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# Turfgrass

MANAGEMENT

## AUSTEP TRIALS: *Final Results*

## Irrigation Audit

*From Barren to Beerwah*

Taking the guess work out of greens

FEBRUARY - MARCH 2001

volume 3.1

# Get The NSN Global Advantage



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This support program is unique to Toro, the leader in large turf irrigation control systems. It is designed to provide a level of central system and computer support not available for any but Toro central controllers.

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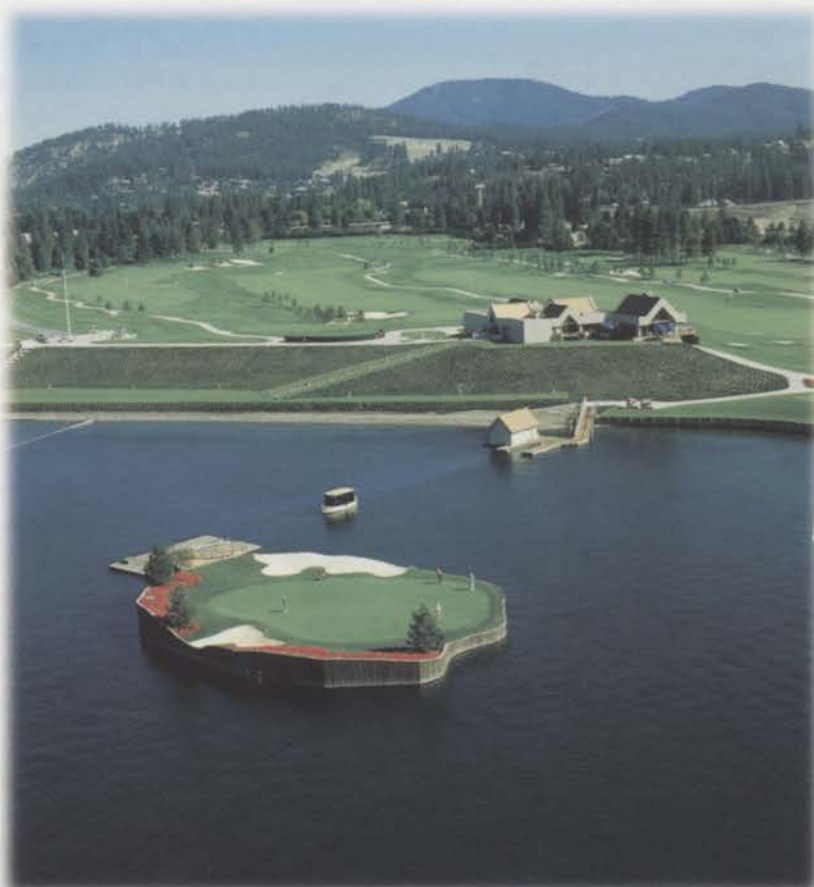
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## ON TRIALS!

Welcome to the first edition of Australian Turfgrass Management for 2001. There will be some changes this year but our focus remains on providing you with up-to-date and useful research and technical information. We also plan to include more 'profile' and general interest stories to fully showcase the colour and diversity that makes this industry so unique.

The 17th Annual Turfgrass Conference and Trade Show to be held in June at the Sydney Convention and Exhibition Center in Darling Harbour looks like being even bigger than last years Melbourne conference. You should have received a registration form by now but if not, please contact Fiona at the AGCSA office. On page 34 and 35 we have a Conference Floor Plan and profile of Duncan Malcolm who will deliver the keynote presentation.

In 'Research' this month we feature final results from the Australian Turf Evaluation Program (AUSTEP), which evaluates 56 varieties of perennial ryegrass at two Melbourne trial sites. Still with variety trials, John Neylan introduces the first results from the AGCSA bentgrass trial sites at the Kingston Heath Golf Club (front cover) and summarizes the performance of the many new bentgrass varieties evaluated in the National Turfgrass Evaluation Program (NTEP) done in the USA.

Geoff Connellan walks us through an 'irrigation system audit' and also in this edition, 2000 AGCSA Claude Crockford Environmental Award winner, Ben Tilley, discusses how a 'lifeless' golf course has been transformed into a unique and valuable habitat for native flora and fauna.

In 'Review' David Goldie discuss a trip of a lifetime that ignited a passion for golf course management and in 'News' we talk to Golf Course Superintendent, Richard Forsythe about the Accenture World Matchplay tournament held in early January.

Lastly, inserted with this edition is a 'reader survey' that tells us what you want to read about. To go into the draw to win \$200 worth of AGCSA Merchandise, simply fill it out and post or fax it to the AGCSA office by Friday 16th March.



Phil George  
Editor



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## President's Pen



Welcome to the first edition of Australian Turfgrass Management for 2001.

The AGCSA has clearly established itself in recent years as a leading source of information, networking, education and now research and technical services for the Australian turfgrass industry. These broad areas of operation provide members and the wider turfgrass community with a one-stop shop for information and technical support to further your career in the turfgrass industry. Furthermore, by broadening the income base, the AGCSA is now also less reliant on government funding and increasing membership fees as the sole source of funding new services or consolidating existing services for members. Indeed in this financial year membership income is likely to only represent 3.5% of the AGCSA's total revenue base.

The AGCSA's strategic planning process has identified 2001 as a year of consolidation for the association.

The AGCSA's Mission Statement, first established in 1992, but reflecting AGCSA's vision from as early as the 1940's is as relevant today as it was then:

**"The AGCSA is committed to serving its members, and enhancing the quality of golf by encouraging professionalism and environmental stewardship."**

This is also reflected in the main object for which the association was founded and which is enshrined in the Association's Memorandum and Articles of Association:

**"The improvement of golf courses and the furtherance of the knowledge of golf course superintendents."**

The AGCSA's present activities aim to meet this overall objective either directly or indirectly.

I am often asked the question as to why trade members are not entitled to voting rights within the AGCSA. There are many reasons for this but the main one being that the association was established as a turfgrass managers association. Membership and input from trade and other sectors of the industry is important in maintaining the overall broad mindedness of the organization, but in my view, governance of the organization must always be held by turfgrass managers. The existing structure means that the Board, made up of four Golf Course Superintendents, are free from commercial bias in deciding on the best course of action that will meet the AGCSA's main role. Indeed, the recent move by the AGCSA to establish AGCSATech as a provider of research, and analytical services would surely have not got off the ground if trade members had voting rights, despite the fact that it is in the best interests of golf course superintendents. The AGCSA's services are analogous to the ABC in television broadcasting. We are the people's provider.

Trade members often ask as to how their views can be put to the AGCSA if they cannot vote. The answer is simple. The AGCSA has an open door policy - anyone with views or opinions they wish to raise with the AGCSA Board or staff are free to do so at any time. It is important that all members avail themselves of this opportunity. Trade members with particular interests might feel that this is a frustration to them because they have no power (in the form of voting rights), other

than that of lobbying voting rights members to control AGCSA's policies. I see this as a strength of the organization, not a weakness. If the issues are lobbied well, and the voting rights members take on these issues as a majority, then change can be effected. Interest groups lobby voting rights members on a whole range of issues and this is healthy and a part of any democracy. Members need to be aware however that their voting influence is important and they should not underestimate the extent, complexity and aims of much of the lobbying that is undertaken. As a turfgrass managers' association however, the final decision must be made by the turfgrass manager.

AGCSA Members would have recently received the AGCSA Membership Satisfaction survey. This annual document provides the AGCSA Board and staff much needed feedback on AGCSA policies and services. The results are published in the AGCSA ACTION Newsletter and are used as an important measure of membership satisfaction by the Board. The value of surveys is that they provide an accurate reflection of the entire membership.

Nomination forms for the AGCSA Board will be distributed in March /April. With two Directors already indicating that they will retire from the Board, myself included, there is an opportunity for members with a passion for the profession of turfgrass management to join the Board to help build on the strong association we have today.

*Peter Frewin  
AGCSA President  
Golf Course Superintendent  
Barwon Heads Golf Club*





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# What will an irrigation system



## ACHIEVING EFFICIENT AND EFFECTIVE IRRIGATION

Many hundreds of items of equipment make up a complete functioning irrigation system. The system will work well if it has been well designed, equipment carefully selected and it is competently installed, well maintained and well managed. Sounds simple! Unfortunately it only takes one component to fail or one part to not perform to specifications and the performance or effectiveness of the whole system is diminished.

Therefore it is important to regularly check the functioning and performance of all irrigation systems.

The performance of the irrigation system can be assessed in terms of

- (1) Efficiency of water application to meet the needs of the plant.
- (2) Reliability of the system (breaks, failures, malfunctions etc), and
- (3) Quality of management of the system.

Therefore, what are the requirements of an effective and efficient irrigation system?

- Water applied at the correct precipitation rate without runoff or losses.
- Water applied uniformly.
- Correct depth / volume of water applied to meet site needs.
- Water applied at the right time (taking into account rainfall and climatic conditions).

## WHAT IS AN IRRIGATION AUDIT?

The process of taking field measurements to evaluate the existing performance of an irrigation system is the basis of an audit. An integral part and outcome of the audit is the development of irrigation schedules (how much to apply, when to apply) that meet the needs of the site. The audit will also provide information on how to improve the performance of the system.

An audit with follow up improvements to the system if required should benefit the irrigation manager both in the improved efficiency of water application and also in the management of the system. Poor irrigation systems not only result in a waste of water and nutrients, they are expensive in labour and time. In many cases an audit results in direct cost savings through reduced water consumption.

## CONDUCTING AN IRRIGATION AUDIT

### *Base Audit Information*

Conducting an audit of an irrigation system requires the establishment of an accurate record of the system, the site and the vegetation. The foundation to building a quality irrigation management program is a detailed plan, which not only includes records of locations of important features, but also reference to accurate details of equipment. The make, model and size of components (sprinklers, valves etc) must be recorded.

Details of the water supply and control equipment are particularly important - pump or meter, controller, master valves, etc. It is also critical that details of control programs for each control station be noted so that recommendations can be made on the appropriate run times of the system as tested, to meet the needs of the vegetation (turf) at the particular site. For example, it may be recommended that the sprinkler be operated for 35 minutes to apply 8 mm. In addition to the system performance details the auditor would have taken into account, the root zone

# audit tell you?

BY GEOFF CONNELLAN



PRESSURE TESTING OF OUTLETS IS IMPORTANT AND PROVIDES VALUABLE INFORMATION ABOUT THE SYSTEM

depth of the turf, soil type, water-holding properties of the soil and recommended depletion amount at each irrigation event.

### Test Conditions

An audit should be carried out under conditions, which provide fair representation of the normal performance of the system. The climate conditions, in particular wind, should be within acceptable limits during the test. A maximum wind speed of 10 kph can be used as a guide.

The system pressure should be checked to see that the equipment to be tested is operating under design conditions. A pitot tube gauge (small diameter tube inserted into water stream) can be used to check nozzle pressures. When using this method it is important to note that the nozzle pressure will be higher than the inlet (base) pressure to the sprinkler head. Irrigation systems are most commonly designed on inlet pressure and so this difference needs to be taken into account when analysing a system.

### Identifying Problems

The system should be operated prior to the

actual audit to check the functioning of the various components. This stage of the audit process is sometimes referred to as the "walk through". Often, problems that directly affect the performance of the system will be observed. For example, a sprinkler head may be damaged or blocked. These problems should be fixed prior to the audit test. It does not make sense to evaluate the performance of an irrigation system that has readily fixable problems.

This check procedure is included, as a first step, in the Certified Landscape Irrigation Auditor (CLIA) training course developed by the Irrigation Association (USA) and is available through the Irrigation Association of Australia (IAA).

Some of the problems that might be identified during the walk through include:

- Malfunctioning valves
- Sunken sprinkler heads
- Incorrect or non-rotation of sprinkler heads
- Tilted heads
- Plugged nozzles
- Broken casings and missing parts
- Distorted spray distribution

- Incorrect nozzles installed
- Leaking pipes, valves, fittings, equipment, broken seals
- Incorrect operating pressure

Any problems observed should be identified according to position and controller station. This information should be recorded and noted on the plan as part of a maintenance record of the irrigation system.

Not all problems can be fixed prior to the test. The audit may indicate system deficiencies (problems) such as incorrect sprinkler spacing or low operating pressures that may involve major works or design changes.

### AUDIT RESULTS

#### Key Performance Data

The two key performance readings that an audit will provide are the mean precipitation rate and the evenness or uniformity of the application. Both are essential information for the management of an irrigation system.

It is the responsibility of the system designer to select a precipitation rate appropriate to the soil type and site. Outlet equipment (eg.

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sprinkler nozzle) should be selected so that the sprinklers or sprays will apply water to match the design rate. An audit test will tell you what is actually being achieved in the field. It provides a check for new systems and accurate information on the precipitation performance for existing systems.

The precipitation rate (rate of water falling on to the ground), expressed in millimetres (depth) per hour, is used in conjunction with the recommended irrigation depth, to determine the duration of irrigation. It is also used to ensure that the water is being applied at a rate that will not result in runoff and water loss from the area.

All overhead sprinkler and spray irrigation systems apply water unevenly. Good design is about selecting equipment and operating conditions to achieve a high level of uniformity so that efficient irrigation can be achieved. Whilst there are several indexes used to measure uniformity, the recommended index coefficient for turf is the Distribution Uniformity (DU) coefficient. The audit test will provide a DU value for each area tested.

#### *Distribution Uniformity (DU) and the Scheduling Coefficient (SC)*

The industry standard is that DU should not be less than 75%. Low values indicate poor uniformity and a wide range in readings within the test area. If the DU value is significantly lower than 75%, for example 65%, then the system should be investigated to determine possible causes.

There are many reasons why the sprinklers may not be applying water evenly including low operating pressure, incorrect sprinkler spacing, incorrect nozzle size, damaged sprinkler head or excessive wind. Additional measurements taken during the test, such as pressure and flow rate, will often provide an indication of the possible cause.

In addition to providing a measure of non-uniformity, the value of DU can be used to provide a time adjustment factor, called the Scheduling Coefficient (SC), for the control program. In order to ensure that all parts of the irrigated area receive an adequate depth of water, it is recommended that the sprinkler run times are increased to allow for

unevenness in the application. For example, the SC25% value corresponding to a DU of 75% is 1.33 ( $SC25\% = 1 / 0.75$ ). This SC25% value has been calculated using the same field as that used to calculate DU. There are other SC terms in use. It is important to clarify which SC term is being used in each situation.

#### *Pressure Testing - Why pressure testing is so important*

An accurate pressure gauge is an extremely valuable tool for the evaluation and monitoring of irrigation systems. Pressure is the heart rate of the irrigation system. Part of the audit test will involve checking the actual sprinkler operating pressure and pressure variation throughout the system. Some of the key information that can be provided through pressure measurements include;

- (1) Checking the sprinklers are operating at correct (optimum) pressure?
- (2) What is the pressure variation along the lateral? Is it acceptable?
- (3) What is the pressure variation between stations and sprinklers in different parts of the system?



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- (4) What is the amount of pressure loss due to friction in mainlines and submains?
- (5) What is the pressure loss across valves and special fittings?

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### *Pump Performance*

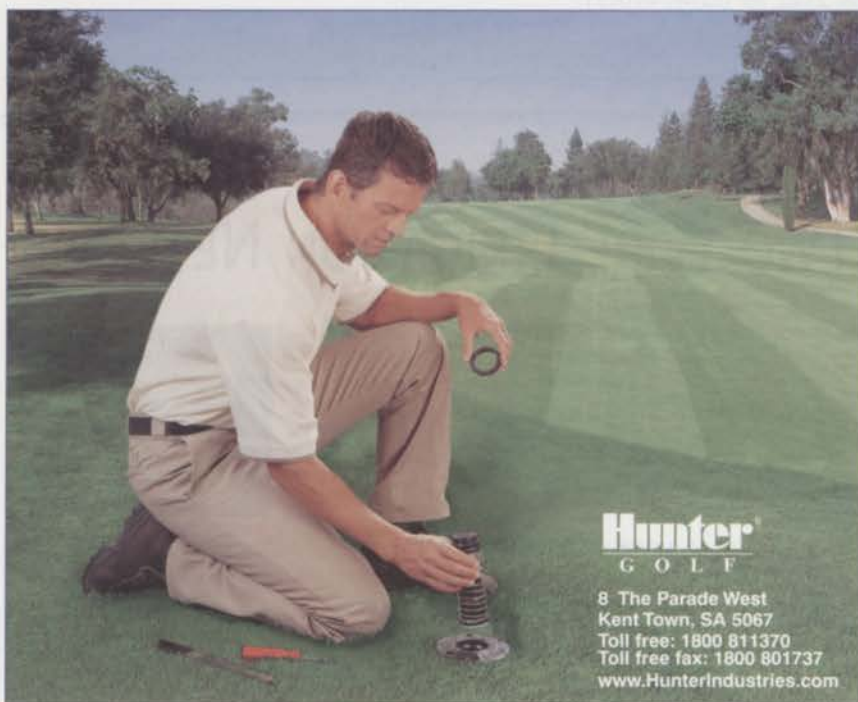
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There may also have been changes in the hydraulics of the irrigation system that may



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require adjustment to the pump configuration and operation. A common source of changed pump performance conditions is increased flow rate resulting from the installation of more sprinkler heads or the fitting of larger nozzles. These changes can reduce the efficiency of the pump or in some cases may justify a different pump. A thorough check of the pump on a regular basis is therefore strongly recommended.

#### Pump Testing

The measurement and interpretation of the performance of the pump requires considerable expertise and should be carried out by qualified personnel. Pump delivery flow rate and pressures provide the basis for analysing pump performance. Broadly, the testing should show if the required duty (the design flow rate and pressure) is being achieved and it will also indicate the efficiency of the pump. Irrigation pumps are selected to operate within specific efficiency ranges. Electric powered pumps can be directly checked for efficiency by measuring the electrical power being consumed (current and volts) and comparing this to the energy of the water (flow rate and pressure) being delivered by the pump.

The use of solid state speed control and data-logging facilities within the pump control module is now providing access to higher quality historical pump performance information. Stored data, on both electrical and hydraulic aspects, can be used by the pump specialist to develop the best advice for the pump and irrigation system.



GEOFF CONNELLAN READING CATCH CANS AS PART OF A SITE AUDIT

Full details on the pump and its performance characteristics should be held by the irrigation manager as part of the irrigation system document record. A pump curve can be used to check the current performance of the pump and is likely to be required to make recommendations on improving pump performance and changing the irrigation system.

#### ORGANISING AN AUDIT

An irrigation audit requires a methodical informed evaluation of the system. Trained personnel are therefore recommended. The Irrigation Association of Australia (IAA) has been conducting two day training programs on behalf of the Irrigation Association of USA (IA). There are now more than forty qualified Turf and Landscape Auditors in Australia. Details of these can be obtained from the IAA Secretariat, PO Box 301, Homebush South, NSW, 2140. Tel: (02) 9746 0531.

#### NEXT STEP

In the future irrigation managers will be required to achieve high levels of efficiency in water use, account for the amount of water used and demonstrate that this resource is being used in a responsible way. All of these point to having an irrigation system that has a high application efficiency and is well managed. Now is a good time to start testing your system to ensure that you will achieve the best possible performance standards of water management.

Geoff Connellan is a Certified Landscape Irrigation Auditor (CLIA) and a Principal Lecturer at the Burnley College, University of Melbourne.



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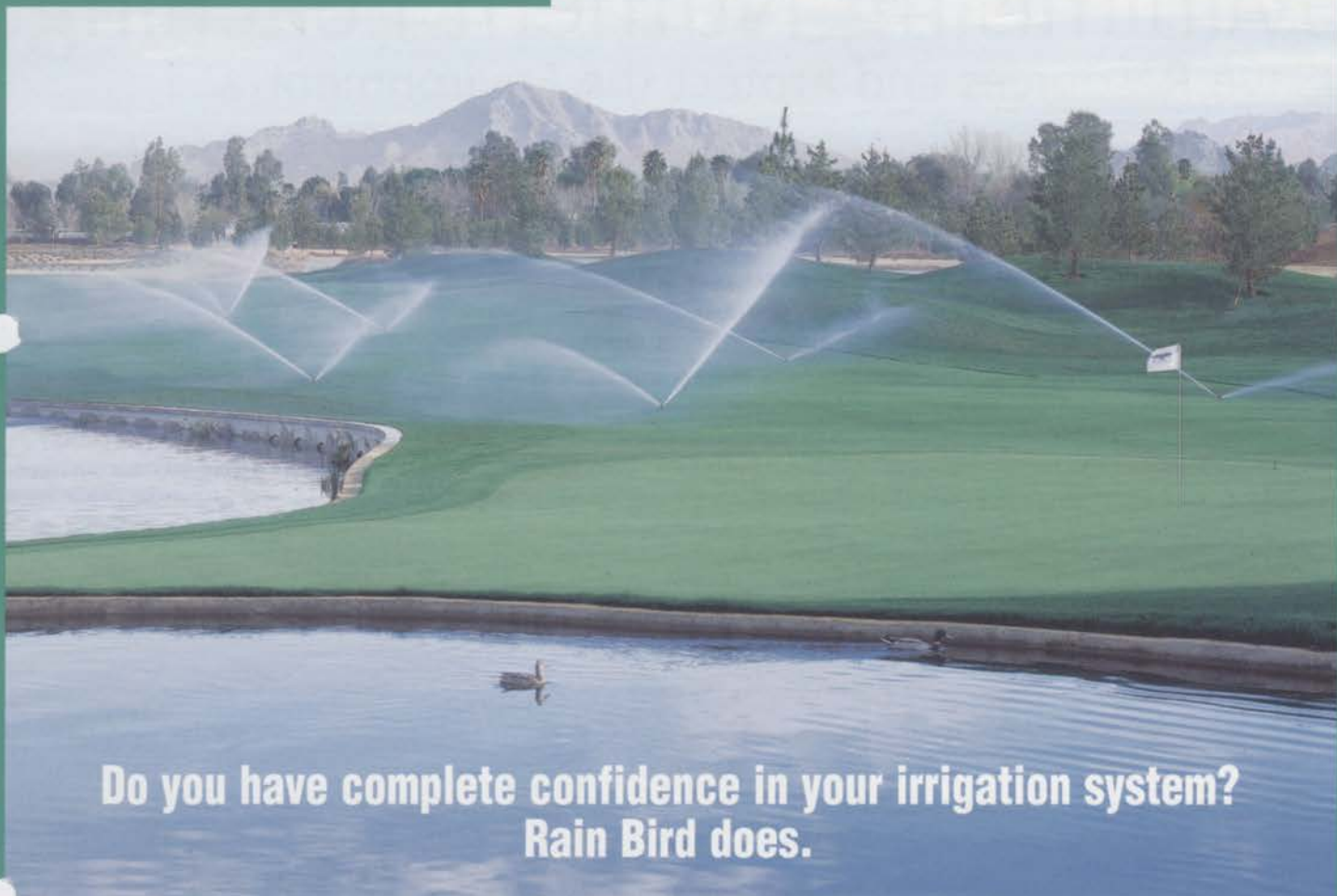
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# Minimising Nutrient Leaching:

## Save Resources and Protect the Environment

BY DR. TIM COLMER

**EFFICIENT USE OF NUTRIENTS AND WATER SHOULD BE A MAJOR OBJECTIVE OF TURF MANAGERS. IF POORLY MANAGED, NITROGEN AND PHOSPHORUS IN FERTILISERS CAN CONTRIBUTE TO GROUND WATER POLLUTION AND EUTROPHICATION OF SURFACE WATER BODIES.**

High levels of nitrate in water have adverse effects on animal health (including humans); the World Health Organisation set a maximum acceptable limit for nitrate in drinking water of  $10 \text{ mg L}^{-1}$ .

Phosphorus is generally the limiting nutrient for algal growth in water bodies, so additional inputs can cause "algal blooms" which in turn often have adverse effects on other organisms in aquatic ecosystems. (Refer, volume 1,2)

These nutrients (and other chemicals) can move from the area of application near the soil surface to greater depths via a process termed leaching, or move to adjacent locations via the process termed runoff. In both cases, a flow of excess water (either downwards in through the soil profile or lateral surface flow, respectively) transports the nutrients.

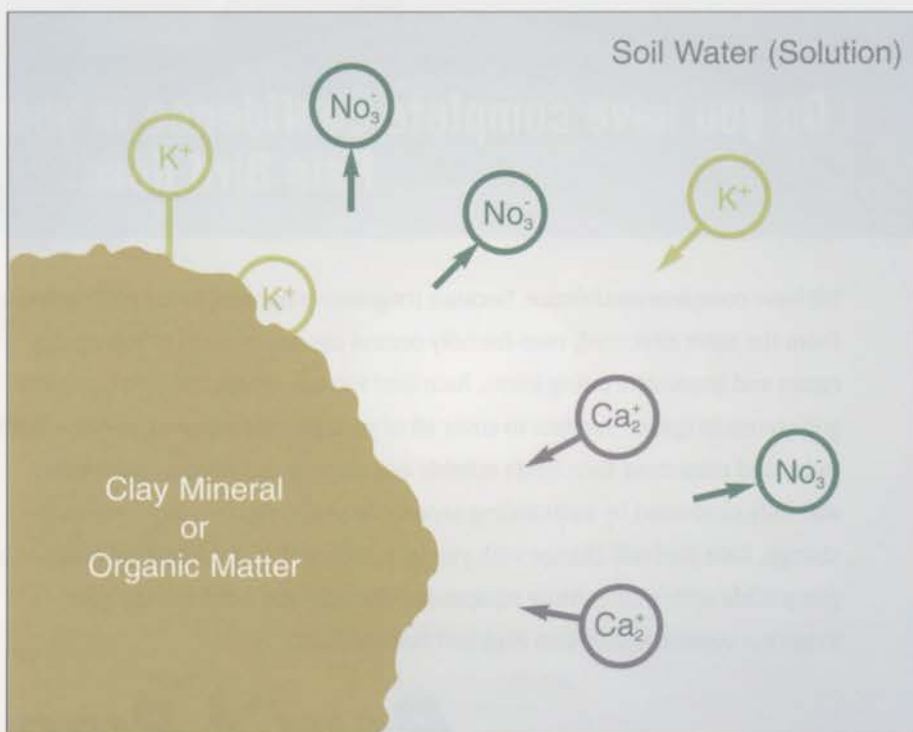
Thus, water management is a crucial component of good nutrient management.

Not all substances leach at the same rate. The chemistry of a particular molecule and the way it interacts with the soil determines its mobility. For example, positively charged ions (eg. potassium,  $\text{K}^+$ ) may be adsorbed to negatively charged

sites in the soil matrix such as on clay minerals and organic matter, whereas negatively charged ions (eg. nitrate,  $\text{No}_3^-$ ) are repelled from these sites (see Figure 1).

Thus, a high cation exchange capacity (CEC) is one soil property that can retard the leaching (ie. help retain) of the positively charged nutrient ions at least.

**Figure 1: Interaction between clay minerals or organic matter with plant nutrients suspended in solution in soil water.**



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Other soil properties (in addition to CEC) also affect the rate of movement of nutrients; thus soil type has a major influence on potential leaching. A well known example is that clay soils rich in iron or aluminium oxides tightly "bind" applied phosphorus, so losses via leaching are minimal. However, it is important to note, that even phosphorus bound to small clay particles can be lost via surface runoff since clay particles (with nutrients attached) are easily suspended in flowing water and subsequently deposited elsewhere as sediments. In contrast to the situation for clays, phosphorus applied to sandy soils is not tightly bound so that leaching of phosphorus from sands can be substantial. The low ionic adsorption capacities and high hydraulic conductivities of sandy soils contribute to the potential for large amounts of water and nutrients to pass beyond the rooting zone of plants. Such soils are a particular challenge for turf managers.

#### Management Options:

Public concerns over potential for pollution of ground water and wetlands has resulted in increased scrutiny of the issue of nutrient management in our landscapes. The objective of managers should be to better match nutrient supply with plant demand.

#### Examples of management options and strategies are:

- (i) Split applications of soluble fertilisers, termed by some as "less but more often".
- (ii) Use of "slow release" fertilisers, like (a) those with soluble nutrients

enclosed within a physical barrier that prevents release of nutrients until such time as the coating is penetrated or degraded so that water can gain access; (b) those in which a soluble form of a nutrient has been reacted with other compounds to produce a new compound of lower solubility, so that the dissolution rate is decreased.

(iii) Use of organic fertilisers, since these contain both "soluble" and "insoluble" forms of nitrogen and phosphorus, with the "insoluble" pools becoming available with time as mineralisation proceeds. The rate of mineralisation will depend on the soil biota, temperature, and soil water availability.

(iv) Monitoring of the nutrient status of the soil and/or plant tissue can also aid management decisions. Data to compare sites and trends with time can be particularly useful.

(v) Good irrigation scheduling so that water movement below the root zone is minimised will also reduce the potential for nutrient leaching.

Different approaches may be appropriate for different management objectives (eg. high versus low input turf areas) or stages of development (establishment versus maintenance). For example, there has been recent interest in the use of fertilisers containing nitrogen and potassium but no phosphorus in the maintenance of established turf on sandy soils in sensitive locations near waterways on the Swan Coastal Plain in Western Australia.



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Soil amendments (eg. additions of clay-like materials to sandy profiles) may also aid nutrient and water management in sandy soils.

Improved availability of information on nutrient use efficiency in turf systems under relevant management and soil types in several regions of Australia (different soils and climate) would assist turf managers to better match nutrient supply with plant demand.

*Dr Tim Colmer is a Lecturer in Plant Sciences at the University of Western Australia. Dr. Colmer coordinates the Turfgrass research at UWA, a program in collaboration with industry.*



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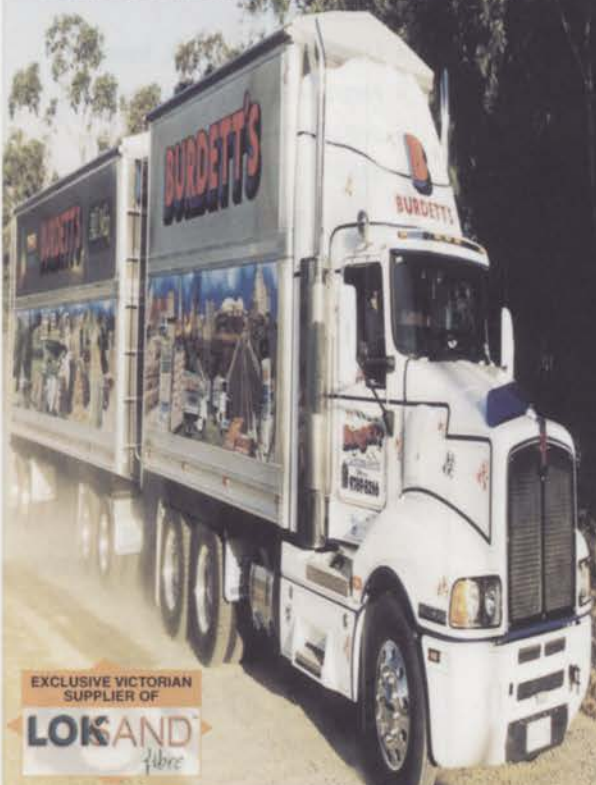
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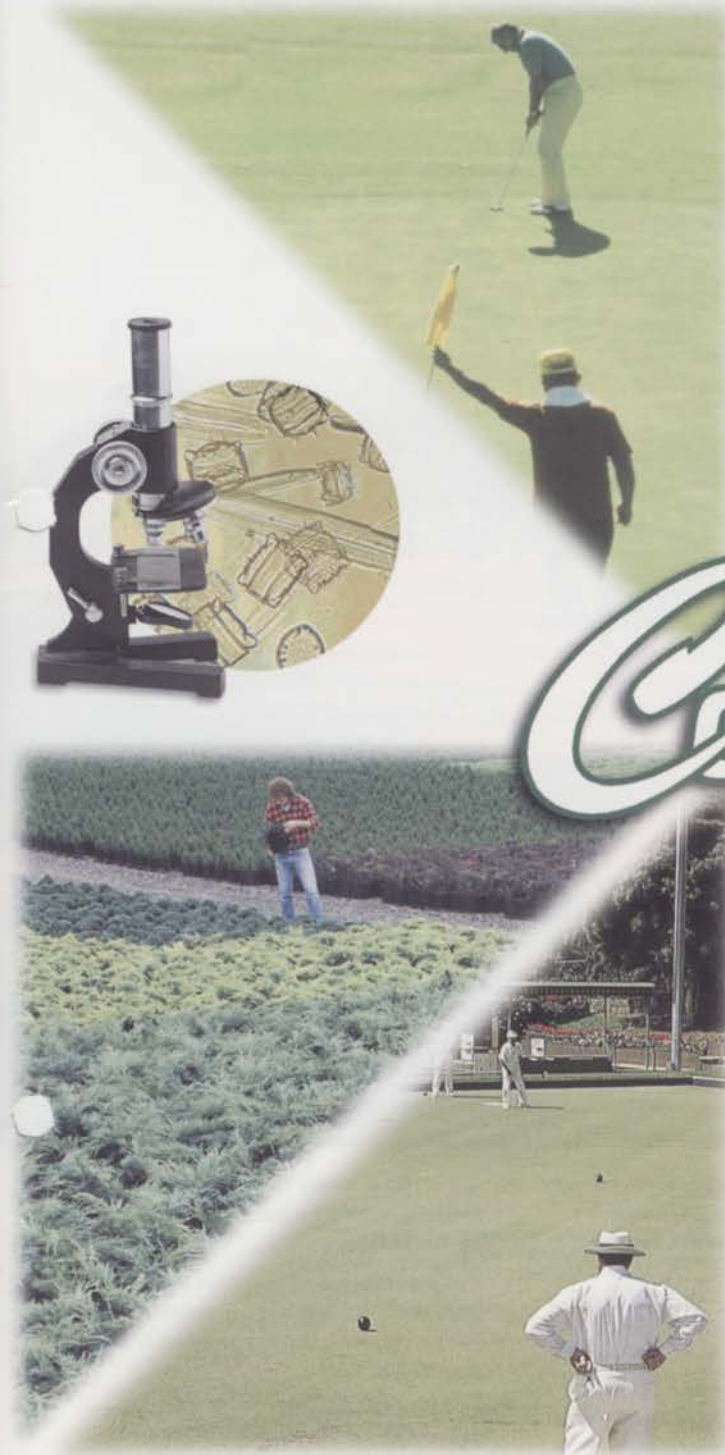
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# Turf: The World Over

**I needed a change** - something to inspire me to follow this trade for the rest of my career. Those were my thoughts fourteen months ago and I am now just about to complete the experience of a lifetime that has seen me working in my profession of turf management in America and Britain.

The Ohio State University International Intern Program offers Turfgrass Internships to single 17-27 year old greenkeepers. It handles your placement, health insurance, visas and accommodation. The program has interns currently training at Augusta National, Pebble Beach, Pine Valley and Shinnecock, to name just a few. Twelve -18 months work training is offered in the US with the option of six months turfgrass studies at Ohio State University. They assist you during your entire stay in America and have helped many in obtaining good jobs following their return to Australia.

My first eight months were spent in a hot, humid region of the U.S, at Harbour Town

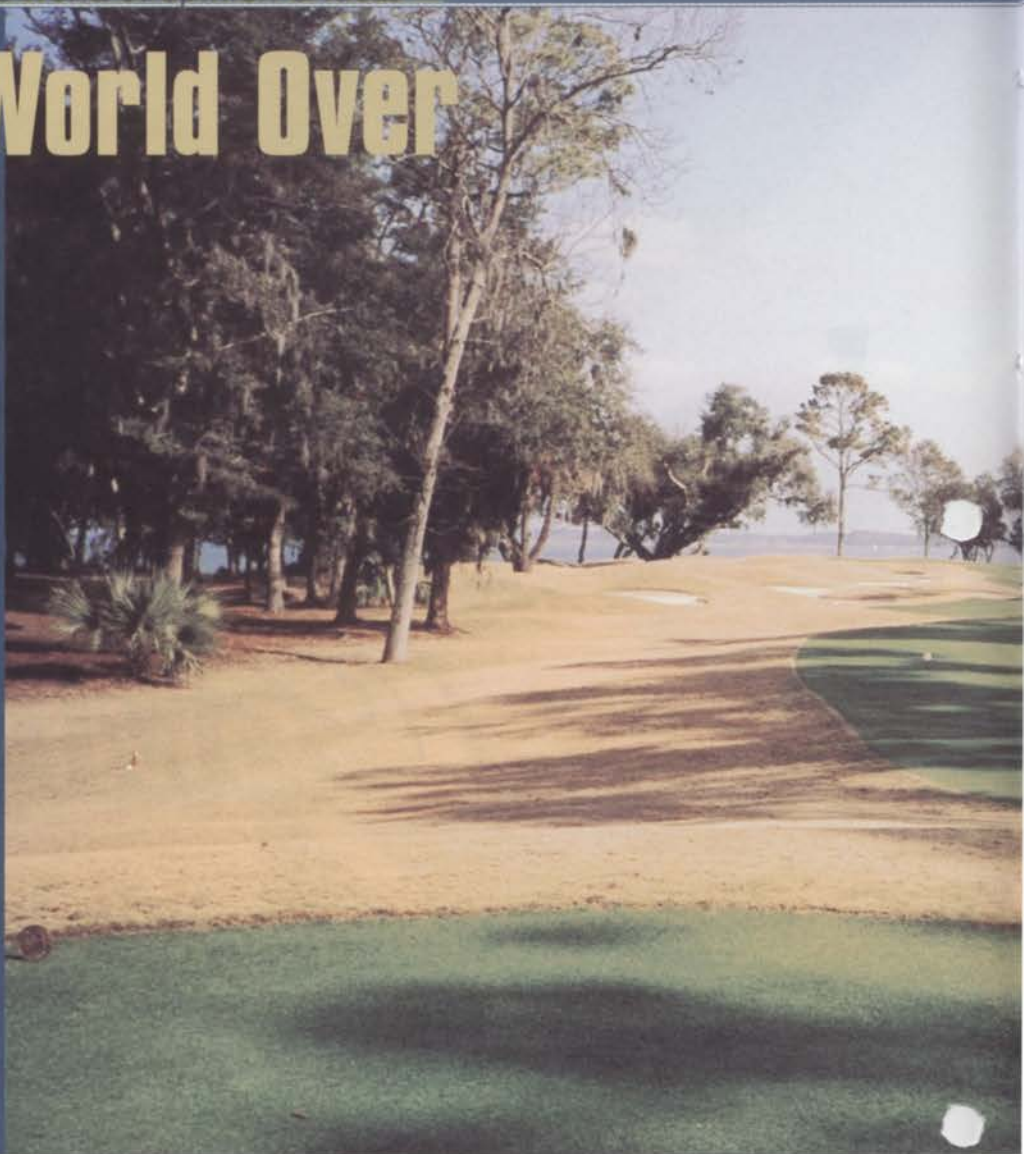
Golf Links, Hilton Head Island, South Carolina. There are 33 championship golf courses on this exclusive 20mile long island, and the grasses are C4 predominant. Our staff was comprised of nine African Americans, four non-English speaking Mexicans and five white Americans. On my second day, I was asked to train the Mexican's to mow greens with a pedestrian greens mower. It is amazing how quickly you can learn a new language, when you have no alternative.

My introduction to South Carolina weather was Hurricane Floyd and although it missed us by 600km, the damage left behind took three weeks to clean up. Generally though,

the weather is very forgiving for growing turf and frequently, hot weather is followed by heavy rains.

The most interesting operation I was involved in at Harbour Town was the overseeding of the entire course that is performed in mid autumn each year.

In America, "Green is Good" and dormant bermudagrass (couch) just doesn't cut it. Depending on the state of the balance sheet some courses would oversow only greens, others greens and tees and some fairways as well. In the middle of winter the cool season grasses provide an astounding contrast



Harbour Town Golf Links



The Local 'Gator'



Hell Bunker

BY DAVID GOLDIE



Fairways oversown with cool season grasses provide a stunning contrast with the dormant couch

between the oversown areas and the white, dormant couch in the rough. Due mainly to the annual PGA tournament held in April and the 40,000 players a year paying US\$220 a round, Harbour Town overseeds 'wall to wall' at a cost of US\$30,000.

We used 'Cypress' and 'Stardust' Poa trivialis at 3.9kg/100m<sup>2</sup> followed up with small percentages of Chewings Fescue and Seaside bent to overseed greens. Due to its deep colour, varieties of perennial rye at 4.53kg/100m<sup>2</sup> were chosen for the fairways. The rates seemed amazingly high to me but I later learnt that the

superintendents deliberately used such high rates to crowd the plant, thus maintaining it at a juvenile stage throughout the growing season. Then, come transition time in mid-spring, the ryegrass is not deep-rooted and clumpy and the couchgrass is more easily able to re-establish. Some superintendents used even higher rates. One course near Orlando, Fla., used 80% Perennial Rye and 20% Poa trivialis on greens at 12.2kg/100m<sup>2</sup> and Haig Point G.C on Defauskie Island used perennial rye for overseeding fairways at 8.50kg/100m<sup>2</sup>!

Much of the fertilisation or pesticide



"St Andrews is all about tradition"



Fleet of Jac's in preparation for the Millennium Open

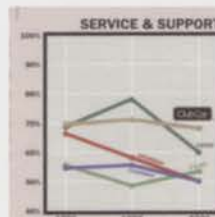
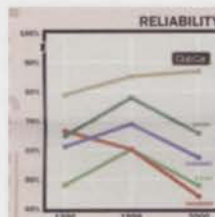
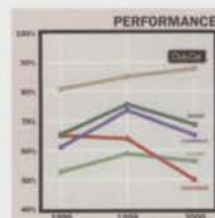
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applications at Harbour Town was performed by contractors that ran 20-ton trucks fitted with large spreaders and turf tyres. A lot of dust and four hours later every inch of turf on the property, bar the greens had been sprayed. I don't think the quality of the job was great, but the job was done fast, with success and there was no disruption to play.

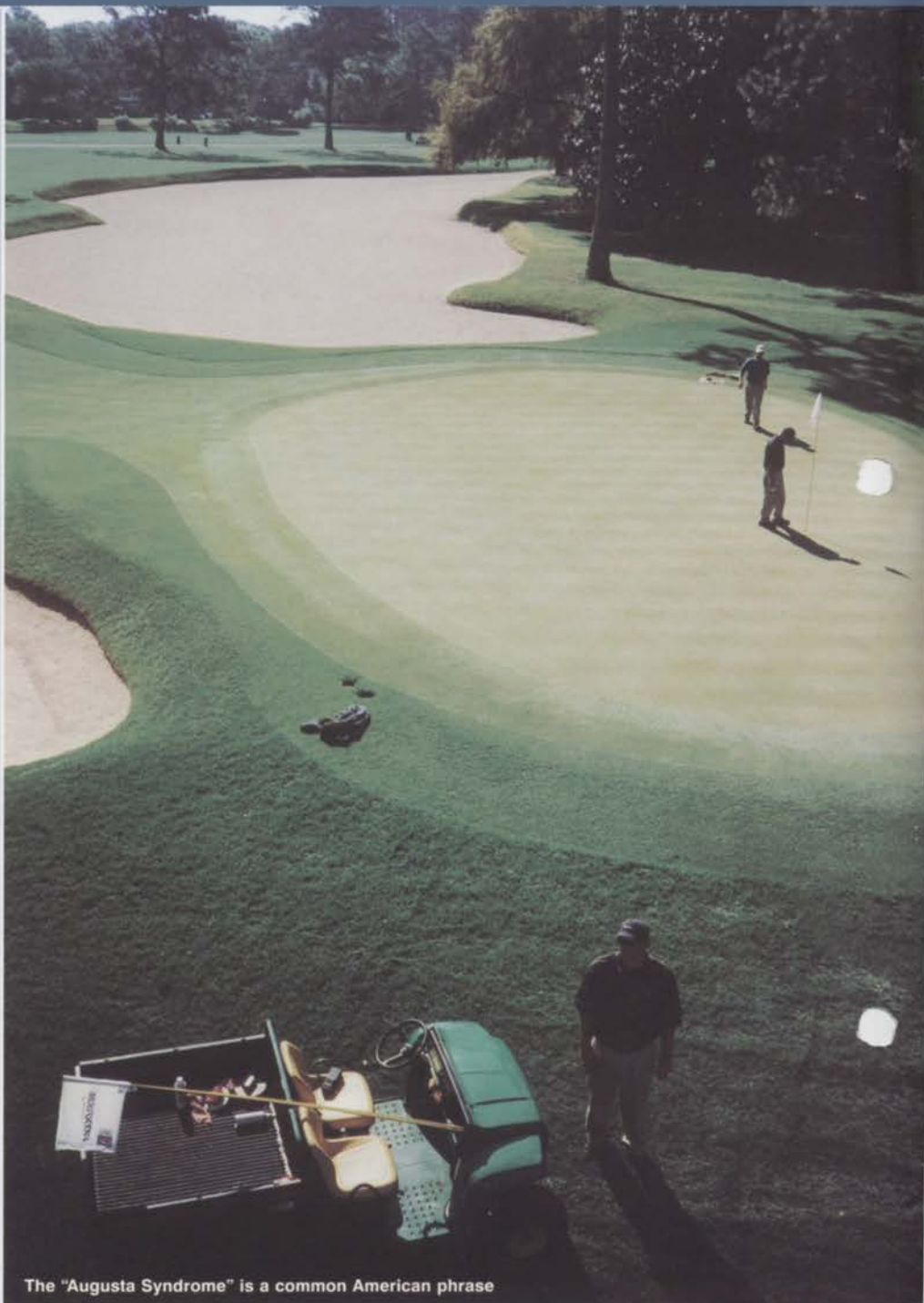
Although their upkeep was tedious and never-ending, the pine trees and pine straw beds provided a beautiful border, and enhanced the shape of each hole. The greens, fairways and tees needed to be blown, or vacuumed free of pine needles daily. Green sand was used to repair divots and the course's appearance was generally kept at a high standard every day of the week.

The "Augusta Syndrome" is a common American phrase used when discussing the trend that golf courses must always be lush, golfer friendly and immaculate in every way and it was fair to say that Harbour Town had a fair dose of it.

Although taken for granted by the locals, the most 'unique' aspect of Harbour Town was the wildlife. The diversity was incredible and it was not uncommon to skip cutting particular areas due to the presence of 4m long alligators. There are small ponds on every hole of the course and the 'gators' found the connecting pipework an efficient way of moving between lairs. Dolphins would swim within 30m of the 18th green and pelicans were forever fishing in the estuary in front of the 17th tee. I saw an eagle take a squirrel out of a pine tree one day, then a fish from the Atlantic the next and families of deer darted about the course at dawn and dusk. The only wildlife that have an adverse effect on the course are the moles. They can burrow through a fairway as fast as you could walk across it.

Working the MCI, Heritage of Golf, PGA tournament was an invaluable experience. Everything was presented trimmed, true, striped and green for CBS television. Azalea flowerbeds were planted everywhere and many tons of pine straw bales were spread. During the tournament I worked alongside the PGA officials cutting pin positions and moving tee markers. There were no second chances when cutting the cup and the 8ft tall pins had to be dead straight for the players and television.

My involvement with the Ohio State International Intern Program also enabled me to attend a two-day turfgrass workshop in Titusville, Fla., and I also visited the Ohio State University. Whilst in America, I took the opportunity to attend the Annual GCSAA Turfgrass Conference in New Orleans and I was fortunate enough to visit the very private Pine Valley G.C, NJ, Southward Ho Country



The "Augusta Syndrome" is a common American phrase

Club and Long Island, NY. Above all else these experiences have shown me how turf management has grown into a highly respected profession in America.

It was with great regret that that I finally had to sell my beloved black V8 Cadillac before setting off on a new adventure. When I arrived at the 'Old' Course, St Andrews, Scotland for the final six months of my trip, I was thrown straight into the boiling pot of the Millennium Open preparations. Eddie Adams greenkeeping staff were working long hours and five years of preparation was culminating in an exciting finish.

I could not have chosen a course more opposite in every detail to my placement in America. St Andrews is all about tradition. The pioneering 'Old Tom Morris' in the late 1800's developed many of the turf management techniques used at St Andrews today. Current Superintendent, Eddie Adams has a world of modern turf machinery and technology at his fingertips, yet he is very particular about his use of it. At St Andrews, the playability of the turf is the main priority. This is in direct contrast to America, where the aesthetic appeal is so vital that playability may be jeopardized for it.

The turfgrass on the entire links is as god intended. The hollows are green and the

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mounds brown. Television and books do not come close to recreating reality here. There are countless features that are far more severe than I ever imagined. The 'valley of sin' at the front of the 18th green, and 'hell bunker' hidden in the center of the 14th fairway are nothing short of awesome. Eddie Adams speculates he has 50 varieties of grasses that make up the mix of indigenous fescue and bentgrasses. The fescue is particularly encouraged and *Poa annua* is eradicated very effectively using cultural methods. The putting surfaces were never sown or sprigged and they haven't been replaced since play started there in the 16th century.

The 2000 Open preparation was extremely interesting. We prepared the 'Old' to have a strong links appeal so fairways were running and the greens were firm. One afternoon some parts of the fairways were actually running at 9.5 to 10 on the stimp meter! No fertiliser was used, greens were never rolled, striping was avoided, and the automatic watering system was almost completely ignored. Yet, the course looked brilliant for the Open.

Although, a links course is not as low-maintenance as most presume, there is a definite art in its maintenance and managing the turf can be likened to walking a tight rope. It's starved appearance keeps it close to senescence, yet an eye drop of nitrogen would result in unwanted rapid growth. The daily works program is dependent completely on the current turf condition, the day's weather and the future forecast. If Eddie Adams were ever to leave his post, the wrong replacement could very quickly destroy the precious appeal of St Andrews.

The staff for the Open comprised the 12 full time staff from the 'Old', as well as 2 interns from America, two from Australia and 41 staff from the sister courses in St Andrews. These include the New, Jubilee, Strathclyde, Eden and the Balgove. All are positioned on the southern side of the river Eden and overlooked by the town of St Andrews. The entire staff is very talented, and required virtually no direction as they had all worked on the 'Old' during preparations for the annual Alfred Dunhill Cup.

If you think you are competent behind a pedestrian mower, think again. The total area of the greens on the 'Old' is 35,000m<sup>2</sup>, 8.75 acres! The largest double green is 6500m<sup>2</sup> and requires two sprinkler heads on its' surface to get adequate coverage and takes a pedestrian mower 1.5 hrs to cut. Because growth is so minimal, greens are not dark in colour and there is rarely a good dew, determining where you have already cut is near impossible. At times the unlucky greenkeeper has to hold a straight line for up to 100m. Those chosen to pedestrian mow for tournament preparation were cutting daily for four months, and their skills and standard of work were exceptional.

Using the traditional art of 'revetting', all 112 bunkers on the 'Old' course were completely rebuilt for the Open. They are by far the toughest bunkers I have ever seen. During the Open, many professionals were forced to hit sand irons out of fairway bunkers and often were required to come out backwards from some devastating greenside bunkers. I am sure that Tiger's low score was due in part to the fact he was the only player to not enter even one bunker for the entire tournament.

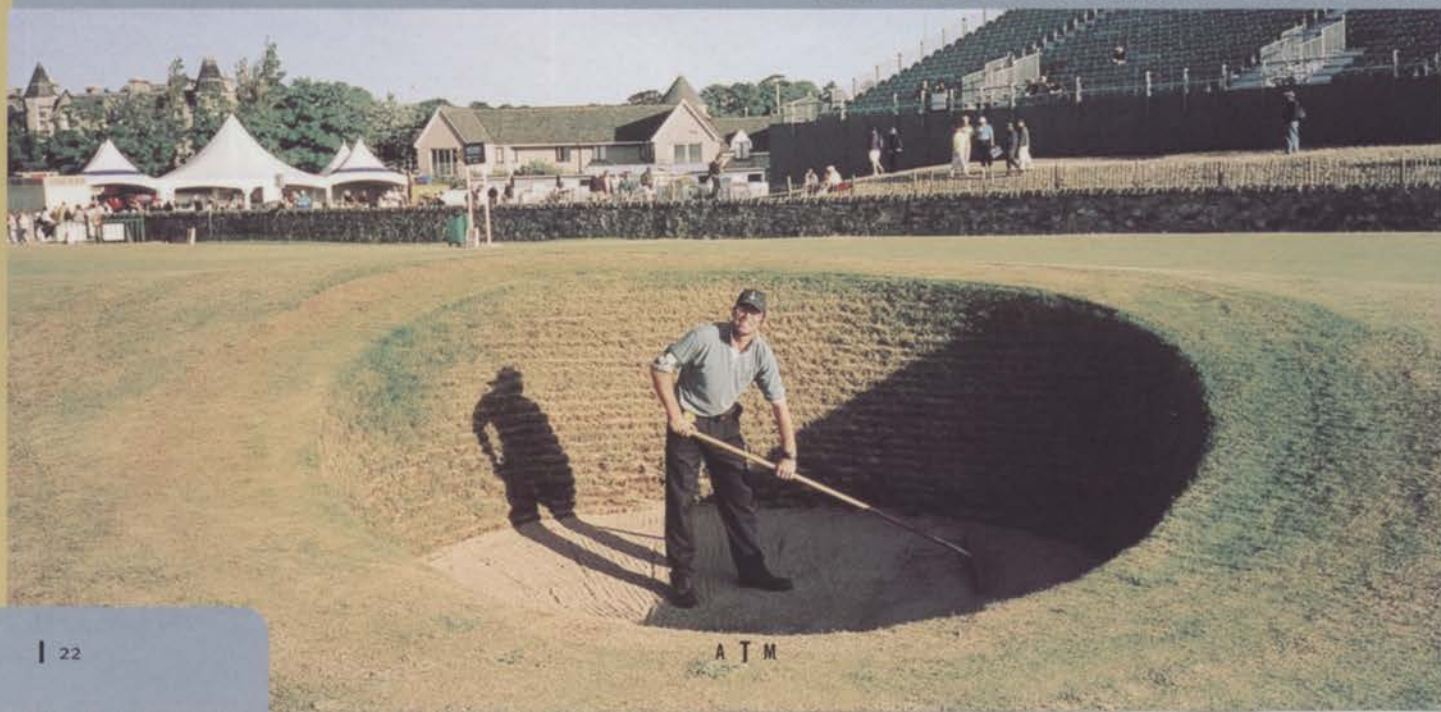
At 5:00am on the Wednesday of tournament week, the Royal and Ancient contacted Eddie Adams to tell him that players had been complaining that the bunkers were too difficult to play from when their balls did not roll back from the walls and therefore they needed to be reshaped. There was no panic; Eddie calmly asked his chief bunker man how long it would take for one person to put more concave into a bunker. He then proceeded to instruct 45 of his staff to drop what they were doing, collect shovels and wheelbarrows and then sectioned them to particular bunkers for reshaping. All staff understood exactly what was required and after just two hours and minutes before the start of play every bunker on the course had been reshaped.

The Open was much larger than I ever expected. There was seating for 21,000 and 230,000 spectators hampered for a glimpse of the action during the week. It was an amazing sight on the final day seeing so many people surging towards the home end to get a glimpse of Tiger. Our reward for the long hours worked in the previous week was first hit-off time on Monday morning. We played from the championship tees and to Sundays pin placements. If it wasn't for the massive tournament hangover I may have even remembered that day.

It is amazing the damage that so many peoples feet can do to a golf course over a week. Relieving compaction, repairing irrigation and restoring damaged turf was high on the list of priorities following the Open.

The Links Trust is currently installing a \$7million Toro 'site pro' irrigation system to the 6 golf courses (600 acres in total). For the

Me at work in one of the devastating greenside bunkers at St Andrews.



first time the entire links will be covered by one centralized system. The valve-in-head Toro 690 series sprinklers have been installed at the Eden, Strathtyrum and Balgove courses. The 'Old', 'New' and Jubilee will have joined the system by spring 2001. This will bring the total number of heads to over 4,000. To assist in the planning of the project a global positioning system (GPS) survey was carried out to pin point every feature on the links. The new flowtronex pump station will pump out 150L/second through 120km of polyethylene pipework from the 3,405m<sup>3</sup>-storage tank. It will take eight hours to irrigate each of the five courses except the Old Course. Eddie requires to irrigate his course in less time than that so the system has been designed to irrigate the 'Old' inside four hours. Since the heads can be turned on individually and there will be many more of them Eddie says he will "actually be able to irrigate less not more".

In StAndrews the townsfolk live, breathe and sleep golf. There are five golf shops on the street I lived on! At 5:30am there are already up to 30 golfers waiting at the starters hut for the chance that their name will be chosen out of the ballot to play the 'Old'. Tee times are booked a year in advance and the course is constantly full. However, on Sundays the course is closed and the locals have free reign of the fairways to walk the dog or have a picnic. This is where golf began, and it is refreshing to see so many people respecting and enjoying the game for what it is.

There is a lot that can be learnt from how golf courses are managed overseas. Quite often the end result will be the same, but the techniques and management styles are hugely different from what we are taught in Australia. We have a mixture of all turf and golf course types and our professionalism and turf quality is second to none.

This trip is something I will always remember and the skills, knowledge and contacts I have made along the way will be invaluable in my career as a turf manager. I now look ahead with a refreshed enthusiasm and a yearning to succeed. I recommend working overseas to any young turf manager who can live and travel alone, and be prepared to listen, watch and work hard.

*\*For anyone interested in internships in America please contact Michael O'Keeffe at [mokeeffe@pop.service.ohio-state.edu](mailto:mokeeffe@pop.service.ohio-state.edu) or myself at [dg67mg@hotmail.com](mailto:dg67mg@hotmail.com)*



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# From Barren to Beerwah

During a lunch break in October 1999, having just read an article published in *Australian Turfgrass Management* (volume 1.5), one of my staff members remarked **"...has he been bugging our shed?"**



The article was entitled "Enviroman" and was written by Michael Russell (Werribee Park Golf Club), winner of the 1999 AGCSA Claude Crockford Environmental Award. Little did I realise that the very next year, my staff and I would be celebrating this same prestigious award that recognises a commitment to the environment.

Established in 1968 on 50 hectares of state forest and expanded to 18-holes in 1985 on a forestry lease, the Beerwah Golf Club is nestled in the Glasshouse Mountains on Queensland's Sunshine Coast.

Early course maintenance consisted of boundary to boundary mowing at the same height, 'token' pine trees defined fairways and there were very few areas of remnant vegetation.

On my very first day as Superintendent in 1994, a life member of the club duly informed me that I should cut all the grass low as this "stops the course from getting wet and members can find their balls more easily". In my opinion, the course needed some character; the environment was very sterile and the token pine trees did little more than drop cones, which put a constant strain on the maintenance budget.

In October 1994 the Management Committee approved the removal of 60 pine trees from the front 9-holes which opened the course up

further. Following the back filling of stump holes and the associated clean up, I sought advice from the local Forestry Department for suitable species of trees that we could plant on the course in an effort to develop some more natural areas. A short time later, I coordinated a 'New Work Opportunities Project' which allowed us to plant 600 trees and the process of restoration was underway.

During 1995 we began to reduce the width of the fairways and started to create more fairway shape and contouring, incorporating carries to the landing area.

In the spring of 1996, after continually mowing areas of little or no play and wasting resources in doing so, I made a conscious effort to leave these areas as zones of 'Native Vegetation'. I also felt they would compliment our fairway shaping and improve aesthetics off the tee. This practice caused considerable consternation amongst some of the established members, who were accustomed to and wanted 'wall to wall' mowing as they felt (not without reason), that this strategy helped keep the field moving and kept lost balls to a minimum.

The next couple of years were spent struggling with successive committees who ordered on numerous occasions that these areas be cut down. I even managed to survive a 'Special General Meeting' but in the end, we persisted

with what we believed should be the definitive layout of the golf course and encouraged the perimeter zones of native vegetation and areas of regeneration. Most of these areas were left to develop with manual weed removal our only influence.

Continued monitoring and development in consultation with the Caloundra City Council and the Land for Wildlife Organisation, saw the full registration of the Club on the 'Land for Wildlife Program' in October 1999. Registration involved liaising with their field officers who conducted onsite inspections to determine our suitability to meet their guidelines of sustainable management practices.

With the tremendous support of the 2000 Management Committee, I engaged the services of a private consultant to map and record the diverse zones of indigenous flora and fauna populations and make recommendations for the protection and development of these areas as part of a continuing Environmental Management Plan (EMP). The entire golf course property has been mapped. This survey is kept in the main office and is available for all members to use as a reference.

Since 1996 regular surveys of our bird populations have been undertaken by the Wildlife Preservation Society of Queensland. During a survey conducted on the 8th of June in 1999, two plum-headed finches were



**A** AERIAL VIEW OF THE SITE FOLLOWING SIGNIFICANT REVEGETATION



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sighted which is significant in that they are uncommon in our area. During September and October of 2000, interested community groups observed 67 bird species. This compares favorably with the 44 species of birds surveyed on our first observation in September 1996.

We have established a program of nesting boxes to create more habitats as part of a Barung Landcare community involvement scheme. These boxes are targeted at Sugar Gliders, Pardalotes, Parrots, Owllet Nightjars and Kookaburras. Also, we were selected as a site for the Birds Australia Atlas survey and the course is a release site for rehabilitated birds from Wildlife Volunteers Rescue.

Surveying and mapping has commenced on our frog populations and these results will be incorporated into our overall Management Plan.

Our water supply consists of storage dams supplied by the catchment area of the town of Beerwah and the Golf Course and only greens and tees are irrigated. Applications of fertilisers and chemicals are confined to greens, tees and landing areas only and I am very conscious of limiting our impact on any other areas of the golf course.

Any excess water flows through the course waterways onto forestry land and eventually the 'Pumicestone Passage'. Our outflow waterways are heavily vegetated and act as a very effective filtration system. Monitoring of water quality at inlet and outlet points has been done regularly and will form a critical part of our EMP.

At the committee's invitation, our vegetation management consultant addressed the Club's 2000 Annual General Meeting where he expressed the uniqueness of the site to Club members. Being predominately surrounded by Pine Forest makes the course a very valuable habitat of native vegetation. This exercise proved valuable in educating our members on the benefits of creating and preserving a harmonious coexistence between the golf course and its

immediate surroundings. At the meeting, many members actually expressed their lament at the loss of early vegetation due to previous wall to wall mowing practices. This was quite a shift in how the membership perceived the golf course and it was a very satisfying conclusion to a rewarding process of transformation.

Whether your shed is being 'bugged' or not, coordinating your management practices toward better environmental stewardship can lead to some very positive outcomes one of which is enhancing your clubs profile in the community.

Whether helping with flora regeneration or observing nesting boxes and wildlife, Winning the 2000 AGCSA Claude Crockford Environmental Award has been a catalyst in encouraging my members to become involved in an important aspect of their courses maintenance and has been a rewarding experience personally.

I have received great support from my present committee and in addition to them I would

like to take this opportunity to thank Marc Russell from Barung Landcare for his valuable input as our vegetation consultant and various community groups for conducting surveys and providing information for our Management Plan. Jon Penberthy from Gainsborough Greens has been of tremendous assistance and lastly, thank you to Aventis Environmental Science for supporting the award that allows us to demonstrate that superintendents are not 'environmental vandals' but can and often do, play an important role in the management and preservation of valuable ecosystems.

*Ben Tilley is the Golf Course Superintendent at the Beerwah & District Memorial Golf Club Inc.*

*Please note that information on the 2001 AGCSA Awards program is carried as an insertion in this edition of AUSTRALIAN TURFGRASS MANAGEMENT.*



BEN TILLEY (LEFT) WITH JEFF EINMAN FROM AVENTIS

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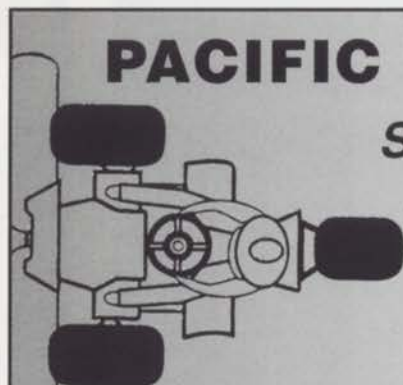
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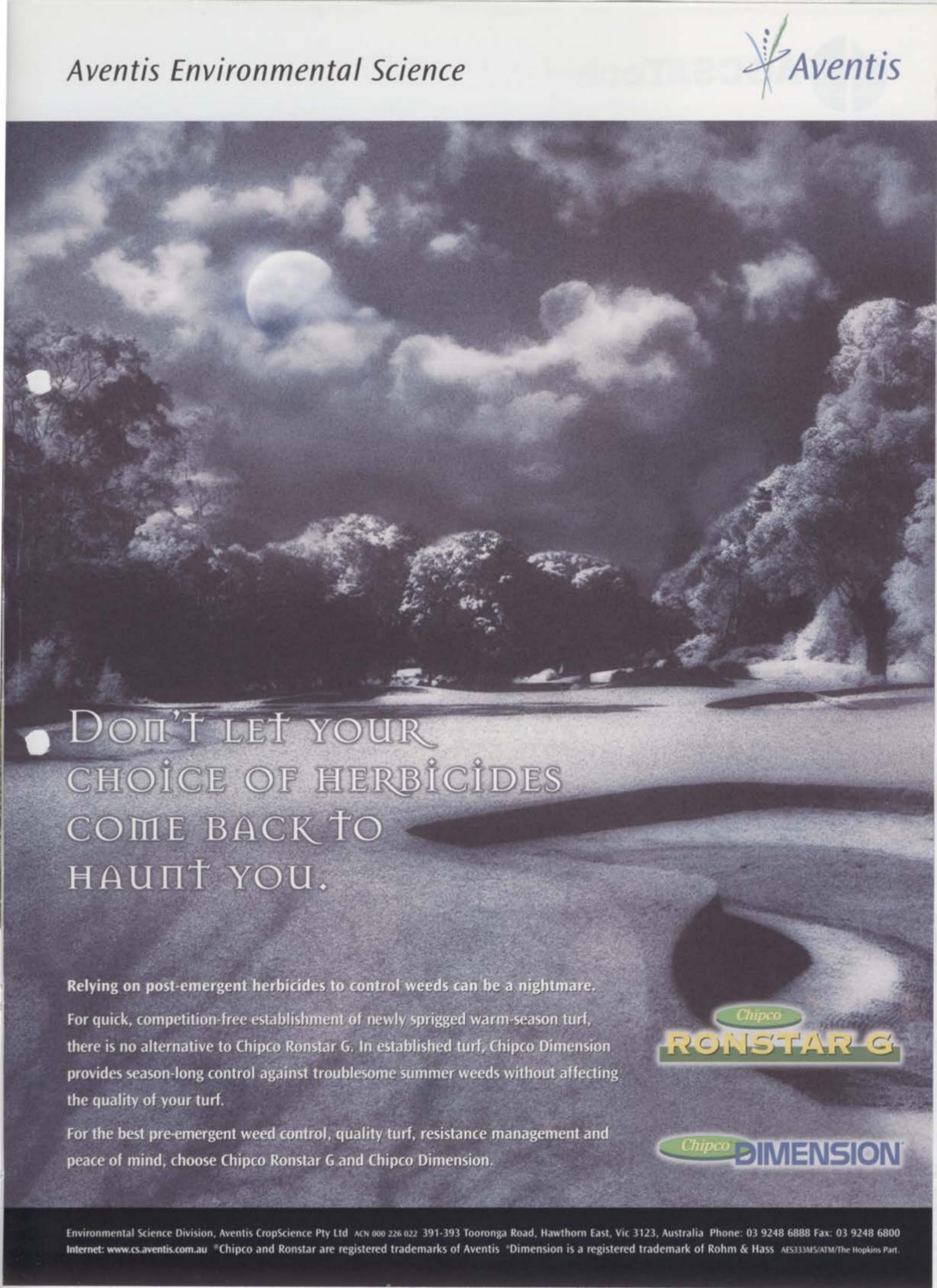
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Kingston Heath Golf Club

## RESEARCH WRAP

The AGCSA's couchgrass trial site was planted in late January at the Lakelands Golf Club in Queensland. The site includes couchgrasses maintained at both greens and fairway height. The national couchgrass collection is also well under way with samples arriving at the AGCSA office, from as far away as Western Australia and Northern Queensland. Single runners of these will be replicated and then planted out at the Queensland trial site. Meanwhile the AGCSA's bentgrass trial site at the Kingston Heath Golf Club is progressing well, with the bentgrasses now being mown at 4mm. Over the next twelve months intensive monitoring and comparison of these cultivars will be undertaken and reported in Australian Turfgrass Management (ATM). The combined AGCSA / EPA project on Developing an Eco-Efficiency Manual for Queensland Golf Courses is nearing completion. The Manual will be launched during workshops to be held at the Brisbane Golf Club on March 14th and in Townsville on March 13th. The AGCSA is also finalising arrangements with the NSW EPA to undertake a similar project in that state.

## QUALITY CONTROL

During a recent consultancy, the question of quality control was again raised as a consequence of a problem developing. The problem involved the addition of soil amendments, but more pertinently it was how the recommendation was derived. The process involved the taking of a sample by a third party and a recommendation made by a person with minimal (or no) knowledge of the project. The recommendation that was made did not give specific units for the rate of application and did not recommend that check tests be undertaken to ensure that there were no deleterious affects as a result. In fact, the recommendation would appear to have been made based on the soil chemistry with disregard for the soil physics. There was also a lack of knowledge by the person making the recommendation as to the potential impacts that the amendment could have on the soil physical conditions.

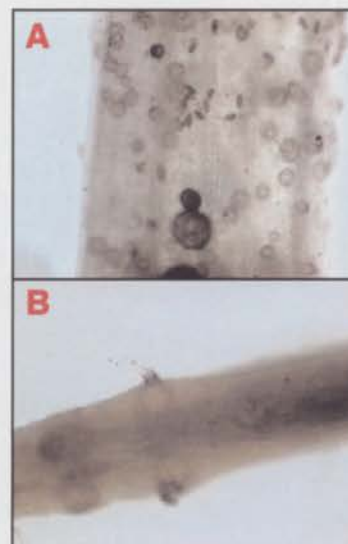
**So what should the process be for all construction projects?**

1. Test the soils to be used for construction for hydraulic conductivity, aeration porosity and volumetric water content. These tests are standard tests with well-documented specifications.
2. Based on this data a person experienced in interpreting results for turf soils can then decide on the appropriate amendment and rate of application.
3. The construction soil and the amendment must be mixed together and then retested.
4. Where large quantities of amendments are to be blended, they should be blended off-site and then tested for consistency.

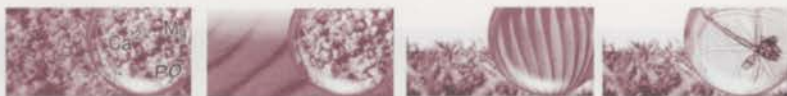
While this process is time consuming and considered a "pain," it does minimize the potential for problems to occur. Remember, the foundation of a golf green, bowling green or sports field is the soil. Get that right and the fundamental factors affecting plant growth (e.g. drainage, aeration, water holding capacity) will also be right. The keys are to; understand what the performance criteria are, sample and test appropriately, seek experienced advice and TEST again.

## DISEASE OF THE MONTH

Hydrophobic conditions or "dry patch" is not a disease. However, the symptoms often give the appearance that something more sinister is occurring. Dry patch conditions develop on high sand content soils where the sand particles become coated with water repellent, waxy materials. These waxy coatings create a very high surface tension that repels water



A & B: Phoma sp.



molecules and prevents their penetration into the soil. In Australian turf conditions the greatest water repellency occurs in the thatch layer and at the thatch/soil interface.

"Dry Patch" can often occur during the first hot, dry spell of the summer, even after a wet spring. It is apparent that these hydrophobic conditions develop during dry winters when soil moisture levels are not critical to the health of the turf. Once the soil becomes hydrophobic, it is difficult (sometimes impossible!) to evenly wet the soil without taking remedial action. Consequently, with the first hot day the turf quickly goes into moisture stress.

Treatment with wetting agents is the common remedy for hydrophobic soils. Wetting agents are surfactants that greatly reduce the surface tension, allowing the water molecules to penetrate the soil. In severe cases, mini tining is also required to assist in the 'wetting up' process.

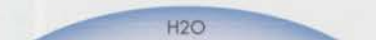
Phoma sp. is a fungal organism associated with damage caused by dry patch and other fungal pathogens. It is an organism that develops in the dead or dying leaf tissue and is rarely associated with living, healthy tissue. Is it a problem in its own right? All of the authoritative references say no and that it is present because of some other causal organism. Is it causing any damage? Again the literature says no, stating that it is taking advantage of the weakened plant tissue, where it can easily penetrate and grow and is only living in plant tissue that would die anyway.

The literature does not discuss any specific fungicide treatments because of its association with other causes. However, most systemic fungicides will clear it up.

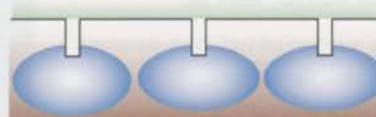
If Phoma is diagnosed as the only fungal organism present, other causes such as dry patch and nematodes should be investigated.



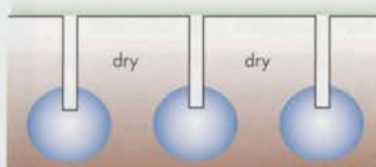
Hydrophobic soil - high surface tension



Soils treated with wetting agents reduces surface tension and allows the water to spread over a greater area for easier penetration



Shallow closely spaced mini tyres provides greater wetting of hydrophobic surface soils



Deep tining is not as effective in reducing hydrophobic conditions in surface soils.

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# AUSTEP: Australian Turf Evaluation Program – Perennial Ryegrass

## Final results – Melbourne Trial sites

**T**urf Type Perennial Ryegrass (*Lolium perenne*) is the main cool season turfgrass used in golf course fairways, tees and surrounds, sportsfields, cricket wickets, racetracks and domestic lawns. It is also used for winter overseeding of dormant couchgrass sportsfields and fairways as well as being an important component of seed mixes. It forms a medium textured turf of high density and uniformity. Its non-creeping bunch type growth produces a uniform sod when properly established and maintained. It has a rapid rate of seed germination, establishment and vertical leaf extension.

It is best adapted to cool, moist regions that have mild winters and cool, moist summers as well as dry, warm areas where irrigation is available. Perennial ryegrass has poor tolerance of climatic extremes of cold, heat or drought. The major market for ryegrass in Australia is the southeastern seaboard (South Australia, Tasmania, Victoria and the lower half of New South Wales).

There has been a multitude of Ryegrass varieties available in the Australian turf-market over the years. This coupled with limited Australian testing has meant that turf managers have made choices based on

overseas data or very limited local field trials and have often used inferior varieties for their particular situation.

### The aims of AUSTEP were to;

- Evaluate a range of turf-type perennial ryegrass varieties under uniform maintenance practices and assessment criteria in Melbourne and Sydney (the two largest markets).
- Compile a recognised list of varieties, which indicates a varieties relative position amongst its peers in respect to the characters assessed.
- Provide turf managers with sufficient background information so that they can make informed decisions on selecting the most appropriate variety for their specific conditions.

This article summarises the two and a half years of assessments at the Melbourne trial sites.

### METHODOLOGY

Trials were established at Werribee Park Golf Club (heavy soil) and Keysborough Golf Club (sandy soil) in May 1998. 56 ryegrass varieties (see Table 1) were evaluated and these included commonly

Table 1: Perennial Ryegrass varieties under trial

VARIETY	COMPANY
Cutter Dasher II Fiesta II Stallion Supreme Sunshine	Alliance Seeds
Allsport Delaware Dwarf Legacy II Nobility Pleasure Williamsburg	Nuturf
Catalina Quickstart	Groco Australia
Anabella Barlemulm Bamona Gator II Pinnacle Pinouette Premier II Top Hat	Heritage Seeds
901 2 DLM Arena Brightstar II Checkmate Duet Endurance Headstart Marathon PG 932	Pyne Gould Guinness
Divine	Scots Australia
Certified Victorian Perennial Ryegrass	Standard
Imagine	Stephen Pasture Seeds
Express Pennant II Wizard	Sutherland Seeds
Assure Edge JD-92 Lowgrow Matilda Olympic Pick Lp EE-93	Turf & Irrigation
Calyppo II Linedrive Racer Roper VPR073 VSCR1	Valley Seeds
AVS 98A	Viccombs
Joust LP 3026.01 LP 3026.02 LP 3026.03 SR4100	Wrightson Seeds

used "industry standards", new releases and experimental varieties.

12 seed companies, who are members of the Seed Industry Association of Australia (SIAA), entered varieties and these companies encompass all the major players in the Australian ryegrass turf-seed market. There were two mowing heights - low cut group (15-20mm) and the high cut group (40-50mm) with 4 replicates for each mowing height giving rise to 448 plots per trial site. All varieties were sown at 30 g/m<sup>2</sup> adjusted for 100% germination. The maintenance program was based on a low to moderate level of nutrition as this most closely reflects the maintenance level of the majority of golf course fairways and sportsfields.

The trials were assessed during establishment for seedling vigour and rate of turf cover. Once full cover was attained the trials were assessed every two months for colour, density, and shredding for a two-year period. Seasonal growth was assessed four times per year during the last half of each

season. During spring, summer and autumn, visual growth was assessed after a two-week period of no mowing while winter growth was assessed after a three-week period. The assessment methods are summarised in Table 2.

Analysis of variance was used to compare the varieties within each trial site and there is no comparison between sites. A Least Significant Difference (LSD) is presented and is used to determine statistical differences between varieties.

**Table 2: AUSTEP Assessment Criteria**

**Seedling vigour**

Visual estimate based on ground cover, plant height and health assessed 10 days after emergence.

1 = very low and 5 = excellent vigour

**Rate of turf cover**

Visual estimate of ground coverage (%) at 4, 8, 12 and 16 weeks after seeding.

**Turf colour**

Visual estimate which reflects the inherent colour of the variety (not chlorosis or browning caused by mower damage, disease or other stresses).

0 = very light green and 9 = very dark green

**Turf density**

Visual estimate of living plants per unit area

0 = bare ground and 9 = very dense

**Cutting/shredding**

Visual estimate of how cleanly the sward cuts

0 = no shredding and 9 = severe shredding

**Incidence of insect pests, disease and weed invasion**

Visual estimate of the area damaged (%) or area taken up by weeds (%)

**Seasonal growth**

0 = no growth to 9 excellent growth

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## RESULTS AND DISCUSSION

It is important to recognise that the results presented are the averages for a two-year period and that differences in a variety's performance can occur during the year. Hence it is essential that the full results are studied and further information is obtained from the seed companies before a decision is made on the "best" variety for your situation.

Some statistical differences were observed between varieties in terms of seedling vigour and rate of turf cover. All varieties had attained full cover by 12 weeks at Werribee Park Golf Club and by 16 weeks at Keysborough Golf Club. The heavier soil at Werribee Park Golf Club retained greater moisture and nutrients than the loamy sand at Keysborough Golf Club and hence establishment was quicker.

From a practical point of view a faster establishment rate may be beneficial when a quick cover is required, such as before a tournament or major event, when seeding late in the season before the weather turns cold and when overseeding. However, how a variety performs once full cover is attained will in most cases be of greater importance.

The two-year average for turf density, colour, shredding and seasonal growth for the low and high mowing heights at Keysborough Golf Club and Werribee Park Golf Club are summarised in table 3. In general the pasture type ryegrasses tended to exhibit the lowest density, were lighter in colour and showed the highest leaf shredding.

Of all the seasonal growth assessments, winter growth is probably the most important with the use of turf areas for winter sports and with the practice of overseeding ovals and fairways. The pasture type ryegrasses tended to have the most growth although there were several turf types that showed good winter growth.

Disease only occurred on the high mowing height group at Keysborough Golf Club. During February 1999, anthracnose and drechslera caused some damage while in February 2000, the same diseases occurred along with dry patch. There were some major varietal differences observed (Results not shown).

## THE FUTURE

The irrigation has been turned off at

Werribee Park Golf Club and the varieties will be assessed for how well they perform and survive under no irrigation. Assessment of turf density, ground cover and weed invasion will be undertaken following the autumn break and again in spring.

A field day is scheduled at Keysborough Golf Club for Tuesday, March 20th 2001 where all the results will be available for purchase in booklet form.

A trial was set up at New Brighton Golf Club, Sydney in April 2000. Sydney is a very transitional climate with hot summers and high humidity, which is not overly conducive for Ryegrass. Hence the major aim of this site is to evaluate how the ryegrasses perform under high stress conditions (high humidity and temperature etc.) and associated disease pressures.

## CONCLUSION

These trials have provided turf managers with useful data on which to make informed decisions on selecting ryegrasses for their particular situation. The Seed Industry's new code of conduct will govern how the seed companies can use these results. These sites

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have also provided an excellent educational tool for turf managers and students who have frequently visited the trials.

I would like to express my gratitude to the Horticultural Research and Development

Corporation and the Seed Industry Association of Australia, Lawn and Turf Seed group for their financial support as well as to

the Superintendents and their staff at each of the sites for providing maintenance. In

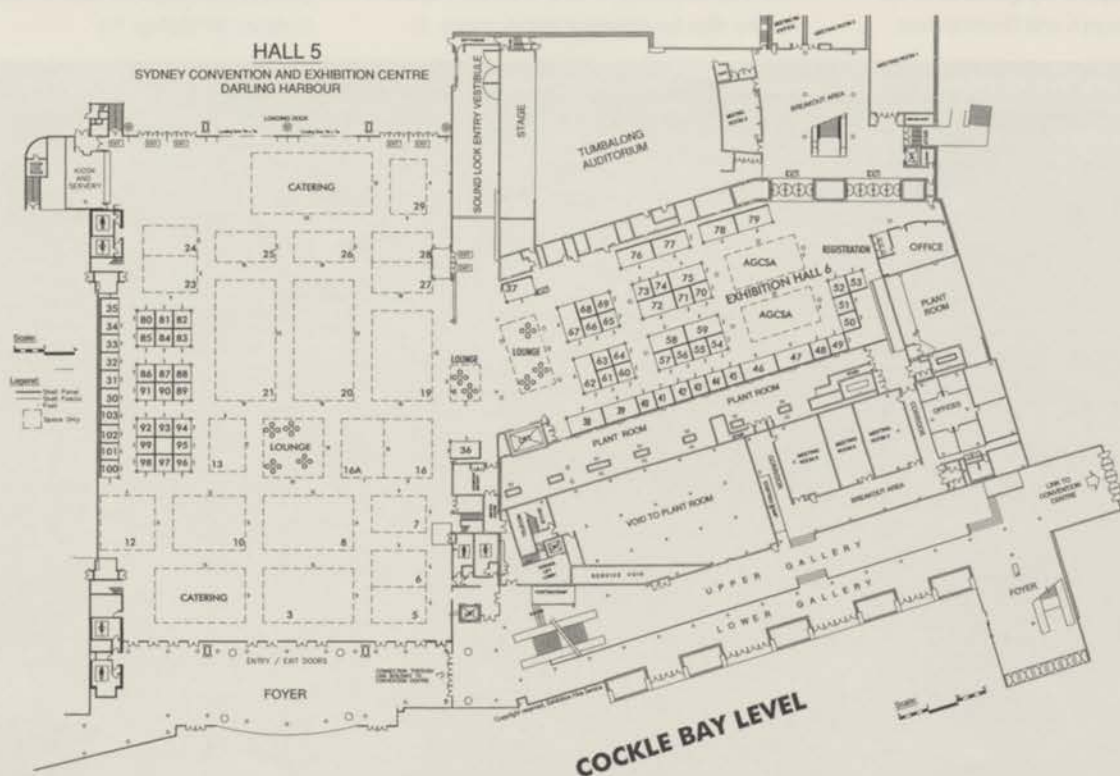
particular, Jim Hull at Keysborough Golf Club and Mick Russell at Werribee Park Golf Club for their tireless dedication in maintaining the trials.

Michael Robinson is Director of Research for Turfgrass Technology P/L



Table 3: Two year ave for Density, Colour, Shredding and Seasonal Growth													SEASONAL GROWTH															
VARIETY	DENSITY				COLOUR				SHRED				SUMMER				AUTUMN				WINTER				SPRING			
	KGC		WPGC		KGC		WPGC		KGC		WPGC		KGC		WPGC		KGC		WPGC		KGC		WPGC		KGC		WPGC	
	High	Low	High	Low	High	Low	High	Low	High	Low	High	Low	High	Low	High	Low	High	Low	High	Low	High	Low	High	Low	High	Low	High	Low
BARLENNIUM	7.4	7.4	7.4	7.3	7.3	7.1	7.3	7.4	0.0	0.0	0.0	0.1	3.0	3.5	4.9	3.4	2.8	2.8	4.5	3.1	2.7	2.8	3.0	2.4	3.5	3.5	3.8	3.1
PICK LP EE-93	7.4	7.3	7.3	7.6	7.1	7.1	7.3	7.3	0.0	0.0	0.0	0.0	3.3	3.3	4.4	3.3	2.8	2.9	4.4	3.6	2.7	2.8	3.1	2.4	3.5	3.5	4.6	2.9
RACER	7.3	7.2	7.1	7.3	7.0	6.9	7.1	7.2	0.1	0.0	0.0	0.0	4.1	4.3	5.1	3.6	2.5	2.8	4.6	3.4	2.9	2.7	3.1	2.4	3.5	3.6	4.6	3.0
HEADSTART	7.3	7.2	7.3	7.4	7.0	6.7	7.0	7.0	0.0	0.0	0.2	0.0	4.2	3.8	5.5	3.9	2.8	2.8	4.3	3.0	2.5	2.9	3.0	2.6	3.5	3.5	4.3	3.1
BRIGHTSTAR II	7.3	7.1	7.3	7.6	7.3	7.3	7.5	7.5	0.0	0.0	0.0	0.0	3.8	3.6	5.0	3.8	2.8	2.9	4.6	3.1	2.4	2.8	3.1	2.7	3.5	3.3	4.3	3.3
CALYPSO II	7.3	7.1	7.1	7.4	6.8	6.8	7.1	7.1	0.0	0.0	0.1	0.0	4.0	4.0	4.9	3.8	2.8	2.9	4.4	3.4	2.8	2.9	3.1	2.5	3.5	3.5	4.4	3.0
CATALINA	7.2	7.1	7.3	7.3	7.0	6.8	7.1	7.1	0.0	0.0	0.0	0.1	3.8	3.3	4.9	3.4	2.8	2.9	4.4	3.3	2.7	2.8	3.0	2.4	3.5	3.3	4.4	3.3
IMAGINE	7.2	7.1	7.2	7.3	6.7	6.9	7.1	7.2	0.0	0.0	0.0	0.0	4.5	3.5	6.2	4.1	2.6	2.6	4.9	3.4	2.7	2.6	3.0	2.6	3.7	3.3	4.6	3.1
NOBILITY	7.2	7.1	7.2	7.3	7.2	6.6	7.0	6.9	0.0	0.0	0.1	0.0	3.9	4.4	5.7	3.8	2.8	2.8	4.4	3.3	3.1	3.0	3.0	2.5	3.5	3.5	5.0	3.3
PREMIER II	7.2	7.1	7.1	7.5	6.8	7.0	7.2	7.3	0.0	0.0	0.0	0.0	5.0	3.5	4.6	3.9	2.8	2.8	4.0	3.4	2.9	2.7	3.3	2.4	3.5	3.3	4.4	3.0
DIVINE	7.2	7.1	7.2	7.3	7.0	6.8	7.0	7.1	0.0	0.0	0.5	0.0	3.4	4.1	5.3	3.5	2.8	2.8	5.0	3.4	2.4	2.7	3.6	2.6	3.5	3.6	4.5	3.3
LP 3028.02	7.2	7.1	7.1	7.3	7.0	6.3	7.0	6.8	0.0	0.0	0.0	0.1	5.0	4.2	5.3	4.1	2.8	2.8	4.5	3.2	2.5	2.3	3.1	2.5	3.5	3.8	4.5	3.1
SUNSHINE	7.2	7.1	7.0	7.4	6.8	6.8	7.3	7.2	0.0	0.0	0.0	0.0	4.9	4.1	4.9	3.8	2.8	2.6	4.1	3.5	2.6	2.7	3.1	2.4	3.5	3.3	4.5	3.0
2 DLM	7.1	7.1	7.4	7.3	6.7	7.0	7.2	7.3	0.0	0.0	0.0	0.1	5.1	3.1	4.9	3.5	2.8	2.8	4.3	3.0	2.0	3.1	2.9	2.4	3.5	3.5	4.1	3.1
GATOR II	7.1	7.1	7.1	7.3	6.7	6.7	6.9	7.0	0.1	0.0	0.5	0.0	5.6	4.4	5.3	4.1	2.8	2.9	4.8	3.2	2.5	3.1	3.1	2.4	3.5	3.6	4.5	3.0
TOP HAT	7.1	7.0	7.3	7.3	6.9	6.6	7.1	7.0	0.0	0.0	0.0	0.1	4.3	3.8	5.0	3.5	2.8	2.8	4.4	3.3	3.1	2.5	3.0	2.6	3.5	3.5	4.1	3.0
ALLSPORT	7.1	7.0	7.4	7.3	6.8	6.8	7.2	7.2	0.0	0.0	0.0	0.0	4.7	3.8	5.6	3.6	2.8	2.8	4.4	3.4	2.9	3.0	3.0	2.4	3.4	3.5	4.5	3.4
PENNANT II	7.1	7.0	7.1	7.4	6.7	6.9	7.2	7.2	0.1	0.0	0.0	0.0	5.1	3.8	4.8	3.8	2.9	2.9	4.1	3.4	3.4	2.7	3.0	2.5	3.5	3.5	4.6	3.0
LP 3028.03	7.1	7.0	7.3	7.3	6.7	6.7	7.0	7.0	0.0	0.0	0.1	0.1	5.5	4.0	4.9	3.5	2.8	2.8	4.4	3.3	3.0	3.3	2.9	2.6	3.8	3.6	4.4	3.4
PIROUETTE	7.1	7.0	7.4	7.4	6.8	7.0	7.2	7.3	0.0	0.0	0.1	0.0	4.1	3.7	5.3	3.5	2.5	2.8	4.4	3.0	2.4	2.8	3.1	2.4	3.5	3.2	4.4	2.8
CHECKMATE	7.0	6.9	7.0	7.2	6.6	6.7	7.0	7.0	0.1	0.2	1.1	0.2	5.5	4.6	5.8	4.1	2.8	2.9	4.9	3.8	2.6	3.0	3.1	2.4	3.5	3.5	4.6	3.3
ASSURE	7.0	6.9	6.9	7.4	6.5	6.5	6.9	6.9	0.0	0.0	0.1	0.0	4.7	4.8	5.1	4.0	2.8	2.6	4.5	3.5	3.2	2.7	3.0	2.5	3.5	3.5	4.4	3.1
EDGE	7.0	6.9	7.1	7.3	6.9	6.7	6.9	6.9	0.0	0.0	0.1	0.0	4.1	4.3	5.4	4.3	2.8	2.8	4.5	3.6	2.9	2.9	3.1	2.6	3.5	3.8	4.8	3.0
STALLION SUPREME	7.0	6.9	7.1	7.3	7.0	6.5	7.0	6.9	0.0	0.3	0.0	0.0	3.6	4.6	5.7	4.4	2.6	2.8	4.8	3.5	2.5	2.8	3.3	2.4	3.5	4.0	4.4	3.6
CUTTER	7.0	6.8	7.0	7.3	6.8	6.7	6.9	6.9	0.0	0.0	0.1	0.0	4.9	4.7	4.8	4.6	2.8	2.8	4.6	3.4	2.4	3.0	3.2	2.5	3.5	4.2	4.5	3.1
WIZARD	7.0	6.8	7.0	7.1	6.9	6.6	7.0	6.9	0.1	0.0	0.1	0.0	6.0	4.9	5.5	4.3	2.8	2.9	4.8	3.6	3.4	3.1	3.1	2.5	3.6	3.8	4.8	3.8
LINEDRIVE	7.0	6.8	7.1	7.4	7.1	6.9	7.3	7.4	0.0	0.0	0.0	0.0	3.6	3.3	4.8	3.6	2.8	2.8	4.1	3.4	2.9	3.0	3.3	2.4	3.5	3.6	4.6	3.1
EXPRESS	7.0	6.8	7.1	7.3	6.7	6.5	6.9	6.8	0.0	0.3	0.0	0.0	5.2	5.1	5.8	4.3	2.8	2.8	4.4	3.4	2.8	3.0	3.1	2.6	3.5	4.0	4.5	3.5
PINNACLE	6.9	6.8	7.0	7.3	6.4	6.4	6.8	6.8	0.0	0.0	0.0	0.0	6.8	4.7	5.7	4.5	3.5	2.7	4.6	3.4	3.6	3.0	3.0	2.4	4.3	4.1	5.1	3.4
QUICKSTART	6.9	6.8	7.1	7.1	6.8	6.7	6.9	6.9	0.0	0.0	0.0	0.0	4.3	4.2	6.1	4.4	2.8	2.8	4.8	3.4	2.6	3.0	2.9	2.4	3.5	4.0	4.6	3.8
ARENA	6.9	6.7	6.8	7.1	6.6	6.3	6.7	6.6	0.0	0.0	0.1	0.0	5.4	5.8	6.1	5.3	2.9	3.4	5.0	4.3	2.8	3.0	3.5	2.6	3.5	4.6	5.0	4.6
VSCR1	6.9	6.7	6.7	7.1	6.5	6.8	6.9	6.7	0.0	0.0	0.4	0.7	5.5	5.6	6.9	6.3	3.0	2.9	5.8	4.8	3.3	2.8	3.3	3.8	3.6	3.5	5.3	4.4
OLYMPIC	6.8	6.7	7.1	7.2	6.6	6.3	6.8	6.7	0.0	0.0	0.0	0.0	4.7	4.8	6.2	4.9	2.6	2.8	5.0	3.8	2.5	3.4	3.4	2.9	3.5	4.1	5.3	3.8
SR4100	6.8	6.6	7.0	7.3	6.5	6.5	7.0	6.8	0.1	0.0	0.2	0.0	5.4	4.2	5.3	4.4	2.9	2.8	4.3	3.7	2.7	3.0	3.5	2.6	3.9	4.0	4.5	3.1
PLEASURE	6.8	6.6	7.2	7.1	6.8	6.5	7.0	6.8	0.0	0.0	0.0	0.0	4.8	4.8	5.4	4.5	2.8	2.8	4.3	3.8	2.9	2.8	3.4	2.7	3.6	4.3	5.1	3.1
901	6.7	6.5	7.2	7.1	6.8	6.6	7.0	6.9	0.0	0.0	0.4	0.0	5.1	5.1	5.9	4.6	2.8	2.8	4.8	3.5	3.1	3.3	3.3	2.6	3.6	4.1	4.5	3.1
LEGACY II	6.7	6.5	7.0	7.4	6.4	6.8	7.1	7.1	0.3	0.0	0.2	0.0	6.7	3.8	5.3	3.5	3.6	2.4	4.5	3.6	3.5	3.1	3.3	2.6	4.0	3.7	4.4	3.3
LP 3028.01	6.6	6.5	7.0	7.0	6.6	6.2	6.9	6.6	0.1	0.2	0.3	0.2	5.2	5.8	6.9	5.1	2.9	3.0	4.9	3.9	2.7	3.3	3.1	2.5	3.6	4.6	5.1	3.6
DELAWARE DWARF	6.6	6.5	7.1	7.3	6.6	6.6	7.0	6.9	0.0	0.0	0.0	0.0	5.6	4.5	5.6	4.5	2.8	2.6	4.5	3.8	2.9	3.1	3.0	2.6	3.9	4.3	4.9	3.5
DUET	6.6	6.4	6.8	6.8	6.1	6.0	6.5	6.4	1.5	1.8	1.6	0.9	7.1	6.1	6.8	6.2	4.0	3.5	5.5	4.6	3.9	3.6	3.5	2.8	4.1	5.3	5.3	4.0
FIESTA II	6.5	6.4	7.1	7.1	6.6	6.5	7.0	6.8	0.1	0.2	0.0	0.1	4.7	4.8	5.3	4.4	2.8	3.0	4.5	3.3	2.6	3.3	3.5	2.8	3.6	4.0	5.1	3.0
WILLIAMSBURG	6.4	6.4	7.1	7.2	6.9	6.6	7.1	6.8	0.0	0.0	0.0	0.0	4.6	4.4	5.1	4.6	2.5	2.6	4.5	3.6	2.4	3.1	3.0	2.5	3.8	3.6	4.8	3.3
JD-92	6.4	6.4	6.9	7.3	6.6	6.7	6.8	7.0	0.1	0.0	0.3	0.0	5.2	4.0	5.6	3.9	2.4	2.0	4.6	3.3	2.9	2.3	3.3	2.4	4.0	3.5	4.8	3.3
LOWGROW	6.4	6.3	7.2	7.3	5.9	6.5	7.0	6.7	2.9	0.0	0.0	0.0	7.9	4.3	5.4	4.4	5.5	2.8	4.6	3.5	4.7	2.8	3.4	3.1	5.8	4.0	5.0	3.5
ENDURANCE	6.3	6.1	6.8	6.6	6.0	5.9	6.5	6.2	1.3	2.2	1.2	1.2	7.5	6.6	6.8	6.4	5.0	4.5	6.4	5.6	4.4	4.4	4.8	3.4	4.9	5.8	5.6	4.8
JOUST	6.3	6.1	6.6	6.6	7.0	5.8	6.4	6.1	0.0	0.7	1.1	1.8	4.7	6.3	6.8	6.2	2.3	4.3	6.4	5.2	3.0	4.2	3.7	3.3	3.7	5.8	5.1	5.3
DASHER II	6.2	6.0	6.9	7.2	6.6</																							

# CONFERENCE FLOOR PLAN



## 17TH AUSTRALIAN TURFGRASS CONFERENCE EXHIBITOR LIST AS AT FEBRUARY 1ST, 2001

Exhibit #	Company	Exhibit #	Company	Exhibit #	Company
3	Textron	34	Arthur Yates & Company	59	Ecogrow
5	Country Club International	35	Hydroplan	60-61	Turf & Irrigation
6	Redexim	36	JFB Agencies	62	Kuranda Manufacturing
7	David Golf + Engineering	38	Turfcare Supplies	63	Pauna Turf Aeration
10	Turf Link	39	Primac Elders	64	Graden Industries
12	Parklands Trading	40	Better Methods	65-66+69	Golf and Bowling Machinery
13	Hardi Sprayers	41	JH Williams and Sons	67	Rainman Irrigation Controls
16A	Greencare Industries	42	TGAA	68	Colin Campbell Chemicals
16B	Yamaha	43	Benedicts	70	Scotts
19	Chemturf	44	Paton Fertilisers	71	TurfCraft
20	Toro	45	Armstrong Tyres	72	Dint Greenkeeping
21	John Deere	46	Simplot	73	Aventis
23	Silvan Pumps+ Sprayers	47	Heritage Seeds	74	Aventis
25	M. Collins and Sons	48	Globe	75	Oasis Turf
26	Club Car	49	Organic Crop Protectants	76	BHM Machinery
27	Honda MPE	50	Barmac Industries	77	Multifert
28	Antonio Carraro	51	Maxwell & Kemp	78-79	Rain Bir
29	OPEC	52	Convault	83	Green Horticultural Group
30	Tru-Turf	53	Envirolinks Design	86	Agrichem
31	LWRRDC	54-55	Process Attachments	88-89	Turf Gear
32	Triodia Pty Ltd	56-57	Drake Extrusion	100-103	Manoeuvre Mow
33	HG Turf	58	Hunter Industries		

# Speaker Profile

## Duncan Malcolm

17th Australian  
**Turfgrass**  
conference



Duncan Malcolm, Chairman of the Irrigation Association of Australia will present the paper, "A National Approach to Water System Efficiency and Sustainability" as the keynote presentation to the 'Every Drop Counts' conference to be presented by the AGCSA in June.

Duncan Malcolm's extensive involvement with the water industry began with his chairing the Rural Water Corporation of Victoria from 1990 until 1995, where he oversaw major changes in the structure of water management in Victoria.

He is currently Chairman of the Irrigation Association of Australia Ltd and Chairman of the National Irrigation Science Network, and is a member of the Gippsland Water for Growth Committee and a Board member of

the East Gippsland Region Water Authority.

Duncan lives with his family at Boisdale in the Macalister Irrigation District in South-east Victoria and has considerable experience in dairy farming and horticulture (vegetable production).

Nowadays his main interests, apart from those in the water industry, are as Chairman of the Gippsland Coastal Board and Chairman of Lakes and Wilderness Tourism Association, in East Gippsland. He is also Chairman of the Geospatial Science Initiative Industry Advisory Board at RMIT University, Melbourne.



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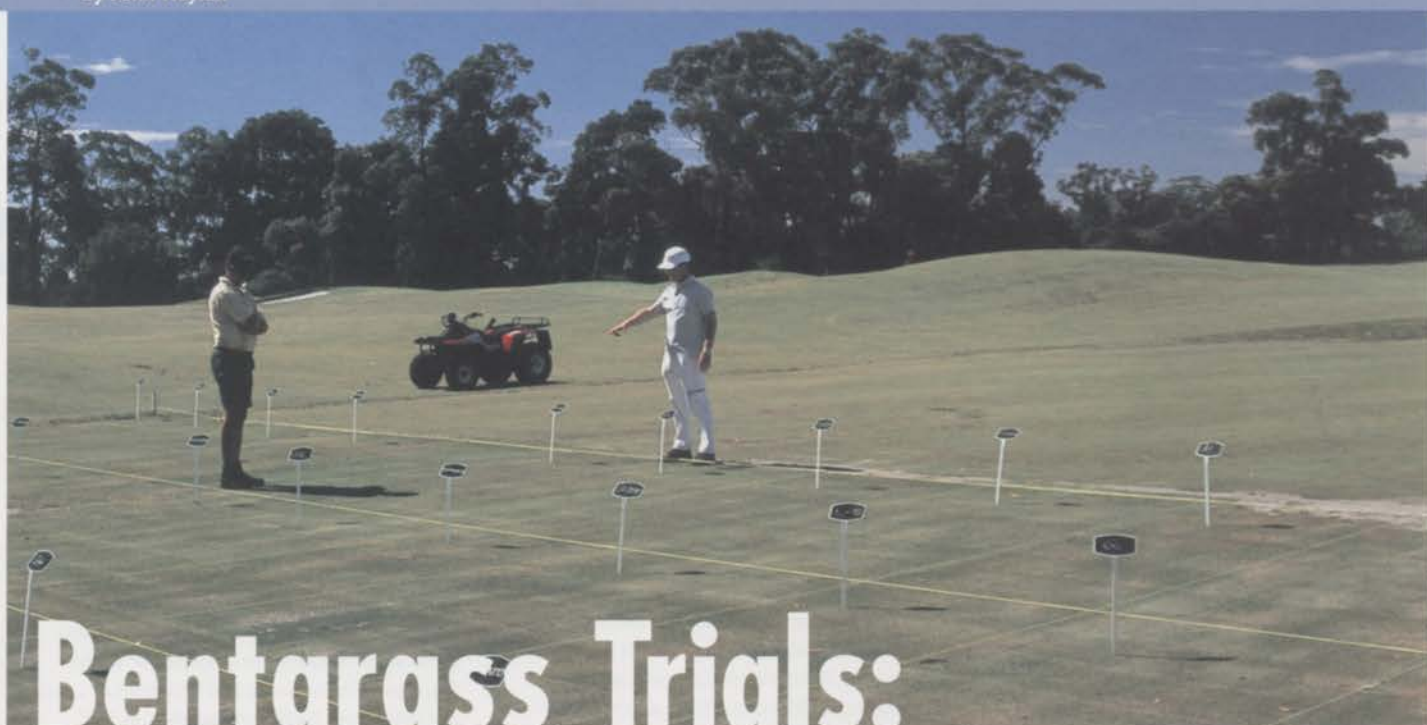
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# Bentgrass Trials:

## Taking the Guesswork out of Greens

Bentgrass has long been considered the premier grass for putting greens with "Seaside" the first of the selected and named varieties released in 1923 (Reese, 2000). The next significant improvements occurred in 1955 with Penncross and then Penneagle in 1979. Since the mid 1980's there have been many new varieties released, with the current new types having been released to the market about 1995.

The breeding programs have had different objectives in terms of turf characteristics. Bentgrasses are most commonly selected for; greater turf density, reduced spiking, lower cutting height, increased salt and heat tolerance and increased disease resistance. The most obvious changes in characteristics have been in turf density and vigour. While the bentgrasses have become more dense and produce

smoother and faster putting surfaces, they require more frequent cutting, dusting and thatch removal.

The Australian Golf Course Superintendents Association (AGCSA) has recently established a bentgrass variety evaluation trial at Kingston Heath Golf Club to objectively assess the growth and performance characteristics of the new grasses under local conditions. While undertaking the trials it is also opportune to review the data from the USA and more specifically, from the National Turfgrass Evaluation Program (NTEP), National Bentgrass Test – 1998 (Putting Green) program (NTEP, 1999).

The NTEP program provides a detailed assessment of many turfgrass varieties, including bentgrass over numerous sites throughout the USA. The bentgrass trials were established in 1998 and the results that follow are from the 1999 progress report. For convenience, only those varieties that are of interest in Australia are discussed. However, the full tables are available through the AGCSA or on [www.ntep.org](http://www.ntep.org) (the NTEP web site).

### Turf Quality

The mean turfgrass quality of bentgrass cultivars grown at 24 locations, provides an average quality over 'all' locations. While this

Table 1: Turfgrass Quality

Cultivar	Mean Turfgrass Quality 24 locations	Mean Turfgrass Quality 3 locations no fungicides
Penn A-4	6.5	5.8
Penn A-1	6.4	6.2
Penn G-1	6.3	5.7
Penn A-2	6.3	6.1
L-93	6.2	6.0
Penn G-6	6.2	5.7
Crenshaw	6.0	4.9
Providence	5.9	4.9
SR7200	5.5	5.6
Penncross	5.5	5.1
Pennlinks	5.4	5.2
Bavaria	4.4	4.6
LSD	0.2	0.4

Turfgrass quality ratings 1-9; 9 = Ideal turf

Source: NTEP (1999)

does not provide specific location results it does provide a good indication of the adaptability of the cultivars. Over the 24 sites the cultivar Penn A4 was the top ranking cultivar with Penn A1, Penn G1, Penn A2, L-93 and Penn G6, marginally below Penn A4 but were of a similar ranking to each other (see table 1). Providence was ranked significantly below all these varieties with Penncross and Pennlinks amongst the lowest ranking varieties.

The mean turfgrass quality ratings for each month indicate a similar trend, with the Penn A and G series and L93 being the dominant summer varieties and there were less significant differences between all varieties during the winter months.

At three sites, the bentgrasses were maintained without fungicides and these results show that Penn A1, Penn A2 and L-93 all rate very highly. Providence, Crenshaw and Penncross were at the lower end of the ratings (see table 1).

In trials conducted on 13 golf courses, Penn A4 was the top ranked variety, with the other A and G series bentgrasses and L-93 also amongst the top rated bentgrasses (Kind, 1999).

#### Seedling Vigour

When establishing a new green it is important that the selected variety has acceptable seedling vigour so that a playing surface can be achieved

as quickly as possible. While this is an important character, it is important to remember that the long term characteristics (eg quality, density, disease, tolerance etc) of the selected cultivar should ultimately determine the selection.

Averaged over 12 sites, seedling vigour for the Penn A series and Penn G1 were the highest

ranked. Crenshaw, L-93 and Penncross exhibited only marginally lower seedling vigour (see table 2)

In the AGCSA bentgrass trials at Kingston Heath Golf Course in Victoria, the rating for seedling vigour indicate that Penn A1 has the lowest seedling vigour.

Table 2: Seedling Vigour ratings (1999 data 12 sites)

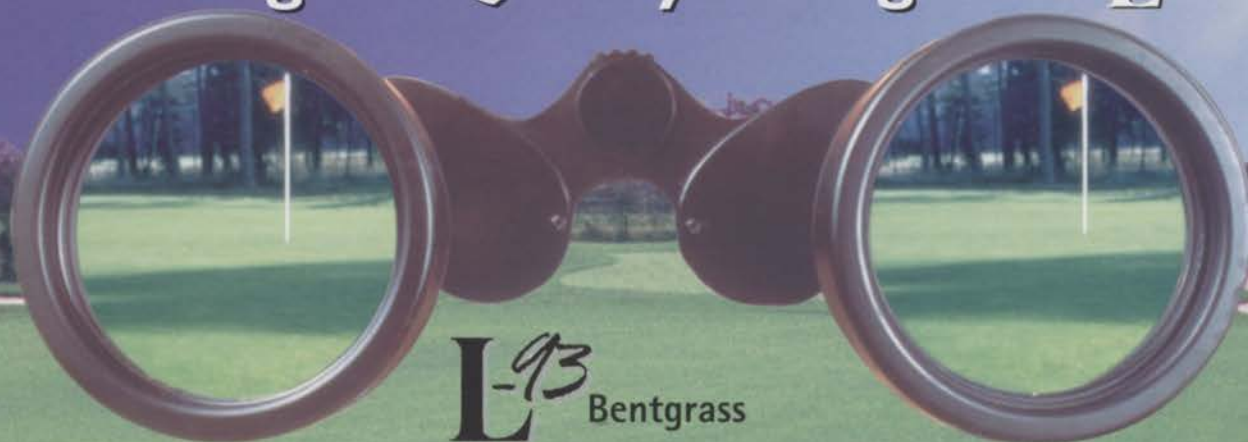
Cultivar	Seedling Vigour 12 sites (NTEP)	Mean seedling vigour (AGCSA Trials - 2000)
Penn A-4	7.3	6.7
Penn A-2	7.2	-
Penn G-1	7.0	-
Penn A-1	6.9	4.0
Crenshaw	6.8	-
Penncross	6.8	7.3
L-93	6.7	7.3
Penn G-6	6.8	7.0
Providence	6.5	-
SR7200	5.6	6.7
Pick MVB	5.3	-
Egmont	-	7.3
LSD	0.4	1.8

Turfgrass quality ratings 1-9; 9 = maximum vigour

Source: NTEP (1999)



## Looking for Quality Bentgrass - L<sup>93</sup>



- Number 1 for overall turf performance in the recent USA NTEP trials
- Reduces fungicide applications due to its exceptional disease resistance
  - Aggressive establishment to combat Poa invasion
- Dense, fine textured leaf, however not prone to excessive thatch

**L<sup>93</sup>**  
LOOKING FOR QUALITY



Melbourne: (03) 9561 9222 Fax: (03) 9561 9333 Mobile: 0418 399 518  
email: michael@heritageseeds.com.au

## Summer Survival

"Summer Survival" is a term that I have selected to describe the results in the NTEP trials where the percentage of living ground cover has been determined. "Summer Survival" is of interest both in Australia and the USA as bentgrasses have been introduced or are being maintained in marginal climatic zones.

In environments such as Adelaide, Perth and northwestern Victoria, summer temperatures regularly reach temperatures in the high 30's°C and there is an on going search for more heat tolerant cultivars.

The results for percent living ground cover over four sites show that; Pennlinks, Providence, Crenshaw, Pennncross, Penn G1, Penn A2 and L-93 where amongst the top ranking cultivars (see table 3).

Summer density ratings were also recorded with SR7200 (velvet bent) Penn A1 and Penn A4 in the top group. Pen G1, L-93, Penn A2, Crenshaw and Penn G6 made up the next grouping with Pennncross and Pennlinks having the lowest summer density (see table 3).

In a recent study undertaken by Toubakar and McCarty (2000), while the new cultivars (A series, G series, L93, Crenshaw and SR1020) ranked highest for quality, the older bentgrasses (particularly Pennncross) exhibited quicker recovery rates during summer.

Carrow (1996) indicated that over summer, Crenshaw was better than Pennncross in maintaining a root system which is the key to summer survival.

density and more vigorous growth has been increased thatch production. Logically, it is not going to be possible to have these improved characteristics without having to have a more vigorous program of thatch control. This can be achieved by lower and more regular mowing and frequent, light topdressing (dusting).

At two sites thatch depth was measured. Results indicate that the Penn A and G series and SR7200 are in the top group for thatch depth (see table 4). The cultivars; L-93, Crenshaw and Pennncross were ranked amongst the lower thatch producers. It is important to note that this is still early in the trials and greater separation between the cultivars is likely to occur over time.

**Table 4: Thatch measurements (2 sites)**

Cultivar	Thatch Depth (mm)
Penn A -1	12.3
Penn A -2	11.8
Penn A -4	11.5
Penn G -1	11.2
Penn G -6	11.0
SR7200	10.7
Pennlinks	10.5
Providence	10.3
L-93	10.2
Pennncross	10.0
Crenshaw	9.8
Bavaria	9.8
LSD	1.7

Source: NTEP (1999)

Pennncross. This has always been attributed to the greater shoot density and less than ideal thatch control techniques which conspire to create a more conducive microclimate for the development of disease.

Most new cultivars are selected for improved disease tolerance as a genetic trait. However, the environment will override any in-built advantages if thatch control and maintenance in general is less than ideal.

Dollar spot, Brown Patch, Microdochium and Pythium Blight occurred at some locations and the results are summarised in table 5. Pennncross was the cultivar most affected by Microdochium, with Penn A2, Penn G6 and Providence affected more than L-93. Pennncross, Pennlinks, Penn A1, L-93 and SR7200 were the least affected by Dollar Spot, with Providence and Crenshaw being the most affected. The incidence of Brown Patch was lowest on SR7200, with L-93, Pennncross, Crenshaw and Penn G6 being slightly more affected. The cultivar SR7200 was in a category of its own, exhibiting almost no incidence of Brown Patch.

Pythium Blight was noted at only one site with most varieties exhibiting very low incidence of Pythium Blight. The variety Bavaria (velvet) was significantly more affected than all other cultivars.

At one site, the incidence of Dollar Spot was recorded where no fungicides were used and the results show that; Crenshaw was the most affected, with SR7200 and Bavaria being virtually unaffected. Penn A1, Pennncross, Penn A2, Penn G6, Penn A4 and Penn G1 were amongst the least affected.

## Management

The new varieties have been in the marketplace for some time and Superintendents are now undertaking their own assessments. Robinson (1998) stated that Penn A-4 required regular low mowing to improve playing quality and health due to high turf density. His program included cutting at 2.5mm and over the year double cutting on 169 occasions and single cutting 93 times per year. In addition to this, the greens were regularly rolled. Top dressing was also considered important with 30-35 topdressings (dustings) per year. Dusting also presented a challenge in brushing in the sand through the dense turf layer, with particles greater than 0.5mm remaining on the surface. Dusting was done almost weekly using a mechanical brush to 'work' the sand in. The program also involved monthly applications of wetting agent to prevent occurrence of dry patch. This Superintendent made cost comparisons with Pennncross and found that the cost of greens management was \$US714/100m<sup>2</sup> for A4 compared to \$US615/100m<sup>2</sup> for Pennncross. The big positives for the A-4 was the consistently high green speeds (>11 feet) and strong competition against Poa annua invasion.

**Table 3: Mean % of living ground cover and mean summer density ratings**

Cultivar	Mean % of living ground cover (summer) at four sites	Mean summer density ratings at 13 sites
Pennlinks	88.2	5.6
Providence	86.2	6.5
Crenshaw	85.7	6.7
Pennncross	85.3	5.6
Penn G -1	85.2	7.0
Penn A-2	83.3	6.9
L-93	82.5	6.9
Penn G-6	82.3	6.7
Penn A -1	73.1	7.4
Penn A -4	72.7	7.1
SR7200	67.1	7.4
Bavaria	60.8	5.9
LSD	9.2	0.3

Turfgrass quality ratings 1-9; 9 = maximum density

Source: NTEP (1999)

## Thatch

With their very high shoot density, upright habit and vigorous growth, the new bentgrass cultivars can be prone to rapid thatch accumulation. As a general observation, the downside of improvements such as greater

## Disease Tolerance

Anecdotal evidence in Australia would suggest that the incidence of diseases such as "Brown Patch" (*Rhizoctonia* sp) and Pythium sp increased with the introduction of cultivars such as SR1020 and Providence, when compared to

Table 5: Incidence of disease

Cultivar	Mirodochium (1 site)	Dollar spot (5 sites)	Brown Patch Warm Temp (3 sites)	Pythium Blight (1 site)
L-93	8.7	8.1	8.7	8.1
Penn A-1	8.0	8.1	8.0	8.1
Penn A-4	7.7	7.1	8.0	8.1
Crenshaw	7.3	5.1	8.0	8.1
Penn G-1	7.3	5.1	8.0	8.1
SR7200	7.3	8.1	8.0	8.1
Pennlinks	6.7	8.2	8.0	8.1
Penn A-2	6.3	7.8	8.0	8.1
Penn G-6	6.0	7.5	8.0	8.1
Providence	6.0	6.1	8.0	8.1
Penncross	4.7	8.3	8.0	8.1
LSD	2.0	0.7	8.0	8.1

Disease ratings 1-9; 9 = No Disease

Source: NTEP (1999)

In trials at the University of Wisconsin, A4, G2, Penncross and Poa Annua were evaluated as their cultivation requirements (Nus, 2001). These trials have demonstrated that most 'topdressing' was removed from A4 (3.9%), 3.3% was removed from G2 and 1.5% was removed from Poa annua. Verticutting prior to topdressing significantly reduced the amount of 'sand pick-up' by mowers. Most thatch was produced by A4, followed by G2, Penncross and Poa annua.

A survey of golf clubs that had established new bentgrass cultivars indicated that thatch control was the main concern and that low mowing (2.4-3.6mm) was essential with the mowing frequency being from five times per week to

range of geographic environments and need an aggressive management program (eg low mowing).

In one study that looked at the effects of nitrogen on the shoot and root growth of L-93 and Crenshaw, concluded that L-93 exhibited significantly deeper root growth at 4kgN/100m<sup>2</sup>/year (compared to 2 or 6kgN/100m<sup>2</sup>/year) while this rate also appeared to be the optimum for Crenshaw (Schlossberg and Karnok, 1999).

#### Salt Tolerance:

Marcum (2000) has studied the salt tolerance in the modern bentgrass varieties. He tested 35 bentgrass cultivars, with increasing salinity

daily double cutting at one club (Fraser, 1998). The average stimp meter reading was 3.05m (10 feet). The report concluded that the new bentgrasses require different management, will perform well in a

concentrations from 1 decisiemens/metre/day up to 8 decisiemens/meter/day at which time data was collected. The most salt tolerant cultivars were Mariner, Seaside II, Grand Prix, Seaside, 18th Green and Century. The least tolerant cultivars suffered complete death after ten weeks exposure and they included Avalon (velvet bent) Ambrosia (colonial bent) as well as Regent, Putter, Penncross and Penn G-6.

#### Conclusion:

There have been significant achievements made in the breeding of bentgrasses, with the newest cultivars being denser and more upright in their growth habit. As a result they require a change in management with the emphasis on thatch control by regular low mowing and dusting. The benefits are improved green speeds, increased summer survival and greater resistance to Poa annua invasion. However, Ostmeier (1999) sums up the situation very well when he states that "yet, for all their greatness those new cultivars are only as good as the Superintendents that care for them".

Over the next three years, the AGCSA bentgrass trials will yield useful local data (albeit at one site) on their management and as in previous trials (Neylan and Robinson, 1995) we are certain that there will be some local anomalies.

John Neylan is the Manager of Technical and Advisory Services for AGCSATech

A complete list of references are available by contacting the AGCSA office on: 03 9886 6200

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## Turf Managers' Handbook for Golf Course Construction, Renovation and Grow-In

By Charles B. White

When asked to review this book, I had no hesitation in accepting. For the past 4 years I have had to undertake major reconstruction of our golf course and still have two thirds of the course to complete. Therefore, I felt that not only could learn a lot from the book but, I would be able to give a good account of it's value based on my own experience so far.

The book was written last year and caters as much for existing golf course rebuilding and grow-in as it does for a new golf course project. Therefore it is a suitable book for nearly every Golf Course Superintendent.

The author, Charles B. White, has a great deal of experience in the field. Having worked on a golf course from an early age, Charles later spent time with the green section of the USGA and has consulted on over 100 golf course projects during construction, renovation or grow-in.

I wouldn't necessarily call this book a 'handbook'. To me the term refers to something you can refer to quickly from time to time when needing information on specific

topics but this book lends itself more to reading through completely, possibly a few times, in order to properly digest the information.

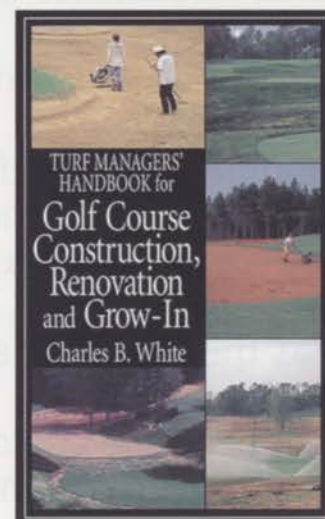
However, it is full of information and has an appendix at the back which serves as a useful checklist.

My major criticism of the book, is that it contains too much information that is hard to digest and appreciate fully, and not enough information that is "to the point". The author touches on and talks about numerous topics, but doesn't give enough concise solutions to potential problems.

Overall though, I found the book quite interesting, easy to read and of use on a number of points. Although I did not entirely agree with everything the author advised, as we all know there are no 'right' and 'wrong' ways in greenkeeping, just ways that work for you!

I would certainly recommend this book to anyone who has some major course reconstruction ahead. Read it thoroughly and apply whatever you can to your situation.

Jeff Lane,  
Golf Course Superintendent,  
Gosnells Golf Club (W.A.)



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# Making the Right Insecticide Choice

By Rick L. Brandenburg

Pesticides play an important role in maintaining high quality turfgrass. Due to the presence of damaging populations of insect pests in many regions, insecticides are an important tool. However, the concern over potential environmental hazards from pesticide use, the view that society has toward pesticide use, as well as the cost of these products make the correct pesticide choice an important decision.

Cost and effectiveness are two factors that immediately come to mind when we discuss pesticides. How well does it work and how much does it cost? These are important questions to ask. How quickly a product works and how long it lasts can often be two different



Birds feeding on turf often indicate the presence of insect pests.

separate functions. Effectiveness is often associated with how quickly it will kill the pest, but in the case of a persistent or recurring pest, residual effectiveness may be of critical importance.

Your final cost is always important and must be looked at carefully. We usually operate under the assumption that you get what you pay for. A less expensive product that has short residual activity may have to be applied more times than a more expensive more residual product. Many factors enter into cost including the products overall effectiveness and the need to retreat, the means by which it must be applied, the labor and equipment involved, as well as the time to apply the product and the actual cost of the product per unit of area.

The actual cost relates directly to the

particular formulations of a product that are available. Some formulations may be more expensive than others. But are they easier or quicker to apply, are they more effective or safer, or more effective against a particular pest? Which one can you put out most easily, accurately and effectively? The real

cost of a product becomes more obvious once you factor in other considerations.

For some turfgrass managers, a label that covers a broad spectrum of pests is desirable. However, it is important to remember, that just because twenty different insects are listed on a label it doesn't mean a single application will get them all. Some may require a higher rate, rarely do they all occur simultaneously, even at low levels, and quite often the application technique varies with the pest. For example, a treatment for white grubs would need to be watered in immediately, whilst one for armyworms would need to dry on the foliage.

Toxicity is a prime consideration when selecting a pesticide. Here we are not talking about toxicity to the pest as we've already discussed, but rather toxicity to people, pets,



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fish, birds and so on. This information is readily obtained and should be considered prior to any pesticide use. It has direct implication toward worker protection practices and may certainly influence location of use. Different formulations of the same product can also differ in their actual toxicity or hazard even though the toxicity of the active ingredient is the same.

There can be dramatic differences in the toxicity of pesticides among various groups of animals. Several new synthetic pyrethroids have recently obtained labels for turf and have longer lasting residual activity than the old pyrethroids. These products have gained favor because of their low use rates, quick knockdown and kill, and relatively low mammalian toxicity. However, these products are very toxic to fish and use near water must be avoided.

Toxicity must also be considered in the context of hazard. Something may be quite toxic, but is not really a hazard because it is used at a low rate or by the way it is formulated. Toxicity concern can also be influenced by the location of use. As

previously discussed the new synthetic pyrethroids are very toxic to fish, but possess less potential environmental hazard than some other products if they are not used near water.

Groundwater contamination and runoff make product solubility a concern for many turfgrass managers. However, the likelihood of a pesticide moving in the soil is influenced by a lot of factors in addition to its solubility. Soil type and texture, annual and seasonal rainfall, thatch, slope, and many other factors all affect pesticides movement. Numerous formulas have been devised to help determine pesticide leaching. The persistence of a pesticide can be both good and bad. When a pest is present for a long period of time, residual activity (persistence) of a pesticide is desirable. When a product persists longer than it is needed and through time expresses some potential for negative environmental consequences, persistence is not so good.

To adequately cover all the factors related to pesticides and the environment, we would need to fill a rather large book. As a general

rule though, many of these factors interact and the effects of a pesticide are generally felt over a wide range of environmental parameters. For this reason, researchers worldwide have begun to develop formulas to put a numerical value (for ranking purposes) on the potential environmental risk of a pesticide. These go under such names as "environmental yardstick" or "environmental index quotient". These 'factor in' information on bird, mammal, and fish toxicity, solubility, persistence, leaching, and a whole array of pesticide characteristics to give a single numerical value. This approach may be a forerunner to future methods to refine pesticide selection.

One particular area of turfgrass integrated pest management that has truly become exciting during the past five years has been the area of non-conventional pesticides. One general rule of thumb for most biological pesticides is that they are a little less forgiving than conventional pesticides. Appropriate timing, application techniques, environmental conditions, and pest life stage are all very critical. Some biological controls

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or biological materials have narrower ranges for optimal activity based on the above factors. Before you select such a product, be sure you understand what it takes to make it work. If you have an interest in using entomogenous nematodes, make sure you understand the technology before you use them. It simply is not the same as applying a conventional synthetic pesticide.

Unfortunately, there are times when we don't see the results we expect and after investing significant time and money into the use of a product and we are disappointed in a big way! Our most common reaction is that the product of choice failed. My experience over the past 20 years of making follow up visits to many of these pesticide failure sites is that the problem was not with the pesticide. Pesticide failures resulting solely from a failure of the product itself are rare. Most every product we use is channeled through quality control programs during manufacturing that ensure consistency of the product. However, despite these assurances, we all know that pesticides 'sometimes' do fail.

When pesticides are used there are always environmental factors that impact upon them and may either enhance or restrict their performance. Understanding the factors that influence pesticide performance and how to take advantage of those under your control can increase your chances of success.

These factors discussed here can fit under three broad categories: biological, chemical, and physical. A wide range of factors can affect pesticide performance. First, is the proper identification of the pest problem. This unfortunately turns out to be a more frequent cause of failures than one would care to admit. Most often it is the result of someone relying only upon turfgrass injury to make a control decision. Decisions to treat based on the damage to the turf may lead to pesticide failures simply because damage can be very misleading.

Another biological factor that is less common, but has shown a significant effect, is that of microbial degradation. Microbial degradation is the breakdown of compounds in the soil by the activity of microorganisms. Were it not for the activity of these microbes, we would eventually run into problems with intolerable levels of substances in our environment. However,

under rare circumstances, the activity of these organisms can be so great that they cause a product to be broken down too quickly. This may result in the product losing its residual activity or not working at all. While microbial degradation is not widespread and common for most pesticides, the fact that it can happen certainly cautions us not to rely solely upon one product year after year and to not use products unless they are absolutely necessary.

A final biological area is that of the development of pesticide resistance by various pests. This has not been a significant problem in the area of insect pests on golf courses, but unwise use of pesticides could contribute to problems. Most of the insect pests faced by golf course superintendents do not have too many generations per year and the development of resistance is not a major concern, nor is it a good explanation for pesticide failure.

Physical and chemical properties would include factors that affect the application of the pesticide or its activity once it is applied. These would include the proper calibration of application equipment and the proper use of the equipment. Improper calibration, or more likely, wear of nozzles and pumps that have altered sprayer output since the last calibration can often result in incorrect amounts of pesticide being applied. Label directions may call for specific application directions with required volumes, so read them carefully. Applying an insecticide under adverse weather conditions can also affect the efficacy of the product. Hot and dry conditions may seriously limit the effectiveness of an insecticide directed towards soil insects. The hot, dry conditions may force the insects deep in the soil and those same conditions may result in some of the insecticide binding to the soil and organic matter and some volatilization of the product is likely to occur. Bright, intense, midsummer sunlight may also break down some insecticides and render them less effective.

Good management practices of the turf go a long ways toward reducing pest problems and reducing the effects of pest injury by improving turfgrass tolerance. Excessive thatch often contributes to insect problems, but more importantly it can act as a 'sponge' for pesticides. Pesticides bound to the thatch are often rendered useless. Irrigation or rainfall also plays an important role in

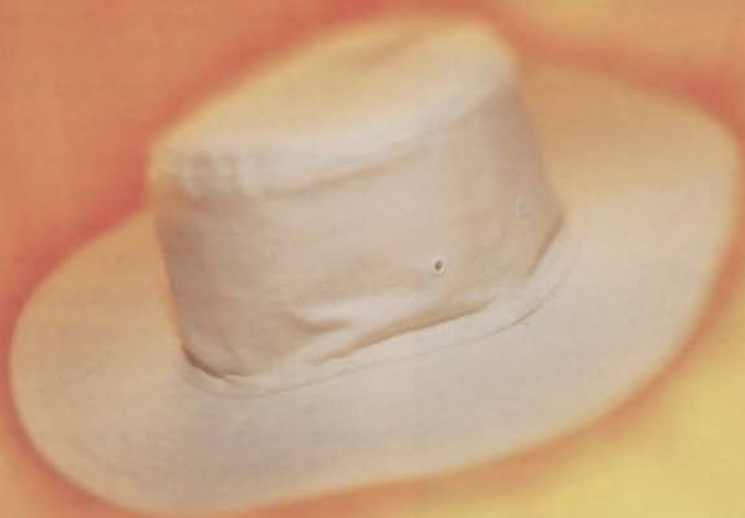
insecticide performance. Many insecticide labels call for an immediate irrigation after application. This may be to reduce surface residues and it may also be to initiate movement of the product into the soil where it can be more effective. Moist soil will generally reduce pesticide binding and encourage the soil insects to reside closer to the soil surface thereby improving control.

Linked closely with the previously mentioned biological factors are the cultural practices of mowing. If one is treating for armyworms, which are primarily active in the evening when the worms are small, then it is best to treat in the early evening. It is also wise to avoid mowing the turfgrass for several days. The armyworms feed on the green, lush turf and will be feeding less on the clippings. If you mow shortly after treating, much of the pesticide will be lost on the clippings.

A final factor that can influence the effectiveness of pesticides is the pH of the spray tank water. Some pesticides are sensitive to higher pH (alkaline) spray tank water. One of the most common sources of alkaline water is found in municipal water supplies. The pesticide is rapidly broken down or hydrolyzed at pH's above 7. The higher the pH the faster the pesticide is broken down. Some products are very sensitive to alkaline hydrolysis, but many are not. If the water you use in a spray tank is alkaline, then you may want to consider the use of acidifiers or buffers with some products. These additives are literally pennies on the dollar and may provide a real boost to pesticide performance even though some pesticide formulations contain their own buffers. If you are unsure then check with the products sales representative. Understanding all the factors that can influence a pesticide is an important component to an effective integrated pest management program. By getting the most out of your pesticide you have an opportunity to use reduced pesticides, avoid the need for retreatment, save valuable dollars in your maintenance budget, achieve better results, the end product being higher quality turf, and a happier clientele.

*Rick L. Brandenburg is a Turf Entomologist with the North Carolina State University*





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## WORLD MATCHPLAY INTERVIEW

Although the timing of the event couldn't have been worse as far as the players were concerned, another Australian golf course was beamed into the living room of a global golfing population and the applause was resounding. ATM spoke with Golf Course Superintendent Richard Forsythe shortly after the event.

**Phil George:** *Richard, congratulation on the Accenture World Matchplay, the course looked sensational and I don't think I have ever heard such positive comment on the condition of a golf course from players and from the media?*

**Richard Forsythe:** The Club and staff were delighted at the positive feedback from the players, particularly as many overseas players were taking their first look at Metropolitan. Tim Finchem, PGA Tour Commissioner made the following statement in his media conference on Saturday 6th January, "I am not sure I recall being at one of our events in the last couple of years where virtually every player is just ecstatic about the quality and condition of the course...Hats off to everybody here at Metropolitan for getting this great golf course in the condition it is in".

It is particularly satisfying to have players comment on the quality of putting surfaces given that nine new greens have been constructed since the 1997 Holden Australian Open.

**PG:** *That is high praise indeed from Tim Finchem but earlier this week Brett Ogle said, "it (the course) should be the*



Metropolitan Golf Club

*centerfold in Greenkeepers Monthly"*

**RF:** I know Brett likes the course but that's a bit over the top!

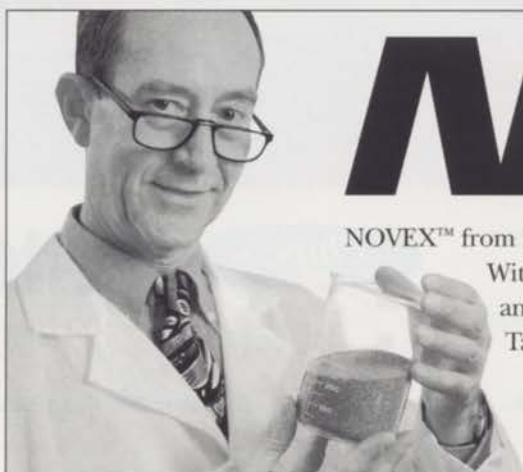
**PG:** *I heard one radio commentator say that the fairways were in better condition than his carpet at home! I saw the Fairways during the Aussie Open in 97 and they were pretty impressive – just how good were they this year and have you seen them better?*

**RF:** Our focus was to present the whole course in the best possible condition but most attention was actually paid to the

putting surfaces. I felt that the fairways this time were about 15 to 20% better than they were for the 97 Open, due mainly to the time of the year, but also to the timing of verti-cutting, fertiliser application and mowing. Much of the credit for the presentation of the fairways goes to the mower operators who took on the responsibility of quality control and establishing pattern cutting. Support from Toro Australia, who supplied additional mowers and mechanical backup was also a great assistance. Our Mechanic, Marty Fergus was under the most pressure and his efforts in keeping all the mowing equipment cutting precisely was a major factor in the overall presentation of the course. In terms of colour, uniformity and surface quality, the fairways were at their best for tournament week.

**PG:** *I am sure that the many thousands of ATM readers (especially those managing couch) would love to know exactly what kind of couch you have on the fairways at Metro and exactly how you prepared them to such a high standard?*

**RF:** The majority of fairways are Common Couch overplanted with Wintergreen and four fairways are grassed with Santa Ana. Timing of maintenance work played an important role in achieving the optimum result in the first week of January. In January / February 2000 fairways were heavily scarified then verti-cut three times in November 2000. No irrigation was used on fairways until December when wetting agent was applied prior to first watering. Soluble N, K, Fe + Mg fertiliser was applied in the second week of December. This was a very



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dry period and it was difficult to apply enough irrigation. 43mm of rain fell on the 22nd of December and even though it washed out every bunker face, it was welcome assistance. Two Toro 5400 and two Toro 5500 fairway mowers set at 7mm commenced double cutting on patterns three weeks prior to the tournament week and a second application of soluble fertiliser was made on the 28th December. Catchers were used on the fairway mowers during tournament week.

**PG:** *The World Matchplay is a pretty high profile event and I am sure that the worldwide audience was massive. Any idea how big, and what sort of infrastructure and planning is required for an event such as this?*

**RF:** We know that the tournament was televised to 140 countries through ESPN, Fox Sports, NHK Japan, ABC US and Channel 10. Over the past couple of weeks we have had contact from South Africa, Great Britain, Japan, Canada and the United States via phone, fax and e-mail, asking questions related to the course presentation. The World Golf Championships are controlled by the Federation of World Tours. However, this event was primarily controlled by the US PGA Tour. Tony Rosenburg was responsible for tournament set up and promotion here in Australia. The size of the television production was probably the most significant difference to an Australian tournament. 350

people worked on the outside broadcast, which required enormous equipment, cabling and course transport. 150 golf carts on-site created some headaches for us. Phone services were upgraded in the immediate area to accommodate 300 new lines into the course. Temporary water and power supplies also required some major work.

**PG:** Was much reconstruction work required in preparation for the tournament and is there much more still to come?

**RF:** There was very little actual construction work done to the course specifically for this tournament. There was some major work done to develop a 1.5-hectare site to accommodate the outside broadcast compound. Clearing, Earthworks, irrigation, grassing and the supply of services was carried out in March 2000. Since the 97 Open, the course itself has had nine greens reconstructed, five new tees, bunker alterations and a new green complex at six but this has all been part of our scheduled course improvement plan. Players were particularly complimentary to the new work. Three greens remain to complete the reconstruction of all greens.

**PG:** *The tournament officials changed around the order of some of the holes – why was that?*

**RF:** Results indicate that the average matchplay contest finishes after 16 holes.

The PGA tour decided that they wanted the final three holes to finish in the vicinity of the Club House to accommodate corporate and spectator requirements. Holes one to eight remained the same, the 11th became 9 and so on in order with the 10th played as 17 and the 9th as 18. This created minor difficulty and confusion in the coordination of staff movements.

**PG:** *The club must have been happy with the way the place looked and you and your staff must have felt pretty satisfied. What was the feeling like at 6:30 on Sunday night?*

**RF:** The Club Committee and Members were very proud of the way the course was presented and received by players and the media. I was particularly pleased for our staff that had worked so hard and made plenty of sacrifices over the Christmas / New Year period. They all took on responsibility for their particular task and the quality of presentation is a reflection on their skills, enthusiasm and dedication. We were also assisted by eight staff from other clubs who volunteered their services for twelve days to experience tournament preparation. They played an integral part in course preparation and I thank them for their efforts. At 6:30 on Sunday we had just watched Steve Stricker receive his \$1.8 million winners cheque and it was time to unwind and celebrate.



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## COUCH FOR MELBOURNE BOWLING GREENS

In a swing labeled as revolutionary, a number of Bowling Clubs in and around Melbourne are 'turfing' their existing bentgrass greens and replacing them with Tiff Dwarf Couchgrass.

One such club is the Port Melbourne Bowling Club who contracted Barry and Brett Armstrong from Sports Turf Curators to replace their bentgrass 'Helmore Green' with Tiff Dwarf at the end of December last year. Darren Walls, Greenkeeper at Port Melbourne said that his decision was inspired by greens in the Murray River region (considered by many as the best in the world) that are "just not that far away" and bowlers continually calling for an extended playing season.

Also, Darren feels that the summers are getting hotter and he has noticed that his bentgrass greens just aren't coping with the

kind of management that is required to get them rolling up around the 15 second mark. Darren said that, "bentgrass greens (his) were magnificent for the first 5 years but once they get 'thatchy' you get problems (slow pace in winter and stressed out in summer)".

The new green at Port Melbourne was cut six weeks after installation and will have been topdressed twice before it comes into play at the end of this month (February).

Darren estimates that he has had approximately 50 Bowling Greenkeepers come and look at the new green and predicts a 'revolution' if his new green and couch greens recently installed at Whittlesea and Fitzroy Bowling Bowling Clubs prove to be successful.



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It is envisaged that the successful candidate will undertake regular courses in the Cantonese language in order to aid communication with staff.

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Applications containing resume and details of work experience should be sent to:

The Assistant Course Manager, P.O. Box 133, Sandringham, Vic. 3191 or by fax on 03 9598 7895

## NEW LOOK AGCSA AWARDS

AGCSA President Peter Frewin, recently announced that John Deere, Scotts Australia and Aventis Environmental will join the AGCSA as partners in presenting the 2001 AGCSA Awards program.

Of special significance is the new agreement between the AGCSA and John Deere Ltd., which sees the previous AGCSA Fellowship Award revamped to more adequately reflect the nature of today's golf course management industry. Presented in partnership with John Deere Ltd., the revamped award will be called the AGCSA Excellence in Golf Course Management Award, and will build on the history and prominence of the previous award. The major change (apart from the name) will be the selection criteria, which previously had significant emphasis on the contribution by the nominee to the AGCSA and/or State Superintendent Associations. The key selection criteria, is now solely based on the nominees demonstrated excellence in the management or construction of a golf course in the previous two years. It was felt by all parties that many worthy nominees who did not have the opportunity to serve on national or state superintendent associations were being deterred from nominating for the

award. John Plunkett, John Deere's new Golf and Turf Manager stated that, "John Deere is excited about the new Award and is proud to once again support the AGCSA in recognising those that achieve excellence in their golf course management career."

Nomination forms for all AGCSA Awards are included in this edition of Australian Turfgrass Management. A new feature of the 2001 AGCSA Awards Program will be the presentation ceremony to be staged as part of the Gala Opening Ceremony of the 17th Australian Turfgrass Conference. The Gala Opening will be held on the evening of Monday June 18th, 2001 in the Ballroom of the Sydney Convention Centre. The traditional Conference Welcoming Cocktail Reception will take place immediately after the Gala Opening, and in 2001 this will be presented in partnership with Rain Bird Australia.

As part of the AGCSA's commitment to acknowledging past Award winners, Peter Frewin also announced that the association will establish a 'Hall of Fame' in the AGCSA exhibit to be a regular feature of future Australian Turfgrass Conferences and Trade Exhibitions.



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## AGCSA TO RESEARCH HISTORY

AGCSA President Peter Frewin announced in December that the AGCSA has commenced the preparation of a detailed history of Australian greenkeeping and the AGCSA. In announcing the project, Peter Frewin stated that, "Australia has a proud history of greenkeeping, but much of it remains unknown." The township of Bothwell, in Tasmania, is the official home of Australia's first golf course, Ratho. Recent evidence suggests that there were several golf courses in the area around Bothwell as early as 1822, but these were maintained by grazing sheep and rabbits, not greenkeepers! In 1936 the first "The Australian Greenkeeper" journal was published as the official organ of the following groups:

The NSW Greenkeepers Association

- The Green Research Section, VGA

- The Green Advisory Committee, VBA

- The Green Improvement Committee, QLD Bowling Association

- The Green Research Committee, Western Australian Bowling Association



The 1937 edition of the Australian Greenkeeper includes minutes from a meeting of the NSW Greenkeepers Association. Within the minutes it mentions a Mr. Blythe, as being the founding

President of the organisation. Is he the first President of a golf greenkeepers association in Australia? We aim to find out!

In 1981 the first of a new breed of turf publication called the "Australian Golf Superintendent" appeared on the scene. This is the first publication by the new Australian Golf Course Superintendents Association.

The first President of this organisation was well-known turf identity, Geoff Hatton. In 1992, the modern AGCSA was borne as a Company Limited by Guarantee. In 1991 Francis Grindlay was appointed as the first employee of the Association as a part time administrator to assist in running the association. The Launceston Conference in 1992 was the first national conference administered by the AGCSA.

There are many unknowns and holes in the history of greenkeeping and greenkeeping associations in Australia.

If you have any old books, magazines, articles or minutes from old association Board meetings, please send them (or copies) to the AGCSA to assist us in this information gathering exercise. We aim to compile this information into a booklet for distribution to members and set up a display at the 17th Australian Turfgrass Conference to be held in Sydney later this year.

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The TeeJet 2001 Buyers Guide is available from all TeeJet Original Equipment Manufacturers and distributors in Australia and New Zealand, as well as TeeJet's head office in Geelong. It can also be downloaded from the TeeJet website at [www.teejet.com](http://www.teejet.com) (as a pdf file in Adobe Acrobat format).

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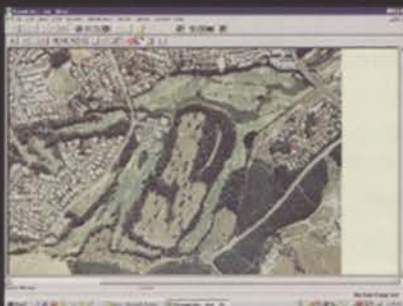
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## FNQGCSEA

After the wettest year since records have been kept (1941), a total of 3423mm (600mm in December) of rain fell in 2000 and it looked like we were in for a long wet season. However, the rain halted on the 3rd of January and the weather has been surprisingly good for this time of year. Sunny, warm conditions with excellent course conditions reported right through the north. Enjoy it now supers and staff as it wont last forever!

A farewell to John Moriconi (Territory Manager for Chemturf). John has been servicing the turf industry in the north for the past five years, was well like by all and will be missed. We wish him well in his new venture.

Cairns Golf Club has gone under contractors. It is believed to be Resorts Course Management who won the tender.

Our annual general meeting has been scheduled for the second week in February.

Lets hope for a cyclone free year.

Paul Earnshaw

President, FNQGCSEA

## GCSAQ

Once again the variable weather has been creating havoc in Queensland. The south east corner has had a bit of everything starting with some extreme storms that hit from Coffs Harbour up the coast to Brisbane with some storm cells behaving like little cyclones. Casino had hailstones the size of cricket balls (the game cricket), while there were plenty of trees knocked over up the coast. The Grand Golf Club reported they had the tops blown out of some mature gum trees through one side of the course when a localized "twister" ripped through! The associated rain was certainly welcome at the time after a long dry spell that has affected a band between the Sunshine Coast and the Gold Coast and leading back inland.

Upcoming events on the calendar are the AGCSA Roving Seminar on the 14th of March and the Secretary Managers and Superintendents Golf Day in May. Our Vice President, Barry Cox, has been busy organizing an itinerary for our Granite Belt tour later in the year and is looking like one not to be missed.

Our association has been working with the QGU, the Secretary Managers Association and the EPA to come up with a Code of Practice

# state REPORT

relating to the new Noise Abatement legislation that has proved such a vexatious issue for those clubs with neighbours close to course boundaries. The EPA has provided us with guidelines and golf industry groups have been meeting to come up with a useful industry document that should ease the burden on those clubs under the hammer.

Meanwhile the DPI research site at Redland Bay is extending its turf related activities and has a large block of land set aside to use.

The AGCSA greens turf trials site at Lakelands is up and ready to go. They do need samples from your greens so please send in a plug either through your friendly Nuturf rep or off your own bat.

Plenty of Superintendents seem to have found time to take a break over the summer, a report on some of their more unusual holiday adventures would make good reading, I'll see what I can dig up for the next exciting installment!

Jon Penberthy

President, GCSAQ



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## GCSAWA

Recent autumn weather has come as a welcome relief for supers and staff in the west after another hot and relatively humid summer.

Our programme of events this year started with a Basic First Aid training course organized through St John's Ambulance on 31st January. Judging by the response we will need to organize another course for later this year.

The Heineken Classic golf event was held at the Vines for the very last time.

Congratulations to Golf Course Superintendent Dion Warr and staff for once again providing such quality playing surfaces for this golfing spectacle.

Our very own AGCSA John Deere fellowship award winner Mr Alan Devlin of Secret Harbour is currently enjoying himself on his very first trip to the USA. With Alan's wry and witty sense of humour I'm sure we can all look forward to an interesting presentation at the 17th Australian Turfgrass Conference in June.

Congratulations to Neil Thorpe on his new position as Golf Course Superintendent at Dunsborough Lakes Country Club. Neil was the former 21C at Lake Karrinyup Country Club and replaces Alan Gratorex who after more than 8 years of service at Dunsborough has left due to personal reasons.

The year 2001 promises to be another busy one for our Association with events planned for every month of the year.

Members are advised to 'diarize' all events in particular round 3 of our John Deere Super Series (6th Feb) which will be played in the morning at Gosnells Golf Club to be immediately followed by a combined AGCSA / GCSAWA workshop focusing on time management.

Also, on the 27th of April we will be staging the very first intercourse challenge at Pinjarra Golf Course. Members will be advised of further details in due course. Hope to see you there.

**Rob Macdonald**

President, GCSAWA

## NSWGCSA

With the extreme temperatures and all irrigation supplies stretched to the limited, many turf managers are under extreme stress. It is hoped that committees and golfers are understanding and supportive in these trying times.

Our annual championships are to be held at Avondale Golf Club on Wednesday 14th February and defending champion Kenton Boyd will be looking forward to playing 'arguably' the best fairways in the state. Host Superintendent David Warwick tells me he has enough water to look after six golf courses, and I am sure those Supers who at the moment can only water their greens would love to devise a way of taking

some of his 'spare megalitres'.

The Christmas cruise on 'the best harbour in the world' was a resounding success with 90 people attending. It was a great way to finish the year.

On a more serious note I urge all members to give thought to standing for the Board of the AGCSA as Peter Schumacher is standing down after a very successful stint with the AGCSA, it is vitally important that our state be represented as we have the most number of members of any state. Anyone interested can contact me or the AGCSA for more information.

The best news so far this year is that Andrew Watson from DGE has had a successful operation to remove a Melanoma from under his arm and it is a very poignant reminder of how careful we must be in our profession in protecting ourselves and our staff from the sun.

As I am writing this it is 44°C with a hot nor-westerly blowing. I am off to help with the hand watering.

**Martyn Black**

President, NSWGCSA

## VGCSA



Over the past six months a number of articles have been published in various turf publications (including the VGCSA's newsletter), regarding the state of turf education in Victoria. Whilst most members are aware of the new National Turf Industry Competency Standards it is obvious there is confusion regarding the different competency levels as well as how you can be assessed at those levels. As a result the VGCSA's first meeting for 2001 to be held at Devil Bend Golf Club on Monday the 19th of February will have a comprehensive review of turf training / education in Victoria. Mr David Nelson, executive officer of Primary Skills Victoria will outline how the National Turf Industry Competency Standards have evolved. He will also explain the role of TAFE Colleges and Workplace Assessors within this new system. Representatives from the AGCSA, TAFE sector and a 'private provider' will also be speaking. Needless to say its important that as many members as possible are in attendance to discuss this important issue.

Don't forget the VGCSA's Annual General Meeting is to be held in mid April at Woodlands Golf Club while our Turf Research Golf day is to be held at Commonwealth Golf Club on Monday the 14th of May.

**John Geary**

President, VGCSA

## SAGCSA

Now that we are well and truly into summer, we are all feeling the stress of the heat in more ways than one. With temperatures averaging in the high 30's we could all do with some relief.

The other problem I'm sure we are all suffering with is the constant power interruptions, i.e. no power...no water.

I hope everyone had a relaxing Christmas as the week of Christmas was quite cool, after a few drops of rain on the Thursday and Friday before.

There has been some movement's at a couple of courses with Ian Kakosche from Clare to Hahndorf and Wayne Dale returning to Fleurieu. Also Shanna Rowlands from Coopers is leaving to enjoy the bliss of marital life in them ol' cotton fields back home.

Good luck to everyone for the rest of the summer.

**Shawn Standfield**

President, SAGCSA

## TGCSA

The TGCSA finished the year 2000 on a high with a very successful trade and golf day at Port Sorrell Golf Club. Our day was well supported with seven trade exhibitors entertaining for the day.

Once again the 9-hole stableford event provided some memorable moments. Harry Skledar at Port Sorrell G.C. provided superb playing conditions for all to enjoy. Trophy presentations followed the golf and congratulations must go to Steve Harris Mowbray Golf Club for winning the prestigious Reg Roberts Memorial trophy.

Thanks to Harry and all involved for making this a successful event every year.

At the time of tabling this report most Supers would be monitoring water levels in storage dams. The lack of rainfall since late October has really tested our skills in all aspects of turf management.

Irrigation is everyone's priority at present, so our next field day in late February-March will provide valuable information. Brad Fawcett from Rainbird Irrigation will host the day with Steve Wilson (L'ion Country Club Casino) to explain Steve's recent upgrade in control of their irrigation system at the casino course. Other relevant topics on irrigation design etc will also be debated.

Finally, I would encourage all of our members to give serious thought to nominations for the AGCSA awards. Our association is yet to submit a nomination in any category, so lets be active in this event.

**Phil Hill**

President, TGCSA

## TGAA (Vic)

Initially, I trust everyone did have an enjoyable Christmas and expectations were satisfied with families and loved ones.

We have decided to break tradition slightly in not pursuing our early year lead off Ansett Cup Football night Super Box meeting at the now defunct AFL Park. Although always well attended, issues and time uncertainties plus doubt as to whether two Victorian based clubs were to compete this year at Colonial Stadium forced this tradition to be deleted from our activities program.

Our kick off 2001 field day will be in the form of an Occupational, Health and Safety Forum set down for April (actual dates to be confirmed soon to Members – Sponsors via our normal mailing / advertising). As in the past, this type of day is extremely well attended and delegates come away thoroughly enriched and much more aware and advised. It is also an opportunity for Apprentices, new employees, Administration Managers, Bursars and Responsible Head of Departments to become involved.

Early work has commenced in preparation for what is acknowledged as our Premium Event since TGAA inception – that is the Turf Wicket

Seminar (M.C.G.). More about this in later editions.

Since the 2000 release of our TGAA Buyers Guide the calls and request for additional copies and information such as a sponsorship listing for the 2001-2002 edition has been encouraging.

Last November our President was cordially and generously invited to attend the ground breaking inaugural opening of our newest chapter TGAA (Western Australia). On his return he enthusiastically conveyed his comments as to the resourceful structuring of the occasion and the prime location (Burswood Centre). He also commented that the quality and range of fine speakers was a credit to the new committee. A large turf delegation that was in attendance for this history making event. Congratulations Western Australia!

Jim Slatter / Rob Savedra

Committee, TGAA (Vic)

## TGAA (ACT Region)

I hope that everybody's transition into the New Year was a pleasant one, although extreme heat coupled with little rain not only in our territory but throughout Australia caused an increase in stress levels of turf and

turf managers. Most golf clubs have used large portion of their maintenance budget purchasing town water just to keep turf alive. The positives are that it couldn't possibly be worse and can only become better.

It seems that the years are progressively becoming hotter with less rain, meaning expectations of the turf manager to provide an ever increasing quality of playing surface is becoming more difficult. With the costs associated with water usage and the current water restriction it is essential that today's turf managers exercise sound and effective irrigation practices using the correct management techniques. "Water is a valuable resource let us not be wasteful".

The quality of water used for irrigation and the monitoring of run-off are important environmental issues affecting many clubs. The ACT TGAA is currently considering purchasing a water testing kit that will be available for use by all members. It must be remembered that these field kits are no substitute for laboratory testing. Results are correctly recorded and used simply as a reference. Water samples should be sent for testing in a laboratory on a regular basis.

All the Canberra Institute of technology students have successfully completed all

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learning outcomes required for the Level 4 Certificate in Turf Management that started mid 2000. Congratulations to all who participated. Time and time again, CIT staff demonstrate their dedication to the turf industry. The CIT plans to run the level 3 course sometime this year.

In local sporting news Manuka Oval is to play host to 4 games of AFL this season. It's long overdue and should prove to be a real crowd pleaser. Congratulations to Greg Brearly and his staff for maintaining a ground suitable for professional AFL.

Justin A K Haslam,

TGAA (ACT Region), Committee Member

## VGA

"What a summer we are having"! Extended drought and very hot days have tested our skills to the max in producing top quality bent greens.

Recent VGA events included the T&I Triples at Newport Bowls Club, with Kieran Smith (on his home turf) taking out the title with his team of Max Hughes and Ashley Walsh.

Essendon Bowls Club held the Oasis 100-Up with Andrew Kent rolling Duncan (spunky) Knox in a tight final.

### Coming Events

Golf Day – Tuesday, 13th February at Goonawarra Golf Club, Sunbury at 12 noon.

This should prove to be a great day as there are some noted golfers in the Association and some who think they can play! We'll be able to get onto this well-groomed course for half price, so dust off those clubs and enjoy yourselves.

Invitation Fours Day – Sunday, 11th March at MCC Bowls Club at 10.00a.m. Sharp.

There will be \$1,000 in prize money up for grabs so get in early with your entry by contacting our match committee on 9337 0112 or my self on 0403 045 280.

I look forward to seeing as many of you as possible at these days, till then "cheers".

Peter Rasmussen

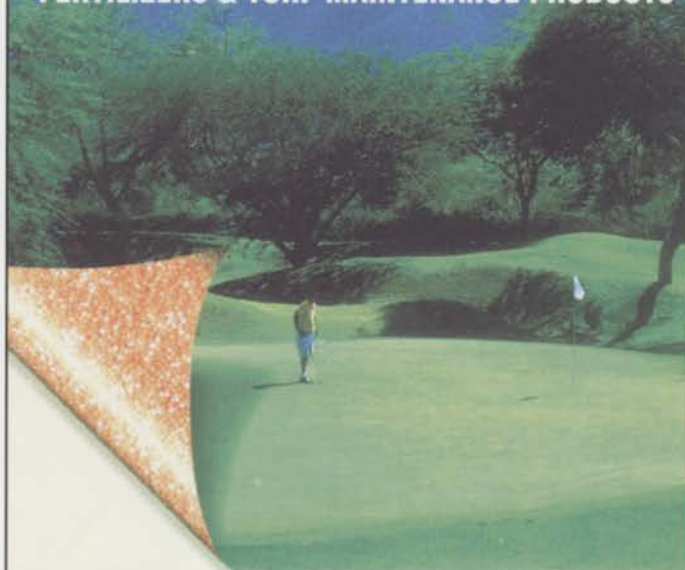
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