AUSTRALIAN
Turfgrass
MANAGEMENT
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Lake Karrinyup Walks Tall

FUTURE GOLF - *It's here, Now*

TREES AND TURF - *Managing the conflict*

WETTING AGENTS - *Rootzone Effects*

LIGHT IT UP - *Shade Performance of Couchgrass*

volume 4.1
February - March 2002

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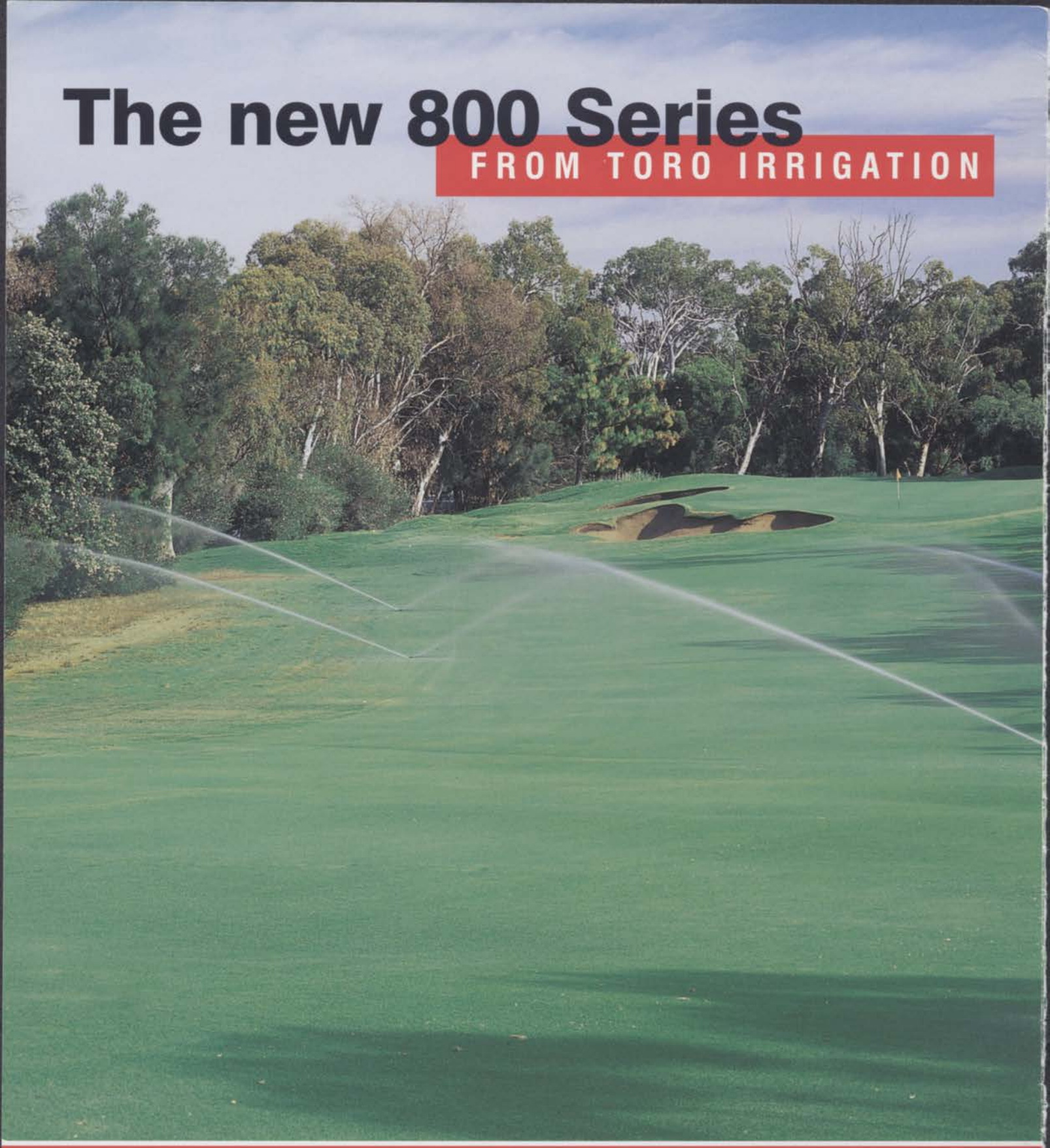

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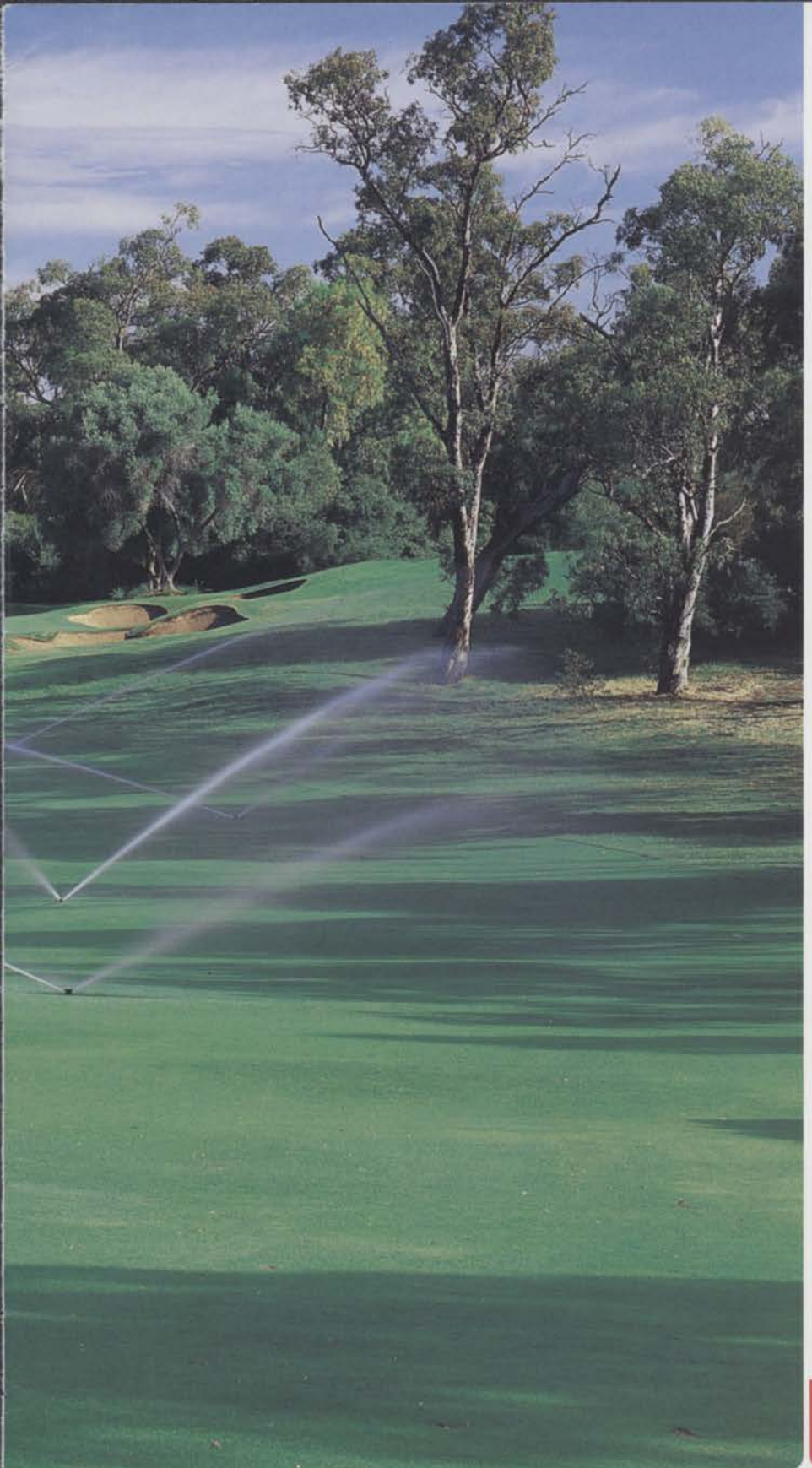

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Hydrovar has gained a reputation as the pump mounted, microprocessor pumping system controller. But it does much more than just change motor speed.

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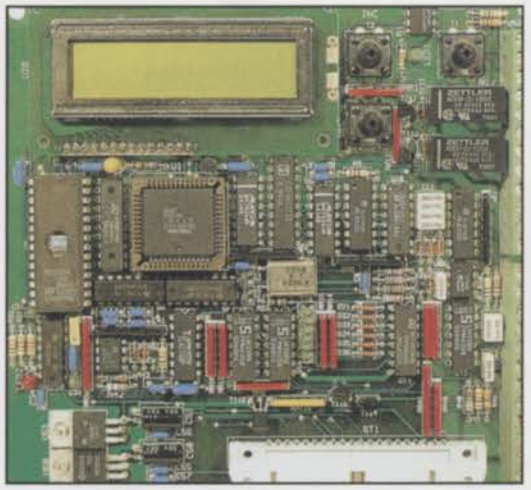

How does Hydrovar work?

Hydrovar monitors a system parameter e.g. pressure, flow, or level via a signal transducer.

Hydrovar then calculates the correct motor speed to maintain the required system parameter constant.

Hydrovar achieves this by modifying its output commanding pump motor to start, increase speed, decrease speed or stop to meet the system demand.

For multiple pump installations Hydrovar will vary the order of the lead pump and start lag pumps as required automatically.

Hydrovar applications.

Hydrovar is purpose designed to fit directly on to most Lowara pumps. This has created an extremely versatile range of pumps ideal for Golf Course watering.

The Benefits of using Hydrovar.

Maximises system performance.

Reduces energy consumption.

Reduces starting current.

Eliminates bypass lines and pressure modulation and metering valves.

Eliminates pressure pulsation and water hammer.

Increases pump reliability and service life.

Eliminates large storage tanks.

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Fully programmable on site via inbuilt touch pad.

LCD display on the control panel indicates all information and programming help.

Display lights indicate power onto the Hydrovar, pump running and fault.

Automatically stops pumps when system demand is zero.

Integration into central control systems via special monitoring terminals.

Multiple Hydrovar pump systems incorporate built in automatic redundancy.

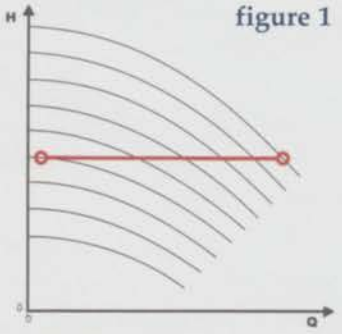
What can Hydrovar do?

The basic function of Hydrovar is to meet and control the demands of the pump system.

Hydrovar maintains constant discharge pressure.

The operator sets the desired pump pressure then Hydrovar varies pump speed as demand increases or decreases to keep the pressure constant. (figure 1)

figure 1

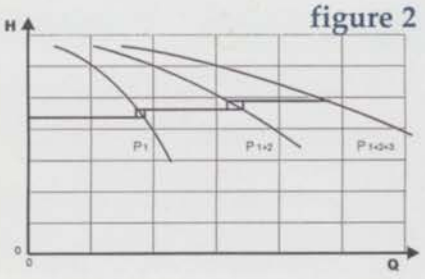


Control for constant pressure

Multi-pump Installations.

Up to 4 Hydrovar controlled pumps can be operated together. No other control panels are necessary. The Hydrovar units are wired together through their RS485 interfaces. The microprocessors monitor the activity in each Hydrovar and pump to adjust the overall system performance. (figure 2)

figure 2



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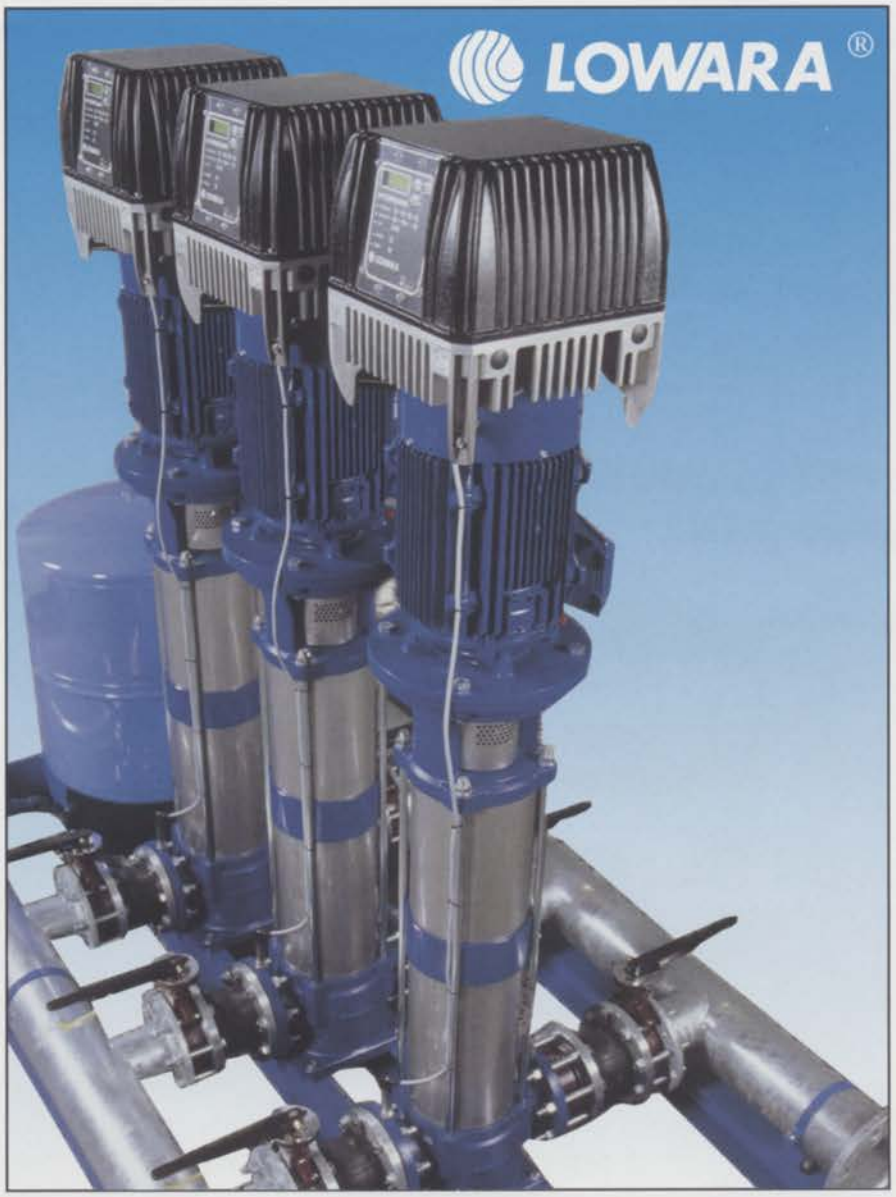

How Hydrovar reduces installation expense.

No special pumps or motors required.

No separate microprocessor systems.

No separate control panels and inverters required.

No bypass lines, metering or control valves required.

No large pressure tanks required.

Compact design.

How Hydrovar reduces maintenance cost.

Hydrovar software is designed specifically for centrifugal pump operation, control and protection. Hydrovar can thus be setup to protect the pump from operating under various unfavourable conditions eg. cavitation, operating against closed head, low NPSHa or operation past a pumps maximum flow rate. Hydrovar will automatically shut down and alarm if adverse conditions occur.

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How Hydrovar reduces energy consumption.

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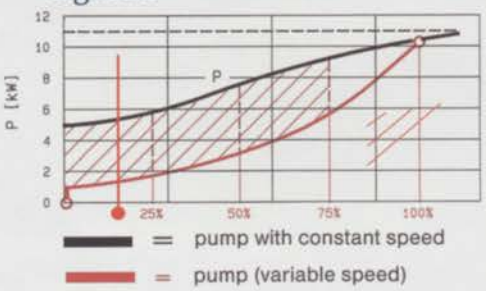
figure 3



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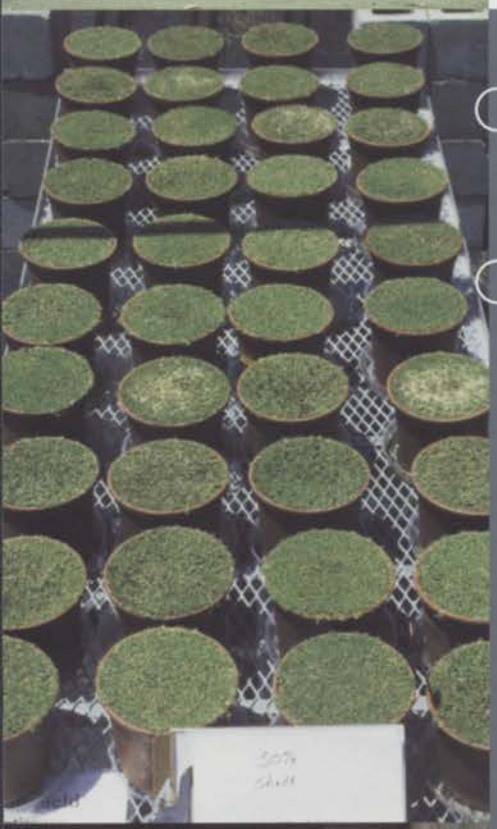

special features

research

in every edition

Editors Note

Summer is synonymous with bushfires in Australia and our thoughts go out to those turf managers caught up in the recent Sydney bushfire crisis. Often our facilities become refuges for both wildlife and people in such circumstances.

Heat also brings with it dry patch problems for turf managers with the resultant need to turn to wetting agents as a salvation. But how does the use of wetting agents effect water retention in turfgrass rootzones. Bernd Linauer reports

Summer also brings with it the Australian tournament season, and ATM starts the new year with an in-depth look at what it takes to prepare a golf course for a major event. I caught up with Course Superintendent, Wayne Miller some three weeks before he played host to the Johnnie Walker Classic in late January and the course looked to be in fantastic shape. Wayne and his dedicated team have been planning and preparing for the tournament for more than a year - and it shows. The full report appears on page 10.

Continuing with the summer theme, a team from the University of Florida also takes a look at the new ultra-dwarf couchgrasses, and how they perform under shade.

With a year of the national bentgrass project under his belt, John Neylan provides a detailed status report including comparative data of the performance of the newest bentgrass varieties to see how they stack up against the old favourites. A must read for anyone with bentgrass greens.

The only constant in life is change and nowhere is this more evident than in the changing golf industry. Following on from her successful chairing of the Golf Club Secretary Managers Conference, Terri Clementson discusses the changing face of the Australian golf market. She reports on how this has the potential to alter the traditional golf club management structure and the roles of secretary managers and course superintendents. Terri challenges the golf industry to move with the times or become irrelevant.

So buckle down and hang on, we're going to take you on the ride of your life in ATM in 2002,

PHIL GEORGE
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AGCSA

LES BURDETT
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WARREN WILLIAMS
DOOMBEN RACING CLUB

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Phil George

President's Pen

Mark Couchman, AGCSA President

Welcome to the first edition of ATM for 2002. I hope that for those fortunate to have had time off over the Christmas period that they enjoyed the opportunity. Certainly the bushfire crisis in NSW in January caused some anxious moments for many people and I hope that any readers who were either involved either voluntarily or through necessity have come through unscathed. It would appear that the weather on the eastern seaboard has thrown many varied situations for turf managers, with scorching conditions throughout most of NSW and Queensland, whilst snow was seen in the Victorian highlands over Christmas. Hopefully, the weather gods will even up the score for everyone throughout the year ahead.

The year ahead for the AGCSA will revolve around promoting the profession and continuing with the education of our members. The AGCSA has been successful in the last two months gaining significant media coverage of its research and other activities in golfing journals and the broader media. We aim to continue with these efforts in 2002.

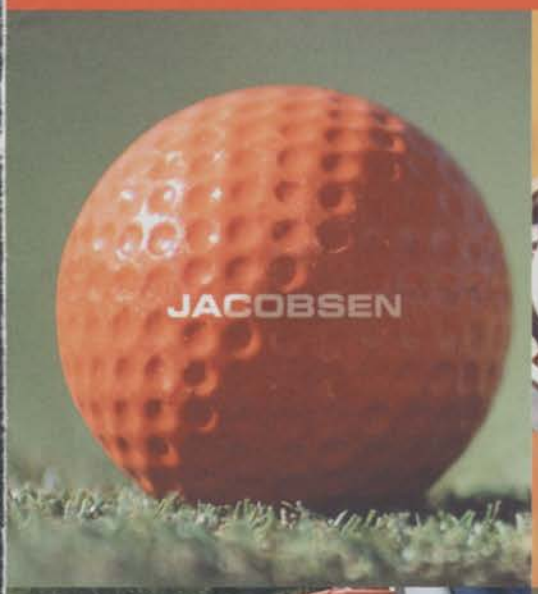
Event wise, the AGCSA will be running a workshop series through April with Dr. Jim Moore from the USGA doing a presentation in relation to the USGA Greens Specifications.

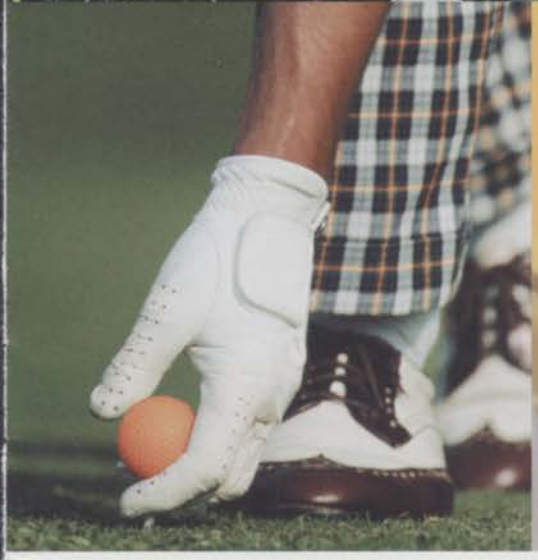
The big event for the year will be the18th Australian Turfgrass Conference to be held in Brisbane from June 17th –21st.

In closing I would like to wish everyone a great 2002.

Enjoy the magazine.

Mark K. Couchman
President, AGCSA





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LAKE KARRINYUP WALKS TALL

Lake Karrinyup at its best

In just over ten years the Johnnie Walker Classic has gained the reputation of being one of the best golf tournaments in the world, continually attracting outstanding players, huge galleries and worldwide television coverage.

Sanctioned by the European, Australasian and Asian PGA Tours, the 2002 Johnnie Walker Classic heralds the return of world-class golf to the 'modernized' layout of the Lake Karrinyup Country Club.

Located just 13 kilometers north of the Perth CBD and widely acknowledged as Western Australia's best private club, Lake Karrinyup was designed in 1928 by Mr. Alex Russell from Melbourne who had just joined in a new partnership with celebrated Scottish golf architect Dr Alistair McKenzie. Russell was given virtual carte blanche, to design the best golf course that the site could carry and given that the club has made only subtle changes to the original layout to remain relevant as a championship golf course, Russell's design must surely rate as highly successful.

In notes attached to drawings of the general layout of the course that were presented to the committee on the 13th March 1928, Russell concluded with the following comments that almost 65 years later, still provide an accurate description of what was created so long ago.

"I consider that with the ample room available, the good soil present, the natural undulations and the very pleasant situation and surroundings that your course should compare favourably with any course in Australia. I have endeavoured to avoid blind shots to the green and to design a course which will be difficult for the scratch man but relatively easy for the short player, if he can keep it straight."

"The course as laid out is admittedly difficult but given good fairways to play second and third shots from I think that you will find it fair and reasonable to all classes of Golfers." (White, 1988)

Native vegetation makes LKCC special

Scheduled for November 2001, Golf Course Superintendent Wayne Miller and his staff of 15 were busily preparing for the Perth International Golf Tournament when in the middle of last year, IMG International were forced to find a venue for the Johnnie Walker Classic that had a time zone more suited to the demands of an Asian Market.

Western Australia was the obvious choice so the Perth International was rescheduled for later in the year and Wayne was asked to have the course ready for the end of January rather than November. If you are familiar with a Perth summer, you will understand that this was a much tougher task.

Preparation for an event of this standing coincided with the appointment of Wayne Millar as Golf Course Superintendent who took over from legendary GCS and GCSAWA Life Member, Neil Adams.

Wayne was immediately set the task of completely rebuilding a failing irrigation system that was no longer able to maintain the course to a standard acceptable to the members.

Johnnie Walker Classic

BY PHIL GEORGE

Lake Karrinyup draws its irrigation water from deep below ground and it contains an extremely high concentration of iron that in over just seven years, had built up to such an extent inside the pipes that a line originally 100mm in diameter was now only 50mm!

Said Wayne when discussing the problem, "It was simply impossible to even get any water at all to some parts of the course and this was starting to cause major problems. All the roughs and surrounds here are cool season grasses and it is pretty tough to get them through a Perth summer without water"

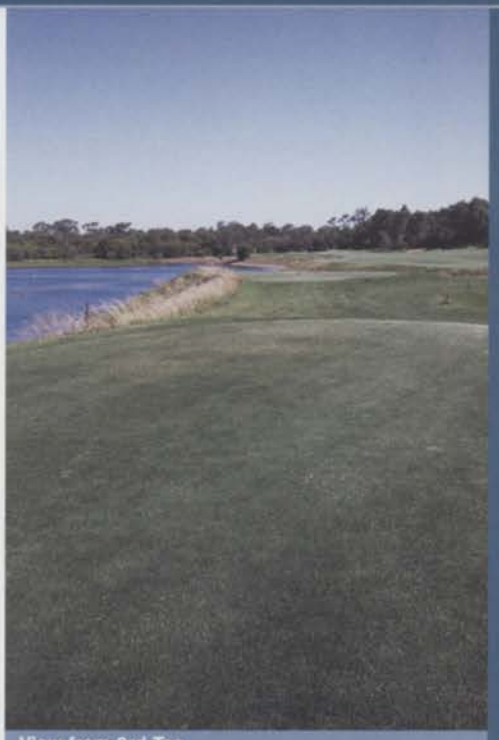
Stage one of the irrigation system upgrade was the construction of a fully lined 13 megalitre storage dam just near the first tee. The new dam really is a 'work of art'. Ground water from the 5 bores is pumped straight into an aerated holding pond and is then fed through a system of fully landscaped waterfalls to an 8m deep settling pond that is kept moving by 'bottom mounted' aerators driven by a 2.5 hp air compressor.

Water entering the system from the bore has an iron concentration of approximately 2.9ppm but by the time it enters the irrigation system, the iron concentration has been reduced to just 0.4ppm.

Four new 55 kilowatt variable speed pumps were installed and by the end of 1998, the entire irrigation system on the nine hole short course positioned in the north western corner of the property had been replaced.

Commencing almost immediately, stage two of the irrigation upgrade involved rebuilding the system on the 6200m Championship Course. This included the installation of approximately 1400 Rain Bird heads and tens of thousands of meters of irrigation pipe. The irrigation system on the eighteen-hole Championship Course was designed to provide for course changes that were scheduled to commence at the beginning of 1999.

These changes included the construction of 21 new greenside and fairway bunkers that were designed by Peter Thompson and the



View from 3rd Tee

Finishing touches leading up to the tournament

reconstruction of new greens on the first and seventh (adding 50m in length to each hole), eighth and fifteenth holes.

In addition to this, new Championship tees were built on holes three, four, five, seven, eight, nine, fourteen, sixteen and eighteen and extensive renovation work was done to tees ten, eleven, twelve and fourteen.

In the lead up to the tournament the Penncross greens were verti-drained using 8mm solid tines and then lightly topdressed in October. The greens were fed with nitrogen and a trace element mix at the start of December and received only low doses of nitrogen when needed from then until the start of the tournament. Potassium (1.5kg/100m^2), magnesium and iron (250g/100m^2) was applied monthly. The greens were maintained at a cutting height of 4mm for the month of November, greens were rolled and cutting height was reduced to 2.7mm for December and straight after New Year, heights were dropped to 2mm. In the last week before the start of the tournament, greens were double cut with Jacobsen triplex mowers and were rolled daily. Wayne believes that rolling the greens increased green speed by between 6 and 12 inches and was extremely happy with the 'finish' that rolling achieved.

The Wintergreen and Santa ana tees are verti-drained every month with 12mm solid tines to relieve compaction and maintain soil aeration and are kept on a year round slow release fertilizer program using a polymer coated product (Best Greenskote 18) that is applied every eight weeks at 2.4kg/100m2, although the newer championship tees were dosed with urea to speed up their establishment. Tees are maintained at a cutting height of 10mm for normal club play and this height was maintained for the tournament as well.

Last October, all fairways were cored (John Deere 1500) that was fitted with 19mm hollow tines set to a depth of 17mm. The machine took out a heap of material and Wayne and his staff were able to do the entire short course (6 ha) in 13 hours and covered the 22 ha Championship Course in just over four days. Renovation scars were just visible when I visited the course in December but these had recovered completely, well before the January event.

Once cored, the fairways were cut back to a height of just 6mm and were then lightly verticut then fed with a granulated sulphate of ammonia (21% Nitrogen) at 250g/100m^2. For their final application of fertilizer late in December, a 'duel action' (part quick release, part slow release – Scotts Sportsground) fertilizer was applied to all fairways at 300g/100m^2 which proved sufficient to carry the fairways through tournament week.

To counteract the huge 'ball roll' that Professional golfers squeeze out of the new generation drivers and balls the fairways were maintained at 10mm ('longish' for most tournament standards) and as an extra measure, the tee shot landing zones were vertidrained with 8mm tines just days prior to the start of the tournament to soften them further.

If length wasn't going to sort the men from the boys, Trevor Herden from the PGA was going to make sure that accuracy was and apart from the new tees and bunkers, the most striking addition to the course was the rough. Even six weeks out from the tournament, the mostly cool season roughs seemingly reached out and grabbed any wayward drive or approach and in most cases (certainly mine) extracted a one shot penalty.

The rough seemed to change the whole look and set-up of the course and in fact on some holes such as the tenth and the third, the edge of the fairway was brought in by 10 or 15 meters. In these areas, Wayne scarified the fairway and then oversowed with Ryegrass (Premier II) at a high rate to make removal a little easier.

Preparing for such a major tournament takes years of planning and months of hard work. Wayne and his team are to be congratulated for their efforts in providing a course in superb condition for the 2002 Johnnie Walker Classic.

Teamwork in action

Teamwork in action

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MANAGEMENT OF TREES IN RECREATIONAL TURF ENVIRONMENTS

photo courtesy of The Dunes Golf Links

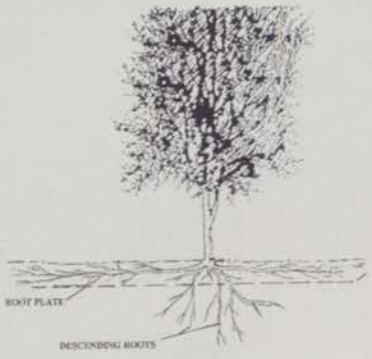
The establishment and growth of trees in recreational turf environments is often difficult because of sub-optimal conditions for their success. Not only are basic requirements for tree growth compromised, but the characteristics of the trees themselves may be unsuitable for such sites. Trees that have not been selected or bred for such situations are planted and expected to make a positive contribution to the landscape that is unlikely to be realised. This is poor planning and expensive management!

ROOT SYSTEM MORPHOLOGY

The knowledge of the tree below the ground has expanded dramatically over the past two decades (Perry, 1982; Yau, 1991; Watson and Neely, 1994; Moore, 1995). The era in which those managing recreational turf landscapes could ignore the management of tree root systems, because they were 'out of site and out of mind', has long passed. So too has the era when people assumed that large trees had large tap roots, and that root systems could not be managed to meet the demands placed upon trees in such sites.

Large trees usually have large root systems to support them. While this may seem axiomatic to arborists, its importance is too rarely appreciated by those from other professions responsible for interacting with tree management. Rarely are the issues of adequate soil root volume, or an appropriate area of open soil surface to the atmosphere, necessary for successful tree establishment and growth given attention. Even the space around trees planted in streets and the sizes of grids used around them often seem to have been arbitrarily derived.

Figure 1. Typical root structure, showing the root plate, which is relatively shallow and spreading, and the descending roots which anchor the root plate.

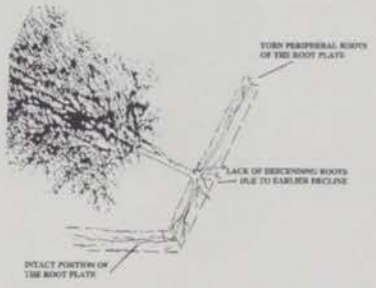


It is well known that tree root systems tend to be shallow and spreading (Figure 1), rather than restricted and deep (Watson and Neely, 1994; Moore, 1995).

Given this knowledge, landscapes should be appropriately designed to accommodate this basic biological need.

In recent years the rootball concept, which saw the root mass as relatively narrow and deep has been replaced with the notion that the spreading

Figure 2. Wind thrown tree showing the typically shallow root plate structure and absence of descending roots in the part of the plate that has failed.



root system forms a wide but relatively shallow root plate. This concept has been very useful, especially in educating other professionals about the importance of tree root systems in situations that involve interaction with the hard landscape. The focus on the root plate, however, has tended to distract people from recognising the importance of the descending roots. These roots, sometimes called sinkers or vertical roots, are an important component of the overall root system morphology. In trees that fail and fall, the root plate is often intact, but the descending roots, which appear to anchor the root plate, especially against strong winds are usually damaged (Figure 2) or entirely missing (Moore,1995).

The focus on descending roots does not mean that the root plate is not important, but emphasizes that it is the whole root system, which is important to tree survival and growth.

The shallow spreading roots that make up the root plate must be properly managed, but so too must the descending roots. These descending roots are easily damaged or destroyed by changes that see rises in the watertable, changes in soil aeration or nutrition, or disruption to subterranean water flows. These changes commonly occur when existing trees are impacted upon by construction works. It is also possible that paving, grade changes and compaction around the root systems of pre-existing trees can cause loss of descending roots. Such situations are all too common in recreational turf facilities. An investigation of the root systems of fifty mature trees of various species that had fallen during strong wind storms, revealed that none had intact descending root systems, and that none had any root material that was still living below a depth of 0.5 metres, and often less (Moore, 1988). In each case the trees appeared healthy and the root plate remained intact, but there was evidence that descending roots had been either damaged or had died.

THE ROOT: SHOOT INTERACTION

The closeness of the relationship between the canopy of trees and the root system, which supports them cannot be over emphasised. It is well understood that to get a healthy vigorous tree requires a healthy supporting root system. However, what is often unrecognised is the intimate relationship between root growth and canopy. Recognising the close relationship between good root biology and successful tree establishment, requires appropriate management of the environment in which roots grow. In most turfed situations it should be assumed that the trees will be growing under stress for at least part of the year. The stress may result from high or low levels of water, low soil oxygen or low or high soil nutrient status. Furthermore, many trees produce chemicals that affect the growth and development of other plants around them. This effect is called allelopathy and can be significant in influencing tree and turf establishment under large canopies.

The use of Eucalyptus species in urban plantings is increasing rapidly in Australia. Some species have been identified as being stress resistance, and in particular drought resistant. However, species like the River Red Gum (E camaldulensis) are drought avoiders, and only grow in places where water supply is constant, or where its extensive root systems can tap into subterranean water sources. Despite this biology, it is still often recommended for planting where rainfall is limited, or where there are hard landscape structures near by. Furthermore, this species is renowned for the allelopathic chemicals that leach from its foliage and restrict growth under the dripline. The chemicals are naturally washed away during floods and so regeneration may occur, but on golf courses heavy irrigation may be required to allow turf or other species to successfully establish under their canopies.

TREES AND SOILS: A NECESSARY INTERACTION

Tree roots tend to grow along lines of least resistance (Yau, 1991). As root tips grow and subsequently elongate, they do not grow around soil particles as many people think. Rather the tip is forced through the soil, pushing particles aside and as a result is constantly abraded by the particles. In soils with high bulk density (Smith, 1997), the resistance to root tip growth, elongation and subsequent development is high. In such soils the establishment of an extensive root system can be limited and so it may take many years before the plant can successfully establish and grow in such a soil.

In other situations however, where the natural soil profile has been shattered by earth works for the construction of foundations, pipelines or other hard structures, the soil bulk density is much reduced and so the roots can extend and develop along these lines of lesser resistance. In such situations the construction processes often provide ideal conditions for root proliferation in the very places that landscape managers would wish to have few, if any, roots at all. In short, bad management and poor arboricultural practices are inadvertently providing conditions of low soil penetrative resistance, high soil oxygen levels and

- PROPER INSTALLATION OF PLUMBING, GAS, COMMUNICATION AND ELECTRICAL SERVICES
- PROPER BACKFILLING OF TRENCHES AND FOUNDATIONS THAT RECONSTITUTES THE SOIL PROFILE
- APPRECIATE THE VALUE OF COMPACTION AS A ROOT MANAGEMENT TOOL
- MANIPULATE ROOTS BY THE MANAGEMENT OF SOIL:
  - OXYGEN
  - WATER
  - NUTRITION
  - PENETRATIVE RESISTANCE
- ESTABLISH THE MANAGEMENT OF ROOT STRUCTURE AND DEVELOPMENT AS PART OF SITE MANAGEMENT ROUTINE
- DEVELOP APPROPRIATE SPECIFICATIONS FOR HARD STRUCTURES, WHICH RECOGNISE THE PRESENCE OF TREES, AND WHICH WOULD INCLUDE:
  - PAVING
  - FOUNDATIONS
  - SERVICES

Table 1. Simple management practices for limiting root damage to hard structures and services (after Moore, 1994).

enhanced soil water levels in places where root growth is not wanted. If organic matter is added to this list by inappropriate back filling, almost ideal root growth conditions have been provided. It is obvious that such a situation must be properly managed.

The issue of properly managing soils around hard landscape constructions is an issue that should be addressed with some urgency (Moore, 1994; Watson, and Neely, 1995). Too often engineering and landscape specifications are inadequate in protecting hard structures from damage due to the presence of large trees. Many of the management practices required to avoid these situations are simple but rarely practiced (Table 1).

It is important that the soil profile around footings, foundations and paving, and along trench lines should be reconstructed by proper back filling and in some cases heavy compaction. Such an approach should minimise the risks of root proliferation in places where root growth is not only undesirable, but where for effective site management such growth is to be discouraged.

PLANTING TREES IN TURFED LANDSCAPES

Container Grown and Bare Rooted Trees

Careful selection of plant material that is container grown or bare rooted is vital to successful planting and subsequent establishment. It is essential that the material is free from the two most common root defects found in trees grown under conventional production systems:

- kinked roots in which the major roots are bent, and
- circling or girdling roots in which the roots circle round the base of the stem or the other roots (Moore 1997a)

Many of the deformities found in container grown plants result from lack of attention to detail in the production system and from inappropriate components of that system. For example it is well known that round containers without baffles or ridges are inappropriate for woody plant growth, but the production industry still uses them and the public expresses a preference for this shape. It is also worth noting that many Australian native tree produce lengthy tap roots as part of their juvenile phase. It is not uncommon for plants that are 1 - 1.5cm tall to have a tap root that is between 10 - 20cm long. The use of conventional growing trays and pricking out techniques can be inappropriate for growing such plants and can lead to both kinked and girdling roots (Table 2).

Trees which have developed kinked and girdling roots should not be planted out as it is highly unlikely that these problems will be resolved as the tree grows and establishes itself. Furthermore, many of the recommendations for remedial action, such as removing parts of the root system or slashing through the rootball are either totally ineffective or represent an uneconomic use of time and resources when compared to the option of replacing a defective specimen with a healthy one.

Table 2. Causes of root deformity due to propagation and planting procedures used in establishing urban trees. (After Moore 1985).

PROCEDURE	ASPECT OF PROCEDURE CAUSING DEFORMITY	KINKING	CIRCLING	MATERIAL EFFECTED
Propagation	1. Depth of Germination Tray	✓		
	2. Container			
	(a) shape		✓	
	(b) diameter		✓	•Container
	(c) depth	✓	✓	•Advanced Stock
	3. Pricking out	✓		
	4. Potting on	✓	✓	
Planting	1. Hole			
	(a) shape		✓	•Container
	(b) diameter		✓	•Advanced Stock
	(c) depth	✓	✓	•Bare Rooted
	2. Twisting as planting		✓	
	3. Depth of planting	✓		

Advanced Tree Establishment

Advanced trees have their own set of advantages and disadvantages. The major advantage is that they make an instant contribution to the created landscape, and are often seen as an ideal way of achieving a mature landscape in a short period of time. However, advanced trees whether container grown, directly lifted or grown in bags or spring rings have an unbalanced shoot to root ratio. The production system aims at producing a plant which is tall and which has a crown out of proportion to the size of the root mass. This is an intended outcome, which requires specific management techniques for successful establishment. Some of these techniques, such as staking or anchoring the plant would be considered inappropriate in other contexts.

Planting and the Planting hole

The planting hole should be as wide as possible, but need not be deeper than the existing rootball. This contrasts the still common practice of digging small but relatively deep planting holes (Smith and Moore 1997). There is no prescription for the hole shape, but a wide and irregularly shaped hole is probably best. However, a round, smooth-sided hole should never be used, especially in clay soils, because if the clays are wet the sides of the hole can be polished and as a consequence the roots can grow round the edges of the hole. This effect is exactly the same as growing a plant in a round container and can lead to girdling root problems.

When filling a planting hole the material taken out of the hole is the best material to put back in the hole. Sadly many domestic and professional landscapers are in the habit of using mulch or sandy loam in planting holes especially if they are planting into clays or sandy soils. This is not only poor practice but is potentially dangerous. In such circumstances it is not uncommon to find trees of ten to fifteen years of age with root systems that are restricted to the 'improved' planting medium. In such cases the plants have been effectively growing in a container for years. They are prone to poor canopy development, dieback and wind throw.

Support, preparation and post planting management

Stakes should only be used when there are appropriate biological or management reasons for doing so. In many instances stakes are not only unnecessary but are detrimental to successful tree growth and establishment.

Weed control is always an important part of site preparation. Weeds compete with desired plants

for space, light, water and nutrients. Competition from turf species can reduce both establishment and subsequent growth rates of many native species. Various techniques of weed control can be quite effective. More usually, weeds are controlled through the use of herbicides, and these days specific herbicides and targeted application may enable the use of chemicals without threatening other plants nearby.

The use of mulching materials is probably the best method for controlling weeds. Mulches give good control over a long period of time, are environmentally friendly, and are relatively cost effective. Various materials can be used for mulches. These range from the use of rocks and pebbles, pine bark and hardwood chips to shredded paper or garden green waste. However, the most effective of the modern mulches are the woven mulch or weed mats. These are cheap, biodegradable, porous to water, nutrients and air, and they are very affective in reducing weed competition over a long period of time.

BASIC CANOPY MANAGEMENT

Given the advances that have been made in the knowledge of branch attachment and canopy structure, and the improved technologies that are available for pruning and tree surgery in general, it might seem that many of the issues associated with proper canopy management have been resolved. Although there has been great progress in the past decade not only in pruning practices, but also in the quality of the arborists who undertake these operations, there is still considerable room for improvement. Most modern horticulturists and certainly all trained arborists, would use the branch collar and the branch bark ridge (BBR) as guides for final pruning cuts. Failure to do so would not only be unprofessional, but verge on environmental vandalism. In the context of recreational turf facilities, professional management would require the highest level of pruning practice. However, while the flat cuts of a rigid chainsaw in a single plane may be the best we can achieve at present, new technologies which might involve laser and high pressure water cutting devices may be more appropriate for future arboricultural use.

Inappropriate pruning, especially of native trees can result in the production of large epicormic shoots. These are poorly attached, can reach considerable size and so are easily shed. It is not uncommon to find trees that have been lopped years earlier with large epicormic shoots of considerable length and weight growing in recreational facilities. They represent a significant danger to life and property, and those managing such facilities could find themselves liable for damage and injury that resulted from the shedding of such a shoot.

Trees planted in recreational turf facilities are usually growing under conditions that are sub-optimal and as a consequence they require appropriate, and often sophisticated management if they are to establish and achieve their full potential as amenity trees. They have to be properly managed, especially if their contribution to the landscape is to continue for future generations.

References available upon request.

Adapted from a workshop presentation to the Millennium Turfgrass Conference 2000

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Tomorrow's Club today

The biennial golf Club Secretaries & Managers Association Conference held recently in Melbourne shone a hot spotlight on emerging changes in the industry and the role of Managers and their teams leading change. The future could be dramatically different from the past – both in terms of Club members' profile; their expectations and the demands they will place on Clubs. Part of the challenge is defining the future and acknowledging that what we've come to know may shift. The way Superintendents and Club managers work on the future, not just in it, will be critical.

Where to from here?

Organic Change or Revolution?

It would be fair to say that typically change inside Clubs has been incremental with a focus mainly on physical upgrades to aging Clubhouses and Courses. Clubs have responded well to what's known & understood. The process has often been compounded by a killer triangle of:

1. voluntary part-time Committees [often pushed to capacity to make tough decisions involving a conflict of interest];
2. vocal members [often resistant to any change] and
3. limited resources.

The triangle is often tactical – because of problems forecasting the future strategically. Being strategic requires some definition of a competitive position for a Club operating in an increasingly complex market. Thinking strategically has not been an imperative - not until now. There is a revolution underway. It's typified by :

- A new next generation of members coming forward;
- aggressive mushrooming of new Clubs and Courses – particularly on the Eastern seaboard
- a social shift affecting people's need for 'belonging'; time and investment consciousness and
- a deeper market full of variety.

These changes particularly effect tomorrow's 'clients' - members & players and their expectations.

Members & Players

The generation running and using Clubs today are aging and being replaced. Up until now Clubs have been dominated by 'The Battlers' – a generation so named because they have survived hardships such as wars and a depression. Toughing it out taught that generation to value safety, manage defensively and save. They brought this mindset to their Clubs and their golf.

But 2001 was the first year 'Baby Boomers' – the next generation – started retiring. No one really rang bells about this, but it will have a huge impact on the culture of Clubs, their products & services, their management priorities and therefore strategic direction.

Boomers are the generation typically aged today between 40-55 – post-war babies, the teenagers of the '60s. They have retained a preference for ground-breaking and seek things that are genuinely different or unique. Despite this, it appears Clubs have not researched this market or tailored their development to meet needs.

At the conference, Jeremy Sankey of Grey Worldwide reported findings from a continuous ten year study on Boomers called 'Eye on Australia'. The findings are clear. Boomers are:

- More interested in having flexibility than stability – they look for variety in experiences;
- Concerned with maximising the value of any spending decisions they make– worried that their funds may not last through retirement and so will research their purchases and
- Concerned about health, family and relaxation time and want to escape the rat race and remain youthful.

The survey that looked across all consumer groups and age brackets revealed that men aged 35-54 are the most stress-rich and time poor in our society.- factors that may also influence their choices.

If this is the picture of Clubs' emerging market, one has to ask how well are Clubs adapting their offering to meet needs and what future products and services will be required or emerge?

Possible Responses to Change:

If the profile of the emerging Baby Boomer generation is accurate, there may in fact be clear signposts regarding change Clubs should be considering right now:

1. BUILD FLEXIBILITY & VARIETY

Some examples Clubs may embrace could include:

- Memberships that offer a mix of experiences beyond just reciprocal rights.
- The ability to play a defined number of days at a cluster of Clubs with an attractive blend of differences [in design, complexity, location]
- A greater migration to 'high-end daily fees' as an alternative offering a seemingly endless variety of choice and pay-to-play-only expenses.
- Course cams that can be accessed via the Web so that weather can be viewed at a range of courses, the optimal Course virtually 'walked' and then booked on-line to play
- Experiences not bound by tradition – night golf / flood-lit greens; less than 9-hole rounds / speed golf for the busy professional or parent
- Golf combined with other health experiences that could be brought into the Club intermittently – masseurs, cholesterol / blood pressure checks, visiting nutritionists
- Super cost / high value 'experiences' – like the Club in Melbourne offering helicopter pick-up from the city; drinks on touchdown on the back nine 8 minutes later, a brief lesson, 9 holes, gourmet lunch and return flight over the city at dusk.

The pressure associated with more unconventional membership offerings may put new pressures on Courses and their staff.

2.ENHANCE THE VALUE PROPOSITION

Equity-based memberships may become the norm – offering members something tangible rather than a one-off joining fee. The equity model offers a tradable share of value, an 'investment' for today that potentially appreciates over time. Ron Stevens, an advisor in the field talked at the Conference about the returns realised by some Clubs who have proceeded with the equity model and whose members are now enjoying a strong secondary market offering healthy returns on shares bought and later sold. The forecast may be that Boomers could push Clubs to think seriously about offering such options. The secondary benefit to Clubs is the capital such an offer raises – a neat solution to fund a much needed watering system or Course Masterplan. The new pressures shareholders looking for returns may place on resources inside Clubs could add pressures to resource allocations and retained earnings available for asset development.

Maisey Mooney of WGA also addressed the conference on the issue of women's golfing needs and the results of a survey undertaken recently. The results indicated that women generally, like Boomers, are keen to see any monies outlaid as a longer-term investment.

Women also appear less interested in buying into the prestige and exclusivity higher-end Clubs offer, with women's Club memberships in decline. Interestingly, despite many Clubs undertaking such developments [perhaps without adequate market research] women reportedly don't see much appeal in Clubs offering child-care or Gym facilities– as extensions to the conventional Club offering. Women appear to just want access to a handicap and a decent course to play– without the restrictive climate or elaborate routines imposed by Clubs. This call for freedom and relaxation is another preference expressed by women in the survey as well as Boomers in Grey Worldwide's research .

3.YOUTHFUL FAMILY-STYLE ESCAPE

An Australian version of the USA Country Club environments may hold additional appeal for the Boomer generation inside Clubs of the future – devoid of inflexible rules and a 'fused' culture where outsiders and children or adolescents are not always openly welcomed. Combine such a culture with an equity model and a mix of commercial 'products' designed to raise revenues and extend variety, and Clubs may be left with an even more complex environment. This complexity may cry out for leadership by small, nimble professional Boards supported by business school graduate management teams – as many other sports are now preferring. Facing such a challenge may require steep rethinking or even a constitutional reform voted on by existing members to deliver new Committees excited and skilled to deliver such a future. It may also herald a call to experienced Managers to undertake continuous professional development as most other executives do throughout their careers in other industries.

4.UNIFIED MANAGEMENT TEAMS WITH CLEAR DIRECTION & FOCUS – AS THE DRIVING FORCE

This snapshot is being talked about today. To some it seems radical – to others who are experimenting or having to respond creatively to current commercial pressures, it seems feasible even essential. The central drive for such changes will need to be strong Management teams.

At the Conference, Managers were interested in hearing about progressive models operating across Management teams inside Clubs:

- Pro-Shop Managers [as staff or outsourced contractors] that perform as service centres and the marketing doorway to a Club rather than merely a booking centre or tired shop.
- Food & Beverage Managers that collaborate with the Club Manager to cultivate something unique and cost-effective that supports the marketing effort or unique image being cultivated by a Club.
- Superintendents that work alongside General Managers who recognise they don't have to become Course experts to work effectively with their Superintendents. Managers are keen to see new ideas and encourage the Superintendent to study, experiment, share networks, reframe the thinking of traditional Greens Committees or even use consultants if they think they can support [and ideally not dominate] the Superintendent's team.

After all, Managers recognise that up to 50% of total Club spending may go through the Superintendents budget. If supers are not thinking strategically about the Course and its uses and market in the future, Club strategy and operations will not be aligned.

It will be the depth of information and insight Managers can bring to their teams inside Clubs that will determine whether there will be continued renewal and revival of Club's relevance to tomorrow's golfers.

Clubs may need to collaborate to fund further market research; to think freshly about their markets and develop relevant and competitive products and services. Converting ideas to plans that Superintendents and other managers can implement will bring strategy into action and position Clubs for the future that's fast unfolding.

Starting a dialogue about what the future market may ask of Clubs is positive. But merely talking about it and playing 'wait and see' is a little like admiring the lights at the end of the tunnel only to be quickly run down by the train you discover behind those interesting lights.

Terri Clementson is the managing Director of Reardon Rothbard - a business analysis and advisory firm dedicated to working on strategic business planning for membership cultures and sporting organisations.

Terri coordinated the education component of the recent National 2001 Biennial Golf Club Managers Conference held in Melbourne. She is currently writing a book on Managing Membership Organsaitions - 'Herding Cats' to be released in 2002. Terri has completed several degrees in : Communication & Media; a Masters in Business Management and is finalising a Masters in Commercial Law.

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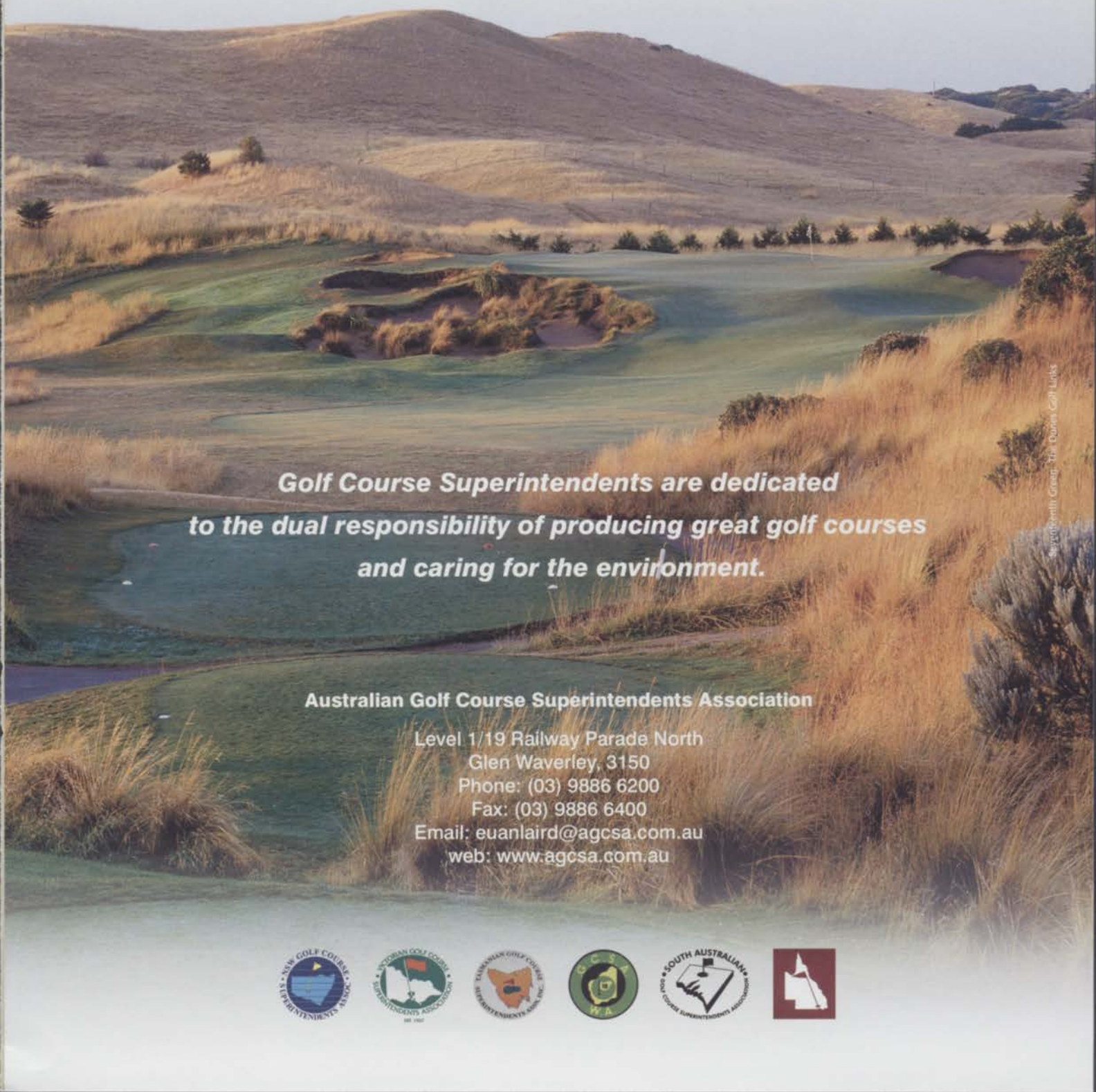

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By John Neylan

BENTGRASS VARIETY TRIALS

Pennlinks (lhs), SR7200 (rhs)

Penn-A1 (lhs), Penncross (rhs)

INTRODUCTION

Over the past 5 years there have been several new bentgrass varieties released and represent a "third generation" of improved bentgrasses for putting greens. The first of the major improvements was "Penncross", then followed by varieties such as "SR1020", "Providence" and "Pennlinks". The latest generation of varieties is noted for their very fine leaf texture, high turf density and reduced susceptibility to spiking. These new varieties have been introduced into Australia based on trial data from the USA, however, there has been very little replicated trial work undertaken under Australian climatic conditions and maintenance regimes, with most trials consisting of localized single plot assessments.

Because of the high turf density, thatch management has been identified as a significant factor in the successful use of these new bentgrasses. There is also a belief that the new bentgrasses provide faster putting surfaces than the older varieties.

The project objective is to evaluate the performance and maintenance requirements, of the new strains of bentgrass compared to the established industry standards.

TRIAL PROTOCOL

The varieties established at both sites are in the following table. Due to the lack of seed availability and/or low viability, "Penn-G2", "Grand Prix" and "Bengal" were seeded at Glenelg GC in late 2001. RA1 and RA2 consisted of vegetative material (corings) from two greens at the Royal Adelaide Golf Club.

The Kingston Heath GC site was established in October 2000 and Glenelg GC in March 2001.

The plots are 4 square metres in area and each variety is replicated three times in a random block design. Note that statistical significance is determined by using the LSD (least significant difference) value in the tables. To determine whether a cultivar's performance is truly different from another, subtract one entry's mean from another entry's mean. If this value is larger than the LSD value, the observed difference in cultivar performance is significant.

VARIETY	KHGC	GGC
Penncross	√	√
Egmont	√	√
Penn-A1	√	√
Penn-A4	√	√
Penn-G2	√	√
Penn-G6	√	
Cato	√	√
Pennlinks	√	√
L93	√	√
Dominant	√	√
SR7200	√	
Mix		√
RA1		√
RA2		√
Grand Prix		√
Mariner		√
Bengal		√

Mix = Blend of Dominant, Egmont and SR7200
RA1 = Vegetative material from Royal Adelaide GC
RA2 = Vegetative material from Royal Adelaide GC
Grand Prix and Mariner = Salt tolerant varieties
Bengal = new introduction

The plots are assessed for the following parameters;

1. Turf quality
2. Turf density
3. Incidence of disease and pests
4. Thatch depth
5. Wear tolerance – 4 times a year
6. Spiking tolerance – 4 times a year
7. Green speed using a modified stimpmeter

The results to date are detailed in the following tables and as an overall observation, the new Penn-varieties have a greater turf density and better turf quality compared to varieties such as "Penncross", Pennlinks, Cato and Egmont. However, it is interesting to note that there are differences between the two sites (e.g. "penncross" at the Glenelg GC site has good density). Green speed measurements have highlighted that the new varieties are not necessarily faster than the more established varieties. Thatch measurements taken at the Kingston Heath GC site, after 12 months growth, show no significant difference between the varieties.

The AGCSA has received funding from Horticulture Australia and the Professional Golfers Association for this project, which will allow us to establish a site in Sydney (autumn 2002) and to undertake more intensive assessments. We are also grateful to the seed companies that have supplied the varieties for this project; Heritage Seeds, Nuturf, Globe Australia, Turf and Irrigation, Valley Seeds and Wrightsons.

Thanks also to Martin Greenwood (KHGC) and Daryl Sellar (GGC) for their maintenance of the trial sites.

KINGSTON HEATH GOLF CLUB - TURF QUALITY

VARIETY	3/1/01	1/2/01	6/3/01	5/4/01	10/5/01	27/6/01	27/7/01	24/8/01	27/9/01	30/10/01	AVG
Penncross	6.0	6.2	5.7	6.0	5.8	6.5	6.0	5.8	5.8	5.7	6.0
Egmont	6.0	5.5	5.3	5.5	5.7	6.7	6.5	6.2	5.8	5.5	5.9
Penn-A1	6.0	7.2	6.8	7.3	6.8	7.2	6.8	6.8	7.0	7.2	6.9
Penn-A4	6.2	6.7	6.3	6.7	6.8	6.7	6.8	6.3	6.7	6.8	6.6
Penn-G2	6.2	6.8	6.2	6.7	6.8	6.7	6.7	6.2	6.3	6.7	6.5
Penn-G6	6.0	6.5	6.0	6.3	6.0	6.5	5.8	5.8	6.0	6.2	6.1
Cato	6.0	6.3	6.0	6.5	6.2	6.5	6.5	6.3	6.2	6.3	6.3
Pennlinks	6.0	6.2	5.8	6.2	6.2	6.0	6.0	5.7	5.7	5.8	6.0
L93	6.2	6.7	5.8	6.0	6.5	6.3	6.3	6.0	6.0	6.3	6.2
Dominant	5.8	6.7	6.0	6.2	6.2	6.7	6.0	5.8	5.7	5.7	6.1
SR7200	5.8	5.7	5.7	6.2	6.3	7.0	6.8	5.8	6.2	6.7	6.2
LSD (P<0.05)	NS	0.4	0.4	0.4	0.3	NS	NS	0.4	0.3	0.4	

Turf quality 0 = worst 9 = best

KINGSTON HEATH GOLF CLUB - TURF DENSITY

VARIETY	3/1/01	1/2/01	6/3/01	5/4/01	10/5/01	27/6/01	27/7/01	24/8/01	27/9/01	30/10/01	AVG
Penncross	7.0	6.3	5.8	6.2	6	6.3	6.2	6.2	6.0	6.3	6.2
Egmont	7.0	6.5	5.8	6.3	6.2	6.8	6.7	6.3	6.7	6.5	6.5
Penn-A1	7.3	7.2	7.0	7.7	7.0	7.0	7.2	7.2	7.0	7.7	7.2
Penn-A4	7.3	6.7	6.5	6.7	6.8	6.8	6.8	6.5	6.7	7.3	6.8
Penn-G2	7.7	6.8	6.3	6.7	6.7	6.8	7.2	6.5	6.5	7.2	6.8
Penn-G6	7.0	6.5	6.0	6.5	6.2	6.7	6.3	6.2	6.3	6.5	6.4
Cato	7.3	6.5	6.0	6.5	6.2	6.3	7.0	6.3	6.2	6.8	6.5
Pennlinks	7.3	6.3	5.8	6.2	6.2	6.2	6.5	5.7	6.3	6.3	6.3
L93	7.0	6.7	6.0	6.3	6.2	6.5	6.3	6.3	6.5	6.8	6.5
Dominant	7.3	6.7	6.0	6.3	6.3	6.5	6.5	6.2	6.0	6.0	6.4
SR7200	7.5	6.7	6.8	6.7	6.7	7.0	7.5	6.3	7.0	7.8	7.0
LSD (P<0.05)	NS	NS	0.3	0.4	0.3	NS	0.5	0.4	0.3	0.4	

Turf quality 0 = worst 9 = best

GLENELG GOLF CLUB - TURF QUALITY

VARIETY	12/6/01	12/7/01	15/8/01	17/9/01	12/10/01	15/11/01	12/12/01	AVERAGE
Penncross	5.0	7.3	6.0	6.0	5.0	6.0	6.3	6.0
Egmont	5.3	6.7	6.7	6.3	6.0	6.0	5.7	6.1
Penn-A1	5.0	7.3	7.0	7.0	7.7	7.7	7.7	7.0
Penn-A4	5.7	7.7	7.7	7.7	7.3	7.0	7.0	7.1
Mix	5.0	7.0	7.0	7.0	6.3	6.0	6.0	6.3
Cato	5.3	7.3	6.7	6.7	6.3	6.7	6.7	6.5
Pennlinks	5.3	7.0	6.7	6.7	6.0	6.3	6.3	6.3
L93	5.0	7.0	6.7	6.7	6.0	6.7	6.7	6.4
Dominant	5.3	7.0	6.7	6.7	6.0	6.7	7.0	6.5
RA1	4.7	5.7	6.3	6.3	6.7	7.0	7.0	6.2
RA2	5.0	5.3	6.0	6.0	5.7	7.0	7.0	6.0
Mariner	3.3	4.7	4.0	4.0	4.0	4.3	4.3	4.1
LSD (P<0.05)	0.7	1.3	1.3	1.3	1.4	1.6	1.7	

Turf quality 0 = worst 9 = best

GLENELG GOLF CLUB - TURF DENSITY

VARIETY	12/6/01	12/7/01	15/8/01	17/9/01	12/10/01	15/11/01	12/12/01	AVERAGE
Penncross	6.0	7.3	7.0	7.0	6.3	6.7	7.0	6.8
Egmont	5.3	6.0	6.7	6.3	6.3	6.0	6.0	6.1
Penn-A1	6.0	7.3	7.3	7.3	7.3	8.0	8.0	7.3
Penn-A4	6.7	7.7	7.3	7.3	7.3	7.0	7.3	7.2
Mix	6.0	7.0	7.3	7.3	6.7	6.0	6.0	6.6
Cato	6.0	7.3	7.0	6.7	6.7	6.7	6.7	6.7
Pennlinks	6.3	7.0	6.7	6.7	6.3	6.3	7.0	6.6
L93	5.0	7.0	7.0	7.0	6.7	7.0	7.3	6.7
Dominant	6.3	7.3	7.3	7.3	6.7	7.3	7.3	7.1
RA1	4.7	6.0	5.7	5.7	6.0	7.0	6.7	6.0
RA2	4.3	6.0	4.7	4.7	4.7	6.7	6.3	5.3
Mariner	5.7	6.3	6.3	6.3	6.3	6.7	6.7	6.3
LSD (P<0.05)	0.9	0.9	0.8	0.8	0.7	0.8	0.5	

Turf quality 0 = worst 9 = best

KINGSTON HEATH GOLF CLUB
GREEN SPEED (Metres)

VARIETY	30/8/01	9/10/01
Penncross	2.02	1.91
Egmont	1.89	1.65
Penn-A1	1.95	1.92
Penn-A4	1.91	1.89
Penn-G2	2.07	1.88
Penn-G6	2.02	1.86
Cato	1.96	1.81
Pennlinks	2.06	1.86
L93	2.03	1.93
Dominant	2.08	1.86
SR7200	2.01	1.81
LSD (P<0.05)	0.08	0.11

Disease (Rhizoctonia) 0 = no disease 5 = high incidence of disease

KINGSTON HEATH GOLF CLUB
THATCH DEPTH (mm)

VARIETY	9/10/01
Penncross	12.0
Egmont	10.0
Penn-A1	12.3
Penn-A4	12.0
Penn-G2	11.3
Penn-G6	13.0
Cato	11.3
Pennlinks	12.7
L93	13.3
Dominant	11.3
SR7200	12.3
LSD (P<0.05)	NS

KINGSTON HEATH GOLF CLUB
DISEASE ASSESSMENT

VARIETY	30/11/01
Penncross	1.0
Egmont	0.7
PENN A1	1.3
PENN A4	0.3
PENN G2	0.7
PENN G6	0.0
Cato	0.0
Pennlinks	0.0
L93	0.7
Dominant	0.3
SR7200	0.0
LSD (P<0.05)	NS

Disease (Rhizoctonia) 0 = no disease 5 = high incidence of disease

GLENELG GOLF CLUB
SEEDLING EMERGENCE, SEEDLING VIGOUR & DISEASE

VARIETY	Emergence	Seedling Vigour	Disease
Penncross	11.3	3.3	2.3
Egmont	10.3	3.3	2.3
Penn-A1	12.0	4.0	3.0
Penn-A4	9.7	4.0	2.7
Mix	9.3	3.0	2.7
Cato	9.3	4.0	2.7
Pennlinks	10.7	3.7	2.7
L93	11.3	4.0	3.0
Dominant	8.3	5.0	2.7
RA1	*	4.0	1.7
RA2	*	4.0	1.7
Mariner	10.0	4.3	2.7
LSD (P<0.05)	NS	NS	NS

Emergence = days to emergence
Seedling vigour at 14 days 0 = worst 5 = best
Disease (leaf blight) 0 = no disease 5 = high incidence of disease

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John Deere *Salute*

Denise at The Dunes

The Dunes is a true Links golf course, redesigned by architect Antony Cashmore in 1994. The course is made up of 27 holes including a tournament standard 18, and a 9 hole social course.

Beautifully undulating and set amongst the sand dunes adjacent to Bass Strait, every hole is an interesting one. The course is ranked #21 according to Golf Australia Magazine, January 2002.

"Denise, Barb and their John Deere 2653A with the Magnificent Clubhouse in the background"

It is amongst the beauty of these gentle dunes, that we find Denise Hill-Symonds and her maintenance team. Denise is the course superintendent at The Dunes. While there are many women involved in the turf industry as operators, managers, administration support, and industry suppliers, it is rare to find female superintendents, and even more rare indeed to find a female superintendent in charge of such a high profile golf course.

Denise began her career as a summer casual at Cape Schanck in 1987, at a time when they were building the National course. With her College Turf Certificate in hand, Denise headed overseas for a year. Upon returning to Australia, and having passed the State required enrollment and personal assessment with flying colours, she made the move to The Dunes. It is now 6 years since she began as Mark Gahan's assistant, and around 12 months since she has been at the helm in the superintendents role.

Although Denise's main criteria when beginning her career was to work outdoors, she says that the golf industry is a great industry to work in, and hence her choice to remain. Despite the industry being made up predominately of men, Denise says she has never had any problems working in the male environment, although it was a little daunting when she first began. "If anything, my male colleagues seem more helpful and willing to assist me, than they would be to assist other men. They are a great bunch of people which is what makes it so enjoyable to work within this industry."

There have of course been a number of challenges along the way, and one which brings a chuckle is the toilet situation in the Maintenance facility! One extreme example occurred while Denise was looking for work overseas. She was offered a job at a course in Austria, but then, believe it or not, received a letter saying that unfortunately they would not be able to offer her the position after all, due to the fact that there were no female toilets!

Denise mentioned that on many an occasion she has heard comment that female operators do a better job on the course, both because they're more particular, and less reckless with the machinery. At The Dunes, it's said that "God made it, we just need man to mow it". It might be time to change that to "women".

Rumour has it that Denise likes everything green...even her equipment, and upon inspection of the maintenance facility, there are 13 pieces of John Deere equipment, all maintained in premium condition. Apparently Royce, the resident mechanic, takes great care of his "babies" both inside and out, and their immaculate condition is testimony to that fact.

John Deere congratulates Denise on a brilliant career so far, and thanks her for her valuable contribution to the Turf industry.

"Just one big happy family - Mark, Zed, Devon the Dog, Denise, Royce and a John Deere 3235B"

JOHN DEERE

WETTING AGENTS AND THEIR IMPACT ON WATER RETENTION OF TURFGRASS ROOT ZONES

Soil surfactants (Primer 604 and Midorich) repeatedly applied to soil columns in PVC containers

Localized dry spots (LDS), also called isolated dry spots or hot spots, are common but not limited to high sand content turfgrass root zones. They have also been reported in root zones that consist of a predominately mineral but finer textured soil (i.e. push up greens). Localized dry spots appear as patches of wilted or dried turf. The patches can be irregularly shaped or circular and may range in size from only a few centimeters in diameter to covering almost an entire green.

Localised 'Dry Spots' on putting green

The soil or root zone within these patches remains extremely dry, despite heavy irrigation, because the soil environment has become water repellent. The causes of soil repellency are still not completely understood. Research suggests that the microbial decomposition of organic substances (peat, roots, shoots) in combination with fungal activity and frequent wet-to-dry cycles, can produce a wax-like and water repellent coating on sand particles (*Miller, 2001*). Once this occurs, these soils become extremely difficult to be re-wet. Water will infiltrate into those areas only superficially and most of the irrigation water runs off. The turf dries out and ultimately dies if no counter measures are taken.

The application of wetting agents or surfactants has become a valuable tool used by turf managers to treat localized dry spots on golf courses and other turf areas. The infiltration of water into these soils can often be made possible and improved by applying a wetting agent. Wetting agents are detergent-like substances that reduce the surface tension of water, which theoretically should allow it to penetrate and wet the soil more easily. Numerous studies have been conducted to determine if wetting agents can improve the rewetting of dry spots. *Morgan et al.* (1966), Moore (1975), Ruemmele and Amador (1994), and Wiecko and Carrow (1992) have examined the effects of wetting agents on infiltration (water movement into the soil profile) and percolation (water movement through the soil profile) in water repellent rootzones.
All researchers reported increased infiltration and/or increased percolation rates of root zones treated with wetting agents. Studies to investigate the effects of wetting agents on water retention of soils (soil's ability to store water) have given conflicting results. While Wiecko and Carrow (1992) reported a decrease in water retention in plots treated with a wetting agent, several other studies (*Blodgett et al., 1993; Karnok et al., 1989; and Ruemmele and Amador, 1998*) reported a significant increase in soil moisture in root zones treated with surfactants. Although these studies have mostly examined the relationship between wetting agents and moisture content in soils, few studies have focused on understanding the mechanism by which wetting agents improve water availability not only in hydrophobic but also in hydrophilic soils. To treat localized dry spots, wetting agents are generally applied to entire greens or other large areas, which not only include the water repellent areas, but also soil areas that are hydrophilic, and golf course superintendents and turf managers have reported an increase in water retention in hydrophilic soil areas that have been repeatedly treated with wetting agents.

RESEARCH

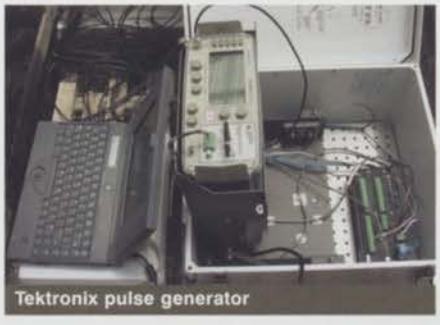
To investigate the effects of repeated applications of wetting agents on water retention in hydrophilic root zones, studies were undertaken at New Mexico State University and at Michigan State University. The container experiments were conducted in green houses at the Hancock Turfgrass Research Center at Michigan State University and at the Fabian Garcia Research Center at New Mexico State University. Soil surfactants (Primer 604 and

Midorich) were repeatedly applied to soil columns in PVC containers, which measured 300 mm in diameter and 360 mm in height. The columns consisted of a sandy root zone, which met USGA standards for particle size distribution, overlaying a gravelly drainage layer. The soil columns had no turf cover.

The treatments were applied at recommended rates of 10 ml m^{-2} for Midorich and 2.5 ml m^{-2} for Primer 604. The control columns received only water. Studies differed in length, rates of precipitation and in length of dry down cycles after precipitation. In one experiment, 27 mm of water was applied to each column every second week, while in the other experiment 27 mm of simulated rainfall was applied two times per week.

Twenty-eight cm long Time Domain Reflectometry (TDR) probes used to measure volumetric soil moisture content were inserted horizontally at 50 mm, 150 mm, and 250 mm depths of the soil columns and connected to multiplexers. A Tektronix pulse generator, data logger and multiplexers allowed continuous non-destructive soil moisture measurements. Soil moisture readings were taken at respective depths at the end of the dry down cycles, one hour before the application of irrigation water.

TDR Probes



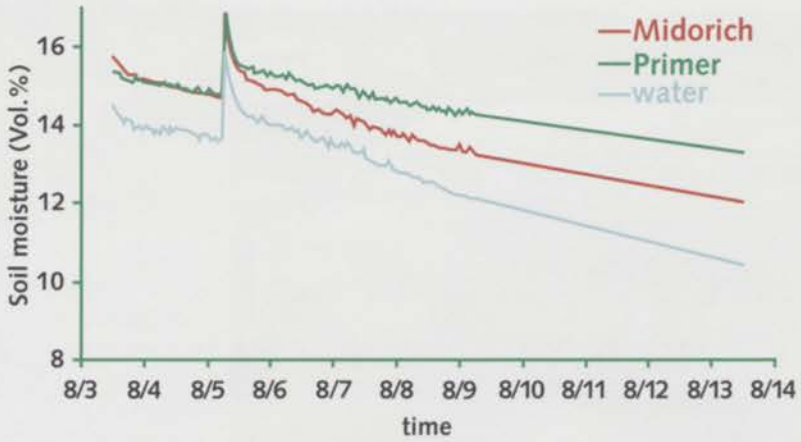
Tektronix pulse generator

RESULTS

Water retention

In experiment 1 (27 mm precipitation every second week and dry down cycles of one week), when soil moisture data were analyzed by averaging over all dates and depths, the columns treated with Primer had significantly

Figure 1: Changes in soil moisture at a depth of 150 mm over a one week period in root zone columns treated with wetting agents.



higher water contents than columns treated with water only. Midorich treated soil columns also had higher moisture contents than the control columns, but the differences were not statistically significant. When the soil moisture data were analyzed separately for each depth, at a root zone depth of 50 mm there was no significant difference in soil moisture between treatments. However, Midorich tended to increase soil moisture levels in the upper layer of the root zone relative to other treatments, and Primer tended to increase soil moisture levels at greater depths of the columns. **Figure 1** shows a typical dry down cycle in experiment one at a depth of 150 mm. At the end of a 7 day dry down, soil moisture readings in Primer treated columns were highest and lowest in the control columns.

In the second study (precipitation rate of 27 mm twice per week and dry down cycles of four days), treatment with wetting agents had no significant effect on water retention in root zone columns, however the same trends as in experiment 1 were observed: Midorich increased water retention the most in the upper root zone (50 mm depth), while Primer application affected soil moisture content greatest at depths of 150 and 250 mm.

The overall trends from both studies suggest that amount of rainfall and/or irrigation influence the effect of wetting agents on moisture retention. In the first study a total of 10.5 L of water was added to each container, which led to a significant increase in moisture retention in wetting agent treated soil columns. In the second study a total of 47 L of water was applied to each soil column and differences in moisture retention where marginal. The reason no statistically significant differences were observed was possibly due to the relatively high volume of irrigation water that was applied in a short time which may have leached parts of the wetting agents out of the root zones.

Soil physical properties

There are a number of mechanisms to explain how wetting agents increase water retention over time. Karnok and Tucker (2001) showed that water containing a wetting agent percolates through a root zone profile more uniformly and more slowly than water alone. This indicates that water in a surfactant treated profile utilizes pore space to a greater extent than water in an untreated profile. Simply put, because of the reduced surfaced tension, water with wetting agents reaches pore space that would not be reached without a surfactant. A second possibility is that wetting agents may affect moisture retention by reducing leaching of fine soil particles (silt and clay) from soil profiles. A reduction in the leaching of fine soil particles from soil profiles would ultimately increase moisture retention over time compared to profiles that lost silt and clay particles. Thirdly, manufacturers of wetting agents suggest that surfactants provide a hydrophilic coating to water repellent sand particles (*Miller, 2001*). This organic hydrophilic coating would reduce or eliminate water repellency, and water that would otherwise run off or percolate through the root zone quickly, is held in the profile.

In our studies we found evidence of both the reduced leaching of fine particles and of a hydrophilic, organic coating of sand particles. At the end of the studies, soil samples from the columns were analyzed for particle size distribution, soil physical properties and particle

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density. At the end of experiment 1, particle density of sand treated with wetting agents was significantly lower compared to sand treated with water only. This might help explain the soil moisture data. Determination of porosity and particle size distribution at the end of the study showed that the treatment of different soil columns with wetting agents did not significantly alter their pore size distribution. As capillary porosity remained unaffected the increase in water retention in surfactant treated soils is more likely to be caused by an increase in water bound to a hydrophilic layer than by changes in porosity. This hydrophilic coating, possibly of organic nature, could have caused the decrease in particle density. However, further research would be necessary to determine if a hydrophilic coating of the particles could have caused the increase in water retention in surfactant-treated soil columns.

In experiment 2, leachate was collected and particle size analysis of the soil particles in the leachate showed significant treatment differences in silt content. Silt content was significantly greater in leachate collected from columns treated with water compared to columns treated with Primer. Also, silt and clay content in leachate collected from water treated columns was always highest compared to Midorich and Primer treated columns. Although treatment differences for silt and clay content were not statistically significant (except for silt content from Primer treated columns compared to water treated columns), the leachate data suggest that wetting agents reduce the leaching of fine particles from root zones.

CONCLUSIONS

Wetting agents increased moisture retention in columns of a sandy root zone. Type of wetting agent and precipitation rate during the study influenced soil moisture retention at different depths. Particle size distribution and soil physical property data do not entirely explain the soil moisture data. The data further suggest that water retention may be enhanced due to coating of the soil particles with a hydrophilic layer and/or due to reduced leaching of fine particles from root zones depending upon the amount of precipitation. Researchers conclude that further research is needed to substantiate the results.

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research

Light Intensity And Duration Influences Growth Parameters Of Dwarf-Type Bermudagrasses

LI-COR 6200 Photosynthesis System

Golf course superintendents are often faced with major challenges due to tree shade on turfgrasses, particularly on putting greens. Relief from this shade stress usually involves raising the mowing height or thinning or removing trees. An increase in available sunlight or an increase in leaf area enables the plant to increase carbohydrate synthesis and storage processes critical for withstanding the many stresses inherent to putting green turf. However, to maintain the natural setting and maximize playability on the greens, these remedies are often met with resistance.

Because the demand from golfers is to increase playability on putting greens, the past decade has spawned research into selecting new cultivars tolerant of lower mowing heights. As a result, a new generation in bermudagrass cultivars, coined "Ultradwarf" bermudagrasses, have been developed that show improvements in lower mowing height capability. Because these Ultradwarf cultivars are new, little research exists evaluating performance in such areas as shade tolerance. Theses grasses were coined "Ultradwarf bermudagrasses" due to their morphological characteristics. These new hybrid bermudagrasses [*Cynodon dactylon* (L.) Pers. X C. *transvaalensis* Burtt-Davy] include, FloraDwarf, TifEagle, Champion, and Reesegrass.

Champion is a dwarf hybrid bermudagrass that was selected by Morris Brown in Texas in 1987. Champion was selected from a Tifdwarf hybrid bermudagrass golf green planted in the late 1960's. Coastal Turf, Inc. of Bay City, Texas subsequently developed this selection and conducted independent research. In 1995, the Florida Agricultural Experiment Station released FloraDwarf. Thought to be a mutant of Tifgreen, FloraDwarf was discovered on a practice green on the island of Kauai, Hawaii, by turfgrass researcher, Dr. A.E. Dudeck in the summer of 1988. TifEagle was cooperatively released by USDA-ARS and the University of Georgia Coastal Plain Experiment Station in

GRADY L. MILLER AND JEFFRY T. EDENFIELD[1]

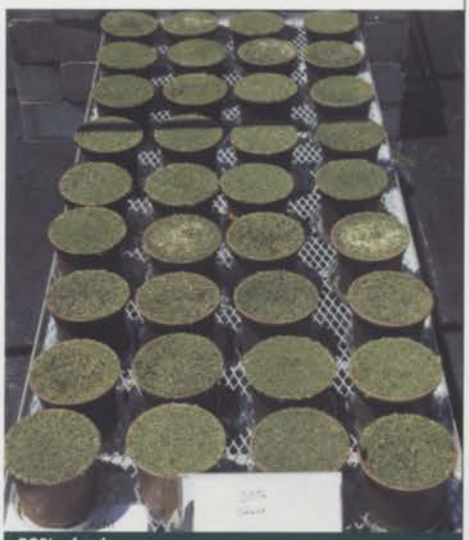
August 1997. It was developed as an induced mutant by cobalt radiation from Tifway II bermudagrass. Reesegrass is a hybrid that was discovered serendipitously on a golf course green in New Orleans, Louisiana. This ecotype is the newest of the Ultradwarf family and initially showed great potential in research conducted in Alabama and Florida.

The research conducted by the authors addresses the dilemma golf course superintendents have when managing putting greens subjected to light stress from excessive tree shade. The approach taken was to evaluate physiological and growth responses of the new Ultradwarf bermudagrass cultivars when subjected to various levels of shade. By determining light requirements of these new cultivars, better decisions can be made when determining what cultivar to use for potential light stressed conditions. Another approach was to evaluate potential advantages of slightly raising the mowing height. It was hypothesized that a slight increase in mowing height would result in an exponential increase in carbohydrate synthesis, potentially facilitating a more stress-resistant turf.

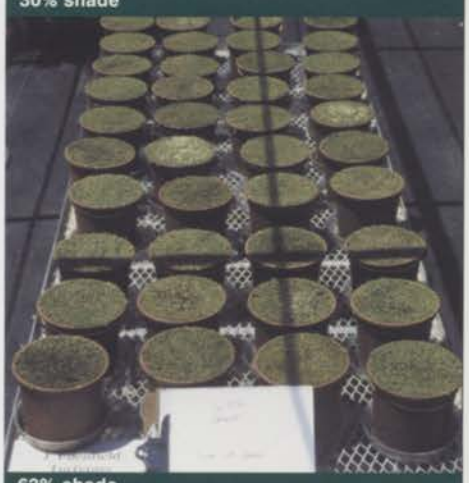
Studies were conducted during 2000 to evaluate physiological and growth parameters of 5 cultivars of dwarf-type bermudagrasses, maintained under three shade regimes and two mowing heights. The cultivars included were Tifdwarf, FloraDwarf, TifEagle, Champion, and Reesegrass. The turf was grown in containers using a mixture of 85% sand and 15% organic matter rootzone, in an effort to comply with that of US Golf Association (USGA) putting green specifications. Irrigation was administered daily by applying at least 0.8 cm of water to maintain proper plant turgor for high quality turf. Nitrogen fertility was applied once a week at a N rate of 12.2 kg ha^{-1} wk^{-1}, for the duration of the study.

This portion of the study utilized covered structures of black polypropylene cloth to elicit either 63% or 30% shade. The small containers were used to facilitate the number and diversity of treatments and allow for whole plant photosynthesis measurements. The second treatment was clipping heights of 3 or 4mm. The grasses were clipped six times a week, with clippings removed.

Data collected were photosynthetic rates, biomass, visual ratings of percent cover, and determinations of chlorophyll a and b. All measurements were taken 3, 6, 9, and 12 weeks after initiation, except chlorophyll determinations, which were taken at 12 weeks after initiation. Photosynthetic measurements were taken at irradiances of 0, 210, 1540, and 1950 µmols m^{-2} s^{-1}. From these measurements,



30% shade



63% shade

dark respiration, net photosynthesis and light compensation points could be determined.

Biomass measurements were taken after three days of growth. After collecting biomass samples, the clippings were oven dried to record measurements on a dry weight basis. Chlorophyll a and b analysis was also completed. Previous research suggested that higher ratios of chlorophyll b:a have greater light-harvesting efficiencies, serving as an indicator of a plant's shade tolerance. Visual ratings evaluating percent turf cover were also taken. All dependant variables were statistically analyzed.

As demonstrated by values of net photosynthesis, biomass accumulation, percent turf cover, and total chlorophyll, TifEagle and Champion cultivars demonstrated superiority over the remaining cultivars. For example, averages of net photosynthesis for TifEagle and Champion in the full sun were 15% greater than Tifdwarf and 87% greater than Reesegrass. For the 30% shade, averages of net photosynthesis for TifEagle and Champion were 20% greater than Tifdwarf and 120% greater than Reesegrass. This indicates these

Shade cast on practice putting green at the University of Florida Golf Course.

grasses were more efficient at utilizing available sunlight, even at reduced light intensity.

Biomass accumulation of turf grown in full sun, averages for TifEagle and Champion were 27% greater than Tifdwarf, 44% greater than FloraDwarf, and 18% greater than Reesegrass. At the 30% shade, biomass averages for TifEagle and Champion were 63% greater than Tifdwarf, while being similar to FloraDwarf and Reesegrass. For percent turf cover at the 63% shade, averages for TifEagle and Champion were 28% greater than Tifdwarf and 94% greater than Reesegrass. These grasses were utilizing their enhanced photosynthetic capacity to produce additional growth compared to the other cultivars. TifEagle and Champion were also shown to have the highest levels of total chlorophyll in each shade treatment, which would provide an increased capacity to absorb light.

Another objective for this study was to explore any advantages in growth parameters by increasing the mowing height. The data suggests few advantages. For example, biomass accumulation, (where one would expect greatest differences), similar results were shown between the two mowing heights. Furthermore, few differences were determined in percent turf cover values. However, there was a significant increase in percent turf cover when mowing height was increased in the 30% shade treatment. The greatest advantage of increased mowing heights was shown for the full sun and 30% shade treatment as demonstrated by net photosynthetic rates. Raising mowing heights 1 mm increased net photosynthetic rates by 13% and 10% for the full sun and 30% shade treatments, respectively. While some figures are statistically insignificant, the margin of benefit to the golf course putting green may be much greater. The added value may be the ability to thin and or remove fewer trees, important to the aesthetics of the course, and still maintain turf vigor.

Evaluations among bermudagrass cultivars exposed to various levels of light stress were displayed as well as for increased mowing height efficacy. The totality of evidence suggests that TifEagle and Champion displayed physiological and growth characteristics more conducive to shaded environments, and that

Shaded Tee:
University of Florida Golf Course at the #5 Tee shows the combination of wear and light stress.

Clippers:
To achieve mowing heights of 3-4 mm a modified Oster Shearmaster sheep shears was utilized.

Reesegrass exhibited growth characteristics least conducive. Furthermore, performance advantages were found with slight increases in mowing height.

A second series of evaluations were designed to evaluate Floradwarf and Tifdwarf under varying light intensity and durations utilizing growth chambers. Due to space constraints only two cultivars could be used for these evaluations. Light treatments were six light regimes. Each photoperiod was based on 12-h days and 12-h nights. In this study, the maximum available light was 1540 µmols m^{-2} s^{-1} denoted as full sun (FS) and shade was either 570 or 1078µmols m^{-2} s^{-1} denoted as 63% shade or 30% shade, respectfully. Light treatments were as follows; (a) 12 h FS + 0 h 63% shade, (b) 8 h FS + 4 h 63% shade, (c) 6 h FS + 6 h 63% shade, (d) 4 h FS + 8 h 63% shade, (e) 0 h FS + 12 h 30% shade and (f) 0 h FS + 12 h 63% shade. Determinations of total light quanta for each light treatment were made and are as follows, respectively; (a) 66.5, (b) 52.6, (c) 45.6, (d) 38.6, (e) 46.6, (f) 24.6 mols day^{-1}. By making these determinations, a more precise analysis could be made for determining light requirements for the two bermudagrass cultivars.

In this intensive evaluation, few response differences were noted between the two cultivars, supporting earlier data obtained from the glasshouse studies. However, as limited as the evidence is, some results suggest FloraDwarf did respond to light stressed conditions better than Tifdwarf. A separation at higher levels of shade stress suggest that FloraDwarf has a greater ability to assimilate carbon reserves at lower levels of light indicating greater shade tolerance. Weekly observations (taken for a year) made on a tree-shaded FloraDwarf green at a local golf course also indicated that FloraDwarf could handle a number of weeks at partial shade without a loss in quality. Data suggested that a light intensity x duration interaction influenced overall turf quality.

This research was supported by a grant from the Florida Turfgrass Association and Florida Golf Course Superintendents Association, Seven Rivers Chapter.

[1]Associate Professor and Research Technician, University of Florida, Gainesville, Florida

HERITAGE SEEDS APPOINTS NEW NATIONAL TURF MANAGER

Heritage Seeds has appointed Mathew Merrick

Heritage Seeds has recently announced the appointment of Mathew Merrick to the position of National Turf Manager, left vacant following Michael Reese's decision to return home to New Zealand late last year. Matthew began his career in agriculture by completing an Honours degree in Agricultural Science at La Trobe University. He then gained experience servicing the pasture and turf seed industry while working in the agricultural industry in Corryong. In addition to this Matthew developed a practical understanding of soils while conducting workshops for Reme Soils. Most recently Matthew has been working for Heritage Seeds supplying technical advice and administrative support for the supply and distribution of turf and pasture seeds. Matthew is also a keen golfer and footballer, helping to add to his personal interest in the turf industry and playing surfaces.Matthew aims to continue Heritage Seeds high profile involvement in the Australian Turfgrass Evaluation Program (AUSTEP) whilst also representing the company at promotional events and to its national customer base.

Matthew can be contacted on:

ph: 1800 727 007,
Fax: 03 9561 9333, **Mob:** 0413 442 811 or
Email: matt@heritageseeds.com.au

TEXTRON HEADS DOWN THE DISTRIBUTION PATH

Textron Turfcare and Specialty Products have announced plans to expand its distribution network in Australia. Textron manufactures a wide range of turf equipment under the brand names of Jacobsen, Ransomes, Cushman, Ryan and also distributes the Turfco range of top dressers. Mr. Garry Kelson, Managing Director – Pacific Rim stated "Over the past decade our specialized reel mowers have given us a very healthy share of the important golf course market. The acquisition and development of new product now makes it appropriate that we expand our operation in

recognition of other strengths in the Textron range. For example, we manufacture rotary mowers ranging from a 1.33m Zero Turn unit up to a 90 H.P. model with a 5m cut capable of mowing 6.6 hectares an hour. Our expanded network is designed to bring us closer to the end user whether it is a golf course, council, racecourse, turf farm, bowling club, lawn tennis club or contractor."

The move will see Textron utilize up to 12 distributors nationally, to sell and service their complete range. This will ensure turf managers have direct access to local sales and service support. The new structure will not be dissimilar to the John Deere structure, and for Textron will see head office and regional staffing numbers reduced in favour of service delivery from distributors. Who the distributors will be in each state is yet to be confirmed but Mr. Kelson stated that he hoped to make further announcements in the next few weeks.

GOLF RETURNS TO AFGHANISTAN

On the world's most dangerous golf course, the only bunker is on the side of the eighth fairway and it was built by the Mujahedeen so they could shoot Russians. All the fighters have gone now, but they've left a lot of their bombs, guns and grenades lying around so the last thing you want to do is try to be nearest to the pin. You do need to call in the services of unemployed curator Mohammad Nazir, 45, who will weigh up your chances of going into a ditch to look for your ball and coming back out with only one leg.

The hills, he explains, are alive with the sound of exploding mines. So why on earth would anyone want to play there? Well, when you're a golf addict used to a regular three rounds a week, and you've been in Afghanistan for nearly a month, needs must. Having been made aware of the hazards that increase any personal handicap tenfold, I took a few practice swings before becoming the first golfer to hit off at the nine-hole Kabul Country Club since 1988.
Hole No.1, a par 4: the ball rocketed down the fairway, kicking up a cloud of dust. Just like a bomb exploding, laughed 18 year old caddy Mohammad Hassan as he clutched his Russian sub-machinegun. Two over. Hole 2, par 4: with the advantage of the slope, the ball rolled to within 60 metres of the green. Shrapnel made a straight putt impossible. Three over. Hole 3, par 3: Mahammad forgot to put the flag in.
He used his sub-machine gun to mark the hole instead. One over.

Hole 4, par 4: I barreled one down with a driver but it hit a 75mm Russian Howitzer gun and ricocheted right back to my feet. Two over.
Hole 5, par 3: almost a hole in one – down the barrel of yet another Howitzer left abandoned by fleeing Russians. A par. Hole 6, par 3: a real blast! Straight on the green. But I blew out with the putter – the ball hit a Kalashnikov shell. One over. Hole 8, par 4: ball rolled into a bomb crater. Took a drop. One over. Hole 9, par 4: ball, unused for 20 years, exploded in mid-air. Game abandoned. I retired to what should have been the "19th hole" – the abandoned, bullet-scarred club-house.

Unfortunately, beer was off. "Many years ago," said Mr. Hassan as we were joined by one-legged former mujahedeen fighter Said Hashim, "we used to have lovely greens and many Americans came here. Big names." I asked him who had found their way to such a remote course. "Oh," he said, "Jack Nicklaus, Arnold Palmer, Gary Player." At the Kabul Country Club, you realize, it is best to let the former staff think that the good old days were even better than they were. As for the price of playing a round at the most dangerous course in the world, Mr.Nazir was happy to have a copy of his photograph. At least it didn't cost me an arm and a leg.

(Article reproduced from the Melbourne Herald Sun, Courtesy News Ltd)

WORLD TEAMS EVENT PAYS OFF

On the 17th & 18th of November on the Talon & Raptor Courses at Grayhawk Country Club in Scottsdale, Arizona the John Deere World Team Championship event was held. The winning team from the Australian final held at The Glades on Queensland's Gold Coast made their way to the US to compete. The Logan City Golf Club team consisted of Phil, Mike, Hayley, and Steve, along with the final member of their team for the purposes of the World Team Championship event, John Deere representative, Greg Clark.

The World Team Championship event was held over two days. At the end of Day one, the Logan City team was 22 under par, with a net score of 50. They were 3 shots in the lead, with the final round to play on the following day. Day two however, saw the Logan City team overtaken by a team from Augusta who hit a score of 49. In the final washout, Logan City finished 2nd in the field of 36 teams, missing out by just two strokes. The golf professional took home a cheque for US$900, and the other team members received vouchers to the value of US$200 to spend in the host pro-shop as prizes for coming 2nd in the competition.

Greg Clarke Manager Golf and Turf Division John Deere presents Euan Laird, CEO AGCSA with $5,000.

John Deere's Australian Manager Golf and Turf Division, Greg Clarke presented the AGCSA with a cheque for just over $5,000 in January, in recognition of the AGCSA's support of the John Deere World Teams Championship.
As part of a joint deal, John Deere Head Office pays the AGCSA $50 for every team that plays in the event. The AGCSA supports the event by encouraging its members to participate and by assisting with promotion of the event.
The AGCSA uses the money derived from the event to undertake research and educational programs. Entry forms will be available from the AGCSA and John Deere in late February.

The Winning Australian Team competing in the US.

Picture Perfect - Mowing Techniques for Lawns, Landscapes, and Sports

by David R Mellor

Book reviewed by:
Tony Hemming

The author Mr David Mellor is currently the director of grounds for the Boston Sox Baseball Club, In *Perfect Picture*, David provides all readers with years of experience and knowledge to prepare simple to use techniques, to make your lawn or sports field the envy of your neighbours and colleagues.

The book is well presented and aims in particular to the home lawn enthusiast, especially throughout chapters 2 – 8. He provides sound knowledge about maintaining healthy lawns.

For the turf professional looking to take on new challenges in lawn presentation, then chapters 11 – 14 highlights this area. David provides very practical tips such as managing sun glare, colour – coded maintenance and correcting a crooked line.

The section simply named "Colour Plates" has 64 magnificent photographs compiled of various turf patterns for sports fields that is a must to see for all. I was impressed he acknowledged the use of his children's drawings to design some of his fields.

What a unique and fantastic resource.

This book is written with passion towards turf and I'm sure David would have had many nights in his "Field of Dreams." And for resources David has dedicated Chapter 18 for a wealth of information just waiting on the Internet.

If you would like to purchase this book, please contact:

AGCSA BOOKSHOP
Level 1, 19 Railway Parade North
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Fax: (03)9886-6400
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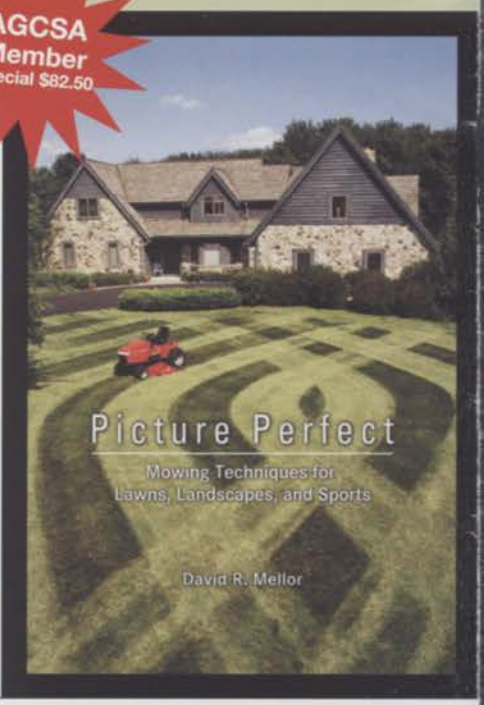

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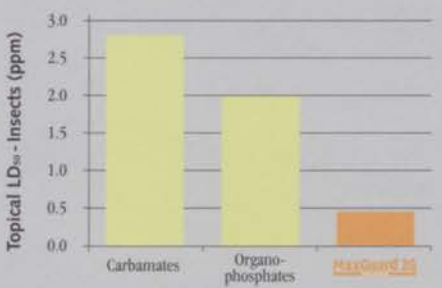
NEW MAXGUARD 2G FROM SCOTTS

MaxGuard 2G is Scott's most recent weapon in the fight against surface feeding insects, such as Lawn Armyworm, Sod Webworm, and ants, including stinging ants. It uses a sand core granule to deliver fast acting, contact pyrethroid insecticide for immediate control. This new formulation uses no solvent and is completely safe for use on all turf areas including greens, fairways, sportsturf, lawns, amenity and utility turf. MaxGuard 2G is a cost-effective alternative to preventative systemic insecticides, enabling managers to monitor pest populations, identify a damage threshold and deliver a targeted treatment that works immediately. Other contact insecticides are notorious for their high toxicity to workers and non-target animals. MaxGuard 2G has less impact on workers, birds and other animals because of its unique chemistry with low mammalian toxicity. Scotts worldwide development program is focused on expanding the MaxGuard label to include a wide range of surface feeding insects. The Australian launch of MaxGuard signifies Scotts strategic aim to develop safer and smarter plant protection products for turf professionals.



MaxGuard 2G has more insecticidal activity than other insecticidal classes

For further information please contact your local distributor or Scotts direct on:

Tel: (02) 8853 7300.

JFB CUSTOM GOLF RELEASE NEW SAND BUCKET

John Broderick from JFB has just announced the release of a new sand bucket made specifically for the golf industry (Not a flower pot substitute). This is not a large item, but an important one nevertheless, especially if you are constantly replacing buckets which have split, broken, or have had handles pulled out. JFB have solved the problem by manufacturing a sand bucket with plenty of UV to combat all weather conditions. The overall wall of the bucket has been thickened to withstand most abuse, and the lip surrounding the handle attachment has been strengthened. The buckets are packaged in boxes of 200 and are available in green and black. (Special colours available upon request – minimum order applies). Printing and logos are a specialty.

For more information, phone:

JFB CUSTOM GOLF on 07 3351 6196, or **phone: John Broderick** on 0418 750 668.
Email: john@jfbcustomgolf.com

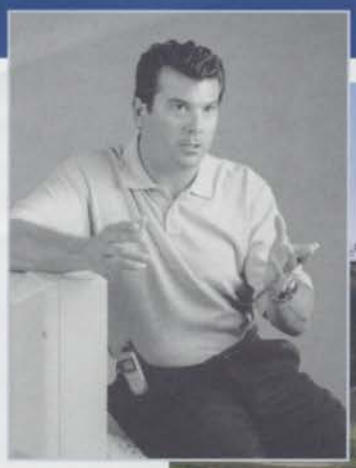
TOYOTA RELEASE HUSKI SKID STEERE

You knew Toyota made a range of passenger and commercial vehicles, but were you aware that they also manufacture and sell high-quality skid steer loaders? With their heavy duty construction, Toyota "Huski" Skid Steers provide owners with a machine featuring reliable Toyota engineering and low running costs – all designed to help your business grow. For example, the compact model "Huski" 4SDK5 is a narrow 1200mm width machine with a 430 kg operating load. Standard features include a full tilting cabin for easy daily checks, a non-adjusting drive system for low maintenance, and a hydraulic flow rate of 53.3ltr/min - giving you the features you need of a skid steer for those tight jobs. The general application size "Huski" 4SDK8 has a 650 kg safe operating load for greater productivity, class-leading 56 horse power engine for plenty of grunt, a full lighting kit providing a safer working environment, and heavy duty boom arms for extra durability. To complete the package the 4SDK8 has a tilt up cabin for easy access for daily checks, a 300mm ground clearance to reduce the chance of bogging, and a 3 year/3,000 factory hydraulic warranty. Toyota has Skid Steer Dealers located in all states across Australia providing factory trained technicians, and a national parts warehouse with $4.0M of stock plus overnight delivery.

For more information please Freecall your local Toyota Huski Distributor Australia-wide on:

1800 425 438 or visit on-line at **http://industrial.toyota.com.au**

Who Says You Need a Million Dollar Budget To Upgrade Your Irrigation System?



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NEW GENERATION TURF-TIDY

New Generation Turf Tidy

Redexim-Charterhouse will launch the new generation Turf-Tidy at the 18th Australian Turfgrass Conference in June. The Turf-Tidy has a three in one multi-functional head for dethatching, sweeping and verticutting. The head floats in all directions, and thus minimizes the risk of scalping over undulations. The turbo fan compresses the debris in the hopper for increased capacity and the diagonal highlift enables it to reach trailers.

The smallest, 1.3m wide, version Turf-Tidy produces a PSI (ground pressure value) of only 7.6 and is therefore ideal to clean up (even wet) cores off greens with a 20HP tractor.

Ring Peter Ellis- 03 9435 0955 or 0419310546 for nearest dealer

DAKOTA TURF TENDER 410

Dakota Turf Tender 410 comes with built in versatility

ASPAC Golf and Turf have recently announced the release of the Dakota Turf Tender 410 greens dusting, topdressing and fertilising system. According to Martin Eade, Managing Director of ASPAC Golf and Turf, the Dakota 410 brings real versatility, stating that it is equally proficient lightly dusting greens as it is applying material on tees or sportsgrounds at up to 12mm thick. Eade states that, "there is nothing more frustrating than constant bridging and clogging on the spinners. The Turf Tender 410 enables you to topdress any time, with any material, in any conditions, you need to be able to topdress to your schedule, not your machines limitations."

The Turf Tender 410 throws 8-9 metres, with the speed of the floor and spinners being controlled by a dial on the operators console. This means that you can topdress a green at 8 metre throw, drive directly to the tee and dial down the throw to 3-4 metres, all without leaving the seat of the drive vehicle.

The Turf Tender 410 comes standard with 11Hp Honda engine, 0.75 cubic metre capacity, easy fill hopper, and vehicle mount control box.

Information on the 410 and the larger 420 (2 cubic metres) and 440 (4 cubic metres) models is available by contacting:

ASPAC Golf and Turf on 1800 640 305.

GCSAQ

Extremely hot weather in Queensland, has made it very uncomfortable working on the golf course. A few decent falls of rain have been recorded but some areas missed out all together. At Gainsborough Greens, like most other places this summer, we've been busy just keeping on top of the rampant growth. There has been a bit of movement amongst the superintendent population with David Scutts leaving Coffs Harbour Golf Club after many years to take on the challenge of the Bonville International Golf Club, a beautiful laid out course with plenty of potential just south of Coffs Harbour.

There have been a few other jobs advertised but I am showing my advancing age by not blurting out who is rumoured to have the job until I check it out myself. See, you can teach an old dog new tricks. Unfortunately this new reluctance to spill the beans may result in an increasingly bland and colourless column but in the increasingly litigious society you have to be a bit careful. Obviously this tropical heat is getting to me. The Queensland Association has a very full program of events for this year; hopefully we can cater to the needs of all our members,

Best wishes for 2002

Jon Penberthy
President GCSAQ

GCSAWA

Fist of all I would like to wish all our interstate colleagues a Happy New Year and may your grass grow well in 2002. We have been lucky here in the West with very mild weather, which has been great for those courses affected by water restrictions. The association held its Christmas family function on the 15th of December at the Rosemount Bowl. All had a great evening and the kids were pleased to see the man in the red suit appear with a sack full of gifts. The ten pin bowling championship was a close tussle but the two finalist teams produced some rivalry in the New family. Craig New and his partner, Rochelle Hambleton fought out a close battle of the pins with Gerri New and her partner, Bob Hunt. All who attended had a great night though and the only losers were those people who chose not to attend.

Congratulations to Wayne Miller and his staff at Lake Karrinyup who presented a superb golf course for the Johnnie Walker Classic. The condition of the course was a credit to Wayne and the professionalism of all those concerned. At the time of writing final preparations are being made for this years John Deere Super Series. A few subtle changes have been made to this years' event but as usual we have some great courses to enjoy. If any of our interstate friends are over here in the West and wish to play in the series please give us a call and we will be glad to accommodate you.

Allan Devlin
State President

NSWGCSA

At the time of writing, there are 80 fires burning across this state. Hundreds of homes and businesses have been destroyed, and it is now officially the worst bushfire disaster in our country's history. It makes you sit back and realize what is important in your life, and that a few weeds in your bunkers over the Christmas period is not "the end of the world" (even though your chairman of greens may think it is). The good news is that no one has been killed and I have had no reports of serious damage to golf courses. Now! On to the more traditional news; the "Organic Debate" held at Manly Golf Club in November was a huge success, with over 100 people in attendance, everybody left wanting more as our time schedule meant we had to end the debate as it was really starting to warm up. Many thanks to professor Peter Martin, Peter McMaugh, Terry Farrell and Warn Penman for providing the background information which " fuelled the debate". A show of hands indicated that the topic needed more time to discuss all the issues more fully. Our first event for 2002 is the Rube Walkerdon Championship Day at Oatlands Golf Club on March 19th. I look forward to a large turnout for this most important historical day. The latest development in the EPA's desire to implement a "Notification of Neighbours" policy is that for the time being it is a voluntary decision that each business can make based on their own situation. However there is a lot of scepticism in many different facets of agriculture that what is voluntary now will become MANDATORY in the future.

I end this report with a big congratulations to Guy Thomas and his staff at Newcastle Golf Club who have managed to keep their sense of humor and morale high, despite unfairly described as the "least courteous groundstaff" in Australia. This totally outrageous slur came from a person by the name of Tom Ramsay; most people reading this will not recognize the name and that is understandable. Suffice to say that while the calibre of Newcastle Golf Club continues to improve through the efforts of Guy Thomas and his dedicated staff, the credibility of Mr. Ramsay continues to diminish. Happy New Year to all fair dinkum people in golf.

Martyn Black
President NSWGCSA

TGAA, ACT & surrounding region.

Hello readers, I hope the summer has been a pleasant one for you all, at work and at home. Although it has been a dry summer to date, turfies throughout the district should make the most of what summer we have left, although some cooler temperatures would be a relief. Some smaller golf clubs have had to limit watering to areas of highest priority on their courses. Yowani Country Club in Canberra is currently in the final stages of surface preparation for the two newly re-constructed bowling green profiles and playing surfaces. The re-construction was necessary due to poor sub-soil drainage and the increased demand for an improved playing surface, a change from creeping bent grass to a hybrid couch. Head bowls Greenkeeper Martin Blacka says he is happy with the progress of the re-construction and establishment period. He is looking forward to the change in management procedures and the many challenges that come with maintaining fine couch surfaces. Ground Staff involved in the re-construction wish to thank the handful of members who assisted by volunteering their time. I would like to remind all of our readers that nominations for the Australian Golf Course Superintendents Association Awards presented at the 2002 Turf Conference in Brisbane are now open for applications. If you know anybody who may be eligible for one of these awards, don't leave it too late & fill out an application now. The December – January issue of Turfgrass Management has all the details and forms required. Till next time, agrostologists.

Justin A K Haslam

VGA

President Doug Agnew easily accounted for sectary Duncan Knox in the final of the Oasis 100 up handicap in December at Bentleigh, 100-75.

Coming up is:

- Globe Singles at Kew Heights on Thursday 24th January at 12.30pm.
- A Golf Day at the new 13th Beach at Barwon Heads at 12.30pm.
  Please contact Bill Hamshere on: **0419 898 477**, if you are interested in attending.
  Don't forget to get your team in the V.G.A Invitational 4's at the M.C.G on Sunday 17th March at 10.00am.
  Contact Peter Rasmussen on: **0403 045 280** for your place in this great day. We congratulate Sportsturf Consultants on becoming the V.G.A's research team. It was a close decision and we thank Turfgrass Technology and N.M.I.T for their submissions.

VGCSA

As bushfires rage in N.S.W, weather conditions inVictoria have been extremely mild. With the cooler conditions to date this Summer, the only Superintendents complaining are those trying to establish couchgrass. The last few months has seen a number of long standing Superintendents on the move. Tennyson Blake, Superintendent of Shepparton Golf Club has decided on a sea change having purchased a restaurant in the local district. Dave Rogers from Corowa Golf Club has also decided to move back to his hometown of Bathurst after serving 10 years as Super on the boarder. Also on the move is Jim Hull from Keyborough Golf Club who will be moving to Sydney to pursue a PhD in Agricultural Science at Sydney University. On behalf of all VGCSA members I would like to wish Tennyson, Dave and Jim all the best on their new endeavours. Finally congratulations to Leigh Yanner who has taken up a position with Greenmaw overseeing the day to day running of the impressive Moonah Links Golf Course. The first VGCSA meeting for 2002 is to be held at the picturesque Anglesea Golf Club on Monday February the 11th. This meeting is to be an educational day with the day's theme to be "Watering, When and How Much."

Noted lecturer and co-author of the book, "Growing Media for Ornamental Plants & Turf", Mr. Kevin Handreck will be our special guest speaker on the day. John Neylan from the AGCSA has also kindly agreed to speak on the day.

Topics for the meeting include:

- Irrigation Scheduling
- Using Water Wisely
- Using Effluent Water
- Panel Discussion: Greens Irrigation

On April 29th, this year's Annual General Meeting is to be held at Metropolitan Golf Club. In keeping with the VGCSA's 75th Anniversary, the day will celebrate our history and the people who have contributed so much to the VGCSA over the past 75 years. It is the committee's intention to invite as many past members as possible. Anyone with contact details of past members could they please contact me on 0417 374 825.

John Geary
VGCSA President

TGCSA PRESIDENTS REPORT

The TGCSA finished the year 2001 with the Machinery Industry Golf Day at Port Sorrell. As predicted the day was another success story for our association. With good attendance by superintendents and a terrific trade display, the day was enjoyed by all. Thanks must go to Port Sorrell Golf Club, Harry Skildar, TGCSA Committee, all trade exhibitors for support of this annual event. The (Holy Grail) Reg Robert Memorial Trophy was won by Tony (Knook) Smith from Mowbray Golf Club.

The TGCSA committee met on the 23rd of January to organise coming events, such as:

27th Feb –

- Pittwater Golf Club combined with the sectary managers association.
- Topic: (L.D Pesticide absorption in skin)

2nd April –

- Bothwell Golf Club and Museum
- The Home of Australian Golf
- Speaker, David Huff.
- Present paper on Poa breeding
- 9 holes of golf to follow
- This event will combine with TGAA

Clint Southorn from Pasminco Golf Club has decided to broaden his career by moving north to Queensland. Good Luck Clint, you have the Best Wishes of our association.

Our secretary Shane Knott is digging deep into the archives to assist the AGCSA History Project – What a great idea.

That's it for now

Phil Hill
TGCSA President.

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- Excellent for improving turf stress tollerance

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