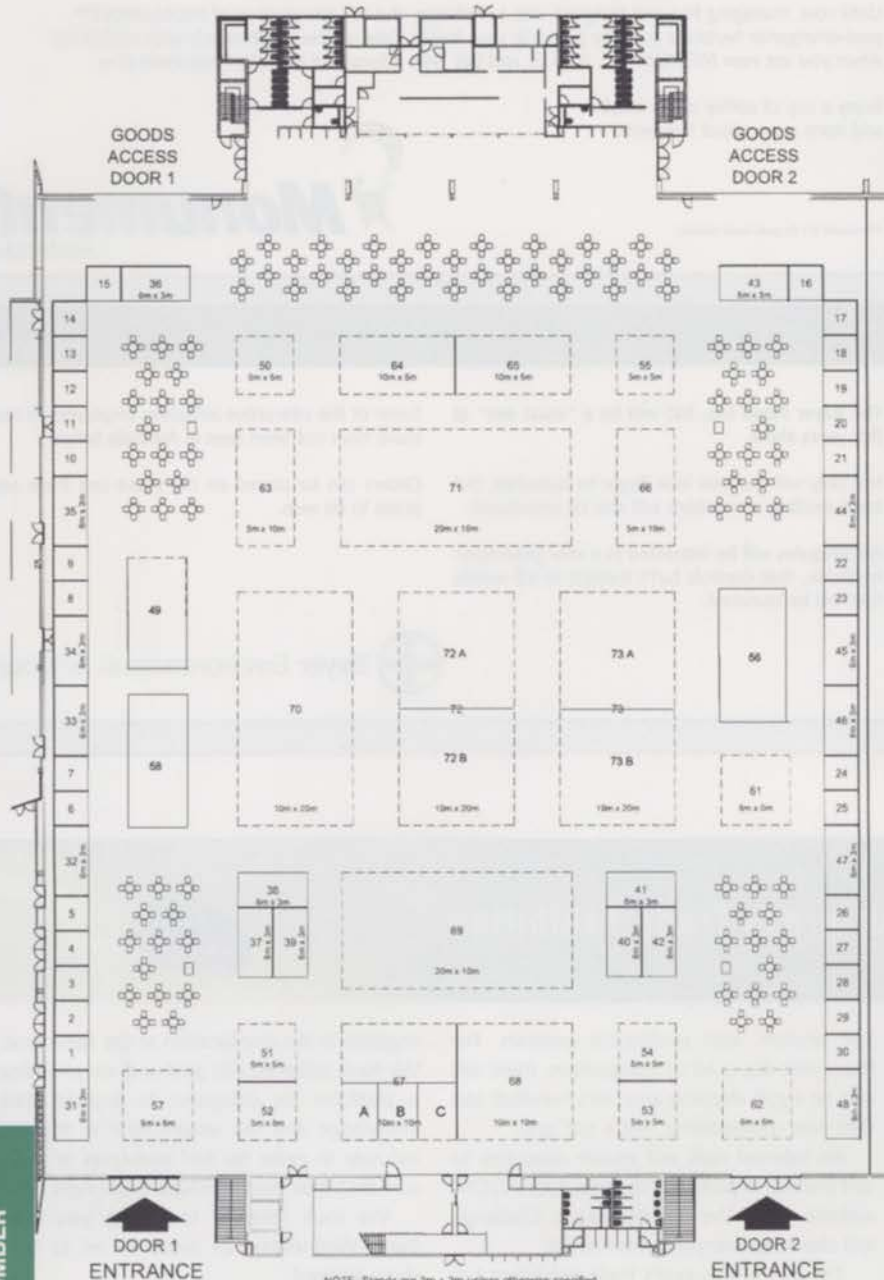




# 2004 Conference Showcase



## The Australian Turfgrass Conference Melbourne Exhibition Centre Bays 1 - 4 21 - 25 June 2004



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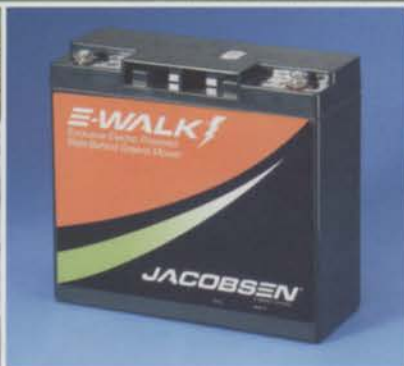
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# AGCSA Member Benefits...



## MEMBERSHIP BENEFITS

The AGCSA is committed to providing greater resources to enhance its leadership, unification and professional development of the Australian turfgrass industry and its members.

Membership of the AGCSA enables golf course superintendents as a collective unit to have their say on matters such as education, turf research, legislation and industry development.

So far during 2004, the AGCSA has undertaken a major redesign of its website for the use of all members of the turf industry.

The AGCSA believes that this medium is becoming a vital communication tool for the industry and something which members need to become familiar with.

The new-look website will feature a special 'Members Only' section, where special offers available only to AGCSA members will appear. Members will also be able to update their contact details in this area.

## MEMBER BENEFIT FOCUS

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Web: [www.clearmake.com.au](http://www.clearmake.com.au)



VGCSA events		NSWGCSA events		Golf Tournaments			
May	June	July	August	September	October	November	December
1	1	1	1	1	1	1	1
2	2	2	2	2	2	2	2
3	3	3	3	3	3	3	3
4	4	4	4	4	4	4	4
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30	30	30	30	30	30	30	30
31	31	31	31	31	31	31	31





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- Six editions of the bi-monthly AGCSA journal Australian Turfgrass Management magazine, the No.1 turf industry publication;
- AGCSA yearly wallplanner;
- AGCSA members hat;
- Access to the AGCSA 'Members Only' area on the AGCSA website;
- Regular AGCSA ACTION Newsletter;
- Turf News email newsletter;
- Reduced registration fees to the AGCSA roving workshops and conferences;
- Receive member discounts on soil and water testing, disease diagnosis and other analytical services through AGCSATech;
- Discounted books from the AGCSA Bookshop;
- Discounted merchandise from the AGCSA website;
- Free legal service provided by Madgwicks Solicitors providing up to half an hour free legal advice on any subject;
- Regular mail-outs of positions vacant within the industry;
- Access to AGCSA Contracts of Employment;
- Regular opportunities to meet with your peers and the allied turf trades;
- Access to AGCSA Skills Recognition Program, Accreditation Program and AGCSA endorsed qualifications; and
- Opportunity to be involved in the Australian Open Course Quality Officials program.

If you have any questions or queries about becoming a member of the AGCSA, or about any of the listed membership benefits, please do not hesitate to contact Jane Phelan, membership services and administration co-ordinator, on (03) 9548 8600 or email [info@agcsa.com.au](mailto:info@agcsa.com.au).

You too can discover how the AGCSA can assist and make a difference in your future endeavours within the turf industry. 🌱



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Superintendents Association



AGCSATech

## AGCSA Membership Classes

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### Associate Membership

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### Student Membership

Golf and Non Golf.....	\$77
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Discount Sliding Scale for joining of two or more staff	5% discount = 2-3 staff 10% discount = 4-6 staff 15% discount = 7+ staff
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## Membership Application Form

Surname: \_\_\_\_\_ First Name: \_\_\_\_\_

Preferred Mailing Address: \_\_\_\_\_

City/Suburb: \_\_\_\_\_ Postcode: \_\_\_\_\_

Position: \_\_\_\_\_

Club/Organisation: \_\_\_\_\_

Club Postal Address: \_\_\_\_\_

City/Suburb: \_\_\_\_\_ Postcode: \_\_\_\_\_

Phone: Work: \_\_\_\_\_ Home: \_\_\_\_\_

Mobile: \_\_\_\_\_ Fax: \_\_\_\_\_

Email: \_\_\_\_\_

Member Class: \_\_\_\_\_

### Membership Payment

Membership payments for any of the above classes are to be sent to the AGCSA.

☐ Please charge this purchase to my credit card account

☐ Bankcard ☐ MasterCard ☐ Visa

Card Number: \_\_\_\_\_ Expiry Date: \_\_\_\_/\_\_\_\_/\_\_\_\_

Cardholder Name: \_\_\_\_\_

Address: \_\_\_\_\_

Signature: \_\_\_\_\_

Send completed application form and payment to:

AGCSA: Suite 1, Monash Corporate Centre, 752 Blackburn Rd, Clayton North, 3168, Vic  
Phone: 03 9548 8600 Fax: 03 9548 8622 Email: [info@agcsa.com.au](mailto:info@agcsa.com.au)





The piece of conveyor belt nailed at one end provides enough tension to hold tools in place when knocked.

## WHAT A BELTER

In past editions of Australian Turfgrass Management magazine we have seen some pretty amazing contraptions that superintendents and turf managers from around Australia have devised to help them in their day to day work.

Some of those have cost considerable money, not forgetting the man hours gone into putting designs onto paper and then in the construction phase.

However, not all innovations have to attract NASA-type budgets. Often it's the most simplest and cost-effective innovations which can prove to be the handiest. For example, the trusty nail on the end of a stick has proved to be a very effective weapon in the collection of leaf litter from bunkers.

Now Carnarvon Golf Club superintendent and NSWGCSA state president Craig Easton likes to think of himself as a pretty technically

proficient fella, but it was one of his younger staff members who came with an extremely simple method of preventing injuries in the shed.

Quite simply, it's a piece of conveyor belt nailed at one end to the tool rack to hold tools in place and reduce the risk factor of tools falling on unsuspecting workers.

The belt provides enough tension to hold the tools in place when knocked, but with enough force applied will allow the tools to slip through. An OH&S specialty at the right price - \$0.00. 🍷

Syngenta recognises our innovative superintendents and is proud to present Craig Easton and staff at Carnarvon Golf Club with a \$150 AGCSA book voucher.

If you have, through necessity, devised or created a tool/piece of machinery/gadget or made alterations to an existing piece of machinery or workplace tool to make the job easier, then we want to know about it! Call or email Brett Robinson at the AGCSA (03) 9548 8600 or [brett@agcsa.com.au](mailto:brett@agcsa.com.au)

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Meadow Springs superintendent  
Greg Simmonds

**GREG SIMMONDS**  
(Meadow Springs Country Club, WA)

**Full Name:** Greg William Simmonds

**Age:** 41

**Family:** Wife Michele and daughter Sarah

**Years as a superintendent:** 19

**Years at current club:** 17

**Number of staff:** 7

**Course specs:** 80 hectares – 48 irrigated valve-in-head, Santa ana fairways, Penncross greens, 1020 buffers, 67 bunkers.

**Favourite piece of machinery?**

Silvan spray units (2 x 2000l). Where would I be without them?

**Most embarrassing moment as a superintendent?**

After changing a hole and turning around and seeing my ute rolling down the fairway 200m away.

**Funniest moment you have seen as a superintendent?**

A staff member was spraying the 8th green using a fish eye nozzle and felt the hose start pulling. He turned around to see the Massey Ferguson tractor and 2000l spray unit sailing over a 600mm retaining wall into the lake. However, because of the air in the tyres and tank, it floated in 2.5m of water. We now call the tractor 'SS Titanic' and the spray unit 'Bob'.

**Plans for the course over the next 12-18 months?**

Reconstruction of tees 4 and 8. Continued transition to Santa ana fairways.

**Best advice you have ever received on the job?**

It's only when you get close to perfection that you know how far away it is.

**If you could change one thing about your job what would it be?**

Western Australia's dry summers and wet winters.

**Best part about being a golf course superintendent?**

The continued competition between Mother Nature and myself. She keeps you on your toes.

**Worst excuse you have ever heard from one of your staff?**

I smashed the Cushman because I saw a snake.

**Career highlight?**

Six years spent at Royal Melbourne - preparing the course for the PGA and Australian Open and the staff camaraderie.

**The overseas course you'd most like to visit?**

Augusta National during The Masters.

**Favourite sporting team?**

Essendon.

**Sporting team you despise?**

West Coast Eagles.

**Dream car?**

Current model Monaro.

**Favourite movie?**

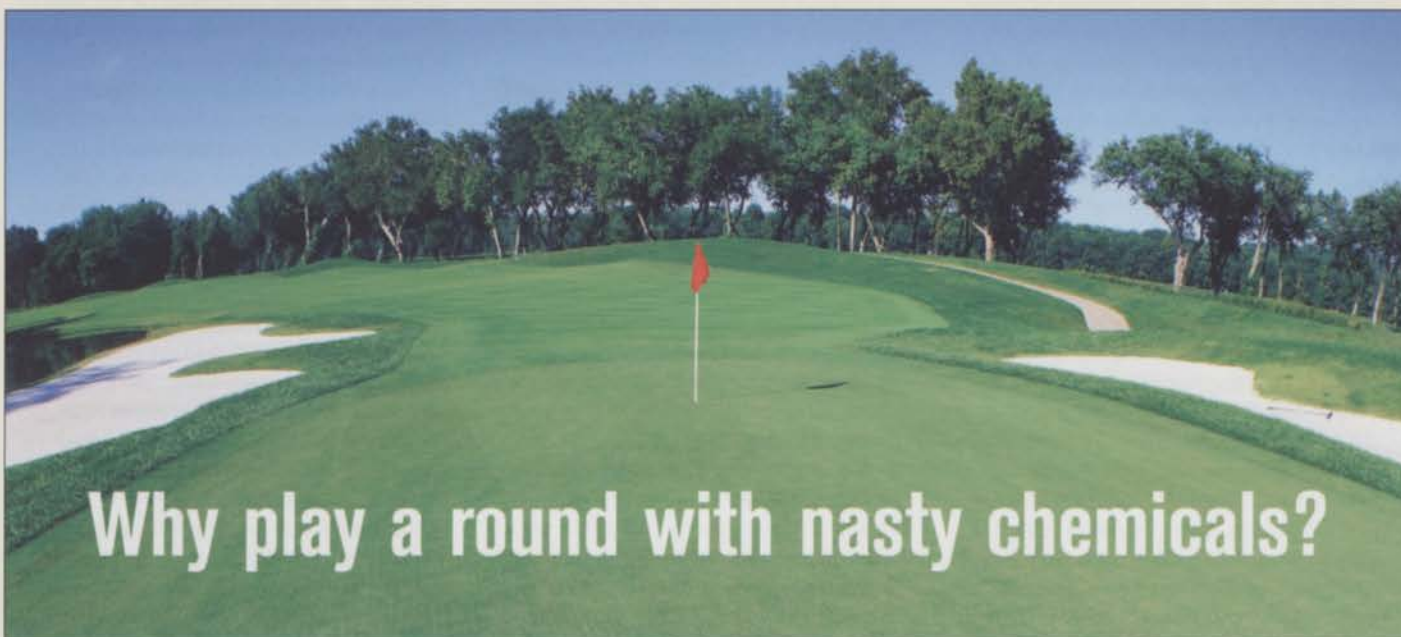
Serpico (1973, Al Pacino)

**Food you could not live without?**

Seafood.

*Meadow Springs came in at 44 in the recent Top 100 Australian Golf Courses list compiled by Australian Golf Digest in March.*

Grow Force Australia recognises the job our superintendents do and is proud to present Greg Simmonds with a 20 litre container of NUTRI-GRO Plus.



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\*Nutri-Gro Plus APVMA Approval No. 49074/0799





Angelina Gilbert, a team member with the QDPI's AFL playing surface project, measures surface hardness with a Clegg Hammer

## MORE GROUNDS FOR CONCERN

The state of country football grounds has come under close scrutiny in the lead up to the AFL season following Hawthorn's threat to refuse to play practice matches due to surface hardness.

Following a practice match in Morwell in late February, Hawthorn football manager John Hook said that unless the AFL provided penetrometer readings measuring the hardness of country grounds, then his side would be pulled out of such matches.

The comments came after two Hawks players, Steven Greene and Kris Barlow, sustained knee injuries on the ground, rubbing them out for the opening rounds of the home and away season.

"If we can't be guaranteed of the ground hardness, or the acceptable hardness, we won't play," Hook was reported as saying in *The Age*. "We are not going to run the risk of losing players on a maybe, possibly, not safe ground."

The article also noted that the AFL's new football operations manager Adrian Anderson had commented that the league had agreed to all requests for penetrometer readings for future matches.

The article even intimated that the Hawthorn club was looking into buying its own penetrometer.

In light of the recent events, AGCSATech manager John Neylan and technical officer Andrew Peart were contracted to undertake ground tests by the AFL, and in the lead up to the season travelled to Shepparton, Bendigo, Adelaide, Perth and Alice Springs.

## Research Underway

The correlation between ground surface condition and player injury has been under the spotlight in recent seasons and comes at a time when two major research projects are underway within Australia investigating playing surfaces at both elite and non-elite level AFL grounds.

The first project, which has been running for the past two years, is being conducted by Melbourne-based researchers Ian Chivers (Racing Solutions) and Associate Professor Dr David Aldous (University of Melbourne).

The research is looking at a number of factors involved in AFL football grounds at the elite level and encompasses regular assessments at all of the main AFL venues across five states. The project aims to achieve several things:

- To develop some understanding of what are normal and abnormal readings on AFL grounds for such factors as surface hardness, shear strength, traction, moisture content, grass type composition, bare area content and thatch depth. This will help to resolve circumstances when players object to the playing surface by offering an objective assessment of the surface and to be able to report that it falls inside or outside of normal playing conditions.
- To determine what instruments are best able to measure these factors, what level of precision they offer and whether that level of precision is required for the purpose. This will help to guide the AFL (and others) as to what equipment is required to fully describe a football playing surface and what the limitations are of each piece of equipment.
- To investigate the relationship that exists for major knee injuries in elite AFL footballers between the rate of injuries and the locations of the grounds. This component aims to develop a range of management techniques for the AFL surfaces that will minimise the incidence of major knee injuries.
- To develop, in conjunction with an extensive survey of players and ground managers, a range of preferred values for the objective measures taken on surface hardness, shear strength and traction. This will help to guide grounds managers in their preparations for AFL matches with the intent to provide playing conditions that are within the preferred range of players and which reduce their recovery time after matches.

Measurements are taken at the same five locations on each ground at each assessment and have been taken in the same week in which the players have rated the ground. This gives a direct relationship between the players' preferences and the measured characters.

The work has so far involved eight assessments of each major AFL venue (Subiaco, AAMI Stadium, MCG, Gabba, Telstra Dome, SCG, Optus Oval and Skilled Stadium) over two football seasons and will involve a further six assessments in each of the next two seasons.

More information on this project can be obtained from Ian Chivers on (03) 9521 6473 or Dr David Aldous (03) 9250 6800.

The second major research project is being conducted in Queensland, where Craig Henderson from the Queensland Department of Primary Industries is leading a Horticulture Australia Limited-funded project at Redlands Park to improve playing surface quality on non-elite (club and community) sporting fields used for AFL in southern Queensland.

Other collaborators in the project entitled 'Best Management Practices for Sustainable and Safe Playing Surfaces of Australian Football League Sports Fields' are AFL Queensland (AFLQ), Brisbane Lions, the University of Southern Queensland, and the Irrigation Turfgrass Consultancy Group.

"These non-elite sportsfields are often based on reclaimed landfill sites, or native soil profiles, with no artificial drainage, generally sandy loam to clay loam surfaces, and have mixed grass cover," says Henderson.

"The other major differences between these club fields and elite sportsfields are the level of available resources and management skills targeted at ground improvement and maintenance.

"As such, our development of best management practices for these non-elite fields focuses on defining acceptable standards for surface playing conditions such as hardness, traction, evenness, turf cover, and how we can manipulate key factors such as irrigation programming, surface soil structure, and turf management to meet these standards."

Early work by the project team has demonstrated that each field presents unique soil and surface characteristics, with major variation at different locations within fields. For example, at most grounds, flanks closer to dressing sheds had greater inherent hardness, more wear, and greater weed grass contamination than the opposite flanks.

As expected, there was significant correlation between surface soil water content and surface hardness as measured with a Clegg Hammer. Recent measurements during the hot Queensland summer gave very high ground hardness levels, where irrigation was unable to keep pace with the high evapotranspiration demand.

With substantial financial support from the project and the collaboration of AFLQ, Brisbane Lions curator Nick Jeffrey has undertaken a program of scarifying, aerating, topdressing and changing irrigation management at several key suburban grounds, to try to improve the



condition and resilience of turf surfaces prior to the 2004 football season.

In conjunction with AFLQ, this project is developing and implementing awareness and training programs to build the capacity of clubs, curators and volunteers to better manage fields within obvious time and resource constraints.

A more detailed picture of this project and results to date will be provided in forthcoming issues of *Australian Turfgrass Management* and on the project's website:

<http://sureplay.aflq.com.au>. Alternatively, Craig Henderson can be contacted on 0408 180 885 or [Craig.Henderson@dpi.qld.gov.au](mailto:Craig.Henderson@dpi.qld.gov.au).

## Development of an Automated Traction Tester

Redlands turf researchers have also started looking critically at the various sportsturf measurement techniques developed to characterise sportsfield surfaces, particularly in relation to player safety.

DPI engineer Les Zeller has made significant advances in the measurement of torsion, which relates to the rotational force on a player's knee when movement of the foot is restricted by the thatch and surface rhizomes that hold the boot in position.

Instead of a single maximum value that equates to the break point of the turf, it is now possible to monitor the way the apparatus loads up to this maximum: how long it takes to reach the break point, and what is the shape of the curve (sometimes a single rapidly rising straight line, sometimes a slower rise with further deceleration of this towards the maximum value).

With this capacity, the next step is to make comparative measurements across a range of turfgrass cultivars and in real life situations, with the aim being able to manage these to produce safer playing surfaces. ▀



Melbourne researchers are using a studded boot device to measure rotational strength of AFL playing surfaces

## SPOT OF BOTHER

Next time you bump into TGAA Victoria president Anthony Uhr-Henry make sure you shake his hand and shout him a drink. You see, the strapping curator at Marcellin College in Melbourne can count himself one very lucky chap. One Saturday during February, Anthony was driving through Ringwood en route to visiting the docs when a timber truck ran a red light, completely wiping the front off Anthony's Club Sport.

With the dash in pieces and the engine nestled in his lap, Anthony had to be cut out of the tangled wreckage and was taken to hospital. Miraculously, Anthony was released that same day and only suffered lacerations and bruising to his ribs and legs, prompting the ambulance officer to remark 'Don't bother buying a Lotto ticket, mate, you've used up all your luck.' We are glad to report that Anthony has made a full recovery and despite a few uncomfortable weeks off work is now back in the shed at Marcellin. ▀



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## AGCSA UPDATE

### Footy Tipping

The mother of all competitions has landed! Yes the AGCSA footy tipping competition, sponsored by our good friends at Nuturf, is up and running and already it's the talk of the turf industry.

There are two competitions – AFL and NRL – and cash prizes totalling \$12,000 are on offer for the pig skin connoisseur. What's more, no tango dinero (that's money by the way) is required to enter! Sweet as.

Nuturf has kindly stumped up some serious loot over which superintendents and turf managers can battle, with each weekly winner pocketing the tidy sum of \$225 (AFL) and \$200 (NRL). If you're a bit short on cash you can always enter both competitions, the only stipulation being that you are a bona-fide member of the turf industry.

The competition will run to the end of the regular AFL and NRL seasons and the top dogs at the end will bag \$700 (AFL) and \$500 (NRL). There will be prizes for second, third and fourth place, while for the poor sod who finishes last, \$25 will be dispensed in order for them to drown their sorrows at a venue of their choosing.

For those who want to join midway through the season, no dramas. Register as normal and you will be given an average score of all the rounds to that point.

To register, simply log on to the new-look AGCSA website [www.agcsa.com.au](http://www.agcsa.com.au) and click on the Footy Tipping icon. This will take you to the introduction page. Follow the prompts, sign up, give yourself a comedy alias and you're away laughing.

Format for tipping is dead simple, even for Banana-benders to comprehend! Punters pick a winner from each game of each round while there is also the option of selecting the draw.

One match will also be selected as a tie-breaker. Punters will be asked to enter what they think will be the winning margin of that particular match. If it comes to the tiebreaker being enforced, the tipster closest to the actual winning margin will snaffle the dosh.

Now if you fail to get your picks in on time you will be at the mercy of the Mystery Punter. From all accounts this fella is pretty damn useless – he plays croquet, loves knitting, grows dahlias and has a fetish for reciting poetry – so no doubt his knowledge of all things rugby is akin to Paris Hilton's knowledge of, well, anything. In other words make sure you get your picks in or face the consequences. The Mystery Punter is at best a dead set drip.

For those tinny enough to pick all games correctly bonus points will be awarded while on the flipside, the dunce who somehow manages to get all selections wrong will not only be vilified and humiliated in the weekly

competition newsletter but also have 10 precious points axed from their tally. Harsh? Yes. Do we give a rat's...? No! So what are you waiting for – [www.agcsa.com.au](http://www.agcsa.com.au). Get picking!

### AGCSA Autumn Workshops

On to more serious matters, a reminder to all superintendents, the autumn series of roving workshops will be held in April. The dates are as follows:

**22 April:** Melbourne

**23 April:** Adelaide

**26 April:** Perth

**28 April:** Sydney

**30 April:** Brisbane

## 20TH AUSTRALIAN TURFGRASS CONFERENCE

### AGCSA Awards

Once again the AGCSA Awards will be dished out at the upcoming Melbourne conference. Nomination forms are in the process of being sent out and those wishing to nominate a candidate for an award must have done so by April 26.

Award categories are similar to previous years – excellence in golf course management, Claude Crockford environmental award and distinguished service award – however, there are a few alterations to the eligibility requirements for the graduate of the year award.

Graduate award hopefuls must have either won or have been nominated by their state association for the respective state graduate awards. The new criterion is fully explained in the brochure.

The awards ceremony will be held prior to the Welcoming Cocktail Reception on Monday, 21 June. And speaking of the ...

### Welcoming Cocktail Reception

Dust off those guernseys (and wigs in the case of a certain NSW superintendent) and prepare yourself for a conference welcoming reception with a distinct footy flavour.

With this year's conference being held in the AFL heartland, the cocktail reception will be held in the Medallion Club rooms at Telstra Dome and as such will carry the theme 'Footy Colours'.

Delegates are asked to come in the colours of their favourite footy team (except Collingwood and Rabbitohs supporters of course), and with the advent of the AGCSA footy tipping the function will provide the perfect opportunity to get one up in the bragging stakes.

Prizes will be up for grabs including the Warrick Capper Memorial Award for tightest pair of AFL shorts. Just kidding. 🍷

## ELLERSTON BREAKS INTO TOP 10

Kerry Packer's Ellerston golf course hit the headlines recently after it was ranked fourth by Australian Golf Digest in its biennial Top 100 Australian golf courses list.

The Greg Norman newcomer was the big mover, debuting behind perennial top three giants Royal Melbourne, Kingston Heath and New South Wales. Western Australia's Lake Karrinyup (7) and Newcastle (10) also moved into the top 10 for the first time.

Victoria has the most courses in the top 10 (5) followed by NSW with three and South Australia and WA with one each. Victoria also had the most courses inside the top 50 with 18.

Here, for the record, is the Australian Golf Digest Top 10 and the top five courses by state.

### TOP 10

1. Royal Melbourne – Composite (*Jim Porter*)
2. Kingston Heath (*Martin Greenwood*)
3. New South Wales (*Gary Dempsey*)
4. Ellerston (*Rod Hinwood*)
5. Royal Adelaide (*Jeff Kaines*)
6. Metropolitan (*Richard Forsyth*)
7. Lake Karrinyup (*Trevor Strachan*)
8. The National – Moonah (*Kyle Wilson*)
9. Victoria (*Ian Todd*)
10. Newcastle (*Guy Thomas*)

### Victoria

1. Royal Melbourne – Composite
2. Kingston Heath 2
3. Metropolitan 6
4. The National – Moonah 8
5. Victoria 9

### New South Wales

1. New South Wales 2
2. Ellerston 4
3. Newcastle 10
4. The Australian (*Rob Ashes*) 11
5. The Lakes 16

### Queensland

1. Laguna Whitsundays – Turtle Point (*Scott Dowdle*) 18
2. Brookwater (*David Lunardelli*) 19
3. Hope Island 24
4. The Glades (*Brad Burgess*) 28
5. Pelican Waters (*Ben Marshall*) 36

### Western Australia

1. Lake Karrinyup 7
2. The Golf Club Kennedy Bay 12
3. Joondalup - Quarry-Dune (*Jeff Lane*) 21
4. The Vines – Composite (*Dion War*) 22
5. Secret Harbour (*Allan Devlin*) 35

### South Australia

1. Royal Adelaide 5
2. Kooyonga (*Stephen Newell*) 14
3. Grange – West (*Chris Klei*) 29
4. The Links Lady Bay (*Wayne Hinton*) 51
5. Grange – East (*Chris Klei*) 53

### ACT

1. Royal Canberra (*Michael Waring*) 15
2. Federal (*Stephen Lording*) 79
3. Yowah 82

### Tasmania

1. Tasmania (*Danny Gilligan*) 57
2. Royal Hobart (*Stephen Lewis*) 68

### Northern Territory

1. Alice Springs (*Grant Reuther*) 59





John Geary is departing Frankston

## APPOINTMENTS

Former VGCSA president John Geary is the newly appointed superintendent at the Tom Doak-designed The Golf Club, St Andrews Beach. The 42-year-old started in the position in early March after 17 years at the Frankston Golf Club.

Geary, a self-confessed connoisseur of golf course design and Doak's work in other parts of the world, said the move to St Andrews was an easy decision to make.

"I just fell in love with the piece of land," he said. "I've read a lot about Doak and his books over the years and always had a deep appreciation for golf course design."

"To be involved in a golf course designed by Tom Doak has me very excited. I'm probably a bit biased, but I think this is the pick of the land in this part of the world."

Geary began his career at the Peninsula Country Club in 1979. In 1985 he travelled Australia and had a brief stint at Mt Lawley Golf Club in Western Australia.

On his return to Victoria in late 1986, Geary began his 17-year career at Frankston Golf Club, a private nine-hole course where he enjoyed his time immensely.

"I had a great time at Frankston," he said. "It was a wonderful part of my career. But now I've got a new challenge and one I'm really looking forward to."

The Gunnamatta Course, currently under construction, measures 6090 metres with a par of 70. The par 72 Fingal Course is 6175m long. A selection of the best holes then make up the Composite course which is a 6450m par 71.

Golf Club Properties Limited commissioned Tom Doak to design what will be his first Victorian project. The Gunnamatta Course is scheduled for completion by April 2004. The Fingal Course is scheduled for construction within the next two years.

\*\*\*

After three years at Mudgee Golf Club in NSW, Justin Sheehan has moved on to Beverley Park where he takes over as superintendent from the retiring Peter Wincote. Sheehan's former 2IC Chris Yeo has been promoted to superintendent at Mudgee.

\*\*\*

Brendon Large has been appointed as superintendent at Melville Glades Golf Club in WA. Large, formerly superintendent at the Bunbury Golf Club, takes over from GCSAWA president Brad Sofield who is now ensconced at Gosnells. John Wanless, 2IC at Melville for some 15 years, was overlooked for the superintendents position and has decided to move on. With Large now back in the big smoke former Royal Perth assistant Des Russell has moved south and takes over at Bunbury. Ironically it was Russell who took over from Large when the latter moved from Royal Perth to Bunbury.

\*\*\*

Superintendent Alan Griffen has handed in his notice at the Axedale Golf Club in Bendigo. 🏌️

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Riverdale Kerb utilises high quality water-soluble packaging. The high quality WSP technology utilised in Riverdale Kerb can be relied on to give even mixing in the spray tank. The 170g WSP size in Riverdale Kerb is the most convenient size available. It allows highly specific application rates, without the need to split bags. The quality water-soluble packaging of Riverdale Kerb means less OH&S concerns. Using Riverdale Kerb means no measuring, no dust or spillage and no bother.

When turf managers use Riverdale Kerb, they can be assured they are using a product that is of the highest quality. Effective wintergrass control demands a high quality product.

**Kerb is the brand Australian turf managers can trust.**

**For more information contact your Nuturf territory manager or local supplier.**

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The Daedong DK551

### NEW DK551 SET TO STORM UTILITY MARKET

Agriculture Holdings is pleased to announce the latest in Daedong tractors. The new DK551 offers a high level of specification, modern styling, a light footprint, a more powerful engine, superior operator environment and benchmark setting affordability for the 50-60hp utility tractor class.

The DK551 is available in both cabin and ROPS versions with either Ag or Turf tyre configuration. Both operator platforms feature a flat floor, suspended pedals, tilting steering wheel, adjustable seat and unobtrusive side mount control levers all of which contribute to easy on/off operation.

The downswept under tractor exhaust contributes to very low noise levels even at full load which will be appreciated by operators in all-day mowing applications.

For more information on the DK551 or any other Daedong models, phone David Richardson 0438 090449 or on 0408 548 547. 📞

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Sierraron can be used on such areas as fence lines, playing field perimeters, established gardens, parks, paths, paved areas and playgrounds. As long as soil is present in the area, Sierraron will go to work on the weeds after watering in. It is environmentally safe with no run-off or leaching, and because of its granular form is easy to apply, with no suit, mask or gloves required by the operator. 📞



Go to work on weeds

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For all enquiries about this first aid kit, defibrillators and first aid training call First Intervention 1300 PARMED (1300 727 633) or email [info@firstintervention.com](mailto:info@firstintervention.com) 📞



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"Monument offers both grass and broadleaf weed control," says James Royal, plant protection product manager at Nuturf. "The initial registration is for control of *Poa annua*, nutgrass, clover, burr medic and ryegrass. Further registrations will follow with the ongoing development of this product."

"We are excited about this product release as it extends our portfolio into herbicides," added Syngenta's turf business manager Kate Dorahy. "Monument goes beyond our current products of Primo Maxx, Banner Maxx, Daconil Weatherstik and Heritage."

For information visit [www.greencast.com.au](http://www.greencast.com.au), [www.nuturf.com.au](http://www.nuturf.com.au), talk to your local Nuturf manager or call Nuturf on 1800 631 008 📞



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## Turfgrass Soil Fertility and Chemical Problems - Assessment and Management

By R.N. Carrow, D.V. Washington and P.E. Rieke (*Sleeping Bear Press*)

Fertilisation is one of the three major turfgrass management practices, along with irrigation and mowing. The use of fertilisers is becoming increasingly more complex particularly due to the heightened awareness of the implications of fertiliser run-off and its affects on water quality and the environment in general.

This text provides the reader with a practical, science-based source of information to educate them on the fertility management practices that confront them.

The introductory chapters provide an overview of what is a soil and soil-related problems, plant nutrition and enhancing the nutrient use efficiency of the turfgrass plant.

The chapter on plant nutrition includes a very informative section regarding nutritional uptake via the roots system and also foliar uptake of applied fertilisers. Tables are provided that outline factors for each nutrient, including micronutrients, becoming deficient, their symptoms and conversely when toxicity may occur. Another table also illustrates the relationship between nutritional levels and the incidence of disease.

The chapter regarding turfgrass nutrient use efficiency covers topics such as leaching, run-off, volatilisation, denitrification, fixation and clipping disposal.


The body of the text centres on soil chemical properties and problems. This covers the basics of cation exchange capacity, the intricacies of pH and associated problems of acidic and alkaline soils.

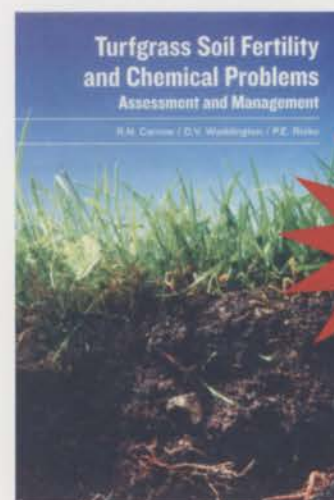
The two chapters on salt-affected soils and the management of salt-affected sites are two chapters pertinent to many superintendents and the difficulties they confront endeavouring to produce quality surfaces on these soil types.

There is comprehensive coverage on each of the major nutrients with a single chapter dedicated to each of nitrogen, phosphorus and potassium, with another chapter examining calcium, magnesium and sulphur and a final chapter covering the micronutrients and other non essential elements.

The final section has chapters dealing with turfgrass fertilisers, factors in selecting a fertiliser and developing a fertiliser program. It also discusses the much-debated issue of quick-

release verses slow-release and the sources of both types.

The appendix, in its own right, is a valuable information source detailing units of measure, common fertiliser calculations, symbols and atomic weights of elements and an explanation of commonly used acronyms. 



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## GCSAQ

Once again the weather is one of the big talking points this time of year. So far we have had heavy rain and flooding followed by hot and humid conditions which have brought the highest temperatures yet recorded. To top that off southeast Queensland experienced the nearest thing to a cyclone.

In the midst of this, clubs have been running pennants competitions as well as all the usual club comps, corporate days and social golf. Spare a thought for Darren Moore at Lakelands and Stuart Laing at Royal Pines, the venues for two tournaments held in extreme conditions.

At Lakelands, the first leg of the LPGA Tour - the ABC Learning Centre Classic - was held with record high temperatures resulting in two competitors having to walk off the course due to heat exhaustion. The course was in great condition despite the hot weather and came up well on TV.

By Tuesday the Gold Coast had been flooded by torrential rain - try 75mm in an hour on top of 65mm overnight. With the Ladies Tour starting at Royal Pines on the Thursday, groundstaff were busy pumping bunkers and pushing up walls to get the course in shape. Come Thursday and the tournament was underway with everything back in shape and then one K. Webb complains the greens are slow and gets national coverage for saying so!

The staff are to be congratulated on having the course ready for play after such extremes of weather.

Recent field day events included a very successful day at Lakelands in February, sponsored by Northern Rivers Rural Buying. Tim Kennedy and Paul Mclean did a fine job of outlining the company's objectives. Darren Moore gave a rundown on operations at Lakelands before the group checked out the pump station and injectors and then the AGCSA turf trials site. Golf winner on the day was Russell Milliner from Tewantin Noosa Golf Club.

In other industry news, JFB frontman John Broderick has finally retired from the grind of being a company sales rep with David Golf to go touring the country. We wish him well in his travels and won't be surprised if we see him lurking around the odd golf show from time to time.

Congratulations also to Burger Macphee for tying the knot, while Daryl Edwards from Sanctuary Cove has been seen on Brisbane TV explaining their Kangaroo management program - tagging and releasing the creatures and administering contraceptives to control the population.

**Jon Penberthy,**  
President, GCSAQ



## GCSAWA

G'day to everyone around Australia. It has been a great start to 2004, and at the time of writing this it is already mid March. The months are coming around as quick as these State Presidents' reports. For all of our members who think to themselves, 'Geez this info is old news', this is due to the fact that these columns are written well in advance of the publishing date.

The stinging crack from the ATM Editor's whip if we are late or too boring can reach all the way to WA too. Trust me! Sorry Brett, I hope I haven't divulged any of your personal fetishes to everyone. Sorry. *(Don't worry Mr Sofield I have many more deviant vices than just whips. Besides you fellas need a regular lambasting, particularly a certain individual from the northern climes Ed.)*

I digress. The Golf Masters Cup is well underway with rounds one and two staged at the Wembley and Gosnells golf clubs respectively. Congratulations to Darrin Wilson and the course staff for preparing the course magnificently for the inaugural round. Fortunately the weather was kind - 32 and what I reckon was 99.99 per cent humidity at 6.30am. Bloody Darwin weather!

Accordingly, big thanks must also go to the course staff at Gosnells for their efforts in preparing the course for round two. To check your handicap or leaderboard see DIVOTS or call Craig New. Even better, come to the next round!

Work is well under way preparing for the GCSAWA Management Challenge hosted at Bunbury Golf Club on 19 April. As discussed in previous reports, the executive committee has restructured the entire calendar of events for this year in response to member feedback and we hope to promote better attendance across the spectrum of membership classes at the scheduled events. The reintroduction of the original management challenge format has been adopted and we look forward to testing the Bunbury course and the management team on their home track.

The GCSAWA committee works tirelessly, much too some people's amazement, organising and reorganising these days to attract as many members as possible. The format and type of days planned by the executive committee usually develop from member feedback so we want your support when we organise them.

This association is well regarded for its tight knit community feel around Australia. Let's foster it and remain a dominant industry association representative of professional turf managers in Western Australia.

Some arrivals and departures of late include GCSAWA life member Geoff Osborne departing Port Bouvard Golf Club to oversee the construction of an exclusive thoroughbred stud in the beautiful southwest as landscape manager. Tidy little position I hear Geoff. Congratulations and we all hope you stay in touch.

Des Russell, formerly of Royal Perth Golf Club, has also moved south and filled the position of superintendent at Bunbury Golf Club.

Last, and but by no means least, congratulations to one of my old work mates Jay Gawley who has been promoted to assistant superintendent at Melville Glades Golf Club. It's good to see another young bloke step up and I'm sure he will make the position his own.

On behalf of the GCSAWA I wish you all the utmost success in your new positions in the future and hope the GCSAWA can be of any assistance at some stage.

Dates to jot down include;

- Management Challenge -  
Monday, 19 April (Bunbury Golf Club)
- Golf Masters Cup R3 -  
Tuesday, 11 May (Lakelands Country Club)
- Golf Masters Cup R4 -  
Monday, 14 June (Mount Lawley Golf Club)
- 20th Australian Turfgrass Conference -  
21-25 June (Melbourne)

**Brad Sofield,**  
President, GCSAWA



## NSWGCSEA

Just as the NSW Minister of Utilities threatened to execute stage two water restrictions upon Sydney and its immediate surrounding districts, the rain broke through in blanket form quite appreciably.

It appears the entire state was the recipient of this late February rain and what a god send it was. Hopefully, this rainfall would have eased the immense pressure many superintendents and their staff have had to endure to maintain their courses.

We can only hope these latest downpours fill the catchments behind Warragamba Dam and that restrictions can be totally lifted and life return to some state of normality.

The last two years of drought should serve as a valuable lesson to our industry and remain the focal point of ongoing research and planning to ensure that in the future our industry is better prepared for the inevitable drought conditions.

In the other major piece of industry news recently, the NSW Department of Environment and Conservation (DEC) has announced that Peter Brown and Kate Lowe have been selected as the successful consultants to conduct the environmental audit pilot program on NSW golf courses for and on behalf of the DEC.

Peter Brown and associates and Kate Lowe and associates are currently developing an environmental template based on the information outlined in the Improving the Environmental Management of Golf Courses in NSW manual.

The program is currently seeking interested parties from the Southern Highlands, Central Coast and the Blue Mountains areas. The program has already secured a number of golf courses from the South Coast thanks to Scott McLauren



and also found a number of willing participants in the Sydney metropolitan area.

The final documentation of this program will be of significant industry value and provide insight of the professional operations of the entire golf course industry. It will provide an independent assessment of the positive harmony golf courses provide as valuable green-space in its local environment and the communal value to its surroundings.

It will also provide leverage for superintendents to monetarily prompt their club committees into an active environmental awareness stance. Furthermore, the documentation may be used to indicate at government level, the pro-active role the industry has voluntarily undertaken given fiscal constraints to ensure golf courses provide long-term ecological sustainability within an ever-tightening legislative noose.

On a lighter note, congratulations go to both Darren Watson (Horizons Golf Club) and Mark Parker (Concord Golf Club) for the magnificent playing surfaces during their respective tournaments recently.

Both these superintendents have been under enormous pressure for varying reasons to produce the goods amid the country's worst recorded dry spell.

Congratulations, too, must be extended to all potable water dependent superintendents who have persevered with stringent water restrictions and eventually witnessed the light glimmer through the other end of the tunnel. The rainfall at the end of February came gift wrapped for these fellas.

Scott Lane, superintendent at Oatlands Golf Club, is currently in the planning stage of implementing a subterranean rubber perforated pipe irrigation system into the soil profile of his nursery as a supplement to his general irrigation supply.

The motive behind Scott's project is of an environmental and visual conscience nature and as an experiment to calculate moisture use through this unique system. Scott is currently investigating installation depths and spacing x volume distribution. The end result will be extremely interesting with the NSWGCSA following its progress closely.

The next NSWGCSA Country Tour will be conducted at Leura and Mudjee golf clubs. Mervyn Hayward and Scott Riley are preparing some excellent speakers and entertainment for the event. 🌱

**Craig Easton,**  
President, NSWGCSA



## SAGCSA

What a contrast in weather conditions the start of the year has thrown at us in South Australia.

January proved to be one of the coolest in decades, then February started with a record for Adelaide – 18 days in a row of over 30°C maximums with a top of 44.3°C on Valentines Day. All this and still no rain to speak of this calendar year by early March!

Congratulations to Steven Newell and his dedicated ground staff for presenting the Kooyonga course in magnificent condition for the recent Jacobs Creek Open. By all reports the Kooyonga course's conditioning is continuing to improve from year to year, certainly a feather in Steven's cap.

Our recent superintendents day at Fleurieu Golf Club in early March was hosted by superintendent Wayne Dale. The day was one of those hot, dry and windy summer days, so it was pleasing to see 25 members enjoy an early nine holes of golf before the course inspection at 9.30am.

During the inspection Wayne highlighted certain irrigation issues particular to his course, as well as the rather inventive nature any superintendent has to adopt when faced with



## THE NEW AGCSA WEBSITE

The AGCSA website has gone through some major improvements recently. You can now lodge your own advertisements for jobs and products, bid for online auctions, join in on bulletin board topic discussions, book and pay for conference and workshops, as well as order books and merchandise. Your current well used pages will still be there including the footy tipping competitions, ATM articles and latest news from around the turf industry.

All this and a flashy new look will help you keep in touch with the AGCSA 24 hours a day!!!

**www.agcsa.com.au**





the ever-tightening budget restrictions which are a big reality these days.

At lunch Nuturf's Andrew Manthorpe introduced the group to Gavin Jones, Nuturf's irrigation representative for South Australia, while Darren Ferber from Aquateck spoke about his company's recent involvement with water management techniques used in the local government area.

In particular, he highlighted application with regard to golf course irrigation management and the savings that can be made, as well as applying this valuable resource as evenly as possible.

Diary dates for SA superintendents to be aware of include the AGCSA autumn workshop which will be held on Friday, 23 April. At the time of writing a theme and venue had yet to be confirmed.

The SAGCSA AGM has been set down for Thursday, 3 June at Riverside Golf Club, host superintendent Stu Gillespie. See you there.

**Peter Harfield,**  
President, SAGCSA



#### **TGAA (ACT & Surrounding Region)**

The most recent news to affect local turfies has been the lifting of stage three water restrictions. The current stage two restrictions in place have eased some of the pressure placed on many turf managers to reduce water usage.

Although this has been welcomed by many, all are aware that this will not be a permanent situation unless significant rainfall is experienced in the coming months.

The local turf industry has recently become aware that a regional turf and horticultural identity Pat Garret has decided to hang up his boots. Pat has been the gardening supervisor at Government House, Yarralumla in Canberra since 1985.

Previous to his employment at Government House, Pat has had a long history of dedicated work in the Canberra region. From his first involvement with the ACT TGAA as a guest speaker for the inaugural meeting to his position of six years as president, his involvement and dedicated contributions to the association has been invaluable.

His professionalism, work ethic and benevolent nature will be missed by all. The ACT TGAA wishes him the best of luck and we can only hope that he will be watching closely from the sidelines.

Till next time, agrostologists.

**Justin A. K. Haslam,**  
Committee, (TGAA ACT & Surrounding Region)



#### **TGAA (Vic)**

Autumn brings a very busy time for us all. At the time of writing, we are seeing cooler

temperatures and hope springs eternal for good autumn/winter rains. As we move into the season for more winter sports, I would like to congratulate those turf professionals who have received awards for efforts in the preparation and maintenance of turf wickets over summer. This recognition is very well deserved.

It has been heartening to see how many members have been successful at handling the enormous stresses of the continuing dry environment. Our industry has been asked to provide suitable surfaces under extremely difficult conditions. Our broader community also wishes for a more sustainable turf environment that can survive on fewer inputs in regards to water, nutrition and basic maintenance regimes, all the while withstanding more wear.

There is no doubt that one of the major reasons for success in this area has been the ability of members to adequately present and communicate compelling reasons for maintenance and renovation programs to management.

Inevitably, the use of a PC, while not essential, is now a great asset in this area. While we appreciate that various members have a variety of skills and solutions for the myriad of turf problems, we cannot forget about the ability to present and communicate.

A well documented report will outline existing conditions and potential problems. Include cost estimates, time requirements and projected out-of-play times. A suggested remedy should also be included. Finally, include a description of the desired outcomes as well as the alternative outcome if no action is taken.

Reports do not have to be excessive in length, just enough to present, in point form if necessary, how you see the situation. A clear, concise report handed to your manager enables them to take your issues up with other site and facility interests. Because of the massive conflicting interests that exist at most work sites, it is in your best interests to have the best presentation available. It therefore becomes important for us to be able to utilise technology to our benefit.

If we improve our communication and presentation skills, our turf surfaces and our whole work sites will benefit greatly from it. The efforts of many of our members in successfully handling our challenging environmental conditions of the past two years have proven that.

On a lighter note, the 20th Australian Turfgrass Conference is fast approaching which will be a great opportunity to catch up with our interstate colleagues. Please take time to review the enclosed registration form and take note of the "earlybird" discount. You will see that we are hosting the Sportsfield Stream and have endeavoured to make it a rewarding program for all.

**Jim Marchbank,**  
Vice President, TGAA (Vic)



#### **TGCSA**

The TGCSA recently held its AGM at Bellerive Oval and I feel this was one of the best days we have had to date.

The Toro boys had heaps of giveaways and again we drained Nev from Pellow's Saws and Mowers for more money. Mark at Nuturf was over too and he gave heaps away as well.

Steve Lewis and Richard Lancaster battled away putting a Toro sprinkler together to win a new mower, which was valued at over \$1000. Males Sand donated a \$200 voucher.

Nick Hanson demonstrated his new laser level at KGV soccer oval. The slides were fantastic and thanks go to Nick for taking time out to present this.

The TGCSA will hold a two-day seminar at Bicheno Golf Club on 4-5 May. A top class line-up of speakers will be in attendance as well as plenty of machines.

The golf will be huge. We are playing for the Reg Roberts Memorial Trophy and the North vs South for the cup. I think this will stay in the south for a long time so I don't think I will even bother bringing it up.

This is Tassie's little turf conference so come along. If anyone has something they would like shown or talked about, then call me on 0438 298 300. There will be a BBQ lunch and a sit down dinner in the clubhouse and presentation of prizes.

The second day will consist of a cooked breakfast and a BBQ lunch. We have not set a price as yet. Members will get a cheaper rate than non-members so hurry and join! There will be plenty of refreshments available as well.

I think we can make this a really great annual event for our association and a time for all to let your hair down after a long hot summer. We are currently negotiating a price for some cheap accommodation in Bicheno.

Invitations will be sent out shortly. Bookings will need to be made asap because of the tourist boom and catering.

The footy season has just started and when you are making your picks for the AGCSA footy tipping comp, you will have one right each week if you pick the Kangaroos. You may laugh, but my boys are looking good! Congratulations to Spinner Atkins and the ground staff at Civic Solutions for the great job at North Hobart Oval. The St Kilda side were rapt to have such a great surface to play on and if you haven't been to the TCA lately go and have a look, it's looking an absolute picture.

Tony Smith at Mowbray Golf Club and his staff recently held the Tasmanian Open and have set a new standard in course presentation. Golfers and spectators just loved it and considering Tony doesn't have the biggest staff or budget to work with, this was a fantastic achievement.

In other news, Mark Potter from the Claremont Golf Club has joined the AGCSA's turf education working committee.



If you have any suggestions please ring me. Dust off the clubs and I will see you at Bicheno. If you don't play golf come and look at the gear and have a beer.

**Chris Hay,**  
President, TGCSA



Many of us in Victoria, especially metropolitan Melbourne, are wondering what rewards were offered to ATM editor Brett Robinson in allowing what must have been an enhanced photo to prevail on the front cover of the last issue of this fine magazine!

Apart from the fact that the magazine must have had a record demand - the Riordan family having acquired 100 copies - I would strongly advise Brett to lift his game!

Maybe somewhere in the vicinity of Australia's top notch performance against New Zealand in last year's Rugby World Cup! (I am still awaiting the cheque from Mr Riordan - Ed)

On a serious note, all is well in Victoria considering this season's water restrictions. A reasonably mild summer has prevailed with

the odd generous drop of rain through January alleviating some of the pressure.

On the job front, two notable superintendents have made a move to new projects recently namely John Geary, formerly of Frankston Golf Club, to the Tom Doak designed The Golf Club, St Andrews Beach.

On the back of John's news was the announcement that VGCSA education coordinator and Cape Schanck Resort superintendent Chris Grumelart has won the superintendents position at the Sandhurst development in Carrum.

The above outcomes are particularly pleasing given the contribution both have made on the local turf scene and I for one am thrilled to see two good mates move onwards and upwards.

In late March, the VGCSA held its meeting at Moonah Links with the theme of the day being, appropriately, tournament preparation. The panel for the morning presentations included Moonah Link's superintendent Leigh Yanner, Royal Melbourne's Jim Porter and John Neylan from the AGCSA.

Thanks to all for attending this most informative session. It was good to visit Moonah considering the positive feedback the course and the Australian Open received during December.

To highlight the aims of the VGCSA this year, we are hoping for an enthusiastic response to the book release of the association's 75-year history which will be available from May 2004.

Anyone interested in obtaining copies for other states will be happily catered for by contacting our administrator Lesley Mitchell. The main aim of this book is to highlight the many conscientious individuals who have long been forgotten throughout the VGCSA's past.

This together with the addition of a number of new faces on our committee this year will move the association forward for the next 10-20 years with the past remembered and the youth of our profession looking after the future.

**Michael Picken,**  
President, VGCSA



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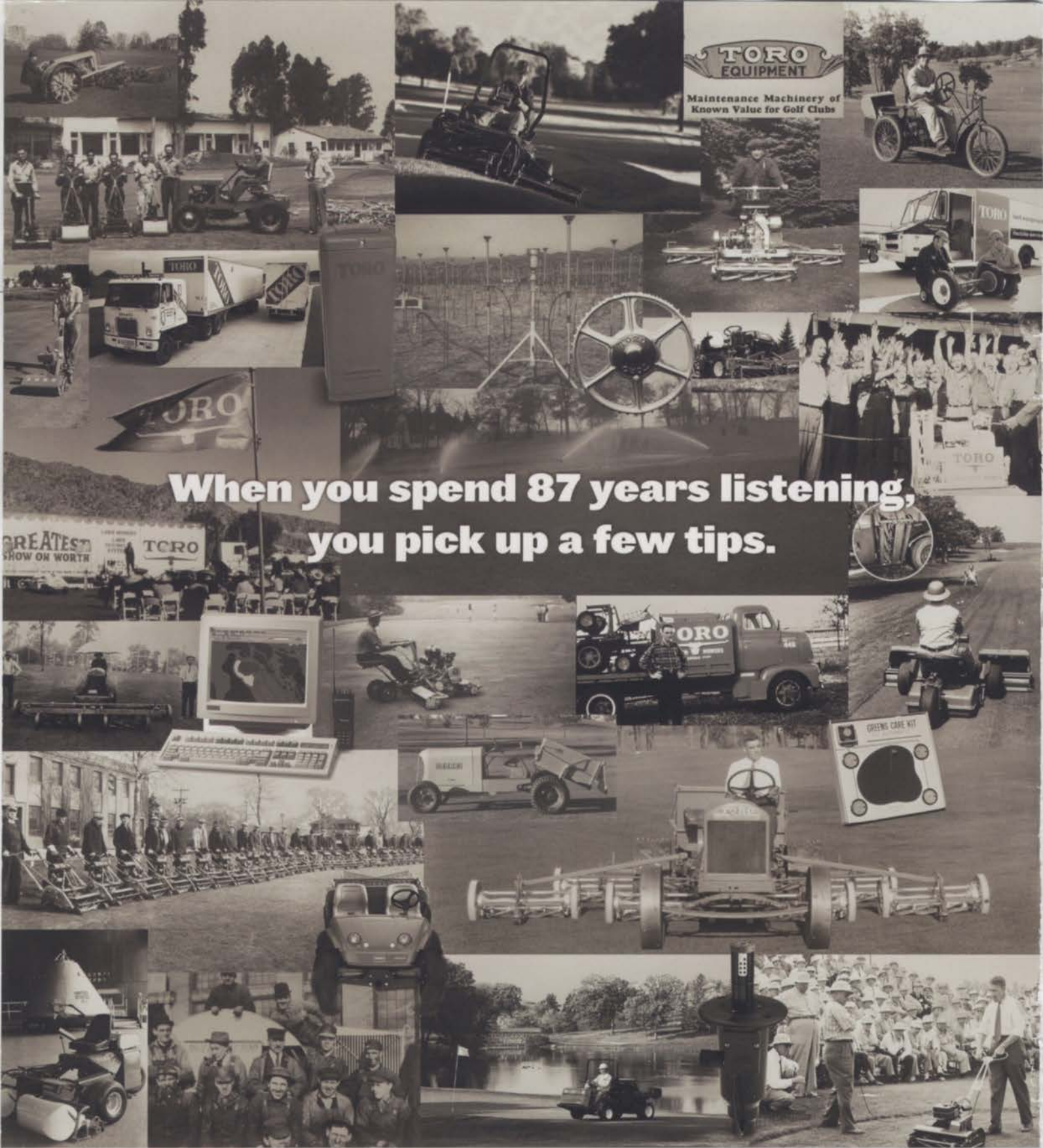
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