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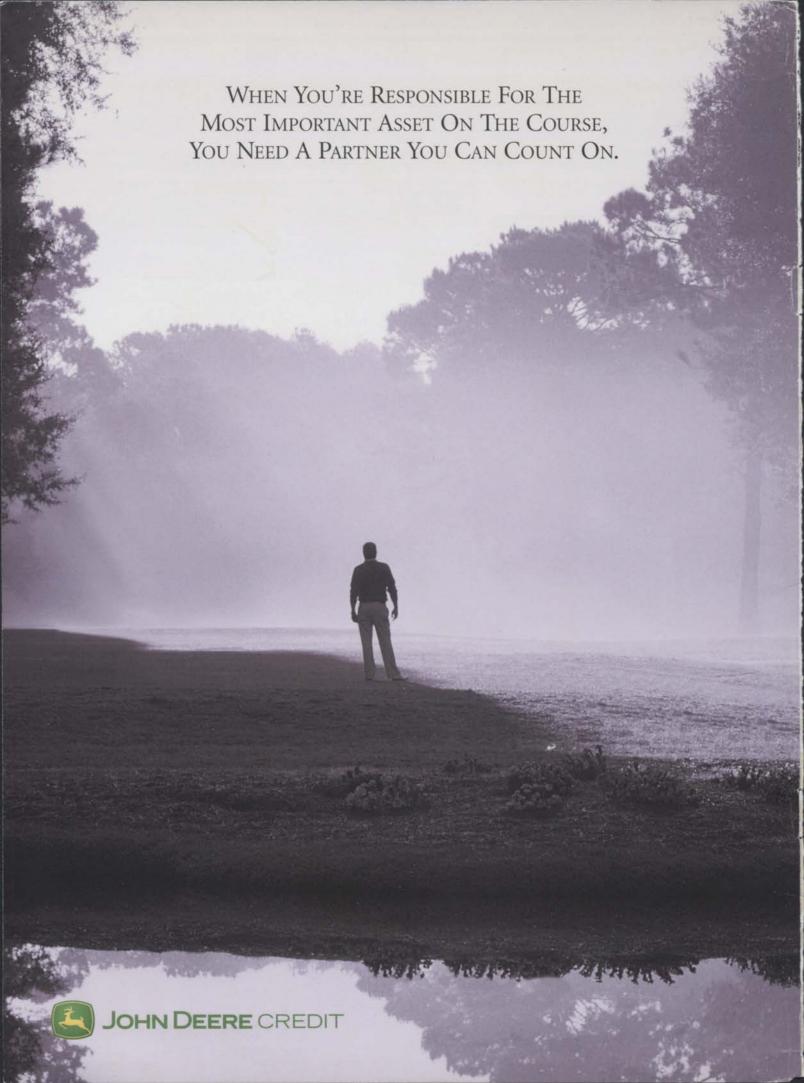
IRRIGATION CONTROL
CART PATHS DRIVING CHANGE
STAFF RECRUITMENT



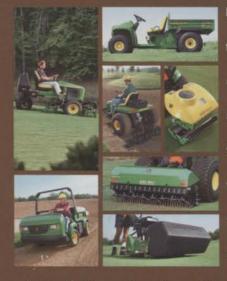
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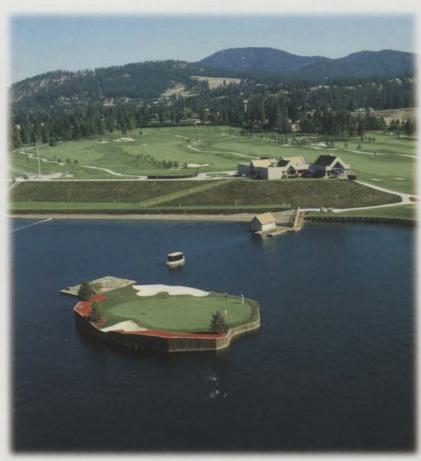
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cover

1st Hole, The Lakes Golf Course in Sydney. (Photo by Nick Wilson, courtesy FSX Sports NSW)

special features

TOOL TEST - Irrigation Controllers

Rapid developments in the elentronics industry have led to dramatic changes in irrigation controllers. This special feature written by Jeremy Cape from the CSIRO will prove valuable for those installing new or upgrading existing systems.

Pumping Systems Intelligence

Respected Irrigation Designer Paul Jones, discusses the various types of pumping stations to help you decide which one is likely

to best suit the requirements of your facility.

17th Annual Turfgrass Conference and Trade Show Directory

This section contains all the information you require including, Trade Show floor plan, exhibitor listings and the conference program. Also, to go into the running to win a trip for two for three nights at the Laguna Quays Resort, get to work on the 'Exhibitor Quiz' on page 41.

Golf Cart Paths - Driving Change

Superintendents have been battling the damaging effects of golf carts since the 1950's but most now see them as an essential tool in promoting the game to certain sectors of the market. It is therefore important to know how to best cater for them.

Toro Australia – New Products Guide (insert)

IRC







research

The Effects of a Variable Depth Rootzone on 56 Moisture Retention in a Sloped USGA Putting Green

If there has been one shadow that consistently looms over the USGA Greens Specification it is the effect that surface undulations will have on a greens hydrology. Kevin Frank from the Michigan State University has some answers.

Effects of Solid Tine Aeration treatments on Soil Physical Properties and Turf Playing Surface Quality

In conjunction with other well know Australian researchers, Davis Aldous from the University of Melbourne investigates the benefits of solid tine aeration.

in every edition

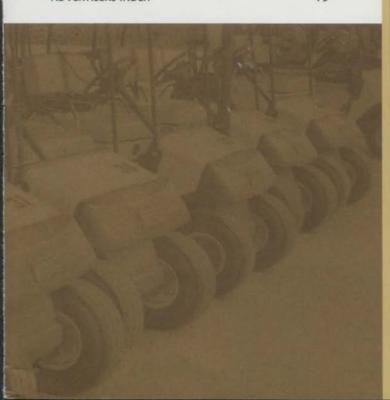
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Mathew Bywater lifts the veil on how Plant Growth Regulators actually work!

REVIEW -28 Let the Games Begin: Recruitment and Retention

Many turf managers report having tremendous difficulty finding and keeping high quality staff. They are not alone and so has spawned a large, highly specialized industry. We get some pointers from the experts.

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WELCOME TO SIDNEY













President's Pen

It is hard to believe that, as I sit to write what will be my last report as President of this association, I have been doing this for four years! As with anything, you know when it is time to leave and that is the case with being AGCSA President.

Recently, I had the pleasure of being invited to speak at the NSWGCSA day at Royal Canberra, and apart from the traditional welcome to any Victorian in NSW (they forgot to pick me up at the airport), the day was a great success. The speakers on the day included Major Grant Gleeson and Roy Masters. Grant Gleeson spoke on personnel management – the army way, and was very interesting. If you have the opportunity to hear him speak in the future, make the effort to attend as it was extremely interesting.

The association is about to commence the 17th Turfgrass Conference in the city in which I attended my first conference, Sydney. The support and response that the association has received from both delegates and trade has been excellent and I am sure that this event will be viewed as one of the best ever.

At the Sydney Conference a "face to face" meeting will be conducted to follow up on a recent conference call. The subject under discussion is the research of the History of the AGCSA and turf management in Australia.

The sub-committee is led by Doug Robinson, often difficult task of implementing the

The sub-committee is led by Doug Robinson, with guidance from other "Elder Statesmen" of the industry, both active and retired. The discussions that have taken place have been very fruitful and it is hoped that anyone with relevant information on the subject will contact Doug or the AGCSA office. The ability to accurately record the history of our association and profession is vital.

As stated, this is my last report, so if you do not like sentimentality then you should stop reading now as I have many people to thank over the past four years.

Firstly, I must thank the Barwon Heads Golf Club, members, committee and staff. In particular general managers – past Andrew Davis and present Philip Nunn for their support over the past years and also assistant superintendents, past and present Gavin Reid, Steven Hewitt and Anthony Toogood. It is always comforting to know that when I am not at the course, work carries on normally thanks to the club's skilled and dedicated staff.

The staff at the AGCSA for their commitment to serving the members in the best possible way, in particular, Euan Laird, who has the

often difficult task of implementing the decisions that the board make. Thank you also to the members who have supported myself and the other board members (past and present) over the past few years. Thank you also to the great individuals I have served with on the board: David Scaife, Craig New, Jeff Gambin, Peter Schumacher and the incoming president Mark Couchman for your commitment and untiring passion to make decisions that were right for all members and the future of the association.

And finally to my Family, Katrina, Mitchel and Bridie who never questioned when I had to be away from home and for always welcoming me back with a smile.

In closing the greatest joy of being president of this association was people I have been able to meet and the new friends I have made. It has been a great honor to be president of the AGCSA and I look forward to catching up when our paths next cross.

Peter Frewin
GCS Barwon Heads Golf Club
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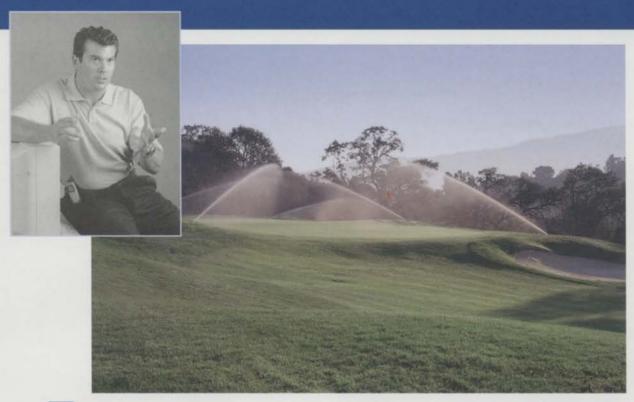
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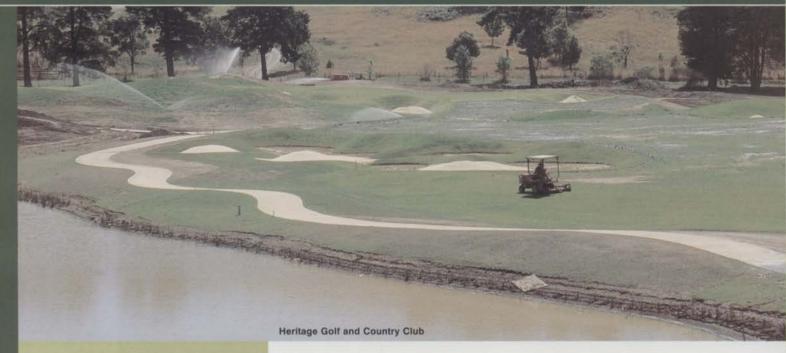
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TOOL TEST - Irrigation controllers



The rapid developments in the electronics industry have led to some dramatic changes in irrigation controllers. Control options that were only dreamed about ten years ago are now a reality and while they are not yet commonplace, more and more supers are taking advantage of what they offer.

Unlike some other editions of "TOOL TEST" this one does not try to evaluate the range of options available but attempts to highlight the key issues to be looked at when selecting an irrigation controller. Readers should also note that this is a personal view of irrigation controllers and so reveals some of my prejudices. As you will read, all of the major systems have strong supporters and it is clear that the final choice for each golf course will be totally dependent on the local conditions.

It is also important to stress that this article has been written as an introduction to the topic of central controllers, in large part because it is a very big and complex subject. Accordingly I have concentrated on the main issues and tried to present an overview.

Finally I would like to emphasise the importance of having a well maintained and correctly set irrigation system. No control system, no matter how flexible, powerful and automatic should be invested in until the irrigation system is functioning correctly. This means a high rate of

uniformity and the ability to apply water at application rates, at times and in quantities required to grow healthy turf. When that is in place then supers can think about installing automatic control.

Some definitions

Figure 1 is a representation to demonstrate some of the individual components of a central controlled irrigation system. The top drawing represents a hybrid system while the lower drawing represents a two wire-system.

The major components of the system are:

The central controller that is a dedicated IBM type personal computer or an IBM PC especially designed to act as the central controller. The controller contains the software that operates the irrigation system.

The central controller is 'connected' to devices in the field, usually through an interface of some kind that is designed to generate a signal appropriate to the devices it is controlling. Thus the signal might be an electronic pulse or a radio signal or a current.

The system may involve satellites, which are field units located around the course that control groups of sprinklers.

Some systems use two-wire pathways with decoders located along them. The decoders control valves.

Some satellites still use conventional common wire systems to control the opening and closing of valves and finally, in most systems there will be some form of radio link between elements

in the field and the central controller.

The major manufacturers provide systems with very similar functionality but all use different technologies to achieve the same result.

WHO SELLS WHAT?

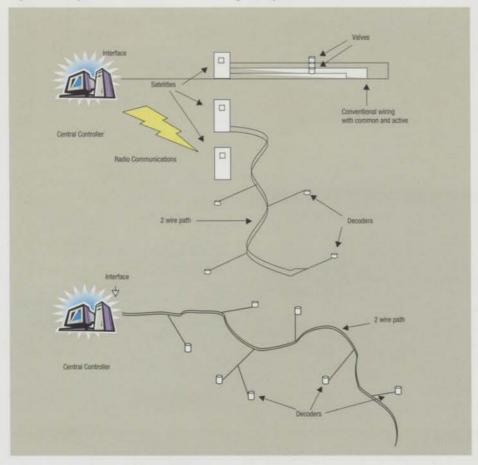
Table 1 is a simple listing of which manufacturer sells which product. There are other brands, in particular the Rainman system so there are other options for golf course superintendents. Not withstanding the quality of other products the three companies listed dominate the market. As indicated earlier, central control is a large subject and just to list the specifications of the products in the table would fill a book. As an example Table 2 (page 12)shows the software modules available in the Rain Bird range.

These features are also available in different formats in some of the software offerings from other manufacturers.

WHAT QUESTIONS TO ASK

Your choice of control system will be influenced by many factors, particularly the local aspects of your course. However, there are still a few generic questions it is worth while asking to help you in your decision making. As with any significant investment you should ask the usual commercial questions about back up service, warranty, availability of parts and also questions about the contractors and staff who are installing your system. Will they be there to help you at 6 a.m. on a Sunday morning to

Figure 1: Components of a central controlled irrigation system



trouble shoot and correct problems?

What is the reliability of the offered system? The reliability of all the components of the system should be assessed. This includes the central controller, the software, the

communications and any devices that are located in the field such as satellites and decoders. Ask about the track record of any technology and about the experiences of other users. Some items such as power surge and

lightning protection are critical. However, the quality varies between manufacturers and what is standard in one brand may be an optional extra in another, in other words not all surge and lightening protection is the same.

Some people prefer field resident memory because they can still retain some functionality even if the main controller is inoperable because of, say, a power black out. In this instance field resident memory acts as a back up to the central controller.

What is the functionality of the software? Table 2 is a long list of different software functionality. It is important that you decide what minimum functionality you require. Don't buy capability you don't need!

Find out what happens if your supplier develops new software. Do you automatically get an upgrade to the new system? Will you have to discard your current version if you buy the new version?

Is there an upgrade path for the technology? Will the product be made redundant by advances in technology? The upgrade path from electro mechanical controllers to radio pagers to true two way communication has been rapid and provided many benefits for superintendents. Some people have found that systems they invested in have become redundant and they need to throw them away when they invest in new technology. It is a good idea to ensure that any technology you invest in will fulfil the investment life span you require.

A similar issue to be addressed relates to the upgrade path of technology. Ask your

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Table 1

	PRODUCTS FROM	MANUFACTURERS					
Manufacturer Hunter Industries Rain Bird Toro							
Software	Genesis III Surveyor Genesis Vista	Cirrus Nimbusti Sratus II SDC-1	SitePro				
Satellites	Genesis Field VSX Field	MSC+ PAR+ COM COM LINK	OSMAC E Series Network LTC Plus Network 8000 Network DR2				
Communications methods supported	Conventional wire 2 wire path with decoders Radio control	Conventional wire 2 wire path with decoders Radio control	Conventional wire 2 wire path with decoders Radio control				

Table 2

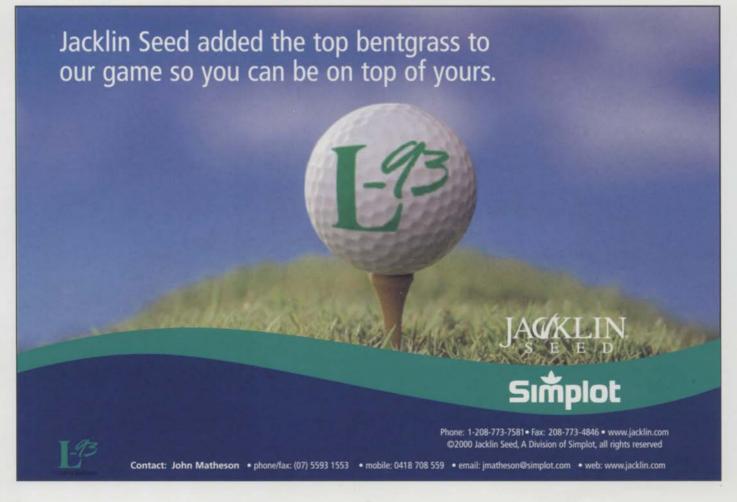
Feature	Cirrus	Nimbus II	Stratus II	SDC-1
Et Reference Weather	Std	Std	Std	N/A
Automatic Weather Station Download	Std	Optional	N/A	N/A
Virtual Weather Software	Std	Std	N/A	N/A
Smart Weather Alarms Software	Std	Optional	N/A	N/A
Smart Paging Software	Std	Optional	Optional	N/A
Rain Sensor	Std	Std	Std	Std
Smart Sensors	Std	Optional	Optional	N/A
Flow Watch	Std	Optional	Optional	N/A
Flo-Manager®	Std	Std	Std	Reduced
Flow Guard	Std	Std	Std	Std
FREEDOM Compatible	Std	Optional	Optional	Optional
Pump Monitor Program	Std	Optional	Optional	N/A
Touch-Screen Compatible	Optional	Optional	Optional	N/A
FREEDOM-Pad Compatible	Std	Optional	Optional	N/A

suppliers whether a product that you might buy now will be compatible with other product that has greater functionality. For example if you improve your software does that mean you have to alter the other components of your system?

Can you gradually upgrade your system? Is it modular? It is common for golf clubs to want to upgrade their system on a gradual basis. This might take place over a three or four year period. Make sure that the control system you choose can be upgraded in a modular fashion.

What is the flexibility of the system?

Since the main aim of the control system is to provide greater control over watering it is important to ensure that whatever system is chosen can provide sufficient flexibility to provide the full range of watering schedules that you need.



WHAT THE USERS SAY

Terry Ford is the super at Kingswood Golf Club who has a Hunter Genesis System, with satellites, controlling his irrigation.

Q. What are the best features of your system?

A. I like the windows based software, the field resident memory and the data retrieval capabilities of the package. This enables me to know exactly what is happening on the course with my irrigation at any time.

Q Are there any weaknesses from your point of view?

A. There are no major weaknesses as far as I am concerned. If I had to make the choice and decision again I would make the same one. I am very happy with my system.

Peter Jans from the Sanctuary Lakes is equally happy with his Rain Bird Cirrus system. The system is a two wire system with decoders.

Q. What are the best features of your system?

A. Feed back from the field that tells me when any sprinkler is on and in particular the flexibility the system gives me to manage irrigations as I want.

Q Are there any weaknesses from your point of view?

A. There were some small gliches with the software early on but they were fixed very quickly and I am very satisfied with the system.

When the decision was made to buy a controller about 4-5 years ago the Rain Bird system was the only one that enabled us to control the irrigation on the golf course and the estate. The available Toro system at the time was not able to do that.

Mark O'Sullivan is the superintendent at the Roseville Golf Club in Sydney. He is very satisfied with the Toro Network 8000 system he has installed.

Q. What are the best features of your system?

A. It has all the requirements needed for me to set a full range of watering programs.

Q. Are there any weaknesses from your point of view?

A. At this stage we do not have radio control. The facility is there for us to upgrade to radio control but it was not available when we installed the system.

We reviewed a number of other systems including Platypus, Rain Bird, and EDMI. Perhaps because we had received very good service from our previous Toro Vari Time controller we were very happy to continue with Toro.

James Telford, Course Superintendent at the Hamersley Golf Course is Perth had this to say.

Q. What are the best features of your system?

A.The system is easy to operate and program, radio communication between the computer and field controllers works exceptionally well and has alarms if there are problems. The system is flexible enough to allow me to add to it and the support I get from the supplier is outstanding.

Q. Are there any weaknesses from your point of view?

A. The flow chart is a little hard to read until you get use to it so you have to zoom in to see if there are any spaces in the programming.



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WHAT SHOULD YOU BE ASKING FOR?

The following functionality is the minimum that a golf course superintendent should be looking for today.

Real time flow monitoring is critical to correct operation of an irrigation system. Monitoring in real time not only ensures that the system is hydraulically balanced but also enables early detection of leaks.

Two way communication between the central controller and the devices in the field is also important. Older systems directed a signal to the satellites in the field and then in turn from the satellite to the sprinkler. A good system today should enable communication in both directions so that information on sprinkler operation can be received and logged at the central controller just as easily as a central controller sends information to the satellite.

Software capability should allow the storage and retrieval of as many different irrigation programs as you might require. If there is a newly sown green or a patch of ground under repair it is important that you can schedule your sprinklers to take account of this changed situation. The software should also be able to monitor and control pump starts and stops as part of the management of the irrigation system.

Acknowledgements I would like to thank Mike Steele and Kate de Heus from Hunter, Wayne Brown and Brad Fawcett from Rain Bird, Tim Emery and Pat O'Shanessy from Toro, Sandy Cattly from Rainman Control Systems and Tony Addis and Steve Peck for their help in compiling this article. Any errors are mine.

Jeremy Cape works with CSIRO Land & Water



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Pumping Systems Intelligence

Thankfully, today's golf course irrigation systems are a far cry from those installed 10-20 years ago.

Greater demands on irrigation systems have been created by a greater appreciation of the need for a high uniformity of application, more point specific control, multi-function programming capability of modern day control systems and the wide range of specialist programs that are required to enable superintendents to meet the demands placed on them for a better playing surface.

The irrigation equipment manufacturers have reacted to these demands with the current computer based control systems, which have been a giant step in that direction.

However, greater demands for more sophisticated irrigation equipment has resulted in greater demands on pump stations.

For years there has been the catch cry that the pump station is the "heart" of the irrigation system and this is still the case. Irrigation design and control systems have become increasingly sophisticated, to maximise the efficiency of water use, increase yields, and lower operating costs. To fully achieve the advantages gained by these techniques, the demands placed on the pumping station have also increased significantly.

The intention of this article is not to delve in detail into all the various types of pumps available and the advantages or disadvantages of each. Comparison of the types of pumps, configuration options, control and drive options are all extremely complex subjects and are often very subjective.

Industry opinion varies greatly and will often produce quite different solutions to a particular application. This is not to say that any or all are right or wrong. Suffice to say there are, like in many other industries more than one way to produce a suitable result.

Broadly speaking there are three major categories of pump types that are used for golf course irrigation in today's market.



They are:

1. CENTRIFUGAL

a. End suction type

Typically these pumps have a close-coupled motor and have either a flooded suction or suction pipe to lift the water from the storage facility.

b. Vertical multi-stage type

Typically these pumps have a series of stages according to the required output and either flooded suction or suction pipe as above.

2. VERTICAL TURBINE

Vertical turbines have their motors sitting above water level and a suspended column in a wet well with the pump near the bottom of the well. This type of pump also has a number of stages according to the required output.

3. SUBMERSIBLE

Submersible pumps are normally placed directly in the water storage facility or in a wet well similar to the vertical turbine set up.

Some of the factors that help determine the type of pumps that should be selected are as outlined below:-

- (i) Water quality.
- (ii) Site limitations such as height of pumps to lowest water level, civil engineering constraints
- (iii) Type of storage facility.
- (iv)Aesthetics is a pump house structure acceptable or feasible?
- (v) Security.
- (vi)Power supply.

In the last decade the most significant change in the industry has been the use of microprocessor controls in conjunction with Variable Frequency Drives.

In the past, with the constant speed pumps there were many pump station designs that required the irrigation system operator to match the irrigation program very closely with the capacity of the pumps in the system. The lack of flexibility of the pump station and the irrigation control system has made this either extremely difficult or impossible.

Generally, this resulted in frequent cycling of pumps which lead to serious surge or water hammer shocks to both the irrigation system and the pumping equipment. Not only did this significantly reduce the life of both, but excessive power bills, motor burn outs and high maintenance costs too often became the accepted thing.

In many cases, modern day irrigation control systems have eased some of the pressures created on pump stations by these older style control systems. However, more than ever there is the need for "Demand Driven" pump stations that can react to the control system and can bring on any number of sprinklers or flow demands from one sprinkler to the maximum number to meet the overall peak season watering demand.

Pumping systems using microprocessor control of multiple pumps have developed to meet these demands.

FLEXIBILITY OF OPERATION

Flexibility of operation is the single most important criteria for a pump station. Irrigation controllers are able to manage the delivery of water depending on climatic





conditions, soil properties, turf or crop variety, and topography. However, the pump station must be able to deliver water at the flow rate and pressure required by the irrigation system.

Pressure fluctuations, particularly the water hammer shocks often associated with turning pumps on or off at full speed, cause fatigue in underground pipes and fittings. Fatigue invariably leads to premature failure, breakages, down time that are in addition to high repair and maintenance costs.

To avoid the problems of high capacity pumps cycling on and off at low flow rates, a common solution has been to by-pass or "dump" water back to the source. This is inefficient and the power costs associated with pumping water to waste make this an undesirable practice.

MULTIPLE PUMP SYSTEMS

One method of increasing the flexibility of a pump system to deliver varying flow rates is to use a number of smaller pumps operating in parallel, rather than one large pump. This allows additional pumps to be started as irrigation demand increases, and turned off

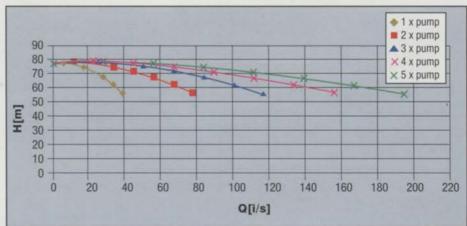
again during periods of reducing demand.

The arrangement shown in Figure 1 would operate 1 pump out to a flow rate of 30 l/s, 2 x pumps in parallel out to 60 l/s, 3 x pumps up to 90 l/s and so on as demand increases. As valves are closed, and the flow rate drawn by the irrigation system reduces and pumps will be sequentially turned off.

The problems associated with one large pump

operating inefficiently for long periods of time, or cycling on and off are eliminated. Relatively constant pressure is maintained across a wide variation of flow rates, and a degree of redundancy is built into the pump station. If a single pump has to be removed for service, the pump station can continue to deliver water up to the combined capacity of the remaining pumps.

Figure 1



VARIABLE SPEED CONTROL

By varying the frequency of the power supply to an electric motor, it is possible to regulate the speed at which it rotates. As the speed of a centrifugal pump changes, the flow rate delivered at a set pressure will also change.

By fitting a pressure transducer to the discharge line of a pump, and providing feedback to a controller which in turn ramps the variable frequency drive (VFD) up and down, it is possible to modulate pump speed to maintain a constant discharge pressure.

This may be likened to setting cruise control in a car. The feedback from the speedometer provides input as to whether the throttle setting should be increased or decreased to maintain a constant speed.

In just the same way as the car will modulate the throttle as the car moves over undulating country, the pump will speed up and down to maintain constant pressure across fluctuating flow rates. As an irrigation valve opens and flow rate increases, the pump will accelerate to the speed required to maintain the set point pressure. As a valve closes and flow rate decreases, the speed will reduce to again maintain discharge pressure at the set point.

Figure 2

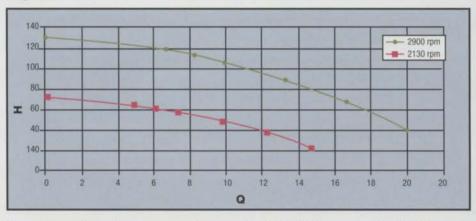


Figure 2 shows the performance curve of a pump operating at full speed (2900 rpm), and the same pump operating at a reduced speed of 2130 rpm. The pressure generated by a centrifugal pump varies with the square of the speed. A 10% speed reduction will result in nearly 20% reduction in pressure.

In this example, you will see that if a discharge pressure of 70 metres(687kPa) is required, once pump speed reduces to less than 2130 rpm, the pump will not be rotating fast enough to generate the 70m, even at zero flow.

The total effective speed control is achieved between 2130 rpm (zero flow) and 2900 rpm (100% capacity of the pump). So although variable speed control can provide a great deal of flexibility of operation and significant power savings, like a lot of technology, it is only beneficial when correctly applied.

If the total pressure change across the flow rate produced by a pump is relatively small, as in the case of an end suction pump with a very flat performance curve, even a slight change in speed will drop flow back very significantly at



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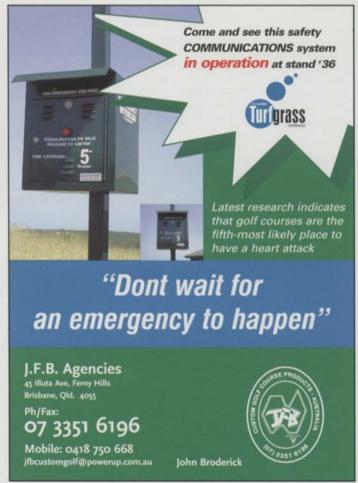
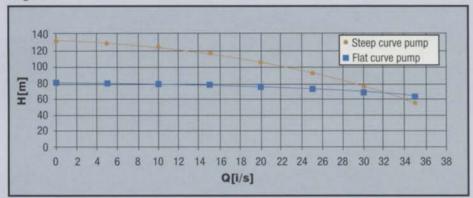


Figure3



a constant pressure. Once speed drops even further, the pump will not be rotating fast enough to generate the required set point pressure.

Flow rate may then reduce from 100%, to zero by reducing speed by just a few rpm. Just as there would be little benefit in fitting cruise control to a car which can only operate between 100 – 110 kph, there is little benefit in applying variable speed control to a pump which can only operate within very narrow pressure parameters. However, some pump station controller manufacturers can exaggerate the "pump head curve " to address this issue.

The two pumps shown in figure 3 are both able to deliver 32 l/s at 70m head. However the steep curve pump will make effective use of speed control, while the change of just a few rpm will reduce the output of the flat curve pump to zero.

By using a pump with a steep performance curve, the set point pressure may change during operation. For example if a large proportion of the total pressure required is used to overcome dynamic friction losses, then the pump controller may be programmed to increase the set point pressure as the flow rate increases. In doing so, the additional friction loss is compensated for by increasing the discharge pressure at the pump.

Other examples are irrigation shifts operating at different elevations across the site. If the irrigation shifts can be grouped so that valves operating at any given time are all at a similar elevation, then the pump controller may be set to deliver a higher pressure while high elevation blocks are being irrigated, and a lower pressure during irrigation of the lower elevations.

Significant power savings may be achieved by dropping the pressure produced by the pump, rather than using energy to pump water up to a high pressure, and then throttling the pressure

back through hydraulic pressure control valves.

The same principles apply if there are varying types of sprinkler operating pressures being used in different areas. High pressures may be generated to run large turf irrigation heads, and the pressure may be substantially dropped to operate micro-sprays in garden areas.

Therefore variable speed control is best suited to pumps that have a steep performance curve. Although some single stage pumps do have sufficient depth in the performance curve, typically, variable speed control is best applied to multistage construction pumps such as line shaft turbines, electro-submersibles or vertical multistage centrifugal units.

POWER SAVING

The power absorbed by a pump varies with the cube of the speed. The same 10% reduction in speed that reduced the pressure by nearly 20%, would have reduced the power absorbed by the pump down by nearly 30%. If a pump operates for long periods of time at a reduced speed, it can be seen that there will be a significant reduction in power costs.

Traditionally, the pump would just be run at full speed, and any excess pressure would have been reduced by use of a pressure-reducing valve in the field. This would be like reducing the speed of a car simply by applying the brakes while maintaining full throttle.

SMOOTH HYDRAULIC OPERATION

Water hammer is strictly the conversion of kinetic energy (the energy contained in a body of moving water) into pressure energy when it stops. The crash of a check valve thumping closed can often be heard in a pump shed at the time of a pump being turned off.

These pressure shocks cause fatigue of pipes

and fittings which inevitably lead to premature failure, down time, and increased system maintenance costs.

The use of electronic soft starters and variable frequency drives allows pumps to be started and stopped by smoothly ramping up to full speed, and ramping back down to a stop. This eliminates the water hammer associated with starting and stopping pumps at full speed.

SUMMARY

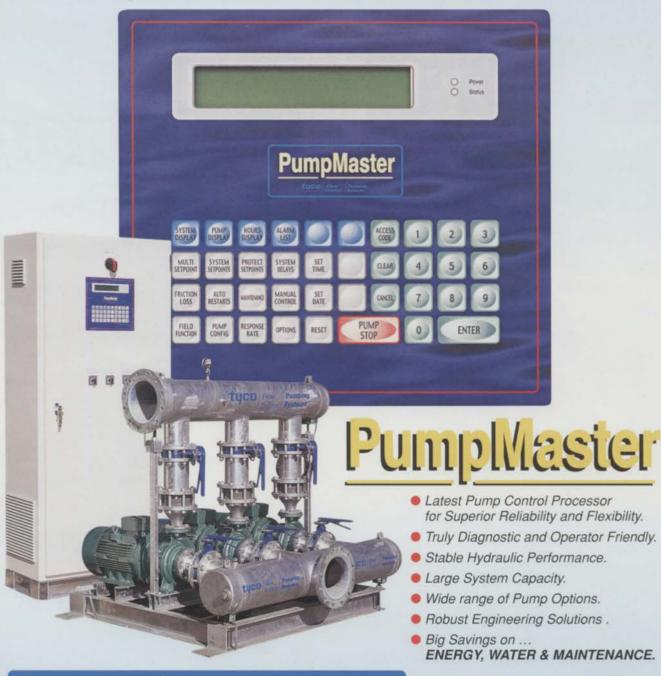
We must point out that variable speed technology is not the only recommended approach. If slight pressure fluctuations can be tolerated, the required discharge pressure is accurately known, and the pressure requirement is constant across all irrigation shifts, then the use of multiple pumps started and stopped using electronic soft starters is often a much more economical solution. However, variable speed control is ideal when:

- Absolutely constant pressure discharge is required across the entire flow range.
- 2. There are varying pressure requirements throughout the irrigation area.
- The exact pressure requirements are not accurately known (as is often the case during up-grades of old poorly designed and documented irrigation systems).
- The pumps selected for the installation have a steep performance curve.

Finally, I should point out that there are a number of companies that provide prepackaged pump stations that are extremely experienced in the design, installation and servicing of them. I recommend that you do not go with any company that has not had a long history of producing a quality product for such an important component of your irrigation system.

Paul Jones is the Principal of Paul F. Jones & Associates Pty. Ltd.

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Plant Growth Regulators - Mode of Action

Plant growth regulators (PGR) have been used for many years in agriculture for such purposes as fruit ripening, defoliation of fruit trees and cotton plants and pre-harvest boll opening of cotton plants. In turf over the last decade, growth regulators have been used to reduce clipping yields, hence mowing frequency.

However, recent research has revealed physiological benefits in addition to growth regulation. These include; increases in carbohydrates and chlorophyll, reduced water requirements, reduction in Poa annua sp, infestations and greater stress tolerance.

A PGR is a compound that has the ability to alter the amount of dry matter production and development of the plant. A PGR can be either growth promoting or growth reducing. Gibberellic Acids (GA) and cytokinins are examples of growth promoters, the former via cell elongation, the later via cell division (refer to table 1). These compounds are naturally produced by the plant and can also be applied as supplements.

The purpose of this paper is to focus on PGR's that reduce the growth of plants.

CLASSIFICATION AND MODE OF ACTION

An understanding of the mode of action is important to not only ascertain the application, but also a products limitations.

Plant growth regulators are classified into groups according to their biological mode of action, that is, the activity inside the plant that causes the regulation of growth.

Traditionally, there were two groups of classification; Cell Division Inhibitors (Type I), Herbicides, Gibberellin Biosynthesis Blockers (Type II) (Murphy, Whitwell, McCarty, Yelverton, 2000).

Watschke and DiPaola (1998) refer to a new classification system that allows for the different modes of actions between gibberellic synthesis blockers along with an additional grouping for the ethylene production enhancement type products. These are discussed below.

Class A: Late Gibberellic Acid Synthesis Blockers Example – Trinexapac-ethyl (Primo)

Class A PGR's interfere with the biosynthesis of gibberellic acid (GA) thus suppressing growth but not inhibiting it. The interference takes place late in the biosynthetic pathway preventing the conversion of GA_{20} to GA_1 (refer figure 1). It is GA_1 that is the final biologically active form of GA in the plant and the primary form that effects cell elongation (Shephard, DiPaola, 2000). Class A PGRs are not known to stop production of any of the hundred other gibberellic acids.

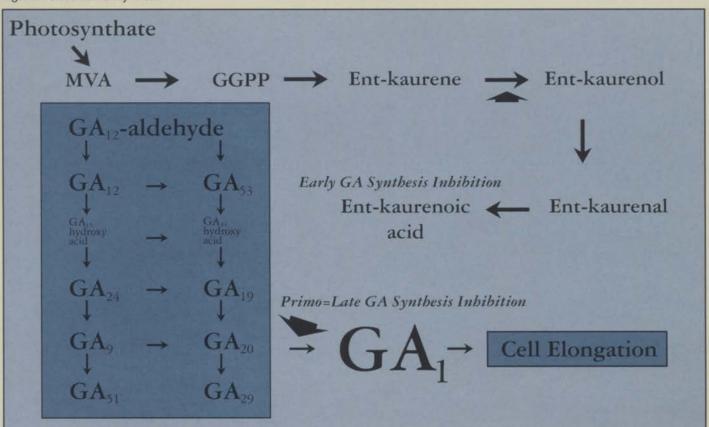
Trinexapac-ethyl is the only compound in this class. It is foliar absorbed, delivers a reduction in foliage growth but only partial suppression of seedheads.

Class B: Early Gibberellic Acid Synthesis Blocker's Examples – Paclobutrazol (TGR), Flurprimidol

Class B PGRs also interfere with the biosynthesis of gibberellic acid but the interference occurs early in the biosynthetic pathway. Interference takes place before the production of the first gibberellic acid compound, GA_{12} . GA_{12} is not only the first GA produced but is also a precursor for all other GAs. This in effect means that total GA production is stopped.

Both compounds in this class are root absorbed, which indicates that post application irrigation/rainfall is important to maximise

Figure.1 Gibberellin Biosynthesis



BY MATTHEW BYWATER

the effectiveness of the product. Both compounds deliver a reduction in foliage growth, but only Paclobutrazol offers partial seedhead suppression.

Examples - Maleic Hyrdazide, Mefluidide

These compounds inhibit the division of cells and differentiation in meristematic regions of the plant. The metabolism of cytokinins in the plant is slowed by PGRs in this class. They inhibit both vegetative growth and seedhead development (Murphy, Whitwell, McCarty, Yelverton, 2000).

The compounds in this group are foliar absorbed and offer suppression of foliage and seedheads. However, seedhead suppression is dependent upon application before seedhead formation and emergence.

Examples - Sulfometuron-methyl, Chlorsulfuron, Glyphosate, Ethofumesate (Prograss)

Herbicide growth regulators are compounds possessing post-emergence herbicidal activity that have also been shown to inhibit the growth and development of turfgrasses at sub-lethal rates (Watschke, Prinster, Breuninger, 1992). It is the interruption of amino acid synthesis or fatty acid biosynthesis that causes the regulation.

These compounds are characterised as having an extremely narrow margin of safety and misapplications resulting in overdose can cause severe injury or death to grass stands (Kaufmann, 1986).

Class E: Ethylene Production Enhancement Example - Ethephon

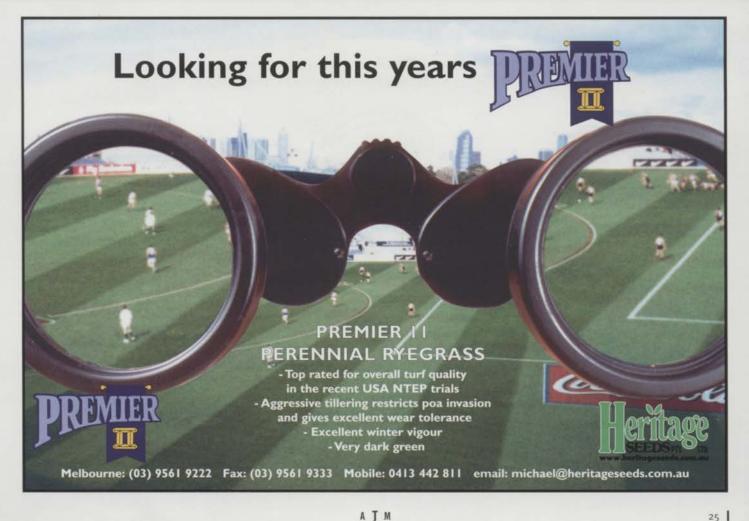
Class E PGR's promote the production of ethylene, which is a regulatory hormone that restricts plant growth by inhibiting the elongation of stems, roots and leaves (Salisbury, Ross, 1978).

PLANT GROWTH SUPPRESSION

By inhibiting the formation of gibberellic acid, products from Classes A and B reduce the growth rate in a much different manner to the other classes. They actually govern the rate of plant growth and thus are considered to be true growth regulators and not growth inhibitors (Batten, 1983).

Class C PGR's typically offer suppression of growth after approximately 5-7 days. However, the residual length of suppression (maximum 3-4 weeks) is generally shorter than Classes A and B (4-8 weeks). Suppression of growth for Class B PGR's begins around the 10-14 day mark while Class A PGR's take effect after just 7 days. Ethephon (Class E) is best suited to cool season grasses and will provide suppression for a period of 4-6 weeks.

Class C PGR's inhibit seedhead suppression through the inhibition of the production of cytokinins and mitosis. Class A and B PGR's inhibit the seedhead stalk length but only partially suppress the formation of seedheads. Class D PGR's suppress seedhead formation



while those in Class E only partially suppress seedhead formation.

TURFGRASS QUALITY

Not only do the aforementioned products have different modes of actions, but they also differ substantially in turfgrass safety. Use of products from Class D are generally only recommended on low maintenance turfgrass due to the high potential of turfgrass damage.

Class C PGR's are used in low maintenance areas where the primary objective is the control of seedheads. These products are used primarily on low-medium maintenance turfgrass areas because phytotoxicity (yellowing) can be a problem (Murphy, Whitwell, McCarty, Yelverton, 2000)

Classes A and B are the 2 most common PGRs used in turf in Australia. This is mainly due to the length of regulation and turfgrass safety. Class A PGRs are noted as being the safest on all turfgrass species as they inhibit only GA1 (final biologically active GA). This means that all

Table 1: Natural Plant Growth Regulators

Hormone	Function
Abscisic acid	Closes stomates, and inhibits germination
Auxins	Apical dominance, cell enlargement, root growth, inhibits axillary buds
Cytokinins	Cell division and enlargement, flowering senescence, inhibits auxin
Ethylene	Stress is stimulated, root growth
Gibberellins	Cell elongation, photoperiod response, and chilling tolerance

other GAs are produced (refer to Figure 1.). The early blockage of GA exhibited by the Class B products prevents the biosynthesis of further GAs which can lead to injury on environmentally stressed turfgrass.

CONCLUSION

With pressure to reduce clipping wastes, fossil fuel use and carbon dioxide emissions the use of plant growth regulators is set to increase. Improvements in turf quality and stress management make this an exciting area of development for the turf industry. #

Matthew Bywater is the Manager of Technical Services for Nuturf

References:

Batten, S.M., 1983: Growth Regulators - new tools for the 80's? USGA Green Section. Vol.21, No.3, May/June, p1-3

Kaulmann, J.E. 1986. Growth Regulators for Turf. Grounds Maintenance 21(5):73

Murphy, T.R., Whitwell, T., McCarty, B., Yelverton, F.H., 2000. Turtgrass Plant Growth Regulators: Best Golf Course Management Practices. Prentice Hall, pp 552-561

Salisbury, F.B., Ross, C.W., 1978. Plant Physiology. Wadsworth Publishing Company, pp 264-267

Shephard, D., DiPaola, J.M., 2000. Regulate Growth and Improve Turf Quality: Golf Course Management. Volume 68, No.3, pp56-59

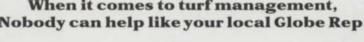
Watschke, T.L., DiPaola, J.M. 1998. Evaluation of V-10029 and Trinexapac-

Watschke, T.L., Prinster, M.G., Breuninger, J.M., 1992. Plant Growth Regulators and Turfigass Management. Agronomy No. 32. American Society of Agronomy, Crop Science Society of America, Soil Science Society of America, Publishers Madison, Wisconsin USA. pp 557-588.



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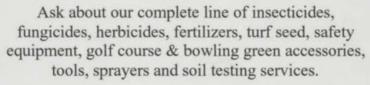






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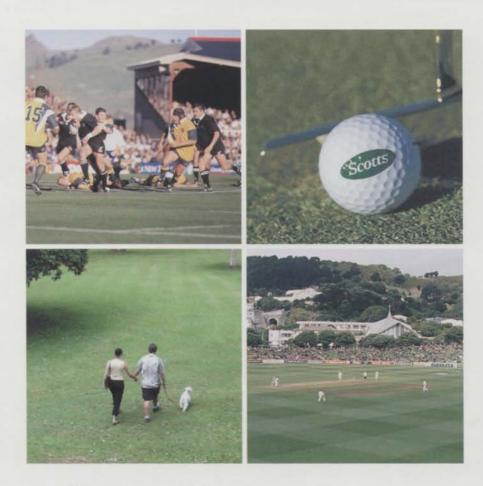


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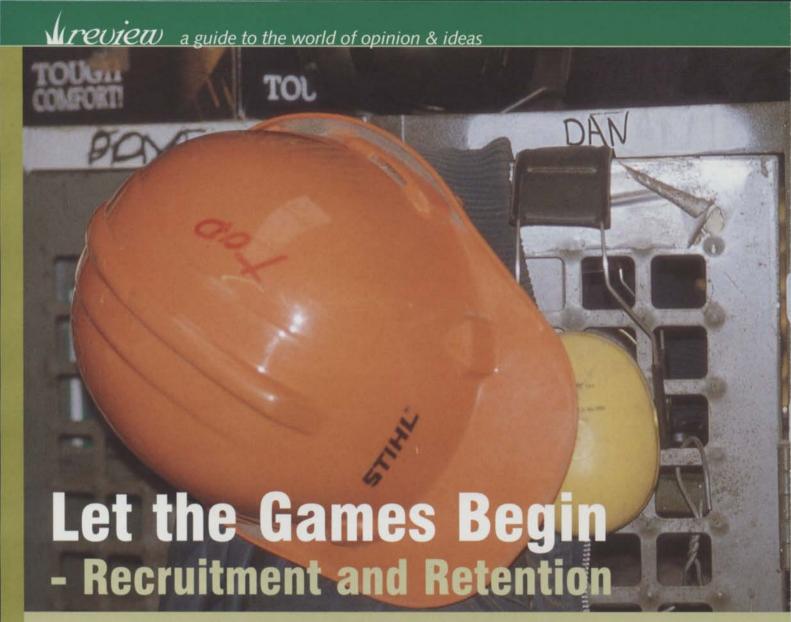
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The employment market within Australia has changed considerably over the last ten years. This change has been driven by a range of factors including the restructuring of key industries, the impact of internationalisation and of international economic conditions on the domestic economy. "Downsizing" is no longer the word on everyone's lips and organisations are finding themselves competing for talent and discovering the need to reassess the way in which they attract and retain quality employees.

As the nature of employment has changed, so to have employees. Employees of today have a higher degree of mobility and education than those of ten years ago and workplace commitment and loyalty has transformed into personal loyalty. As a result, employees are spending considerably less time within the same organisation with the average employee now spending less than four years with the same group.

The competition for employees, and the subsequent mobility of these individuals, puts increasing pressure not only on the recruitment process but also on the non salary benefits and opportunities available to employees as a means of retaining quality staff.

RECRUITMENT

Employers often describe recruitment as one of their worst nightmares and resent the time and expense involved in the process. As a result, employers are increasingly turning to Recruitment Consultancies to manage this process and as a means of gaining a competitive edge in relation to attracting and retaining quality employees.

There are three main types of recruitment undertaken by Recruitment Consultancies;

Contingency Recruitment

Contingency Recruitment is the process whereby a Recruitment Consultancy works "on

spec" for a Client and gets paid only upon the placement of a successful candidate. Within this situation there is no guarantee provided and limited follow up to ensure the success of the placement.

Advertised Recruitment

Advertised Recruitment is where the Recruitment Consultant advertises on behalf of their Client, either under their name or anonymously as a means of attracting a greater range of candidates. The Recruitment Consultant, in conjunction with the Client, develops the advertisement and arranges its publication. The Consultant is then responsible for receiving initial telephone inquiries, receiving

BY ANGELA SNELL



responses and screening candidates, undertaking first round interviews and presenting a shortlist of qualified candidates. The Consultant will be involved in reference checking the preferred candidate and negotiating the offer of employment.

Advertised recruitment provides candidates with the ease of working with a third party and enables the employer to get on with the business of managing their business. It also has the advantage of providing the employer with a guarantee whereby if the selected candidate does not prove successful or resigns within a given time frame, the Recruitment Consultant will replace the candidate and the Client will only be charged for the cost of the advertisement.

Executive Search

For all its advantages, Advertised Recruitment only attracts those people who are currently actively looking for a position. When looking to fill particularly specialised, senior or hard to fill roles an effective Executive Search strategy may unearth the staff required. Executive Search can be undertaken locally, nationally or internationally and is growing in popularity as a means of filling middle to senior management positions.

Recruitment Consultancies can be generalists with a range Consultants specialising in specific industry sectors, or specialists who focus on one particular industry segment. Whether you choose a generalist or specialist Recruitment Consultancy to undertake recruitment assignments on your behalf, there are a number of important factors to consider such as; how long have they been in business, do they understand your industry and the specific needs of your business and do they offer a guarantee?

Recruitment Consultancies can provide you with an efficient means of finding new staff but they don't meet the needs of everyone. Here are some ideas that you may find useful to consider if you prefer to do your recruitment 'in-house':

- Former employees can be a great source of prospects to fill positions as they become available. Make a conscious effort to stay in touch with former employees (if they were good!) and if they left for something else, invite them to let you know how their new job is working out. Employees often discover that "the grass is no greener".
- Current employees are also an excellent source of contacts. No one knows the requirements of the job better than they do. Encourage them to become involved by offering current employees (and others) a 'finders fee'
- Offer flexible working arrangements such as 'flextime'. Whilst incomes have risen, free time has diminished and many people find themselves under the pressure of caring for children or elderly parents. Offer flexible working hours and promote this benefit in your recruiting efforts and interviews.
- Although you want to encourage employees to stay with you as long as possible, the best individuals will expect to depart for another employer somewhere down the road. The progression of staff should be viewed as a compliment to you and your organisation and often, the demonstration of your ability to assist in long-term career development will help secure the best person.
- Work closely with your local organisation or industry association as these groups are in constant contact via a range of mediums with people you would consider as potential



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Whether or not you choose to use a Recruitment Consultancy to assist you with your recruitment needs or undertake the process in-house, there are a number of steps that need to be taken in order to facilitate the recruitment process and increase the possibility of finding the right person for the role.

- Ensure that all parties involved have a thorough understanding of the position to be filled. This can be achieved through the creation of a job description. Job descriptions should be well written and accurately reflect the nature of the position.
- 2. When looking to fill a position that has become available as a result of internal promotion or resignation, do not assume that the job description remains the same. The needs of the organisation may well have changed from when the job description was originally created and a candidate with a different set of skills may well be more suited to the current needs of the organisation.
- 3. An objective approach is essential. It is best to avoid hiring "mates" or people who fit within a predefined stereotype, for example, "she reminds me of Sally who was the best receptionist we ever had" will not necessarily result in hiring the best person for a particular position.
- 4. Formal reference checking is essential. We recommend a minimum of two referees be

contacted for junior positions and four for senior roles.

Retention

Once a candidate has been recruited, retention becomes the next major issue. Research has indicated that this is particularly the case with those employees within the "Generation X" age bracket. "Generation X" can technically be defined as the generation following the Baby Boomers and characterise employees now ranging in age from 20-35. These employees are proving more loyal to themselves, technology and opportunity rather than a specific employer. Further research has indicated that for these employees and employees in general, retention strategies that include elements other than and in addition to increased remuneration levels, are proving successful.

Remuneration is obviously an important factor, however, the following list includes a number of other options that may have a positive effect on staff retention rates.

- Opportunities for useful training and development opportunities.
- Introduction of a degree of incentive based pay.
- Improved career opportunities.
- · Opportunity for flexible working

arrangements.

- Developing the organisational profile as an employer of choice
- · Job redesign.
- · Introduction of a share plan.
- The provision of benefits including health insurance, discounts on home loans and financial advice, discounted movie tickets and entertainment, social club etc.

It is worth noting that some staff turnover can actually be good for an organisation and can generate a range of opportunities. New staff can bring with them new ideas and perspectives and turnover creates new opportunities for those staff currently within the organisation.

On balance, the current environment is proving challenging for employers, however with the assistance of a well thought out recruitment and retention strategy, attracting and retaining the right staff is possible #

Angela Snell is a Recruitment Consultant with Mason Partners Executive Recruitment.

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Baycor Turf

BENTGRASS COLLECTION

Over the past 8 weeks, bentgrass ecotypes have been collected from golf greens in Victoria, South Australia and Western Australia. Grasses have been selected for varying traits including high density, heat tolerance, disease tolerance, putting quality, summer survival and salinity tolerance.

Core samples are collected, a small sample taken for propagation and the original core planted at the Kingston Heath Golf Club research site. The core samples will be evaluated for; leaf texture, density, vertical and horizontal growth and rate of turf formation.

NEW COUCHGRASS HYBRIDS

The trial site at Lakelands Golf Club is now well established and we have been fortunate enough to introduce two new couchgrass hybrids. These are "Tifeagle" and Tifsport". Both new cultivars have been introduced into Australia by Mr Max Stephens (Twin View Turf)

"Tifeagle" is one of the super fine couchgrass hybrids for putting greens. "Tifeagle" rates highly in the NTEP trials for turf quality.

At the Lakelands site we will be able to evaluate it against "Tifdwarf" and Tifton 328.

"Tifsports" is also a new release from the USA and has been bred as an alternative to "Tifway" and other fairway grasses. It will be compared against Greenleas Park, Wintergreen, Windsorgreen and Legend.

BENTGRASS VARIETY TRIAL IN SOUTH AUSTRALIA

A bentgrass variety trial has been established at the Glenelg Golf Club in Adelaide. This provides a second bentgrass trial site, where the emphasis is on evaluating bentgrasses for heat and salinity tolerance. The varieties, Grand Prix



A bentgrass variety trial at the Glenelg Golf Club

and Mariner have been included because of their reported salinity tolerance.

In addition to the bentgrass varieties; Penn A1, Penn G2, Penncross, Pennlinks, Egmont, Grand Prix, Mariner, Dominant a mix of a capillairs, stolinfera and canina have been included.

Corings from two greens at Royal Adelaide Golf Club have also been planted, as an example of what has been a very successful Turfgrass blend for putting greens.

WATER TESTING

The availability of good quality (ie low salinity) water for maintaining turf continues to be one of (if not the most) important issues challenging turf managers. The cost and availability of irrigation water low in contaminants is forcing turf managers to utilize lower cost, and potentially poorer quality water supplies such as bore water and recycled waste water.

Recycled wastewater is being used in may turf situation, however the presence of





dissolved salts, nutrients, sodium and bicarbonates increase the challenges in sustaining a high quality turf/soil/environment system.

Any water source other than potable water used for irrigation must be tested at least annually. Water that has a demonstrated low level of contaminants should be tested prior to the start of the irrigation season. Waters that have moderate to high salinity or other contaminants need to be tested every two months during the irrigation season. Recycled wastewater or water that

varies considerably over time needs to be tested monthly for most parameters and salinity on a weekly basis.

At the very least, irrigation water needs to be tested for salinity and pH. Depending on the source of the water the following parameters are recommended:

PH, E.C (Salinity), Bicarbonate / Carbonate, Na, Ca, Mg, SAR, Nitrogen and Phosphorus.

While potable water does not require regular testing for salinity etc, a check of pH is very useful. A recent example in a metropolitan area revealed that the potable water supply had a pH of 8. This water was used for applying pesticides and was reducing the efficiency of some herbicides and fungicides. Once the pH was reduced, there was a significant improvement in the effectiveness of the pesticides.

Preventative testing is a valuable investment in ensuring that water quality does not compromise turf quality and sustainability.

CSIRO EXPERIENCE

I recently had the pleasure of spending time with Robin Bedding from the C.S.I.R.O's department of Entomology. I was fortunate to visit the laboratories in Canberra and to discuss with Dr Bedding numerous topics related to EN's, beneficial nematodes and the science behind biological control methods.

Dr Bedding is an inspirational scientist that has developed biological controls for the Sirex Wood Wasp, white ants and in more recent times the EN's which are used in turf to control scarab larvae, stem weevil and other insect pests.

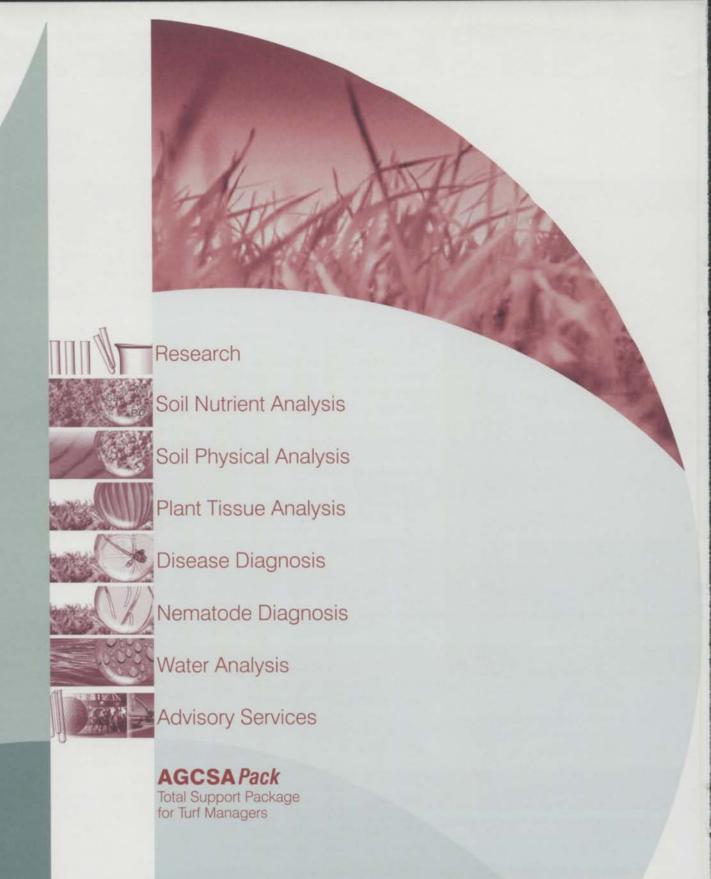
The visit highlighted several important points;

- To develop an effective biological control agent requires years of detailed research.
- 2. From research laboratory to production also involves a dedicated research and development program.
- 3. Refinement and improvement of the product requires ongoing research.
- 4. There are many other possibilities for developing biological control agents

I was amazed at the detail required in not only developing the EN's, but also understanding their biology and physiology. This includes; measuring fat levels in the nematodes and relating it to their efficacy; the symbiotic relationship with a strain of bacteria specific to these nematodes; the breeding of a particular moth larvae as a source of food during production and the selection of new and more efficacious strains.

Seeing all this in action makes you question the science behind many of the "bugs in a jug" fix all concoctions marketed in the turf industry. It also increases your understanding of why there is a lack of success in using some of these products.

The EN's do work. However, when using a living product it is very important that the application methodology is followed. It is also important to continue to monitor your pest levels (as with any IPM program)





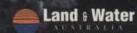
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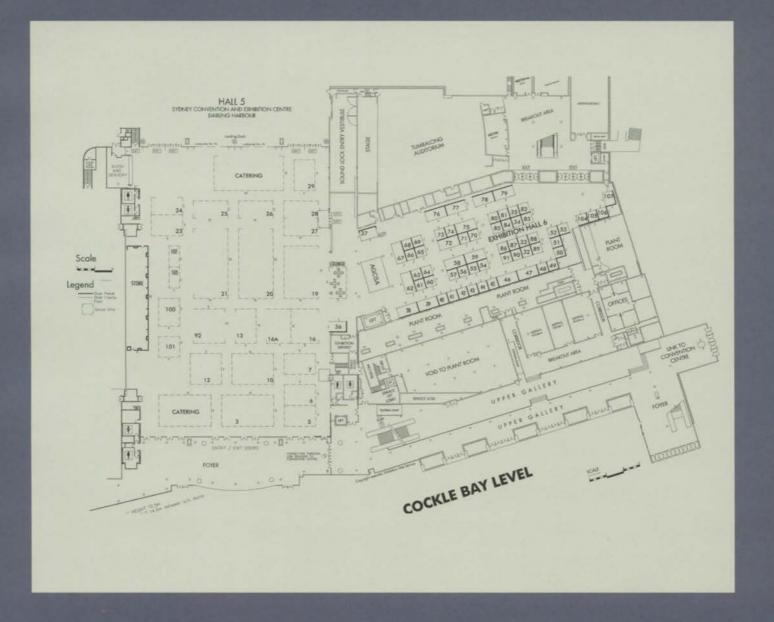








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17TH AUSTRALIAN TURFGRASS **CONFERENCE PROGRAM**

Sunday June 17th

AGCSA Award Judging - All Seasons Darling Harbour

Monday June 18th

Morning AGCSA Golf Championships: The Lakes Golf Club. Presented in partnership with the Toro Company

5.00pm Opening Session, AGCSA Awards Presentation Ceremony Tumbalong Auditorium, Sydney Convention Centre

6.00pm Welcoming Cocktail Reception - Presented in partnership with Rain Bird Sydney Convention Centre Ballroom Foyer

Tuesday June 19th

All Sessions to be held in Tumbalong Auditorium

9.00am Keynote Address

"A National Approach to Water System Efficiency

and Sustainability'

Duncan Malcolm, Chairman, Irrigation Association of Australia

Tumbalong Auditorium

10.15am Morning Tea

10.45am Every Drop Counts - Open Forum

Panel members include: Greg Muir NSW EPA; Alan Gregory, Sydney Water; Andrew Campbell, CEO, Land and Water Resources Research and Development Corporation; John

Neylan, AGCSATech, Nic Moschis, IAA

12.15pm Lunch

1.00pm AGCSA Award Winners Presentations - Award winners talk about their nominations / applications, their careers, their golf courses, their employers, and their future aspirations.

3.30pm

4.00pm Eco-Efficiency in Golf Course Management

A joint presentation by Frouke de Reuver, NSW Environment Protection Authority Dave Thompson, Pesticides Division, NSW Environment Protection Authority, Julian Thompson, Operations Department, NSW Environment Protection

Authority John Neylan, AGCSATech

4.45pm Close

Wednesday June 20th

All sessions in Tumbalong Auditorium Trade Show Opens at 9.00am: Entrance via Hall 6

The Superintendent and Committees - Open Forum 8.30am Chairman: Martyn Black, GCS Castle Hill Country Club Peter Smith, Craig Easton, Roderick Hetherington; Carnarvon Golf Club

10.30am Morning Tea, Trade Show, Lunch Exhibition Halls 5 and 6

12.30pm Research Wrap Up

"Biological Products Research Update" - Andrew Peart,

Turfgrass Technology

"The Efficiency and longevity of Typha spp as a nutrient remover in a golf course environment" - Mark Couchman, Course Superintendent Tewantin Noosa Golf Club "Sand and Gravel Bridging Factors" - Peter Speight,

Benedicts Sand

"A study of the dominant bent (Agrostis spp.) cultivars of selected greens of the Royal Adelaide Golf Club" Daryl Sellar, Course Superintendent, Glenelg Golf Club



Trade Show and Afternoon Tea

Exhibition Halls 5 and 6

3.30pm "Architects as Part of a Team"

Presentation from the Society of Australian Golf

Course Architects

AGCSA Annual General Meeting 5.30pm

Tumbalong Auditorium

Thursday June 21st

All Sessions in Tumbalong Meeting Rooms Level 2, Convention Centre Trade Show Opens at 9.00am, Closes at 3.30pm

Entrance to Trade Show via Hall 6

8.00am Workshop 1A - Tumbalong Meeting Room 1

"Preparation of Planning Applications for Golf Course Redevelopment" Greg Britton, Patterson Britton & Partners

Allan Gear, Patterson Britton & Partners

Workshop 1B - Tumbalong Meeting Room 2

"Flora and Fauna Surveys" Greening Australia

10.00am Trade Exhibition, Morning Tea and Lunch

Exhibition Halls 5 and 6

12.30pm Workshop 2A - Tumbalong Meeting Room 1

"Total Assett Management using CAD and GPS"

Paul Jones, Paul Jones and Associates

Workshop 2B - Tumbalong Meeting Room 2 "Water Management" - John Neylan, AGCSA Tech

Trade Show & Afternoon Tea. 2.30pm

Exhibition Halls 5 and 6

3.30pm Trade Show Close

Workshop 3 A - Tumbalong Meeting Room 1 3.30pm

"Salary Packaging " - Gerry Power, Power Planning

Workshop 3 B - Tumbalong Meeting Room 2

"Profile of a Golf Course Builder"

Allan Maw, Tony Maw, Andrew Purchase - Greenmaw

6.00pm Pre-Dinner Drinks

6.45pm Conference Dinner

Harbourside Room, Sydney Convention Centre

Friday June 22nd

All delegates please note that dress regulations apply for Turfgrass Tour. All delegates must have sports jacket for luncheon at Ryde Parrammatta Golf Club.

7.00am Turfgrass Tour Departs All Seasons Darling Harbour - note dress regulations above

Turfgrass Tour Departs Novotel Darling Harbour- note dress 7.15am regulations above

Tour visits Stadium Australia, Concord Golf Club, and Ryde Parramatta Golf Club

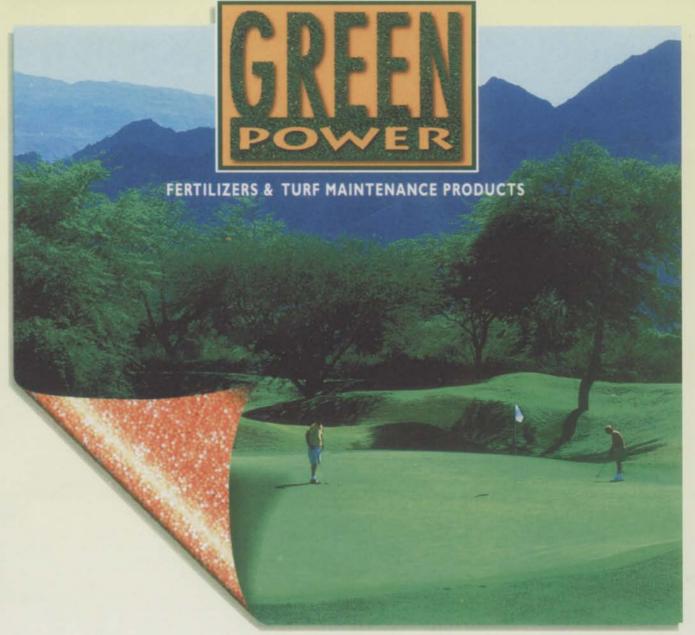
Tour includes Luncheon and Keynote Presentation " The Reconstruction of the Ryde Parramatta Golf Course" by Golf Course Architect Ross Watson

Tour returns at 3.00pm

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Exhibitor Listing - 17th Australian Turfgrass Conference

Exhibit # 88 - ABULK

Abulk Pty Ltd is a Sydney based wholesale nursery and turf farm providing quality turf and ornamental native grasses, wetland plants and native trees and shrubs to golf courses Australia wide. Our range of turf includes Nioaka, a native lawn to Sydney, Melbourne, Brisbane, Adelaide and more. This lawn requires little mowing and can be mown tall or short, making it flexible lawn for the rough. Palmetto Buffalo, the versatile grass, is a hardy, low maintenance grass. Its tolerance to drought and cold, resistance to disease and adaptability to moderately shaded areas means this lawn is ideal for any golf course. Also specializing in ornamental grasses native grasses means we have a wide range of suitable grasses for golf courses, including some new varieties. One of our newest varieties we have released is Pennisetum alopecuroides 'Nafray'. Nafray has a beautiful cream purple seed head, which flowers for a long period of the year from December to May. Another we have available is Poa labillardieri 'Eskdale'. Eskdale has proven to be our most popular grass with golf courses. This 'Big Blue' tussock not only looks better than its common form, but it also suppresses weeds much better. This is only a brief rundown of what we have available for golf courses. For further information and availability, please do not hesitate to contact our office on (02) 4577 5912, or see us at stand 89.

Exhibit # 86 - AGRICHEM

Agrichem Manufacturing Industries is Australia largest and leading manufacture of liquid turf fertiliser. Their ranges of specially formulated NPK, trace element and organic products are the industry leaders. Nitro Iron, Nitro Iron, and Kelpak are an important component of many turf Professional's nutrition program. Agrichem's commitment to research and development has seen them involved in many industry trials. Currently Agrichem is involved as part of the industry research and trials of organic products. Kelpak was also one of the products that was involved in the research into nematode management and know provides a leading alternative in the management of nematode problems.

A complete range of foliar and fertigation products are available through Agrichem and its distributors in each state. These products include: EDTA chelates, the most stable of all chelates in the market, like Supa Iron and Supar Cal; clear liquid NPK formulations suitable for foliar applications and Groflow high analysis suspension concentrates with Humic Acid suitable for fertigation. Along with the largest range of liquid fertiliser products in the market, Agrichem provides the industry with in filed support second to none. They have 11 field representatives to support distributors and end users across all states in Australia and also encourage turf professional to directly contact their key research people at their head office in Brisbane. Agrichem are the nutrition experts!

Exhibit #86 - AGRITURE

"At Agriturf Environmental, we support clients in providing excellent recreational and landscaping facilities through innovation, quality and environmental responsibility."

This is achieved from understanding what clients want to achieve and then delivering solutions in line with your objectives.

Based on working closely with you, Agriturf Environmental will design environmentally responsible and sustainable soils systems, including the use of leading products and management strategies. These are ment to be:

- Economical which means that the knowledge we build into our designs means long term benefits and lower maintenance costs – economic good sense
- Safe we design systems to be as safe as inherently possible for those who work with them, and supply the right protective gear and advice to manage any hazards which arise.
- Sustainable we design systems for "the long run" systems that will sustain good turf and plants in the face of seasonal stresses, year in, year out
- Responsible we value the quality of water, and the hidden costs of waste and degradation. Our designs aim to preserve water and soil quality.

Our products are chosen for quality. They will be products that can only enhance our reputation, never harm it.

Exhibit # 90+91- ALPINE NURSERIES

Alpine Nurseries and Hortex Australia. Alpine Nurseries is Sydney's leading grower of quality wholesale plants. Producing an extensive range of plants in sizes from 200mm to mature trees, Alpine has the stock you are looking for and the quality you expect. Alpine Nurseries has been producing quality stock for over 30 years and supplies to golf courses, government departments, local councils, developers and landscape contractors to name but a few. Alpine nurseries will be displaying a range of trees and shrubs that showcase their quality stock and will be distributing copies of their 2000/2001 Multimedia CD ROM (not to mention a few freebies!). So come and say G'dayl Do you have problems not getting water into your turf? Do you have problems keeping water in the root zone of your turf? Are you looking to improve your organic content in the sand / soil combinations you use? If so, Hortex Australia may be able to help. We are dedicated Horticultural company providing new and innovative solutions in water management, plant nutrition and pest control. Market leading products like MoisturAid, RainSaver, SprayFast, CLC, Seasol to name a few are all used by Turf Professionals throughout Australia and abroad with great results. See us on our stand in Sydney or contact 767 or Freephone: 1800 737 email hortex@ozemail.com.au. Contacts Rick Keene, Rob Reynolds.

Exhibit # 28 - ANTONIO CARRARO OCEANA

Antonio Carraro Oceania is a subsidiary of the Antonio Carraro factory in Italy, which produces compact 4WD turf tractors that offer a number of benefits over conventional tractors in their field. Low ground pressure, hillside safety, reversibility, multi-functionality, excellent visibility, and shorter working times are all features of Antonio Carraro tractors. Models range in horsepower from 36hp to 83 hp and include both mechanical and hydrostatic transmissions. Suitable for maintenance and renovation work in parks, sports grounds, golf courses, racetracks, Antonio Carraro tractors have been responsible for some of Australia's most famous turf, including the M.C.G., Colonial Stadium, Royal Sydney Golf Course, Randwick Racecourse, and even Stadium Australia. With a range of implements such as reel mowers, finishing mowers, turbine collection system with hopper, front-end loaders, and others, Antonio Carraro provides the complete package of a versatile utility tractor capable of carrying out numerous functions in any turf application.

Exhibit # 45 - ARMSTRONG TYRES

Trelleborg Tyres have on display a wide range of tyres suitable for all turf-care applications. Tyre sizes from 65mm to 850mm wide with a large variety of tread patterns available for an array of applications. Trelleborg have tyre options for use on the decks of out front mowers taking care of the highest quality greens to the largest horsepower tractors in use in the industry, as well as high speed flotation tyre options. Trelleborg tyres are able to provide the necessary flotation and traction required for high quality finishes while doing so without disturbing the lawn surface and root structure. Operating pressures of as little as 5psi ensure that soil compaction is kept to a minimum. operator comfort is improved and wear and tear on vehicles is reduced. The ability to operate machinery in very wet conditions without leaving ruts and creating excessive soil compaction is the biggest feature of equipment fitted with Trelleborg Flotation Tyres. With global experience supplying turf producers, carers and subsidiary markets, Trelleborg Tyres are able to meet all of the various industries needs with the backup and service professionals require and expect.

Exhibit # 34 - ARTHUR YATES AND COMPANY

Yates Ltd will display a range of products from fertilisers to new chemicals, and all specific to the Australia's turf industry. The predominant feature on our display will be the complete range of Dynamic Lifter products. Dynamic Lifter is Australias No.1 selling organic fertiliser/soil conditioner, and we will have staff on hand to explain the benefits and rates for the complete range. Also at the Yates Ltd stand will be a new and exciting product called SURRENDER, which in its short life has already become the smart choice of many Professional Turf Managers. SURRENDER is the new safe alternative for the control of moss and algae on all types of turfgrass areas. Also on display will be the range of FLORANID SLOW RELEASE turf fertilisers from BASF in Germany. These are great cost effective turf specific fertilisers that are available in many different NPK ratios and prill sizes to suit all turf applications. Yates are proud to also introduce Australia's only CERTIFIED ORGANIC LIQUID LIME and DOLOMITE These products make applying lime easy and more importantly, accurately and safely. We look forward to catching up with everyone as they come in and have a look at the Yates Ltd stand and display.

Exhibit # 37 - ASPAC GOLF AND TURF

Aspac Golf and Turf (previously Land Pride Australia) welcome delegates and encourage you to stop by our display where we will have the complete range of Genuine BUSH HOG BEDKNIFES that have very quickly established themselves as THE quality alternative to the original, and non genuine bedknifes for greens mowers of all designations.

For those who are still to try these well performing bedknifes, here is your chance to see them up close. Released for the first time will be the TORNADO TM360. DEBRIS BLOWER, a highly effective unit due to the unique blast intensifier, and the quietest debris blower on the market, enabling its use in built up residential areas. Anyone considering a debris blower should stop by for a look, and when you like what you see, arrange for a demonstration on your turf. The AERA-cator, our most popular product will also be on display, this extremely versatile and popular unit for broad acre aeration is suitable for a majority of turf aeration applications, is ideal for hard ground, bare or fully grassed areas, and can even convery to an overseeder. Stop by to discuss your aeration problems with us.

Exhibit #73+74 - AVENTIS ENVIRONMENTAL SCIENCE

Chipco the Turf division of Aventis Environmental Science continues to offer professionals in the Australian Turf industry commitment and support. Aventis Environmental Science has an unprecedented range of products supported by extensive research and development. Chipco delivers innovative and affordable integrated turf management strategies and tools that perform effectively, efficiently and in an environmentally sensitive way. Chipco continues to invest considerable resources into the development of new products ideally suited to the Australian market. We have a dedicated development team who are looking at new technologies which will improve the efficacy of products, and take into consideration new pests and changed climatic conditions. Those involved in turf management, now know that economics often dictate programs, but most have also learnt that taking shortcuts is not sustainable in the longer term. Chipco sees the sustainability of the industry as an essential element - this is why we continue to sponsor the AGCSA Claude Crockford Environmental Award. This award recognised outstanding contributions to the natural environment. It is designed to enhance the reputation of turf managers as responsible caring custodians of the natural environment. Aventis Chipco staff all look forward to congratulating the 2001 winner. Our Environmental Science team has an amazing depth of experience and knowledge. The team is made up of both former entomologists, regulatory and field personnel, who have unparalleled experience in the domestic, agricultural and industrial markets. We look forward to seeing you at the Aventis Chipco Stand in Sydney.



Prize includes domestic airfares, transfers and taxes. Conditions apply.

Name:

Employer's Name:

Exhibit #3 - TEXTRON TURFCARE

Q1. How many batteries are used in the Ransomes "E" Plex II Electric Triplex Greens Mower?

Exhibit #5 - COUNTRY CLUB INTERNATIONAL

Q2. How wide is Environists new Spray Dome?

Exhibit #6 - REDEXIM CHARTERHOUSE

Q3. How deep can the biggest model Verti- Drain penetrate?

Exhibit #7 - DGE

Q4. What is the main feature of having the inner insert in the deluxe D Putting Cup?

Exhibit #8 - GWS MACHINERY

Q5. What is the highest horse power available on a Kawasaki Mule?

Exhibit #10 - TURF LINK AUSTRALIA

Q6. What is the model # of the new Lastec Diesel Articulator Mower?

Exhibit #13 - HARDI SPRAYING EQUIPMENT

Q7. How can you ensure both operator occupational health and safety as well as minimal environmental pollution when spraying?

Exhibit #164 - GREENCARE INDUSTRIES

Q8. Name Greencare's newest product

Exhibit #19 - NUTURF

Q9. What is Nuturf's new corporate brand?

Exhibit # 20 - TORO AUSTRALIA

Q10. What does Toro's N.S.N. stand for?

Exhibit #21 - JOHN DEERE

Q11. How can you win a trip to play golf at Grayhawk Country Club in Arizona through John Deere?

Exhibit #23 - SILVAN PUMPS & SPRAYERS

Q12. What is the name of the hydraulically driven pump on the Silvan Trailed Turf Sprayer?

Exhibit #24 - BEST / Simplot

Q13. What is UMAXX?

Exhibit #24 - TURECARE NSW

Q14. How long has Turfcare NSW been operating in NSW?

Exhibit #25 - M. COLLINS AND SONS

Q15. How old is the oldest piece of machinery on M. Collins and Sons exhibit?

Exhibit #26 - CLUB CAR

Q16. What is the load carrying capacity difference between a Carryall Turf 2 and a Carryall Turf 272?

Exhibit #27 - HONDA MPE

Q17. What milestone did the Honda racing division achieve in the year 2001?

Exhibit # 28 - ANTONIO CARRARO

Q18. What is the ground pressure exerted by the Antonio Carraro TTR 4400 HST reversible turf tractor?

Exhibit #30 - TRU-TURF EQUIPMENT

Q19. What five model walk behind greens mowers can be carried on the new MT2000 greens mower trailer?

Exhibit #32 - TRIODIA

Q20. In which year was 'Plateau' couch granted Plant Breeder Rights?

Exhibit #33 - HG TURF

Q21. Name HG Turf's turf replacement system

Exhibit #34 - ARTHUR YATES AND COMPANY

Q22. What is the name of the feature product on the Yates stand?

Contact #:

Exhibit #35 - HYDRO-PLAN

Q23. How many golf courses have Hydro-Plan provided a design service for in NSW?

Exhibit #36 - JFB AGENCIES

Q24. What is the network range of Safety Communication's solar powered emergency intercom?

Exhibit #37 - ASPAC GOLF AND TURF

Q25. What will Aspac Golf and Turf launch for the first time in Australia at the show?

Exhibit #38 RHS - STRATA GROUP

Q25. Name the product Strata Group is introducing to the Australian turf market?

Exhibit #38 LHS - TRADITIONAL LINKS CONSTRUCTION

Q27. Name the latest golf course project Traditional Links has worked on?

Exhibit #39 - PRIMAC ELDERS

Q28. What is the name of the manufacturer of Liquid Foliar Fertilizers on the Primac Elders Stand and name one of their products?

Exhibit #40 - BETTER METHODS

Q29. Spell Don's Surname

Exhibit #41 - JH WILLIAMS & SONS

Q30. What is the name of the J.H. Williams new turf seed product line?

Exhibit #43 - BENEDICTS SAND AND SOIL

Q31. How many tonnes of sand did Benedicts supply to the Randwick Racecourse reconstruction?

Exhibit #44 - PATONS FERTILISERS

Q32. Name one of the new turf fertilizer range recently released by Paton Fertilizers.

Exhibit #45 - ARMSTRONG TYRES

Q32. A main feature of the Trelleborg Flotation Turf Tyre is it's ability to run at very low inflation pressure, True or False?

Exhibit #46 - ORARA TURF

Q33. Where is Orara Turf based?

Exhibit #47 - HERITAGE SEEDS

Q34. What is Michael Reese's golf handicap?

Exhibit #48 - GLOBE

Q35. What is Globe's target?

Exhibit #49 - ORGANIC CROP PROTECTANTS

Q36. How many cfu/gram of Trichoderma does Trich-A-Soil contain?

Exhibit #50 - BARMAC INDUSTRIES

Q37. What colour is Barmac's New Lake and Pond Colourant Loch Ness?

Exhibit #52 - CONVAULT AUSTRALIA

Q38. Where is Convault Australia based?

Exhibit #53 - ENVIRO LINKS DESIGN

Q39. Name the latest golf club to use EnvrioLinks as the golf course designer?

Exhibit #54 - TYCO FLOW

Q40. Name the Tyco Flow's new multiple pump control system?

Exhibit #55 - GREENMAW

Q41. How long has Greenmaw been in operation?

Exhibit #56 + 57 - DRAKE EXTRUSION

Q42. What is the latest stadium to be constructed using Loksand?

Exhibit #58 - HUNTER INDUSTRIES

Q43.On the Hunter Golf 800 Reries Rotor, which of the following components can be accessed without using a shovel? (circle); internal gear drive, control valve, pilot valve, adjustable pressure regulation, valve seat, rock screen, solenoid coil, wire connection, all of the above.

Exhibit #59 - ECOGROW

Q44. What organism has recently come into the turf market that is a biological control against insect pests?

Exhibit #60 + 61 - TURF & IRRIGATION

Q45.What is the brand name for T&I's successful range of soluble fertilisers?

Exhibit #62 - KURUNDA MANUFACTURING

Q46.How many different countries have Kurunda sold 'Whale Super Soppers' to?

Exhibit #63 - PAUNA TURF AERATION

Q47.What machine "massages" your soil like no other on the Pauna Turf Aeration stand?

Exhibit #64 - GRADEN INDUSTRIES

Q48.Which model of Graden Verticutter is used by Augusta National Golf Course in the USA?

Exhibit #67 - RAINMAN CONTROL SYSTEMS

Q49. What does TWIN stand for in RAINMAN TWIN?

Exhibit #68 - COLIN CAMPBELL CHEMICALS

Q50.What Campbell product should pythium be afraid of?

Exhibit #69+65+66 - GOLF AND BOWLING MACHINERY

Q51.Name the new system to be released by Golf and Bowling Machinery at the show.

Exhibit #70 - SCOTTS AUSTRALIA

Q52.Who won the Scotts sponsored state teams touch football competition?

Exhibit #71 - TURFCRAFT INTERNATIONAL

Q53.What is the special subscription price offered at the turf conference by TurfCraft International?

Exhibit #72 - DINT AUSTRALIA

Q54.Which company who manufactures putters and green-keeping equipment made the gold plated trophies for the 2001 AGCSA awards?

Exhibit #73+74 - AVENTIS

Q55.What Chemical Grouping do the 3 following Fungicides fit in?

- 1.Chipco Royral Green
- 2.Baycor Turf
- 3.Chipco Spin

Exhibit #75 - OASIS TURF

Q56.What are the 2 products Oasis Turf are advertising in the conference edition of ATM?

Exhibit #76 - BHM MACHINERY

Q57.What size mini-types would be used to aerate a green?

Exhibit # 77 - MULTIFERT/HAIFA CHEMICALS

Q58.What is the name of Haifa's turf fertiliser range?

Exhibit 78 + 79 - RAIN BIRD

Q59.How many years since Rain Bird released EAGLE ROTOR range?

Exhibit #80+81 - MAXWELL AND KEMP

Q60.When was Maxwell and Kemp formed?

Exhibit #82 - INDUSTRIAL MOWERS

Q61.How long has Scott Bonner Queen Mowers been manufactured in Australia?

Exhibit #83 - THE GREEN HORTICULTURE GROUP

Q62.What is the ground pressure of The Green Horticulture Group's Uni Mog topdresser?

Exhibit #84 - SUPATURF

Q63. What is SupaTurf's magic product?

Exhibit #85 - PAUL F. JONES & ASSOCIATES

Q64, What is D.G.P.S. an abbreviation for?

Exhibit #86 - AGRICHEM

Q65.When referring to chelates what does EDTA stand for and how many ligands of protection does it provide the ion?

Exhibit #87 - WINDSOR TURF SUPPLIES

Q66.Name Windsor Turf's new couch variety.

Exhibit #88 - WATERCORP

Q67.What measurement system does the Aquaflex Sensor use?

Exhibit #89 - ABULK

Q68.What is the name of the new native turf that requires much less mowing and is ideal for golf course roughs?

Exhibit #90+91 - ALPINE NURSERIES

Q69.Which Hortex product is a critical ingredient in all soil mix used by Alpine Nurseries?

Exhibit #100 - MANOEUVRE MOW

Q70.Name the new Koro machine displayed by Manoeuvre Mow?

EXHIBIT #101 - EVERGREEN TURF

Q71.Which AFL team does Rob Davey barrack for?

Exhibit #105 - KENDON CHEMICALS

Q72. How do you spell probiotic?

Exhibit #106 - RYDE COLLEGE OF TAFE

Q73.What is the name of the head Turf teacher at Ryde College?

Exhibit #102 - AGRITURF

Q74.Name Agriturf's newest product?

Exhibit #103 - TURF MACHINERY AUSTRALIA

Q75. How wide are the TR50 / TR74 Turf Renovators?

Exhibit #107 - IMECO PTY LTD

Q76.Where is the VARIas company located?

Exhibit #16B - YAMAHA

Q77.By what name are Yamaha's golf car range known?

Exhibit #31 BSF - GOLF MANAGEMENT

Q78.On what date did BSF Golf Management move into its new Bayswater premises?

Exhibit #29 - OPEC

Q79.What is Landa's new bioremediation system called?

How may times does Sid appear this edition of ATM?

Completed answer forms must be submitted at AGCSA booth by 3pm Wednesday 20th June 2001.



AGCSA

Where the Action Is II

The focal point of the trade show will be the AGCSA exhibit. Here you can:

- Meet fellow turf managers and Discuss the latest turf management strategies
- See the latest testing techniques used to solve your turf problems.
- · Access the new AGCSATech soil testing kits.
- Hear how to have your existing skills recognised with an AGCSA Qualification.
- Learn how to access the world wide web through AGCSA Online web site.
- Study the comprehensive display of turf management books on offer through the AGCSA Bookshop
- . Discover the careers open to turf managers
- Read the latest edition of Australian Turfgrass Management Magazine
- · Purchase the latest AGCSA workwear
- Talk to an AGCSA Board or staff member about what you would like the AGCSA to be doing on your behalf.

Exhibit # 50 - BARMAC INDUSTRIES

Barmac Industries was established in 1955 to develop high quality products for some of the smaller areas of the chemical industry, focusing on innovation and service. Barmac began formulating a wide range of commodity and specialty herbicides, fungicides, pest control products and fertilizers. Satisfied clients spread the word and our reputation grew. Soon professionals in the golf course and bowling club markets as well as other areas of amenity horticulture asked for help with their particular problems. Barmac took the challenge and developed a group of fertilizers and pesticides which met the declared needs of sporting and recreational turf. The Barmac brand name is now known for high quality and innovative products, clever products for Australian conditions. Throughout, Barmac remains a private family company with 100%

Australian ownership

Barmac chooses the best products of our own development, integrates them with trusted and familiar commodity products developed years ago but which still have an important place in professional programs and now markets those with exciting new proprietary products designed to overcome the most difficult problems facing industry. Visit our stand and find out about products for golf courses all over Australia. Drop your card in the CLEAR container and you are in the draw to take home elegant crystal drinkware.

Exhibit # 43 - BENEDICT SAND AND GRAVEL

Benedict Sand and Gravel is a Sydney based, family owned and managed Mining and Resource Company. Established in 1966, it grew from a Haulage Contractor to become one of the largest resellers of Quarried and Recycled materials in NSW. In 1978 the Company entered mining by acquiring a large sand resource at Chipping Norton and thereupon embarked on a course of expanding its resource base that continues today. Recently we acquired the extraction rights to a large sand deposit at Mittagong that will provide quality sand into the Sydney market for the next 30 years.

In regards to the sports-field industry Benedict Sand and Gravel has been a major supplier of all your requirements for over thirty years. Some recent projects successfully completed included:

- •Hawkesbury Racecourse @ 10 000t Sand (January 1999)
- Par 3 Golf Club
 Total Construction (January 1999)
- Macarthur Grange Golf Club
 Total Construction (January 1999)
- · Randwick Racecourse
- @ 20 000t Sand (January 2000)
- Oatlands Golf Club
 Total Reconstruction (December 2000)
- . Many individual Golf and Bowling Greens Constructed

- Major Supplier to many Local Governments for all material requirements
- Major Supplier to the Sydney Olympic 2000 Site at Homebush
- *Developer of 'Structural Soil'

Benedict Sand and Gravel also has fully qualified Agronomists and Horticulturalists to assist you with any queries that you may have. We look forward to seeing you at the show.

Exhibit # 40 - BETTER METHODS

Better Methods range of hand tools would be familiar to most people in the turf care industry. However there are always improvements being made & new products introduced. BMS products are featured in the catalogues of most major distributors around the world, but they are all manufactured right here in Sydney. We have distributors covering all parts of Australia & New Zealand. If you are not sure who sells BMS tools in your area please contact us. Our aim is to make the tools available wherever golf is played. Come & talk to us about your hand tool needs. As the master distributor for Standard Golf Company we carry a comprehensive range of accessories & maintenance tools. Pick up the latest catalogue from Standard Golf Company. There are always new items being added to the vast range that Standard Golf carry & we have some of the latest on show this year. The new Tour Cut Hole Cutter will be available in limited quantities as will the Flag Stick Caddie. Both of these will be on show for the first time in Sydney. Also remember to check out the Weed-Pro weeding wand for those spot weeding jobs. As manufacturers & importers we value the opportunity to hear from the users of our products.

Exhibit # 76 - BHM MACHINERY

As a turf grass professional, it is your job to ensure that the greens, grounds and race tracks are kept at their finest all year round. The Soil Reliever can help you accomplish this. The Soil Reliever Deep Tyne Aerator is the only specially



Exhibitor Listing - 17th Australian Turfgrass Conference

designed aerator on the market. With features such as on the go depth adjustment, straight tyne arms and split driven crank, it makes the Soil Reliever fast, efficient and effective, with very low maintenance. There are five models of Soil Relievers to choose from. The first is the SR4B, ideal for golf courses wishing to aerate greens, tees, surrounds and fairways. The 60", 72" and 80" models are all designed for heavy duty aeration on fairways, playing fields and race tracks, yet are delicate enough to aerate greens. Then there is the Rhino 54" aerator, which is designed specifically for the aeration of greens and tees. All Soil Relievers have the ability to fit both solid and coring tynes.

Exhibit # 31 - BSF GOLF MANAGEMENT

Machinery management and turf management contracts, sales, service and repairs.

BSF Golf Management Pty. Ltd. (formerly BSF Commercial Mowers and Golf Course Management Systems), operates a number of five year machinery management contracts. This concept has been developed in Australia by the Company which currently has 14 golf clubs on contracts, under which BSF provides, new, all of the dedicated machinery under a fixed term contract. Regular weekly maintenance service is carried out, with all parts and labour included in the monthly contract price. The company is also gaining a reputation for its high quality turf management contracts at public golf courses; it currently operates six such contracts, the aim of which is to offer reasonably priced, superior quality turf management for the green fee golfer, BSF is also the premier Australian provider of: Sales of quality reconditioned turf machinery; On-site service and repairs to turf machinery; Sale of spare parts; . Professional advice on all brands of turf machinery For obligation free quotes, call BSF GOLF MANAGEMENT PTY. LTD. 22 BRUNSDON STREET. BAYSWATER, VIC 3153 AUSTRALIA TEL: 03 9738 2433 FAX: 03 9738 2455Email: bsfgolf@bigpond.com Website: www.bsfgolf.com.au.

Exhibit # 26 - CLUB CAR

Club Car will have a full range of Turf Utility Vehicles at the Turfgrass Conference including Turf 1, Turf 2, Turf 6, Turf 2 x RT and Turf 272. Club Car will be able to offer unheard of deals to Superintendents looking to purchase products at the Trade Show.

Exhibit # 68 - COLIN CAMPBELL (CHEMICALS)

Stand 68 at the 17th Australian Turfgrass Conference is home to one of Australia's oldest dedicated Turf chemical suppliers – Colin Campbell (Chemicals) Pty Ltd. We are pleased to have the conference back in Sydney and invite everyone to visit our stand.

What you'll find on our stand may impress you, may teach you or just give you a chance to meet our staff. Some of the products showcased will be our two new fungicides, Goldazim and Cyon. Both products continue what Tridim started, which was that quality systemic fungicides don't have to cost the earth. On our shelves you will also find many Technical bulletins that may give you further insight into the Campbell product range.

So come along, visit our stand, see our new products as well as those that have become part of everyone's chemical shed, or just have a chat to our staff and both of us may learn something. In the meantime, enjoy all that Sydney and the conference have to offer.

Exhibit # 52 - CONVAULT AUSTRALIA

Convault above ground fuel storage tanks are manufactured in Ballarat by Convault Australia. The Convault tank employs a new technology for the safe storage of flammable and combustible liquids, above ground. The specific purpose of this product is to overcome the environmental problems associated with leaking underground storage tanks and the hazards of unprotected above ground storage tanks. The added advantage is being able to store two liquids in one dual storage tank that is fully portable. This technology incorporates a steel tank surrounded by 8mm of polystyrene insulation and sealed within a polyethylene

geomembrane which itself is surrounded by a 150mm thick concrete monolithic vault. The polyethylene geomembrane acts as a secondary containment and as such, prevents any liquid from escaping should in fact, the tank ever leak.

As a result of using a Convault product, the following equipment is not required:

- •An external concrete compound to AS 1940
- *An external bund to AS 1940
- ·A roofing arrangement to cover the compound
- A pump and filter arrangement to separate the fuel and water from the compound

Exhibit # 5 - COUNTRY CLUB INTERNATIONAL

Country Club International are the major Australian suppliers of golf range equipment from Europe and USA plus specialist suppliers of environmentally friendly chemical spray equipment, 3-point linkage quick hitches, environmental chemicals, netting for impact and high safety screens, golf course signage and rubber paving. Companies represented include Range Servant Sweden, Redden Netting USA, Pro Turf Golf Mats, Enviromist, Soll Zyme. Flexitect Pacific, Netting Australia, Groovy Signs, Derone Enterprises USA, Triangle Hitch Norway, Herbi Spayers and a range of associated lines. Offices are based in Melbourne and the Gold Coast with agents in Singapore, Hong Kong, NSW and South Australia.

Contact Greg Walker on (03)9570-2202 or 0417 317 194 or Mike Baker on 0418314417.

Exhibit # 7 - DAVID GOLF AND ENGINEERING

DGE David Golf and Engineering started operations in 1955 making the now famous 'David' Ballwasher. Through THE 60'S, 70'S AND 80'S DGE cemented its position as Australia's leading manufacturer and supplier of golf course and driving range equipment by expanding its range and constantly upgrading and updating its products and services.

From 1992 – 2001 DGE has grown three fold as we have continued to upgrade and expand our range, including opening and office in Sydney, New South Wales (1998).

Our Golf Course Hardware and Accessory products range from putting cups, flags, ballwashers, holecutters to all the necessary signage, litter bins, bunker rakes and in fact total over 100 items. We further expanded our range of product by becoming the official distributor of the complete E-GO range of golf carts and utility vehicles in Victoria and New South Wales. For the driving range we supply balls and a variety of mates, large capacity ball washers, ball pickups, dispensers and more. DGE currently supplies to virtually all the 1,800 golf courses in Australia and have expanded our dealings throughout South East Asia, in particular Singapore, Malaysia and Thailand over the last three years.

Please visit our stand number 7, Our biggest yet! Looking forward to seeing everyone at the AGCSA Trade Show.

Exhibit # 72 - DINT AUSTRALIA

Dint Australia has been manufacturing and supplying golf course equipment to golf courses for over 12 years. Recently Dint's expansion has been nothing short of phenomenal, both in the putter and green keeping arenas. Dint has branched into all states of Australia. Now sporting the Dint name are courses throughout New South Wales, Victoria, Queensland, Northern Territory, Tasmania, Western Australia and South Australia. Dint equipment is even in the ground at the home of golf in Scotland. The PGA Tour of Australasia also chooses to use Dint Putting Cups, flagsticks, flags, etc on their tour. Daily, orders flood in from courses that have an ever-increasing desire to put Australian made top quality products into their properties. Dint is totally your one stop shop, constantly adding new products for your convenience. See them on their stand to ask about KAB seating, carefree water conditioners and many other new lines.

Exhibit # 56+57 - DRAKE EXTRUSION

Come and see why Loksand was the first choice of stadium construction at Waikato in Hamilton, New Zealand, home of the "Chiefs" Super 12 Rugby team. Talk to us about other stadiums who enjoy the benefits Loksand brings, like:

Optus Oval – Melbourne, Home of the Carlton Football Club (AFL)

Shark Park – Sydney, Home of the Cronulla Sharks League ANZ Stadium – Brisbane, Home of the Brisbane Broncos League

Jade Stadium – Christchurch, New Zealand, Home of the Canterbury Crusaiders Super 12

Carisbrook Stadium – Dunedin, New Zealand, Home of the Otago Highlanders, Super 12

Adelaide Oval, plus the WACA in Perth. For all your golfers – check out these selected courses who enjoy the "Loksand benefit". In Melbourne, Sanctuary Lakes, Cape Shank, Albert Park and Riversdale. Elanora in Sydney and Auckland Golf Club in New Zealand.

Don't just take our word on it, come and meet the team of:

Peter Wadewitz - S.A

Eric Rolle - Tas

Ray Hird - W.A

David Burrup - Qld

Gary Beehag - NSW and ACT

Andrew Burdett - Victoria

Bruce Duperouzel - Victoria

and see why Loksand should be your first choice in rootzone stabilization.

"Loksand - The Stabilizing Influence"

Exhibit # 59 - ECOGROW AUSTRALIA

Ecogrow Australia is the world's leading solid culture manufacturer of entomopathogenic nematodes, and has achieved some spectacular results in the control of insect pests in turf and horticulture throughout Australia. The unique combination of Ecogrow and CSIRO - Entomology has established the best qualified and most highly skilled turf pest research group in Australasia. The relationship has also resulted in the most extensive R & D Program in the use of EN's in the world today. As and IPM company, Ecogrow takes a holistic approach to pest management, beginning with monitoring and taking into account the best of all chemical, biological and environmental controls available. The company has a long term commitment to IPM principles and strongly supports and promotes environmentally sustainable practices. Ecogrow consultants work with clients in developing IPM strategies for golf courses and turf amenity sites, aimed at introducing a balance between improved turf quality and a reduction in environmental damage.

Significant targets for which outstanding results are being achieved include; African black beetle, billbug, Argentine stem weevil, Argentine scarab, red – headed cockchafer and caterpillars. Ecogrow Australia is proudly 100% Australian owned and is developing and marketing 100% Australian Technology.

Exhibit # 53 - ENVIROLINKS DESIGN

Golf Course Architects, Landscape Architects and Environmental Consultants. Enviro Links Design provide to Clubs and Resorts throughout Australia, an integrated golf course consultancy service that blends golf course architecture; vegetation management; landscape design and environmental studies. Jamie Dawson, the firms Managing Director is well regarded in each of these fields. The exhibit illustrates representative examples covering his diverse project experience of over 100 golf course commissions over the last fifteen years. Jamie is a Full Member of the Society of Australian Golf Course Architects and will be at the Conference. Projects have been undertaken at courses including:

 Sydney: Oatlands, Warringah, Cumberland, Chatswood, The Australian, Concord, Wakehurst, New Brighton, Asquith, Palm Beach and Moore Park.

- Regional NSW: Pambula-Merimbula, Mollymook, Wagga Wagga Murwillumbah and Coffs Harbour
- Queensland: Horton Park and numerous masterplan feasibility studies from Cairns to the Gold Coast.
- ACT: Royal Canberra, Gungahlin Lakes, Yowani, Federal, Woodhaven Green and Gold Creek
- · Victoria: Kingston Heath, Brighton and Elsternwick
- · Malaysia: proposed Johor golf resort and estate

The stand will display representative examples of:

Golf course designs, Master Plan reports, Costing studies, Safety audits, Planning submissions, Detailed construction specifications, Comprehensive vegetation management and planting plans, and Environmental studies, Enviro Links Design can integrate golf course architecture, the landscape and the environment. We provide optimal, cost effective, sustainable and manageable courses that are of strategic interest, have visual appeal and are enjoyable to play.

Exhibit # 101 - EVERGREEN TURF

Superior playing surfaces for Sporting Arenas, Racetracks in fact any sporting activity played on natural turf. How do you achieve this? with TURFGRIDS. The Evergreen Group will be displaying at 101 how you can achieve maximum play from your sports facility and producing a surface that is safe and sure footed for players, athletes and thoroughbreds. The Turfgrid System provides multi-use for all sports arenas. With load bearing qualities, excellent drainage and a surface that is described as "firm, level and not too hard". The Turfgrid System out performs traditional sports profiles, with healthy and vigorous root development, increased shear strength, providing an All Weather playing surface second to none both nationally and internationally. Turfgrids have provided successful turf systems for a wide range of applications: Sportsfields, Racetracks, Athletic Tracks, Overflow Carparks and Event Staging Lawns. Recent successful installations have been: Viking Park, Erindale, ACT, York Park, Launceston, Tasmania, Orana Park, NSW. From a full sand base system to sportsfield high wear areas, the Turfgrid System can be tailored to meet your specifications and project requirements.

Exhibit # 48 - GLOBE AUSTRALIA

Globe Australia Pty Ltd is proud to support the AGCSA through our sponsorship of the 17th Australian Turfgrass Conference. The conference name "Every drop counts" has significance for Globe as we are initiating developments in environmental and sustainable turf management practices. Over the past year Globe has introduced a series of technical advancements to our valued turf clients, including the launch of new and innovative products, technical services and our interactive internet site.

New Products:

Fertilizer combinations, turfseed varieties, soil conditioners, bowls & golf accessories are just a few of the product categories that have enjoyed new developments.

Technical Services:

Our soil testing facilities and reporting systems have been upgraded and extended to include greater flexibility for the turf manager. Recommendations suited to local conditions in all areas of Australia have ensured optimum growing conditions for 1000's of turf surfaces Australia-wide. Globe have recently launched a very unique service in the form of a fully accredited site and greens shed inspection and recommendation program for Occupational Health and Safety.

New Internet Site:

Globes new internet site is a state-of-the-art, fully interactive web site that is second to none in the Australian turf industry. At www.globeaustralia.com.au you will find our full catalogue, regular Turf Journals, new products and technology, turf industry events and much more. Recently added to the site is the ability for our clients to enjoy "Online Ordering". The site is developing into a full business-to-business site, so take the opportunity to log onto www.globeaustralia.com.au and enjoy the new technology

that Globe has to offer.

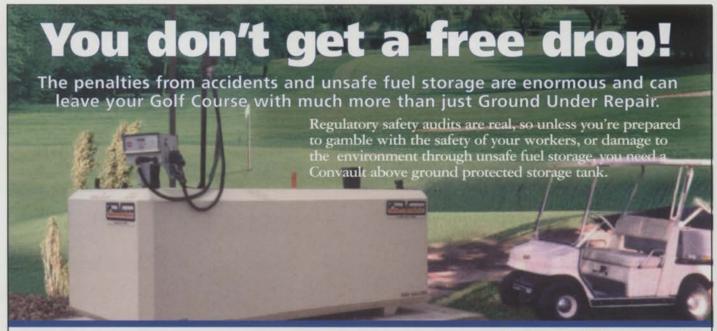
You will find out more by dropping into "The Globe Inn" display at site 48. Our representatives will have plenty of time to talk about what's new for our turf clients, plus assist you with any turf related issues you may have. There is even a competition and prizes to be won, so see you at "The Globe Inn".

Exhibit #65+66+69 - GOLF AND BOWLING MACHINERY

Golf and Bowling Machinery are Australian distributors of Steiner turf equipment. Steiner multi purpose prime movers will accept up to 30 quick hitch attachments, including, 72 Inch outfront deck, 74 and 84 inch gangs, post hole digger, trencher, bucket, power blade, tiller, power landscape rake, and many more. Attachments can be changed in minutes with no tools required. The quick hitch attachment system allows the use of a single prime mover in various, but dedicated applications. Ideal for golf course maintenance, construction, landscaping, or general turf maintenance without the need to finance a fleet of machines. Use one prime mover in conjunction with attachments designed for your applications, and you have your dedicated equipment at a fraction of the cost. Our new release Smoothcut pedestrian mowers are available in 30-24 inch, they have optional 5HP-9HP Vanguard engines, 10-16 blade cylinders, ideal for Cricket Wickets, Lawn Tennis, Greens and a whole range of applications.

Golf and Bowling Machinery in association with Golf Management Systems are pleased to announce the release of Golf Cam. The digitally enhanced system that allows you to:

- · Map your golf course, sporting facility or parklands
- Show committee and members what renovations, improvements or construction will look like
- · Construct, reconstruct or modify
- Add or move bunkers, trees, shrubs, irrigation or structures
- Promote your course on disc.



With some 20,000 units installed throughout the world without a single system failure, it's no wonder 2,000 golf courses have chosen the 'Convault' fuel storage system.

To claim such a record, safety is manufactured into each Convault unit, via its unique method of secondary containment, eliminating the need for external compounds and bunds.

Three reasons why you should choose Convault.

- Two to Four hour fire rating and impact tested.
- · Fully portable for short or long term use.
- · Suitable for either petrol or diesel fuel.

For further information on a variety of Convault systems, contact us immediately.

Proudly Manufactured in Australia by Convault Australia, a joint venture company with Miller Bros. in Ballarat.



106 - 124 Rodier Street Ballarat, Victoria, Australia, 3350 Telephone: (03) 5331 5716

Facsimile: (03) 5333 3456 www.convault.com.au email:convault@cbl.com.au

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Golf and Bowling Machinery have a range of finance options available (TAP), including lease, rental and hire purchase.

Exhibit # 64 - GRADEN INDUSTRIES

The Graden range of Verticutters are becoming known all over the world for their strength, speed, simplicity and quality of cut. On display will be the GS04 Verticutter, a self-propelled walk-behind unit excellent for de-thatching and aerating golf greens and tees, bowling greens, playing fields, tennis courts, in fact any turf area in need of rejuvenation. Also on display is the Graden Swing-Wing Verticutter, a PTO driven tractor mounted machine with a 1.5m operating width designed for large area verticutting. It is Ideal for golf fairways with its semi-articulated cutting heads allowing it to contour to the undulations of a fairway rather than skimming over or scalping your valuable turf. So visit our stand and see for yourself why Graden Verticutters are the hottest equipment in the golf industry today.

Exhibit #16A - GREENCARE INDUSTRIES

One hundred percent Australian owned, manufactures and supplies of turf renovation equipment to the golf course industry. Greencare will be once again displaying its commitment to the AGCSA in this the 17th Australian Turfgrass Conference 2001. For the past 20 years Greencare has been an innovative leader to both the Australian and International markets. With its superior aeration technology Greencare is pleased to display its newest product the Coremaster Precision 1560 to help solve your aeration problems. Whether your priority is depth, speed or accuracy, Greencare has designed this machine to meet your objectives. Achieving depths in excess of 165mm (6 ") at a rate up to 70 000 square feet. per hour. Precision 1560 delivers vertical holes, variable spacings and variable depths. Precision 1560 is designed as a vertical hollow tine aerator and performs equally well with solid tines. Tine sizes range from 6mm to 15mm (1/4" - 1"). Greencare's commitment to ease of maintenance and use has lead to the innovation and development of the first universal tine holder which allows the use of one holder to fit all standard tine sizes whether your needs are solid or hollow. The Greencare booth will also feature the Coremater 6 ECO pedestrian turf aerator. Shattermaster 6/250 deep slicer and of course the legendary Coremaster *12 tractor mounted aerator. A full range of tines, holders and our new QuadraGuard system for Quadra tines will be on display for your consideration. So for further information or to discuss how our Field Service team can be of assistance to you please feel free to drop by our booth number 16A at the Show.

Exhibit # 55 - GREENMAW

There is a spectrum of quality among golf courses ranging from top class championship courses to entertaining and charming country courses. Excellence in the execution of the design and construction requires experience. Our nucleus of key construction personnel combines many years of experience in building golf courses. Over the past 27 years we have been associated with the construction of more than 25 major courses, in 8 countries. We offer our clients a package of services:Bulk Earthmoving, Fine Shaping, Irrigation Installation, Turfgrassing, Landscape implementation, Post Construction & Pre-opening Maintenance, Ongoing Golf Course Maintenance. Experience in constructing high quality and high profile golf courses has ensured a keen understanding of working together with our clients to make their golf courses a reality. Details make the difference. We have the experience to ensure that all details are attended to under the keen and skilful eyes of our specialists. Our experience and expertise enables us to understand the special needs of golf course construction and through this understanding we tailor our construction techniques to efficiently complete the tasks at hand. Successful projects have their foundation in a close working relationship with the designers, effective construction planning with labour and materials being carefully chosen to match every detail of the plans and specifications. Performance, efficiency and experience are the hallmarks of our involvement, which

enables us to provide the highest quality in the design and construction of golf courses around the world.

Exhibit # 92 - GWS MACHINERY

Keep on keeping on with a Kawasaki Mule. The Mules are the ultimate multi-purpose off road vehicles available today. Light in weight, heavy on performance everyone needs a Mule, from the ultra-efficient Mule 2510 Diesel with its torque laden 953cc diesel engine to the light and nimble Mule 550, Kawasaki have the ground well and truly covered. Versatile, durable and incredibly powerful, there's a complete range of Kawasaki Mules to suit any purpose from spraying to towing, the Mule can do it all. Check out the range of Kawasaki Mules, ATV's and Power Products on the GWS machinery stand. Iseki Outfront Mowers and Tractors: Outfront Mowers: Since their introduction in 1994, hundreds of Iseki SF outfront mowers have been sold to satisfied customers in Austalia. All are built for the professional turf care operator with powerful diesel engines, hydrostatic transmissions, and heavy duty decks. Cruise control, power steering, wet disc brakes and Auto / Permanent 4WD are port of the standard package when you buy one of these work horses. Three models make up

 SF230
 24hp
 54" or 60" deck

 SF300
 28hp
 72" deck

 SF330
 31hp
 72" deck

TM Series - 17 to 23hp Compact Tractors

Two models make up the range. The 17hp TM217 comes with 6F/2R syncromesh transmission, while the larger 23 hp TM223 features hydrostatic transmission and can be fitted with a mid mounted mower 60" deck.

TK Series: - 32 to 46 hp Utility Tractors
Four models complete the TK Series line up:

TK532 32hp TK538 38hp

TK546 Cab 46hp

All feature 16F/16R synchro-shuttle transmissions and side-shift gear levers. Power steering and wet disc brakes make steering and stopping a breeze. There is a good spread of speeds for field work, and a top speed of 25kph for fast transport. The quality air conditioned cab on the TK546 provides the comfort needed to get in a full days work, whatever the conditions are outside. GWS Machinery are the sole agents for Metro Sydney area for all ISEKI and Massey Ferguson products.

Exhibit # 77 - HAIFA CHEMICALS LIMITED and MULTIFERT AGENCIES

Haifa Chemicals have released the GREENPOWER range of fertilisers to ease the challenge facing Course Superintendents, groundsmen and contractors. Preparing a quality, healthy playing surface with excellent durability is no easy task. The GREENPOWER range does all that and more. Multigreen (for better feedings), all the essential nutrients for 4 months of feeding, in formulations for year round balance nutrition. Controlled release Nitrogen and Potassium with Potassium in form of Potassium Nitrate mini or granuar. Polyfeed (for prompt response), with more "spoon feeding" being praciteced, the completely water soluble NPK plus micro-nutrient formulations of POLYFEED are and added supplement or alternative to Controlled Release products and can be applied through irrigation systems or as a foliar spray. Multi-K (for tougher foliage and better roots). Potassium Nitrate enhances turf wear, disease resistance and frost damage. Multi-K is available in prills and mini prills and is sulphate free, another advantage in your fight against "blacklayer". The range is now available in Australia. Call and visit with the Haifa Chemicals and Multifert team on Stand No. 77 at the Turfgrass Conference and Exhibition and join the QUALITY REVOLUTION

Exhibit # 13 - HARDI SPRAYING EQUIPMENT

Spraying is fast becoming one of the most important functions of your turf management program. To assist you in understanding the spraying function better, we are displaying a range of Hardi Spraying Equipment products especially designed for better management of your turf

and garden spraying program. As we too are following the conference theme of every drop counts, the focus of our display is the 2000 L Hardi fairway sprayer fitted with a computer controller and a 6 m Windfoil boom. It is an absolute pinnacle of spraying technology that ensures increased safety for the operator, reduced effect on the environment and maximised spray effect... making every droplet of chemical count.

In line with the same theme, we are also displaying a cutaway of a Hardi linkage sprayer, fitted with a nozzle demonstrator and a spray controller simulator. The idea behind this is to ensure that turf managers of today increase awareness of their ability to control droplet size for maximum effect and minimum drift. Additional equipment displayed includes 12 Volt utility sprayers, hand operated sprayers and a hand operated Greensfoll shrouded sprayer, especially suited for spraying tight greens on golf courses, bowling greens and general turf around delicate flower and garden beds.

Exhibit # 47 - HERITAGE SEEDS

As a research and development company Heritage Seeds' focus is on breeding and selecting varieties to meet turf manager's needs. To help achieve this, Heritage Seeds draws upon its relationships with overseas breeding companies to obtain the best of the world's plant genetics. Heritage Seeds has its own fifty hectare research farm in Australia, located at Howlong NSW. This is where trial and evaluation work is carried out on a wide range of species. Heritage Seeds do not rely on this alone and has a large involvement in the Australian Turfgrass Evaluation Program (AUSTEP). Heritage Seeds is the leading Seed Company in Australia and prides itself on providing quality products to the market place. The results of the Heritage portfolio in the AUSTEP trial further enhance this. Barlennium and Premier II lead the way, with all of our varieties being within the top grouping. Three years ago Heritage Seeds has developed a joint agreement with Nuturf to provide a strategic supply and distribution of products to the turf manager. This agreement is working extremely well and your support has been tremendous. On behalf of both companies we would like to thank you for this support and extend an invitation to come and speak with us at stand 47.

Exhibit # 33 - HG TURF

HG Turf is a Victorian based family company supplying turf products and providing maintenance services to the sportsfield industry. The company is the sole licensee for Mots Stabilised Turf in the Asia / Pacific region and has installed the product in the GABBA, MCG, Olympic Stadium, Bruce Stadium and most recently Colonial Stadium. The Colonial Stadium contract involves maintaining and preparing the field for multiple uses, including Australian Rules Football, Rugby Union, Rugby League, Soccer, Cricket and numerous concerts. This busy event schedule requires HG Turf to rotate the turf several times during the year to ensure the turf is kept in pristine condition. HG Turf is also involved in the design and construction of sportsfields, including drainage, irrigation, growing medium and washed turf. The company is the sole licensee for the High Performance Gravity Field Drainage System ("HPG" as recently installed at the GABBA) and the Prescription Athletic Turf Field Drainage System ("PAT" vacuum assisted). Further products supplies by HG Turf include household instant turf, turf seed, lawn seed and fertilisers

For further information please contact:

Hamish Sutherland

Managing Director 0418 325 625

Tim Kirkman

Product Manager 0438 757 900

Michael Walker

Marketing Manager 0407 840 421

TonyHemming Arena Manager – Colonial Stadium 0409 120 302

Exhibit # 27 - HONDA MPE

Honda has always been known for its diversity, quality & durability of its products that are second to none. Research

and development for all products are directly linked to Honda's successful championship victories in Formula 1, Indy Car, World Motorcycle Grand Prix and World Superbike events. This is what gives Honda a worldwide reputation that it is recognised for today. Honda will present the world's first "hydrostatic" ATV at this conference amongst other new ATV models fully kitted for the Turfgrass industry.

Honda also produces a wide range power equipment suitable for the turf care industry. Honda lawnmowers are widely accepted as market leaders in the lawn care industry, and are the mower of choice for most professional users. The Buffalo range of mowers has built a reputation for powerful, reliable and fuel efficient engines, rugged construction and effortless starting. Honda also makes 4-stroke brushcutters. Honda's renowned engineering, that has seen it become the worlds largest engine manufacturer, has produced the Mini 4 series of engines that power Honda brushcutters. Available in 22cc and 31cc formats, Honda brushcutters enjoy all the benefits traditionally associated with 4stroke engines, including easy starting, no oil/fuel mixtures and less exhaust fumes. Check one out now. Honda will also we displaying ride-on mowers, tillers and the versatile WX10 mini water pump.

Exhibit #58 - HUNTER INDUSTRIES

From proven performers to cutting-edge innovations, Hunter Golf offers a complete line of golf irrigation products that can be counted on for their efficiency, reliability and performance. Products like the Genesis 3 and Surveyor central-satellite control systems with true two-way communications and filed-resident memory. The easy-to-install Genesis Viking decoder control system. The efficient and reliable G70 and G90 Series of rotors. The unique low pressure and low precipitation cost saving G60 series. All of these products have been designed to withstand the rugged and varied golf environment. In addition to these products, Hunter Golf is proud to release the new 860 and 870 rotor – the

industries' only fully top serviceable electric valve in head rotors. Visit our booth for a demonstration of this innovative industry first! Of course, all the wonderful products in the world don't amount to a thing if the company doesn't have the financial strength and character to stand by them. The Hunter Service Network is there to take care of customers' needs after the sale. At Hunter Golf, we truly believe it is not just important to build relationships, it is equally important to maintain them.

Exhibit # 35 - HYDRO-PLAN

Australia's largest and most experienced independent irrigation consulting service with branch offices in Perth, Adelaide and Sydney. Founded in 1985 in Perth and Adelaide with the Sydney office opening in 1990, the company offers a comprehensive range of skills in provision of design, documentation and contract supervision services to all segments of the irrigation industry including:

- Golf Courses
- · Sporting stadiums and fields
- Commercial landscapes
- · Parklands and Botanic Gardens
- · Waste water pipelines and distribution systems
- · Broad acre agricultural projects

Hydro-Plan produces drawings with the latest release AutoCAD software and uses a wide range of computer software for hydraulic engineering calculations. Call on stand 35 to see samples of their current work and meet key staff members, John Gransbury, Don Byrne or Bill Walton.

Exhibit # 107 - VARI a.s. (Imeco Pty Ltd)

Vari a.s., the largest producer of light agricultural and horticultural equipment in the Czech Republic, has an annual turnover of more than 7 million Euro Dollars. The company was founded by Antonin Jelinek in 1912. In

1969 Gutbrot licensed the company to manufacture the Terra' range of equipment. In 1987, when this licence expired, the company introduced their new 'Vari' range with designs that provided for the same accessory linkage systems as Terra' making the two systems compatible. In 1992 the company concluded a co-operation agreement with Honda Motors and the 'Vari-Honda' range was released in 1993 after extensive and successful testing. In1994 the company was taken over by BG. TECHNIK which is the exclusive Honda representative in the Czech Republic. A significant export market has been developed over the years and the company now has over 550,000 customers throughout Europe, the U.S.A. and South America.

The equipment being exhibited is the Pony11A drum mower, the Trimmer 50 special purpose mower and the Hurricane F530 mulcher. Each of these machines has unique features that enable them to handle difficult tasks that most other equipment cannot overcome.

Imeco Pty. Ltd. 12-14 O'Connell Street, Sydney, N.S.W. 2000. Australia

Tel: (02) 9231-4332. Fax. (02)9231-4334 E-mail imeco@ bigpond.com

Exhibit # 82 - INDUSTRIAL MOWERS

Industrial Mowers will be displaying the following machinery and spare parts and the conference.

The Scott Bonnar Queen Bowling greens mower.

The Scott Bonnar Queen has been manufactured in Australia for over forty years and is renowned for being the finest Bowling Greens Mower. Many years of continual refinement have resulted in the perfection of the Scott Bonnar Queen as a precision piece of mowing equipment, with its 16 blade cutting cylinder incorporating 180 Degree spirals which will produce up to 247 cuts per metre. Other features include a two speed gearbox, four section rear roller and a teasing rake which lifts out dry thatch. These features, together with many others, will ensure that the Scott Bonnar Queen



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will continue to give high quality of cut, resulting in faster greens.

The Scott Bonnar Scarifier Groover.

The Scott Bonnar Scarifier Groover also manufactured in Australia renovates and rejuvenates greens by thinning dense turf and spongy thatch. This unit features a 5 HP Briggs and Stratton motor, cast aluminum base. The cutting blades rotate in a clockwise direction causing a self-propelling action thus eliminating the need for a power driven system. The depth of cut is controlled by independent wheel adjustment, which can be set to give a depth of cut to 32mm (11/2").

The Industrial Mowers range after market spare parts.

Industrial Mowers supplies quality after market replacement parts for the turt care industry including Councils, Contractors, Golf Clubs, Bowling Clubs, Turf Farms and Mower Shops. Industrial Mowers supplies a wide range of spare parts for most machines used within Australia. Product lines include the following:

- · Bar Blades
- Cutting Cylinders
- · Bed Knives
- · Slasher Blades
- Rollers
- · Domestic Mower Blades
- . Trimmer Line and Heads

Exhibit # 36 - JFB CUSTOM GOLF PRODUCTS

- FLAGPOLES •FLAGS •TEE MARKERS
- *BALLWASHERS *LITTER BINS *BOOTCLEANERS * CUPS *SIGNAGE *AND A WIDE RANGE OF COURSE MAINTENANCE TOOLS

Free catalogue available at stand

J F B has been operating since 1986 and is fully Australian owned and operated. We supply many Golf Courses within Australia and New Zealand with quality products at realistic prices, both direct and via distributors.

GOLF COURSE EMERGENCY INTERCOM

A solar powered unit: "No wires", two way simple to use communication, minimum maintenance, provides safety for club members and visitors.

Economically priced.

There will be a working unit on display at the show with technicians on hand to answer any questions.

New products to be released at the 2001 Conference

LIGHTWEIGHT ONE PIECE ALUMINUM SHOVEL

Weighs only 1 kilo. The handle is set at an angle for easier use. (All Australian Made) Half the price of imported models.

NEW SAND BUNKER RAKE

You have tried the rest! Now try the BEST!!

(All Australian Made)

Exhibit # 41 - JH WILLIAMS AND SONS

J.H. Williams and Sons, Murwillumbah, NSW will be featuring their all-new Signature PROTM line of turfgrass mixtures and blends and their improved turf-type Bermuda couch varieties including Sydney, Mohawk and Princess, the first hybrid Bermuda couch from seed. Exclusively from J.H Williams and Sons, the Signature ProTM line was developed utilizing the most recent agronomic research and advanced information on blending and mixing turfgrass species with proven, premium varieties. This impressive line-up provides options and choices for a wide array of conditions and situations to both please the eye and go the distance.

The new Williams' Signature Pro™ line includes: Fairway Classic™, a links quality blend of improved fine leaf perennial ryegrasses, Just for Kicks Premium Sports Turf Mix™, a specially formulated to score goals all season long - a durable, attractive turf blend with Bermuda couch for additional wear and drought tolerance, Kwik Grass™, a mixture of shade tolerant species for up to 65% shade, Sun and Shade™ a multi-purpose mixture for residential and commercial turf applications and Tempra Blue™, all the

beauty of Kentucky bluegrass plus with just the right amount of Tall Fescue and Bermuda couch for added drought and wear resistance.

Exhibit # 21 - JOHN DEERE

John Deere is again proud to be a part of the 2001 AGCSA Annual Conference and tradeshow. Come along and chat to your local John Deere dealer, John Deere Australia, or Deere & Company representative on the John Deere stand. Ask about the John Deere Team Championship tournaments being held in throughout Australia, with the winning team at the National competition qualifying to go to the US and compete in the John Deere World Championship. Your dealer representative can tell you how to go about submitting a team representing your course.* As in previous years, the John Deere stand will also feature new turf maintenance machinery, as well as attachments and options for current units.

You'll find the Fairway Tender Conditioners on the B Series Fairway Mowers, new ultra-low cut bedknife for the John Deere greensmower range, the new outfront rotary mower F1445, as well as the long-awaited Wide Area Mower WAM1600, and the Wide Area Flex Mower WAFM 1620 complete with Lastec articulated mower deck. A John Deere Credit representative will also be on hand once again to provide finance quotes for Golf & Turf equipment purchases. Enjoy the conference, and we look forward to seeing you on the tradeshow floor.

*John Deere Team Championship has already been held in WA for 2001.

Exhibit # 105 - KENDON CHEMICALS

Probiotic technology was discovered and first applied in the agricultural industry over thirty years ago. Once established in the science of agronomy, such technology proved valuable in the clean up or remediation of hazardous materials in soil and water, but whilst the results were overwhelming, the process was not readily accepted because of poor scientific methods used to measure and determine the results. The term probiotic means to support and enhance life in contrast to antibiotic which means to kill living organisms indiscriminately, whether friend or foe. Such technology utilizes beneficial biologically complexed organic compounds to create an environment whereby micro-organisms can perform their natural degradation functions whilst encouraging the environment to resume the purpose for which it was intended. In achieving this end, toxic environments are buffered or neutralized with the carbon based wastes being degraded naturally so no harmful environmental results occur. Today, the use of Probiotics has gained general acceptance in the United States and Europe, where soil and water remediation has been needed in both agricultural and the heavy industrial arenas, and Kendon now presents to the golfing industry, new, unique and safe methods for disease control and improved root growth, which are key matters for course superintendents to manage.

Exhibit # 62 - KURANDA MANUFACTURING

We will be displaying our 'Whale' Super Sopper, a leading product in World Wide Sales and a working model of a 'Sandpiper' Super Sopper, our most popular model. The 'Sandpiper' demonstration will demonstrate the superior abilities of the unique Super Sopper design in its ability to pick up and remove water from playing surfaces. Brochures will be available covering the entire range of Super Soppers. Skilled and friendly sales staff will be available for the entire exhibition to answer any technical questions.

Exhibit # 25 - M. COLLINS AND SONS

M. Collins and Sons is a company rich in History, Diversity and Resources. Matthew Collins (Managing Director) is third generation in the business and attributes the success of the company to its diversity, foresight in obtaining company resources for its future needs in the industry and being up to date always with new technology. M. Collins and Sons occupies stand No. 25 at the Australian Turfgrass Conference. A company wagon owned by Matthew Collins Grandfather will be the focal point of the stand area

highlighting the length of time that the company has been servicing the industry.

Sand and Soil Materials:

Golf Course Construction / Topdressing Materials

Sportsfield Construction / Topdressing Materials

Landscape Products Including Australian Standards Products

- 1. Organic Garden Mix
- 2. Rich Earth Compost

Cricket Wicket Soil

Bowling Green Materials

Turf Specialists

Legend Couch, Palmetto and Shademaster

Couch, Kikuyu and Buffalo

Washed Turf Facilities

New Technology at the Collins turf farms includes the Megayr Rolls and Squayrs, jumbo turf rolls and conventional turf rolls.

M. Collins is a contracting company producing to its credit many high profile contracts. These construction works will be highlighted with photographic and information boards giving the conference delegates every chance to view recent contracts that the company has been involved in through the Olympic Games and since in the Year 2001.

Exhibit # 100 - MANOEUVRE MOW

The KORO Fieldtopmaker a unique field surface finishing and shaving machine.

Shave — To groom surfaces and take out thatch layers

Shave — To remove the total grass cover, recyclable overburden

Shave — To eradicate weeds eg, Poa annua, African lovegrass, Parramatta grass

Shave — For a level playing surface in one pass

Shave — To harvest planting material (Stolons)

Results — The operation is practical, cost efficient, environmentally friendly

Mechanical not Chemical. Two models two operating widths

FTM200 x 2.00 metres requiring tractor 62 hp. with creep gears
FTM120 x 1.20 metres requiring tractor 30hp.

with creep gears

KORO Recycling Top-Dresser designed to recycle

your own resources.

Three modesl RD225=2.25mtrs, RD165=1.65mtrs, RD130=1.30mtrs.

Deep Aeration capability of providing top-dressing, without purchase and import of expensive soil breaking up of excessive layering, minimizing and ultimately the eradication of mat and thatch. The unique ability of bringing organic mat build up to the surface, allowing nature to break it down releasing locked nutrients providing a quality turf with minimal surface disturbance.

The process is practical and economical, ideal for large areas such as golf fairways and sports fields.

In harmony with environmental and best practice turf management.

Exhibit # 80+81 - MAXWELL AND KEMP PTY LTD

Maxwell and Kemp Pty Ltd were formed in 1984, we have grown from our modest beginnings to be one of the largest independently owned and operated Supply Companies in the specialized turf golf industry.

Maxwell and Kemp operate its business from modern accredited warehouse facilities at Milperra, Sydney. Our six qualified mobile sales and support crew is on hand every working day via our comprehensive fleet of vehicles to service your needs.

We offer the customer a range of products that is required by the industry standard. We are distributors of fertilisers, chemicals, seed and specialized hardware, and distribute for companies such as Aqua Max, Aventis, Better Methods. Bioverm, Colin Campbell Chemicals, Chatoyer, David Golf, Irritrol, Growth Products, Patons Fertilisers, Standard Golf,



Rainbird, Wrightson Seeds.

Our staff looks forward to meeting our customers, old and new at our stand at the Sydney conference and wishes the AGCSA all the success it deserves in organizing this event.

Exhibit # 106 - NORTHERN SYDNEY INSTITUTE Ryde College

Ryde College will be displaying its range of TAFE courses in Environmental Horticulture and Turf Management. Mainstream courses are offered from Level 2 right through to Level 5 at Diploma Level. The Business Centre at the college also offers short commercial courses which can be tailored to your needs. Ryde College is a centre of excellence and is situated on 8.5 ha of gardens and open space 10kms North West of Sydney's central business district.

Exhibit # 19 - NUTURF

Where all Good Ideas get together. It's on again, bigger and better than ever and Café Nuturf will be a part of it. Café Nuturf has become an integral part of every AGCSA Trade Show. It is the place to catch up with old friends, meet new ones and find out what's happening in the turf industry. Make sure you tell you friends to " meet me at Café Nuturf ". At this years Café Nuturf there will be plenty talk about.

New product launches include Nuturf 'Razor'& 'Master' herbicides and Rovral 'GT' & 'Mightee' fungicides. All exclusive to Nuturf. Check out the new range of 'Nuturf Sprayers' and Nuturf has also been appointed Turf Distributor for 'Vicon' pendulum spreaders.

Old Favorites

Visa and

Accepted

Lesco's revolutionary fertiliser 'Novex' will be there as will their Golf Course Accessories. Aquatrols wetting agents and the complete range from Becker Underwood. We will also be holding demonstration sessions on Bear Irrigation.

Promotions

Nuturf will launch their spring fertiliser promotion titled 'Reward your Course'. This looks an exciting way to dress up your course, without any extra effort or cost. Details will be available only from 'Café Nuturf' booth #19. See you there.

Exhibit #75 - OASIS TURF

Oasis Turf will be highlighting "Companion" at this years turf conference. Companion is a unique microbial inoculate, unlike any organic product you might have tried or heard about in the past. Companion guarantees consistency, and has proven its curative and preventative fungal disease suppression. Companions efficacy is backed up by three decades of research as a seed coating as well as in agricultural applications. "Essential" will also be on display. Essential is a rich organic liquid solution containing plant extracts, humic acid, a natural wetting agent and North Atlantic Kelp. It takes a holistic approach because it addresses the needs of the plant above and below the soil. Oasis Turf will also be highlighting the entire range of organic micro nutrients and liquid fertiliser solutions.

Exhibit # 29 - OPEC

Landa, one of the worlds largest manufactures of water cleaning systems has launched the ultimate Bioremediation System for all Golf Courses, Landscape Companies and Turf Firms. These groups are under increased EPA scrutiny because of the oily water, herbicides, insecticides and pesticides runoff they emit from the washing of mowers and other grounds equipment.

The WaterStax uses gram-positive, non-pathogenic and non-toxic bacteria, which have proven to be very effective in "eating" the oil, grease, hydrocarbons, grass clippings, and even HiP's in the typical turf or golf course waste stream. The resultant water can either be discharged to the sanitary sewer or irrigated back onto the course.

The WaterStax processes wash water at a rate of 1,000 gallons per day with peak flow capacity at up to 15 gallons

per minute, well within the range needed for a typical wash operation.

The Waterstax has many beneficial features including,

- a grass cart and stainless steel hydroscreen for automatic removal of grass;
- specially designed layers of biological filters for enhancing the growth and effectiveness of the bacteria
- A valve for easy removal of sludge and cleaning out the system
- Air pump for aerating the wastewater to enhance bacteria growth

To find out more about the Landa Bioremediation System come and visit us at stand 29, or call Graham Hanson on 0414 339 999

Exhibit # 46 - ORARA TURF

Orara Turf has been set up specifically to grow our premium turf product, NatLok Turf for the New South Wales and Southern Queensland recreational turf venues and managers. NatLok Turf is established onto a plastic membrane which is laid in turn onto a laser graded, prepared base, so as to eliminate water ponding during the establishment phase. Inground irrigations and subsurface drainage aid the establishment. NatLok Turf is the name given to the process of establishment along with the presentation of the turf once it arrives on site. Any turfgrass variety can be established in this form, just as any rootzone material can be utilized within the finished product. It is the objective of the qualified staff at Orara Turf to establish your selected turf, as closely as possible to the conditions that you, the turf manager will maintain your turf in. In other words, we treat every order as a totally independent operation, taking note of what your specific requirements are. The staff and management at Orara Turf knows you have a choice in selecting either another turf product or NatLok Turf for your next major project. We look forward to providing you with a premium product and professional service in making the choice a little easier.



Distributed by:

Roy Gripske & Sons Pty Ltd

44 Beach Street, Kippa Ring Qld 4021

Email: pgripske@rgs.com.au Web: www.rgs.com.au



See "Turf the World Over" Australian Turfgrass Management 3.1 February/March 2001

A ONCE IN A LIFETIME OPPORTUNITY!

QUALITY TRAINEE GREENKEEPERS WANTED FOR WORK / TRAINING ON TOP GOLF COURSES IN THE USA

The Ohio International Turfgrass Intern Program has several annual internship vacancies on the finest American golf courses. These are the best places to improve your turfgrass management skills.

Warm and Cool Season placements. Assistance with travel plans, visas, health insurance and staff support. Full briefing at Ohio State University on arrival in USA. Possibility to take turf grass classes at the Ohio State University for 3 months. Turfgrass seminars also provided during training.

MUST BE 19-28 YEARS OLD, WITH TWO YEARS OF TURFGRASS EDUCATION AND ONE YEAR OF PRACTICAL EXPERIENCE. MUST BE ABLE TO SPEND ONE YEAR IN THE USA.

Excellent job opportunities in Asia / Australia / Europe upon program completion. Past participants of this program are highly valued and are being recruited by excellent turfgrass maintenance / construction employers worldwide!

CONTACT MICHAEL O'KEEFFE / JOHN BEARDMORE PHONE: 001-614-292-7720 FAX: 001-614-688-8611

E-mail: mokeeffe@pop.service.ohio-state.edu

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Exhibit # 49 - ORGANIC CROP PROTECTANTS

Organic Crop Protectants have been supplying quality organic products to the Australian Turf market for 10 years. We supply a full range of organic amendments, (Sand-Aid) bio-stimulants (Aminogro and Acodion), Spray adjutants (symentral Oil) and bio-inoculants (Trich-A-Soil) based on Trichodemna spp. Come and see us about how we can help your course be more naturally beautiful.

Exhibit #12 - PARKLANDS TRADING COMPANY

Parklands Trading Company Pty. Ltd, is a family run and owned company, proud of the distinction of having been judged one of the top 500 private companies in NSW for the past three years. Importers and distributors of powered Lawn and Garden products, Parklands distribute the multipurpose AMAZONE Groundkeepers. Fitting most tractors, and with unique "no-tool quick-change" blades, these multi-purpose machines are capable of scarifying, mowing and vacuuming either separately or simultaneously. Heavy-duty Grasshopper range of commercial high-speed outfront mowers in both petrol and diesel versions. Decks are three-way adaptable to mow, mulch, catch in sizes from 44-72". For contractors, the new popular midmount are compact and also come in diesel or petrol options. Having also enjoyed an association with Tanaka for over 30 years, Parklands have an impressive line-up of Brushcutters, Lawnedgers, Hedgetrimmers, Chainsaws, Extended reach Pruners and Headgetrimmers, Portable Augers, Pumps, Engine Drills and Cut-off Saws, built for both Homeowners and Professionals. Tanaka is tough and reliable. Also distributed by Parklands ... Europe's finest range of Oleo-Mac products, including Chainsaws, Cut-off saws, Pumps, Brushcutters, Hedgetrimmers, Portable Augers and Mister-Blowers, offers alternatives not encompassed by the Tanaker range. Rounding out machinery distributed by Parklands, is the fleet of manufacturer's brand Ride-on and Walk-behind Mowers MURRAY, the revolutionary from style Chipper/Mulcher/Shredders, by CARAVAGGI, and out new line-up of All- Australian made Parklander Walk-Behind mowers designed and built for Australian conditions. Parklands Trading Company Pty. Ltd., is exhibiting a product range from all the above manufacturers at Stand 12

Exhibit # 44 - PATONS FERTILIZERS

Paton Fertilizers is pleased to announce the introduction of three (3) new product ranges for the fine turf market:

- Patons Mini Prill Range: a range of homogeneous mini prilled, 3-4 month polymer coated controlled release fertilizer. The range includes different ratios of NPK
- Patons MiniAgri Range: a range of conventional "freely available" mini prills blended with 3-4 month controlled release and slow release mini prills. The Mini Agri range includes a range of different NPK ratios and is a very cost effective option.
- Patons MultiAgri Range: a range of conventional "freely available" standard size (2-4mm) granules blended with 3-4 month controlled release and slow release fertilizers. The MultiAgri range includes a range of different NPK ratios and is a very cost effective option..

Paton's are also pleased to introduce (Spring 2001), a 24 hour turnaround turf tissue test. Patons Quick Test offers a rapid and accurate means of testing for nitrogen content in turf. The Patons Quick Test is also extremely useful in trend analysis for Phosphorus, Potassium and Magnesium. Please, do drop in at Site 44, and discuss your turf nutrient requirements with Deb Murray (NSW) and Chris Doyle (VIC).

Exhibit # 85 - PAUL F. JONES AND ASSOCIATES

Paul F. Jones and Associates Pty Ltd provides a range of Independent Irrigation and Consulting services to the Golf Course. Sportsturf and landscape industries. Established in 1985 the company specializes in the design and documentation of irrigation systems taking clients through the entire process from design to supervision of the installation. Our projects are spread throughout South East Asia, China, Singapore, Malaysia, Thailand, Indonesia and

Japan as well as in Italy, Scotland and of course Australia. As a freeland and Independent operator, the company has been involved in over 150 Golf Course Projects for a wide range of Golf Clubs, Course Designers and Developers. We are official Landscape Irrigation Auditors appointed by the Irrigation Association of Australia (IAA) in conjunction with the Irrigation Association of the USA (IA) as well as being professional members of the American Society of Irrigation consultants (ASIC). Recently we have added a new service which makes use of Differential GPS Equipment that enables us to provide accurate Asset Mapping and "As constructed" Detail Plans. Please call at our stand for further information regarding our Irrigation Consulting or GIS Mapping Services.

Exhibit # 63 - PAUNA TURF AERATION

Pauna Turf Aeration, a new company offering total turf renovation works, was formed in 1997. The company was formed especially to offer a complete renovation service to golf clubs, councils, sporting stadiums, schools and other turf related industries. The company started off with a Wiedenmann Terra Spike deep tine aerator and a Graden scarifier/dethatcher. With such a demand for specialized renovation work the company has expanded to provide further services such as, overseeding, shaving/vacuuming, coring, topdressing, spraying, fertilizing and slit drainage repair and maintenance and major broad acre construction and renovation works. Pauna Turf Aeration today is becoming one of the leaders in the turf aeration and renovation industry. The company prides their work on quality, reliability and providing the customer with what they have requested. All work is guaranteed and completed to a high standard. Come and visit us at stand 63 and have a look at some of our work. Ask us about one of the best machinery purchases we have made, the aeravator decompaction aerator. The one and only and, best soil "massaging" machines on the market to date. If you have any compaction problems this machine will cure it, you will notice turf growth and improvement within weeks. We can arrange a demonstration if needed on your turf at any time.

Pauna Turf Aeration will make sure every drop counts for you.

Exhibit # 39 - PRIMAC ELDERS

Turfcare Products, ranging from:

- Foliar / Granular Fertilisers
- Fungicides / insecticides etc.
- · Special needs, injection products
- Turfcare maintenance products

Primac Elders will have the Spray-Gro range of Foliar Fertilisers.

Exhibit # 78+79 - RAIN BIRD

Rain Bird's Golf Division manufactures a wide rang of irrigation products for golf courses. EAGLE™ gear drive rotors including the new EAGLE 1100/1150 series, field controllers featuring a new, easy-to-use plastic pedestal, map-based central control irrigation systems with optional Smart Pump™ flow management software, decoders, swing joints, flow meters, valves and irrigation accessories. These products are sold worldwide through an extensive network of distributors. Rain Bird's newest products offer advanced technologies to help the golf world wisely conserve and manage its resources. They include:

Remove Video Display Unit: Due for release in mid 2001, the rugged RVDU consists of a 10 inch monitor and mounts to a vehicle with appropriate cabling. The monitor displays information from Rain Bird's central control feature, Course MonitorTM, and provides real-time ability to adjust database information and run time, display global positioning system (GPS) map showing relative motion of the vehicle, and illustrate individual holes from anywhere on the course.

Plastic Pedestal for Rain Bird's PAR+ and MSC+ Satellite Controllers: The new plastic pedestal is designed to increase flexibility of use for Rain Bird's line of golf satellite controllers while making installation and maintenance easier. The innovative new design allows for quick and easy field customization for specific golf course requirements. The plastic pedestal will launch in June 2001.

EAGLETM 110/1150 Rotors: Rain Bird's newest closed-case, valve-in-head rotors are designed for larger single row or double row irrigation systems with sizable spacings. The new rotors throw over 100 feet at 80 psi and 110 feet at 100 psi. With the longest throw in the industry, the 1100 and 1150 rotors are 130 psi rated and provide maximum watering capability with unmatched flexibility. The EAGLE 1100 and 1150 rotors will be available in July 2001 and October 2001 respectively.

Rain Bird Coporation – Golf Division, 970 West Sierra Madre Avenue, Azusa, California, 91702 (800) 984-2255. Internet address:http://www.rainbird.com

Exhibit # 67 - TYCO RAINMAN Control Systems

RAINMAN Greenkeeper is a flexible irrigation control system designed for the golf course industry. Our high quality irrigation controller is capable of operating in the harshest of environments and is designed and manufactured in Australia. We will be demonstrating how RAINMAN Greenkeeper is both an irrigation control and monitoring solution and an effective management tool that can be customized to suit your course requirements. User-defined inputs can be incorporated into the system to monitor and record data such as pressure, flow, wind, temperature, moisture, rainfall, evapotranspiration (ET) and pump performance etc. Our demonstration will also feature the RAINMAN TWIN (Two Wire Irrigation Network) decoder system. The RAINMAN TWIN Decoder System comprises of RAINMAN signaling units that connect via a plug-in lightning protection unit to a twocore cable. Signaling units can be connected to RAINMAN satellites around the course or by communication cable back to a Central computer. Programming can be done on the course if connected to a satellite or via the Central. RAINMAN Project Information Sheets will be available which will give a better understanding of how adaptable our controllers and control systems are to a variety of applications.

Exhibit # 6 - REDEXIM CHARTERHOUSE

Over 50% of the equipment exhibited by the Verti-Drain make their Australian debut here at the 17th Australian Turfgrass Conference. For example, several accessories for the sit-on Verti-Drain 7007 are shown. A special rotating brush mounted behind the Verti-Drain allows for accurate brushing of and into the holes after working with solid tines. With their recent acquisition of the British company ProSeed, Redexim - Charterhouse became the largest producer of overseeders in the world manufacturing several types of precise slitting seeders and models which are able to spike the turf, place seed into the holes, sand brush and roll all in one pass. The all new walk behind and tractor mounted Core Collectors make the removal of cores from greens and fairway type areas a breeze even in the wettest of conditions. The Easy-Spread topdresser allows one operator with a 25-30 HP tractor to spread up to 80 tonnes of sand over fairways or playing fields in one day without the need for extra machinery or operators. AND all this is achieved without leaving the seat of the tractor and last making its World Premiere here in Australia is the new Turf-Tidy with its ability to scarify or mow on undulated areas and its manoeuvrability and size allow it to work tight areas and under trees. For more information and details regarding your state distributor please contact our head office in Melbourne, Peter Ellis, ph: (03) 9435 0955, fax: (03) 9435 0855, mobile: 0419 310 546, or Email: pjellis@pacific.net.au

Exhibit # 70 - SCOTTS AUSTRALIA

The Scotts Company is the world's leading manufacturer of products for turfgrass and horticultural professionals, offering a wide range of controlled and slow release fertiliser technologies, proprietary turfgrass seed, unique plant protection products and specialised spreading equipment throughout the world. Scotts Australia welcomes golf superintendents and turf managers to our stand and also to the stands of our exclusive distribution network. This year you should ask Scotts about new and

exciting product developments. Talk to our leading agronomic professionals and discover why over 5,000 of the world's top golf superintendents rely on Scotts products. Scotts are the only major manufacturer in their category, with a home base in Australia. With a long history of innovation in Australian turfgrass, Scotts have given you HD technology, Triaform, Poly S, Contec, Combination products and Once just to name a few. This year you will see how Scotts global commitment to the golf and turf industry will benefit the Australian turf industry in the future. Enjoy your conference and enjoy Sydney.

Exhibit #23 - SILVAN PUMPS & SPRAYERS

Silvan is a specialist manufacturing company with worldleading expertise in crop protection and related equipment. Sylvan Pumps and Sprayers (Aust.) Pty Ltd comprises four product divisions: Silvan Spraying, SELECTA Merchandise, AgriPOWER Farm Machinery and SprayBoss. Established in 1962, Silvan has been a pioneer in the development and manufacture of agricultural machinery equipment to meet the needs of Australia's primary producers. Always at the forefront in the development of new technology, Silvan combines strong innovative management with a comprehensive understanding of today's agribusiness. A leader in the design of high volume, low volume and electrostatic sprayers, Silvan has a reputation for producing world class products, and has grown to become the largest Australasian manufacturer of crop protection equipment. Specialized equipment has been developed for crops including vegetables, grapes, apples, pears, citrus, wheat and cotton, as well as for pastures and turf. Silvan's product range also includes a complete range of application equipment for the home gardener, nurseries, golf courses and sports fields, as well as world leading farm machinery products such as Nobili, Maschio, Gaspardo and Sitrex. An Australian owned company, its head office, administration, research and development, and manufacturing operations are located on a 3 hectare site in the Melbourne suburb of Wantima South. Manufacturing facilities include steel fabrication, productionand assembly plants, national distribution warehouse and product testing facilities. Silvan is actively represented in all agricultural areas throughout Australia, with warehouses also in Brisbane and Perth providing support to our national dealer network of more than 200 machinery dealers. Today, Silvan products are used in every crop type throughout the Australian continent and they are exported to countries such as Japan, New Zealand, Papua New Guinea, the Philippines, Thailand and New Caledonia.

Exhibit #51 - SOCIETY OF AUSTRALIAN GOLF COURSE ARCHITECTS

The Society was formed in 1989 by a group of Australian Golf Course Architects with the likeminded purpose of forming a society of fellow practitioners who would meet regularly to exchange ideas and experiences, encourage the highest standard of design and construction among its members, whilst further advancing the status of the profession. The Society has been active in promoting the benefits of golf to the environment and publishes an annual magazine on the topic of gold course design - "The Journal". Society members provide a full range of client services, with a special emphasis on the creation of course redevelopment master plans for existing golf clubs. Please call into our booth to have a friendly chat with our members.

Exhibit # 38 (RHS) - STRATA GROUP AUSTRALIA

D.G.M Direct underground maintenance syringing system. General purpose Hose Reefs for watering, weedicide and pesticide use, and wash down.

Exhibit # 84 - SUPATURF

Supaturf will be displaying a variety of Line marking machines, accessories and liquids for turf. The display will range from the old transfer application to the electric models in markers, showing a wide selection of accessories and supplying you with information and some samples on all liquid products available. Specifically drawing attention to the new "ER" (Erasable) product, the Supaturf stand will

offer a variety of information, photos and products used in the new ER method. Come and see Tracey Woodhouse from head office, our Sydney Rep. Traci Harper and Melbourne Rep. Andrew Beasley at stand 84.

Exhibit #3 - TEXTRON TURFCARE

The Textron Turfcare group will again be a major exhibitor at this year's conference. The display (stand 3) will feature products from our four market leading brands:

Jacobsen

The all new model LF4677 Fairway Mower will have its Australian release at this show. Following in the footsteps of the class leading LF3800, the LF4677 is a 7 Gang 33 K.W. light fairway mower featuring 18d x 56cm (7" d x 22") reels which guarantee the renowned Jacobsen quality of cut. Four wheel drive is standard.

Ransome

Do you have complaints from your course neighbours about early morning noist? The solution is the Ransomes E-Plex II All Electric Greens Mower, which comes standard with Power steering and "Dynamic braking". Inspect the E-Plex II on our stand.

Cushman

Sensitive to the environment – "of course" – want to eliminate run-off and overspray – "naturally" – now is the time to make the adjustment to sub-surface application practices by using the Cushman Envirojet sub-surface injection system – on display at the Sydney Turfgrass Conference.

Ryan

Sod Cutters, Renovation and Aeration Equipment – Ryan has it covered. Come and see where Ryan fits your needs.

Exhibit # 42 - TURFGRASS ASSOCIATION OF AUSTRALIA

The Turf Grass Association of Australia is a non-profit industry body that represents turf practitioners, curators, ground managers, superintendents and groundsmen. Our membership is also made up of industry representatives from soil, seed, instant turf and machinery suppliers. In addition we have very close links to the Victorian Cricket Association, Melbourne University and TAFE colleges which offer education in horticultural studies. Our main objective is to offer quality personal development and educational seminars that will assist our members in keeping abreast of new developments within this specialised field, and maintain awareness of industry standards and safety guidelines. Now in our twelfth year we feel that our association is meeting its Aims & Objectives, and through our quarterly newsletter and various publications, keeping our members informed and up to date. We look forward to greeting anyone with an interest in turf at our stand during the 17th Australian Turfgrass Conference. We are a member driven association, therefore Committee persons will be on hand to chat and take any suggestions on how we can improve our services to our entire membership.

Exhibit #83 - THE GREEN HORTICULTURAL GROUP

The Green Horticultural Group is a horticultural contracting company with the ability to service and maintain sportsturf surfaces. Through our specialized spreading division we can apply soil ameliorants, fertilisers, topdressing materials and mulches. Our Turf Renovation division includes the Vertidrain 7521 (H) with a working width of 2.1 metres, with solid and hollow tines. Scarifier and vacuum with brushes, overseeder and laser blade. We have the ability to maintain surfaces once constructed or renovated, to the highest standard.

Exhibit # 20 - TORO AUSTRALIA

At the AGCSA 2001 Golf Show Toro Australia will be introducing it's exciting new line of turf equipment and irrigation products, providing new solutions for all of your turf maintenance demands. These include:

The new Groundsmaster® 228-D is the latest in the 200 series rotary mowers. It features improved operator comfort, durability and increased horsepower. The 28hp



Tow-a-tarp

Take the hard work out of protecting centre squares. With drum mounted on sealed roller bearings. These provide easy, quick and reliable operation. Designed with occupational health and safety issues in mind.



Mentay 2000

The new "ride on" Mentay 2000 Wicket Roller has been designed specifically to meet the demands for a middle of the range roller to assist you in the preparation and management of 1st class turf wickets



Mentay custom build machines and supply sportsfields, racecourses, tennis courts and golf courses nationally and overseas.

Contact MENTAY today on

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> Email: mentay@bigpond.com Website: www.mentay.com.au

Exhibitor Listing - 17th Australian Turfgrass Conference

engine will enable you meet the most challenging of conditions with the quality of cut that only Toro can deliver.

E-Series‰ Osmac, Field Satellite (Digital Wireless Paging)
Compatible with SitePro, and TouchNet‰.

The next generation of OSMAC. E-Series utilises all the features of OSMAC, including digital wireless paging, making it ideal for retrofits and renovations. Just like OSMAC, there aren't any wires, hardware changes or major site disruptions to worry about. And E-Series offers even more.

Groundsmaster@328

Ideal for both grounds and golf customers the Groundsmaster® 328-D features a powerful Kubota engine and improved operator comfort. Fit a 72" FlexDeck for unrivalled ground following capability on undulating ground where scalping is unacceptable.

720 Series Sprinklers

Built for the rough requirements of the golf market, the 720 Series with a radius of 6.7 metres – 14.6 metres, is the perfect complement to Toro's complete line of golf sprinklers. It gives you the precision coverage you need for tee boxes, approaches and other difficult-to-irrigate areas. A screwdriver adjusts flow, arc and radius – all from the top of the sprinkler.

The revolutionary Greensmaster® Flex 21 is a new design in walk greens mowers. With an independent traction unit and flexible 21" cutting unit, the Flex 21 closely follows undulations, virtually eliminating scalping. Innovative design provides a superior cut as low as 1.6mm and unique traction drum tapers at the outer edges alleviate overlap marking. Simplicity in maintenance and no grease zerks ensures grease never leak or weeps on your greens.

SitePro, 2000 Irrigation Control System

Picture-perfect Irrigation Control

SitePro, was designed to accommodate a short learning curve and a long list of features. We based it on the popular, easy-to-use Windows, 95 and 98 operating systems and eliminated tedious keystrokes and layers of spreadsheets – replacing them with point-and-click simplicity.

Exhibit # 38 (LHS) - TRADITIONAL GOLF LINKS CONSTRUCTION

Traditional Golf Links Construction specialize in reconstruction of existing courses and construction of new courses. Servicing the Australian and Asia Pacific market, Traditional Golf Links Construction work closely with golf course Architects and course superintendents to provide a construction package that best suite your budget requirements. We continue to develop new methods of environmentally friendly construction and we approach every project with a long term commitment to its success. Traditional Golf Links Construction are proud to support the Australian Golf Course Superintendents Association, 17th Australian Turfgrass Conference and provide ongoing support to the turf industry.

Exhibit # 32 - TRIODIA

Triodia is an Australian company formed in 1997 by the breeder of 'Plateau' couchgrass and is the holder of Plant Breeders Rights (PBR) for the variety. In the past 18 months we have successfully established an interstate network of quality growers and suppliers of 'Plateau', and they will be present at the trade exhibition to address your inquiries. Examples of 'Plateau' will be on display with independent data and a list of turf managers currently using this unique variety. 'Plateau' is a fine/medium, textured couch, suitable for a wide range of turf applications. If you are interested in a couchgrass with outstanding density, a deep rich green colour, unsurpassed sod strength through a substantial rhizome and fibrous root system, then please drop in and talk to us. In addition, 'Plateau' develops a quality turf with vigorous lateral growth, ensuring rapid divot repair and on low cut playing surfaces, a mowing frequency reduction of at least 50%. On higher mown turfs, mowing frequencies could be even less. 'Plateau' also possesses unique shade tolerance for the species that may enable a reasonable quality of turf to be maintained in environments of up to 40% reduced sunlight. We look forward to seeing you.

Exhibit # 30 - TRU-TURF EQUIPMENT

Tru-Turf Equipment www.truturf.com is Australia's largest manufacturer of golf green rollers and is rapidly becoming the world renown for its quality products and service.

Our latest rollers consisting of the RS48 Roll 'n' Slice, a combination machine to either roll only or to roll and loce in once operation across the most complicated greens surface, the GR39 designed to roll only, the BP60 designed to bowling green applications, for either synthetic or grass surfaces and the triplex Roll 'n' Slice attachment heads designed to suit either the JD 2243, 2500 or the Jacobsen Greens King 4,5 or 6 greens mowers.

Tru-Turf will be launching their new TM2000 walk behind greens mower trailer in Sydney. This concept is ergonomically safe and eliminates problems that are associated with similar transport means. The cushioned ride ensures that your valuable mower arrives at is destination time and time again, unaltered, with the least amount of effort and the unique design allows for servicing and back lapping without removing the mower from the trailer. Come along to our booth and see the benefits of our equipment for yourself.

Exhibit # 60+61 - TURF & IRRIGATION PTY LTD

Turf & Irrigation have been providing professional turfcare products and services to the Australian Turf Industry since 1985. Turf and Irrigation have branches and stores in all on the mainland state of Australia, providing an extensive network of support through their store and field staff, to all facets of the turf industry from irrigation to soil analysis, seed, fertiliser, chemicals etc. Turf and Irrigation are proud to support the AGCSA Conference and Trade Show and invite everyone attending to stand 61 to meet the team and view our display. Featuring products from the latest in fertiliser technology to water treatment aerators.

Exhibit # 10 - TURF LINK AUSTRALIA

Turf Link Australia Pty Ltd are pleased to display the following equipment.

Ty-Crop MH400 Materials Handler / Top Dresser

Versatile 3 tonne unit with interchangeable (no tools) delivery options for any material, top dressing fairways to construction works made easier.

Ty-Crop TD460 Top Dresser "New"

This 3 tonne unit complete with 1.8 metre rear brush, is an ideal tool for top dressing sports fields and golf courses. Low ground pressure attained with Ty-Crops 4-wheel walking beam suspension you will see why this is a world leading top dresser.

Ty-Crop Quick Pass 300 Multi Functional Top Dresser

Designed for "Greens" this small capacity top dresser with optional self contained hydraulics and a choice of spreading attachments (two brushes and twin spinner), allows you to perform all your tasks such as renovation and DUSTING programs.

Ty-Crop Quick Pass 450 Top Dresser "New"

Designed specifically for professional turfgrass managers, the machine can accurately apply a wide variety of materials. Top dressing mixes, composted products, sand, lime, gypsum

and other material under 7mm. Unit features as the QP300 Ty-Crop's 4-wheel walking beam suspension.

Lastec Articulator 421D Diesel Mower "New"

Productivity is the design feature of this 38hp Kubota 4 cylinder diesel engine, 4 individual fully floating cutter decks for the ultimate in No Scalp Mowing. Unique quick height of cut adjustment makes dirty hands a thing of the past. Come and see this high performance finishing mower.

Lastec Articulator Mower 721XR

Fully floating 7 individual cutter decks for the ultimate in tractor drawn No Scalp mowing. Ideal contour roughs mower for large areas.

Lastec Articulator Mower 325EF

Fully floating three individual cutter decks to suit all popular out front mowers. Scalping is a thing of the past.

Exhibit # 24 - TURFCARE NSW

Turfcare NSW is a wholly Australian owned and operated company. The 2 Directors being Bob Cooke and Shane Summerhayes. The business was conceived with one main objective.... to service the commercial turf industry with a range of quality products and services designed to meet the needs of the turf care proffessional. Turfcare NSW are proud distributers for Best Fertilizers, Jacklin Seed, Toro, Paton Fertilizers, Agrichem, Nufarm, Yates, Seed Research, Agrimm (trichoprotection), Simplot turf and horticulture. Shane, Bob, John, Paul and Shaun are all looking forward to seeing you at our stand at this years 17th Australian Turfgrass Conference.

Exhibit # 71 - TURFCRAFT INTERNATIONAL

A bi-monthly trade magazine for the Australian Turf maintenance sector. This 14 year old magazine provides technical and practical information to:

- . Golf Course Superintendents
- · Racecourse ground managers
- · Bowling Green-Keepers
- Sporstfield Managers
- · Parks and gardens keepers
- · Educationalists and researchers

All throughout Australia. The editorial information is unique in that it is provided by contributors who are well known in the industry. Subscription, competition and giveaways available on site 71.

Exhibit# 103 - TURFMACH AUSTRALIA

Turfmach Australia is a family owned Australian company designing and building a range of machinery for the care and renovation of all types of Turf surfaces.

We endeavor to listen to the Turf Specialists and manufacture our range in response to the requirements of the industry.

Our entire range of machinery is built with contractors in mind, hence they are sturdy and easy to maintain with a long service life.

Our range includes:

TR/50/TR74 Turf Renovators (Five Foot, Six Foot wide)

A most versatile and cost effective renovator. This machine is able to Scarify, Dethatch, Vaccuum, Blow and Seed, has Three Hopper sizes and only needs a single operator, extensive owners list including Stadium Australia.

SV6 Sweeper Vac. Excellent Sweeper for very large jobs.

TA30 Deep Aerator. Heavy duty aerator produces a deep slit underground for maximum drainage.

TM3/TM5 Turfmole (Displayed) Vibrating blades Aerate the soil like no other to improve structure and promote healthy turf.

CD36 Compact Dethatcher (Displayed). Perfect for Tees and Greens using a compact tractor.

HSB10 High Speed Blower (Displayed). Terrific for all those leaves, clippings and rubbish. Powerful, right and left handed.

HSS5 High Speed Sweeper. Perfect to pick up cores, stolons, clippings etc from most surfaces.

Exhibit # 54 - TYCO FLOW CONTROL PUMPING

Tyco Flow Control Pumping Systems will be demonstrating the new "PumpMaster" multiple pump control system which will be of particular interest to all Golf Course Superintendents looking to upgrade their irrigation pumping system.

The new Tyco "Pumpmaster" incorporates the latest pump control processor for superior reliability, flexibility and very stable hydraulic performance, while offering huge savings in Energy, Water and Maintenance. Where demand is variable the "Pumpmaster" is capable of 40-80% power reductions, while water savings are achieved by matching hydraulic performance to system demand for accurate distribution through the network. Smooth hydraulic operation reduces wear and potential failure of pipes and valves resulting in reduced system maintenance costs. An outstanding feature of "Pumpmaster" is the versatility to

operate a wide range of pump types including vertical multi-stage, single stage end suction centrifugal, multistage submersible borehole and line shaft turbine pumps.

Visit the Tyco stand at the show or call the National Customer Service Centre on 131 786 or email sjohnstone@typac.com.au for further details.

While Tyco Flow Control Pumping Systems is a new name in Australian Pumping and irrigation industry the producst sold under the new banner are the long established and respected Southern Cross and Everflow Pumps brands.

Exhibit # 89 - WATERCORP

Aquaflex, a breakthrough in soil moisture measurement.

With successful installations in a diverse range of turf and agricultural applications. Aquaflex inststallations range from stadiums, golf courses, research and educational institutions, cricket wickets, amenity turf etc. Aquaflex has been designed to overcome problems associated with measuring moisture in a relatively small volume of soil. Aquaflex measures average soil moisture over a 3 meter length and in a cylindrical volume of 6 litres of soil. In short, aquaflex offers some outstanding features not available with alternative products:

- Moisture measurement averaged over a 3 metre long cylindrical volume
- Accuracy within 2% of volumetric moisture content from dry to saturation
- . Direct measurement of soil temperature
- Moisture measurement compensated for both soil conductivity and soil temperature
- Robustness and reliability for agricultural and turf installations
- · Maintenance free
- Consistent and direct measurement of the same soil volume
- · Easy to install and operate Compatibility

The Aquaflex Moisture Sensor can also be connected to a

wide range of irrigation controllers, weather stations, data loggers, industrial controllers etc. providing both existing and future irrigation systems with reliable information for cost effective irrigation management.

For more information contact Watercorp Pty Ltd Ph: 08 87255902 Fax: 08 8725 1592

Exhibit # 87 - WINDSOR TURF SUPPLIES

Introducing a new variety of couch: Conquest

Conquest is a semi dwarf natural sterile selection of evergreen couch. It is bright green in colour and will maintain its colour throughout the year if correctly fertilised, using a blend of organic and slow release fertilisers. Fertiliser and water rates are much lower and less often than other couch varieties. Conquest can be mown down to 3mm but looks best mown at 12-15mm. It has a very high dense mat with low thatch, which is able to support heavy traffic, and if damage occurs it is able to recover very quickly. With its dense root system Conquest is ideal for washing and after laying, tests have proven it to develope roots up to a depth of 75-100mm, after 21 days. Unlike other couches on the market Conquest can be sprayed with most herbicides registered for couch.

Current sites using Conquest;

Royal Botanical Gardens, Sydney

Graham Park, Gosford

Killara, Roseville, Castle Hill and Richmond Golf Clubs

Parramatta Stadium, surrounds and ticket box walkways.

And many other sites throughout NSW including major landscapes.

Windsor Turf Supplies grow a wide range of other turf varieties and provide the trade with many other services.

Exhibit # 16B - YAMAHA

Yamaha Motor was founded over 40 years ago on a very simple philosophy; make products that make life more fun. This commitment has created some of the most innovative

and highest quality recreational products available today. It also created the finest golf car ever. The Yamaha 'Ultima'. Engineered to practically run forever, the Ultima requires very little maintenance which means less down-time and more golf car revenue for its owner. Running cost comparisons against E-Z-Go and Club Car show significant savings. And with each vehicle wrapped within Yamaha's Sentry Protection System, the entire car is guarded from bumps and knocks. Exclusive air filled, energy-absorbing bumpers protect the front and rear.

And there's unparalleled comfort to match the brilliant engineering. The industry's most comfortable, foam bench seat in each Ultima is thicker than the competition's (with the durable vinyl cover two times thicker in fact) and the seat support made from injection-moulded plastic. The same thoughtful consideration goes into the suspension, steering, control pedals, brakes...just about every single aspect of the car. Because while golfers may not always have a great round of golf, they should at least always have a comfortable one.

Available as G16E 36V Electric, G19E 48V Electric or G16A Petrol models, Yamaha Ultimas exhibit versatility that is impossible to match. No engines in the world are more experienced than Yamaha engines. The Ultima is no exception. From top to bottom the Yamaha Ultima Golf Car is purpose built, specifically to absorb the punishment of today's golf courses.

YAMAHA ATVs... HARD-WORKING.

In fact, Yamaha's reputation for 4-wheelers goes far beyond the manicured fairway. Yamaha's hard-working ATVs are the most innovative and functional range of utility and sport 4-wheelers ever. When it's time to knuckle down and get those big jobs done with the minimum of fuss, there's a 2 OR 4WD ATV designed and built to Australian conditions that's right for just about every application. Take a fresh look at the ATV market place... Yamaha did.

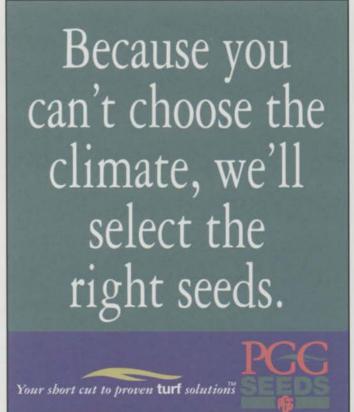


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Take 5 with the Pro's

Aaron Badley

Q1: Home Club? Aaron Badley Croydon, Huntingdale and Moonah Links

Q2: Favourite Golf Course to Play Aaron Badley: Augusta National

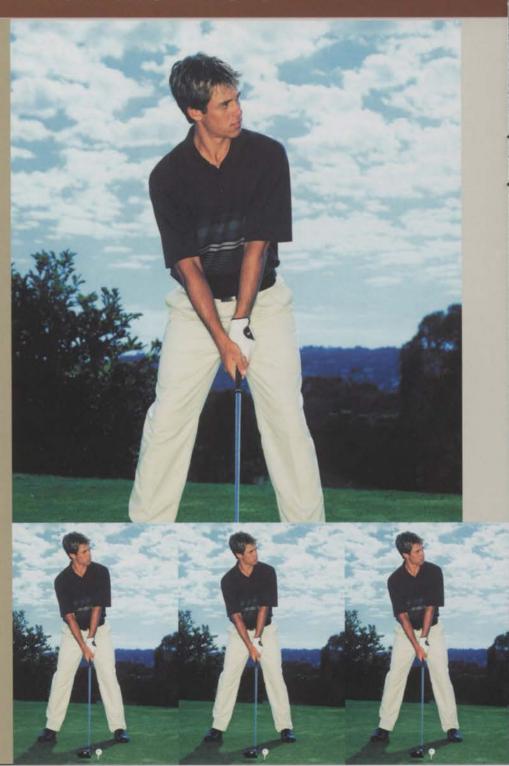
Q3: Best Golf Hole in Australia?

Aaron Badley: 3rd at Kingston Heath because you can play it 5 different ways, driver thru to iron off the tee and it's a no gimme pitch shot either.

Q4: Best Turf Ever Seen (When & Where)
Aaron Badley: US Amateur 1998. Oak Hill
Country Club. Bent Grass on the fairways like
carpet and bent greens running around 11.

Q5: Green Speed ?

Auton Baoley. I like the greens when they are fast. I like the greens to be smooth and no spike marks, or very little, and if the greens are somewhere between 11 - 14 I'm a very happy man cause I know that all I have to do is stroke the putt and the ball will roll over and over then in the hole.

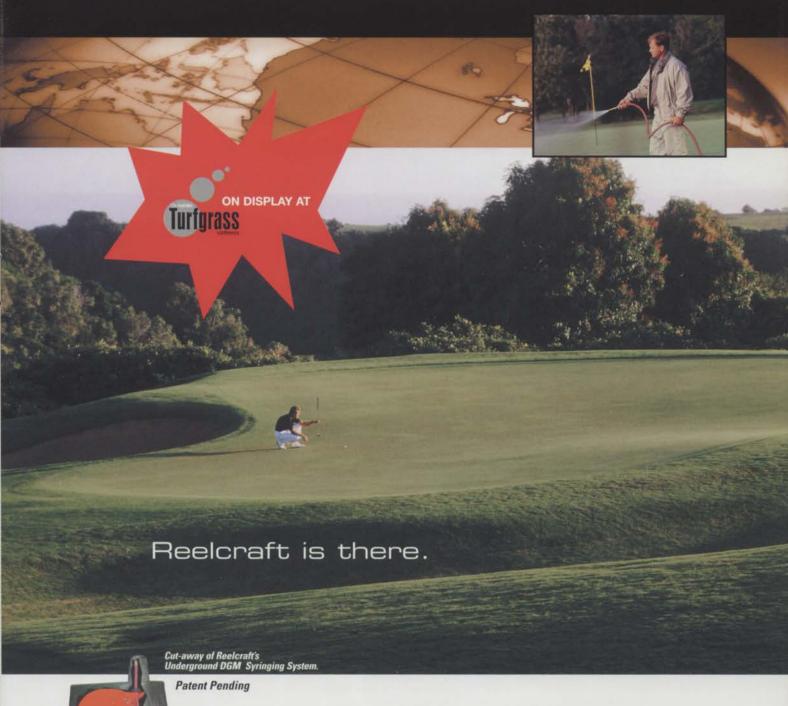




As of 1st January 2001, Shane Summer-Hayes and Bob Cooke have purchased Turfcare NSW and are sole directors.

For same day delivery and unbeatable price on quality turf products.

Call the Turfcare NSW team on 02 9684 6611.



Reelcraft is everywhere.

But don't expect to see it on your approach.

Introducing Reelcraft's Direct Underground Maintenance Retractable Hose Reel System, or DGM, which is specifically designed for syringing golf course greens. The DGM system features a 75-foot, 3/4" I.D. retractable water hose installed underground at each green. The system enables the superintendent to quickly and easily syringe the green when necessary and to just as quickly retract the hose out of the way-and out of sight-when finished.

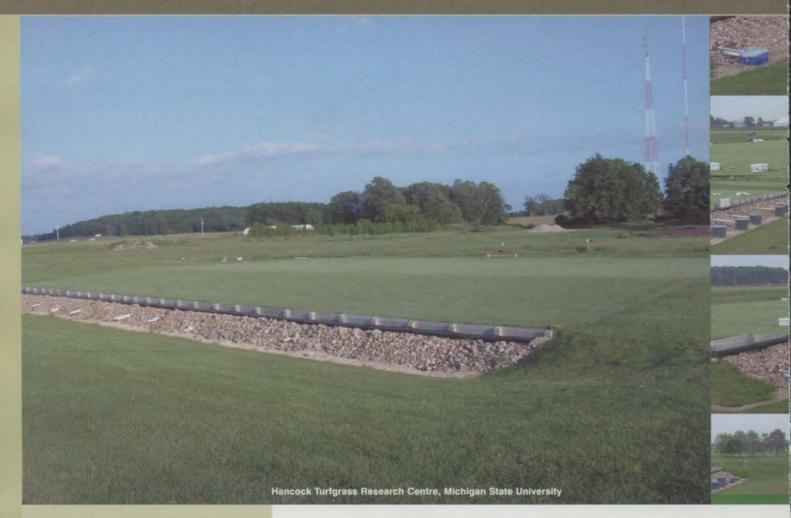
The DGM system allows for a quick response in urgent situations such as extreme heat stress or dry conditions, while preserving the quality of the golf course by reducing turf wear and tear from driving carts and dragging hoses. In addition, hand watering allows for a more even and isolated watering distribution on the green.

So, if your greens are giving you the blues, get back on par with the Reelcraft DGM watering system.





The Effects of a Variable Depth Rootzone on Moisture Retention in a Sloped USGA Putting Green.



The United States Golf Association (USGA) introduced guidelines for constructing putting greens over thirty years ago and since then the USGA green has become the standard for golf course putting greens. The concept behind the USGA recommendations for putting green construction is to build a green that provides a measure of resistance to compaction in the rooting zone and drains quickly to an optimum soil moisture level. Specifications for a USGA putting green require that the sandy rootzone mixture be placed at a uniform depth of 30 cm (12"), across the entire surface of the green. If greens lacked slopes there is little doubt that most, if not all, USGA greens would perform well. However, with the slopes present on putting greens today, the USGA greens do not always perform ideally. The uniform rootzone mix depth does not account for the lateral flow of water in a sloping rootzone. Lateral flow occurs in sloping soil profiles when gravitational and surface tension forces acting on the water become larger than the attraction of water to the soil. This lateral

flow causes lower water contents in high areas of the putting green and higher water contents in low areas. The resultant problems are particularly evident at the higher elevations of the green where hand syringing is often necessary to prevent turf loss.

Research was initiated in 1998 at the Hancock Turfgrass Research Center on the campus of Michigan State University, East Lansing, Michigan, USA, to investigate whether or not altering the rootzone depth, decreasing it in high areas and increasing it in low areas, will increase the water content near the soil surface in high areas and decrease the water content of the rootzone mix in low areas.

MATERIALS AND METHODS

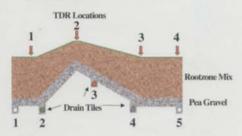
In 1998, a 950 m² (10,000 ft²) research putting green was constructed at the Hancock Turfgrass Research Center at Michigan State University. The green was divided into12 separate plots. Each plot received one of three rootzone mixes; straight sand, sand/peat, or sand/soil. Three plots (one of each rootzone

type) have a rootzone mix with a uniform 30 cm (12") depth (USGA green) and three have a rootzone mix depth varying from 20 cm (8") at higher elevations to 40 cm (16") at lower elevations (MSU green). A series of 120 Time Domain Reflectometry (TDR) probes and cables were buried in the soil to measure soil moisture in 10 cm (4") increments at several locations in every plot. The plots are arranged in a two factor complete randomized splitblock design and are replicated twice. A Rainbird irrigation system was installed to provide uniform irrigation coverage for the entire green. The green was seeded with creeping bentgrass (Agrostis palustris) cultivar 'L-93' in June of 1998.

In 2000, data was collected on soil moisture, leaf surface temperature, turfgrass quality and color, root weights, and quantity of drainage water from various regions of the green. Soil moisture readings were collected for five different 'dry down cycles'. A dry down cycle consisted of irrigating the green until it was near field capacity and then withholding

irrigation for four to five days. A hand-held TDR unit was used to measure volumetric soil moisture content in the $0-10\,\mathrm{cm}$ depth. The locations where TDR measurements were taken are depicted in Figure 1. Data was analyzed to determine differences in moisture content across the slope of the green and between the two construction types.

Figure 1. Cross section through the variable depth rootzone MSU green.



RESULTS AND DISCUSSION

At the 0-10 cm depth there were significant differences in soil moisture content between

Table 1. Volumetric soil moisture content at the 0-10 cm depth on August 31, 2000

TDR Location	CONSTRUCTION TYPE	
	MSU Green	USGA Green
1	17.5 Bta‡	24.2 Aa
2	20.8 Aa	17.5 Ab
3	16.2 Ba	23.4 Aa
4	17.6 Aa	22.5 Aab

† Means in a row followed by the same capital letter are not significantly different according to Fischer's protected LSD (p=0.05)

‡ Means in a column followed by the same small case letter are not significantly different according to Fischer's protected LSD (p=0.05)

construction types and among locations on the green. At the beginning of a dry down cycle on August 31, when the rootzone is near field capacity, at TDR locations 1 and 3 the MSU green had lower volumetric soil moisture content than the USGA green (Table 1). There were no differences in volumetric soil moisture content between the greens at TDR locations 2 and 4. Furthermore, it was evident that there were no differences in volumetric soil moisture content among TDR locations for the MSU green. However, for the USGA green the peak

of the slope, TDR location 2, had significantly lower soil moisture content values than TDR locations 1 and 3.

On September 3, four days after an irrigation event, the MSU green had lower volumetric soil moisture content values at TDR locations 1, 3, and 4 (Table 2). As on August 31, there were no differences in soil moisture content among the locations for the MSU green, indicating that the MSU green had uniform soil moisture across the entire slope of the green.

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Table 2. Volumetric soil moisture content at the 0-10 cm depth on Septmeber 3, 2000

TDR Location	CONSTRUCTION TYPE	
	MSU Green	USGA Green
1	14.1 Bta‡	21.2 Aa
2	14.5 Aa	11.3 Ab
3	14.8 Ba	20.8 Aa
4	13.6 Ba	19,1 Aa

† Means in a row followed by the same capital letter are not significantly different according to Fischer's protected LSD (p=0.05) # Means in a column followed by the same small case letter are not significantly different according to Fischer's protected LSD (p=0.05)

Across the slope of the USGA green, volumetric soil moisture content values were lower at the peak of the slope, TDR location 2. Figure 2 presents the percent difference in volumetric soil moisture content the MSU green is from the standard USGA construction type. What's critical to recognize is that at the peak of the slope (TDR 2) the MSU green had a greater volumetric soil moisture content than the USGA green and at the lower elevations had less. Essentially, by decreasing the rootzone depth at the peak of the slope more water was retained in the surface 10 cm and by increasing the rootzone depth at the lower elevations less water was retained in the surface 10 cm.

Flaure 2. Percent difference in volumetric water content the MSU green is from the USGA green (0-10 cm depth). Data taken on September 3, 2000 (Day 4 of a dry down cycle).



CONCLUSIONS

Our initial results indicate that altering the rootzone depth decreases soil moisture content near the putting green surface in lower regions of the green and increases soil moisture content near the putting green surface in higher areas of greens.

Although the differences were not statistically significant at this time, volumetric soil moisture content was greater at the peak of the slope, TDR location 2, for the MSU green. The results confirm our initial hypothesis that altering the rootzone depth will decrease moisture content in lower regions and increase moisture content on elevated areas of greens. Additional measurements throughout the summer of 2001 are needed before definitive conclusions on the effect of a variable depth rootzone mix on soil moisture in sloped putting greens are made. 4

Acknowledgements

This research is currently supported by grants from the United States Golf Association, Golf Course Superintendents Association of America, and the O.J. Noer Turferass Foundation. We are also grateful for support from the Michigan Agricultural Experiment Station, Dept. of Crop and Soil Sciences. Michigan Turfgrass Foundation, TriTurf Inc., Rainbird, and Bruce Mathews from Design3.





Kevin.W. Frank, Ph.D., Assistant Professor, Michigan State University

Brian.E. Leach, Graduate Assistant, MSU

Jim R. Crum, Ph.D., Professor, MSU

Paul E. Rieke, Ph.D., Professor Emeritus, MSU

Bernd R. Leinauer, Ph.D., New Mexico State Univ.

Thom A. Nikolai, Asst. Coordinator Golf Turf Mgt. Program, MSU

Ron N. Calhoun, Research/Extension Specialist, MSU

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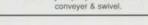
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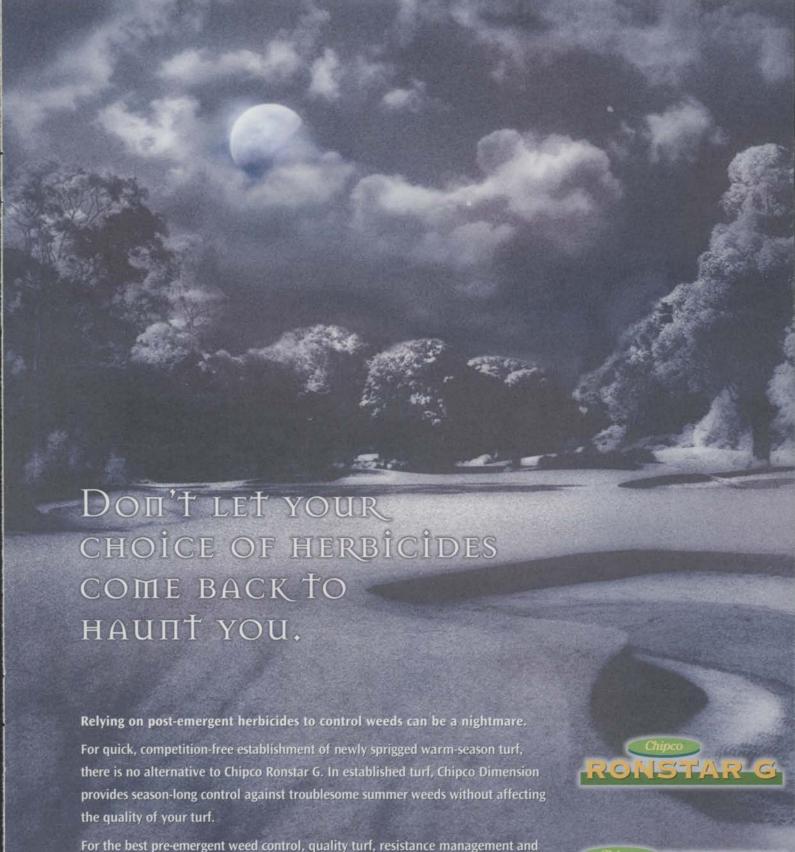


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Effects of solid tine aeration treatments on soil physical properties and turf playing surface quality





Many soils can become compacted under increased playing or mechanical pressure, the effects of which can seriously affect infiltration rate, permeability, root development and penetration. In compacted soils, less oxygen enters the soil and less carbon dioxide can escape. The net result is a gradual thinning of the turf sward, to a point where the soil can no longer support turf growth except for less desirable, shallow rooted species such as Poa annua. The degree of compaction will depend on factors such as soil texture, the severity and frequency of applied pressure, the extent of

vegetative cover, and the soil moisture content. The failure to maintain a balance between the processes of aeration and drainage can influence the level of compaction and the time it takes for the soil to recover.

Turf managers aerate their sporting surfaces to relieve compaction, and by improving the water infiltration and air exchange, stimulate root and shoot growth. Strategic use of the aeration process will assist in the drying of excess moisture and promote deeper root growth for improved heat and drought tolerance.

METHODS OF AERATION

Six basic types of soil aeration equipment are available to the sports turf manager. They operate in different ways including; (a) vertically operated types with hollow tines, (b) circular motion, with open spoon or hollow tines, (c) slicer/spiker, (d) solid tine aerators, (e) deep drilling machines, and (f) water injection aerators. The most conventional means of providing soil aeration involves the use of the hollow-tine aerator and the solid-tine/shatter type aerators. The former punctures the soil profile and removes plugs of



soil, whereas the solid-tine or "shatter" aerators, which include the verti-drain, Southern Green, mini-mole plough, and the vibra-mole, cause minimal surface disturbance and break up the subsoil but does not produce a core plug. This form of aeration is often recommended for soils that are heavily compacted beyond the depth of conventional core cultivation (ie. greater than 75-100mm). Solid-tine aeration can also provide for multiple treatments when the turfgrass surface is undergoing stress but without adversely affecting the playability of the surface.

Deep shatter tining or verti-draining involves the use of solid tines that penetrate the soil profile, with newer models capable of penetrating to a depth of 600mm. Tines of this type are used on golf greens, tees, fairways, and sports fields, with the solid tine size commencing at 8mm diameter and the spacings that can range from 56mm to 1270mm apart. Such equipment may cause the soil to heave up to 18mm while still maintaining a level and true playing surface. A more recent innovation has been the introduction of smaller solid needle tines of 5mm in diameter for wider sports turf field application.

More recent technology uses high-pressure water injection to break up the subsoil instead of the conventional spikes, blades or tines, and causes little or no disruption to the playing surface. Water injection aeration involves the use of water, injected at high velocity to depths that average between 100 and 200mm or beyond 500mm with repeat shots directly into the soil profile. This technique allows for short-term compaction relief with a minimum amount of soil surface disruption.

More often than not, a combination of techniques that best eliminate the compacted area will be chosen. Solid-tine aeration is often used to eliminate 'hardpan' conditions in the subsoil or where heavy traffic has sealed the surface. The hollow-tine corer is better suited to areas where thatch/root mat are to be removed, and where the soil profile can be modified by topdressing, or by adding amendments. Determining which is the most appropriate type of aeration technique will require the turf manager to observe both the signs and symptoms associated with the playing surface as well as the soil profile. Soils that are slow to absorb water, or where water is running off the surface or ponding for long periods of time, are obvious signs of poor

surface drainage. Subsoil indicators may include the presence of compacted layers, a perched water table, shallow root growth and a general lack of structure, particularly in high clay content soils.

METHOD AND MATERIALS

A study was undertaken to investigate the performance of the Vertidrain 7117 Mustang ® sub-surface aeration machine on a range of soil physical properties on the sports fields of Wesley College, Glen Waverley campus which is situated, 20-km south-east of metropolitan Melbourne, in Victoria. The experimental design of a randomised complete block of three replicates was carried out on two soil types; duplex red clay of pH 6.5, and a medium-fine sand profile of pH 6.8. Each plot was systematically aerated with either 5mm or 8mm solid diameter needle tines, applied at three spacings of 55x75mm (wide), 55x55mm (conventional) and 55x35mm (narrow), and with either a 5 or 10 degree 'kick', the latter being the angle at which the tine is extracted from the soil profile (See diagram over page).



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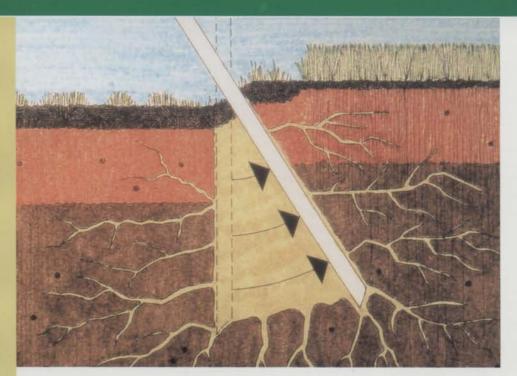
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(The Verti-Drain drives tines into the grass and through the ground and then heaves the soil. The degree of cracking is adjustable: the maximum angle is shown here (Courtesy Redexim Charterhouse).

These treatments were applied weekly for a period of 4 months from February through to May 2000. The soil physical measurements of surface hardness and soil strength were taken monthly as was turfgrass quality. Soil moisture and water infiltration rates were measured in April and May and root weight, and an assessment of root health, measured at the conclusion of the experiment.

RESULTS AND DISCUSSION Soil physical properties

Results indicate that sub-surface solid tine aeration can be effective in reducing surface hardness and soil strength, as well as improving the infiltration rate of both a clay loam and a modified sand profile. The wider solid tine diameter needles (8mm) appear to be more effective, than the 5mm needles with the effects on these soil physical properties apparent after 1-2 months, whereas with narrow diameter needles (5mm), significant effects were not observed for 2-3 months after treatment commenced. The wider

diameter needles, when applied at the conventional spacing of 55x55cm, were better at reducing surface hardness and soil strength, and improving infiltration rate and turfgrass quality in the sand profile. With the clay loam profile, the spacing of 35x55cm, was best at reducing surface hardness and soil strength, and improving turfgrass quality. However, infiltration rate was not significantly improved. The effect of kick and soil moisture content on these soil physical properties were both inconsistent, with more research to be undertaken to determine their significance.

Root weight, health and turfgrass quality

Results indicate that subsurface solid tine aeration using the 8mm needles can improve root dry weight and turfgrass quality in the modified sand profile. However, the 8mm needles may cause injury to the fine root system generated in the clay loam profile. A significant increase in root damage was not recorded with the 5mm tines. Little root damage was recorded using the large diameter needle in the modified sand profile where the roots were larger and fewer in number. It is suggested that the improved root dry weight and the healthier root system of the Kentucky bluegrass (Poa pratensis L.), perennial ryegrass (Lolium perenne L. cv. Cutter) sward in the modified sand profile, contributed significantly to improved turfgrass quality. Root weight and health were significantly poorer in the clay loam profile and this resulted in poorer turfgrass quality.

These changes in root weight and health, and subsequently turfgrass quality, suggest that the timing and frequency of solid tine aeration are

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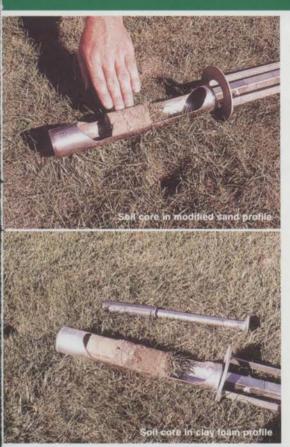
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particularly important with heavier soils.

Australian industry practices suggest 2-3
aeration's per year for warm-season growing
grasses, commencing in early spring, then early
summer, and then perhaps in autumn as being
the most effective. Cool-season turfgrasses
perform best if the aeration is carried out in early
spring or autumn, with summer aeration
normally avoided to reduce plant stress during
hot weather.

FURTHER RESEARCH REQUIRED

This project revealed that the timing and frequency sequencing of solid tine aeration could well be a function of soil texture, soil moisture and playing intensity and merits further research. Another area of research that has emerged from this project is the importance of moisture content and soil texture on the effectiveness of solid tine aeration. It is suggested that soil moisture be below field capacity at the time of aeration, but that sufficient soil moisture be available as a lubricant for tine penetration, yet be dry enough to produce fissures due to the force exerted by the tine entering the soil.

Further information on the project may be obtained by contacting Dr David Aldous on telephone (03) 9250-6800, fax (03) 9250-6885 or e-mail: daldous@unimelb.edu.au. A more comprehensive technical paper on this project is to be presented at the 9th International Turfgrass Research Conference Meetings in Toronto, Canada over 15th-21st July 2001.

Authors

David Aldous, Ken James, and Ben Whykes. Department of Resource Management and Fiorticulture. The University of Meilbourne, Burnley Campus, 500 The Boulevard, Richmond, 3121, Victoria, Australia

John Neylan: Australian Golf Course Superintendents Association, 1/19
Railway Parade, North Waverly, 3150, Victoria, Australia

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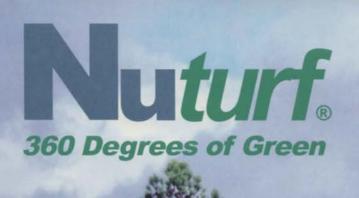
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GOLF CART PATHS Driving Change

Motorized golf cars drove onto the golf course scene in the 1950's and soon after, **Golf Course Superintendents** began to report excessive turf damage that was the result of concentrated golf car traffic. Ted Rupel, Golf Course Superintendent at Cherry Hills Country Club in Denver, reported in the 'Golf Course Reporter' (Mar-Apr 1958) that traffic damage on his course was concentrated in front of the greens, near the tees and extending almost to the fairways.



The damage in front of the greens was the easiest to correct since it had a direct effect upon the game. "We easily took care of this by education and direction of car traffic through small direction signs. It became quite apparent that the golfer did not want to destroy his course in front of the green," Rupel writes.

The area along one side of the tees to the fairway was another matter. Rupel recalls, "Try as we did, we found the golfer forgot all about his course after he had hit is tee shot." He decided that a hard-surface path was the only solution.

Educational programs on golf cars became common at the annual golf course conference and show in the late 1950s and early 1960s. Superintendents realized quickly that golf cars were part of progress and that their jobs included providing the best possible conditions to accommodate cars. Golf course architects were hired to design cart paths on existing courses, and paths became the norm on new courses (GCM October 1998 – 'Historical Perspectives').

Golf Cart paths are still derided by golf purists but are an increasingly important component on some golf courses.

One example on a project I was recently involved with is the Hong Kong Golf Club, a 72-hole golf course with 54 holes at Fanling and another 18 holes on Hong Kong Island. An extensive discussion with Committee and members in respect to the under utilized Eden Course at Fanling, a hilly course with about



65% of HKGC members aged over 60 years of age resulted in the design and construction of a concrete cart path that has recently opened to very positive comments from golfers.

The cart path has also been designed to assist in collecting runoff from nearby slopes and thus is an integral part of the drainage system for the course. The cart path is tinted (charcoal grey) concrete with a brush finish and generally 2.25 metres wide. At critical points along the fairway the concrete has been covered with a rubberized surface to minimise the impact from the path on golf and to make the paths safer in areas where golfers are getting in and out of carts.

Now with carts allowed over the path year round and also on the fairways for parts of the year members who could not previously play the course are returning. As long as these dedicated members can swing a golf club they can now play golf even if age does not allow them to walk the course.

With the increased health and longevity of western societies more and more emphasis is going to be placed on provision of appropriate facilities for this section of the community in the future. As some Golf Clubs are discovering, this section of our community is also one of the wealthiest, has time on their hands and are very politically active. A powerful combination against the purists who are often in the mid thirties to forties and have not yet felt the effects of time.

At HKGC with the slopes coming into sections of the golf cart path the path needed to have cut-off drains installed on the up-slope sides. These drains have grated covers and lead into collection pits that then flow into the more major drains. The specifications shown (fig1 & 2) reflect the more traditional approach to cart path construction

figure:1 TYPICAL SECTION



Notes

(1) Turf surface on either side to be flush with concrete

(2) A slight fall across path, conforming with the natural slope of the land should be achieved to avoid ponding of water

figure:2 CART PATH / STEEP SLOPE



(1) Width (w) of open drain not to exceed width of golf cart tyre (2) At selected points (eg: Tee Zones) open greats may be placed over drain to prevent accidental entry

Another example where Golf Cart paths are seen as an important part of the Golf Course is are the newer "resort style" courses, which cater to a more commercial market of green fee players and corporate events. At these courses the golf cart path assists in the flow of golfers and is a profit centre unto itself.

In Australia, Queensland has led the pack for such courses with the Gold Coast having numerous examples. In Victoria the new Heritage Golf and Country Club developed at the Yarra Valley and the Waterford Valley layout in Knox both have cart paths.

The specifications for these cart paths have a mixture of fibre mesh and concrete with the fibre replacing the traditional f72 or f82 steel

Installation of concrete paths at the Heritage Golf & Country Club



form mesh to give the concrete strength. The more traditional specification will be used at Waterford Valley for the main path / road to the maintenance department where heavier traffic is expected.

The cart path contractor at Heritage (Creteprint Paving) indicated initial skepticism when first using the fibre concrete but was very happy with the results and is planning to submit the same profile for future projects. The fibre concrete profile is 100 to 150 mm of fibre concrete (dependent on requirements & subsurface) placed on compacted screenings of 100 mm depth, the sub-base must also be compacted.

Currently the cost of cart path construction ranges from \$30 to \$39 per square metre with the fibre mesh concrete being the more cost effective solution.

As stated the cart path at HKGC was 2.25 metre wide but a more common standard used throughout the world is 2.5 metres. The narrower path is used to minimise intrusion into an existing golf course or to save on budget.

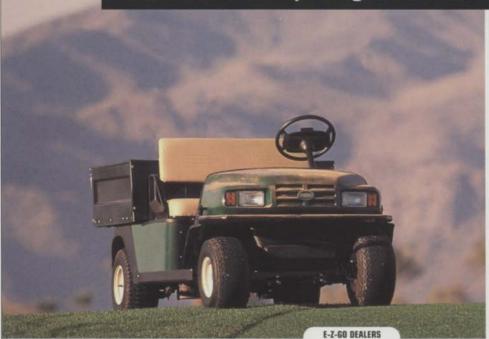
A final compelling reason for cart paths occurs in the tropics where temperatures may reach between 30 to 40 degrees on a regular basis. Carts have become increasingly popular and allow avid golfers to play during the hottest parts of the year.

Alternatives to the basic concrete cart path have been tried in many places and include;

- •Asphalt: a seemingly cheaper alternative but still needs concrete edging to be effective which raises the cost and then compares with concrete. I have seen many examples of asphalt paths but only those with edging have proven successful.
- Paving blocks: seen by some as more attractive but movement in blocks after a few years is very common as is weed invasion.
- •Railway sleepers: a good idea on paper but when carts move over them golfers get a very bumpy ride / not recommended.

It is quite difficult to design a cart path into an

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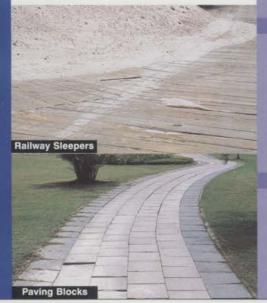
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existing layout and most of the work needs to be undertaken on site to reduce the visual and golf impact. Designing a cart path into a new golf course is easier as mounding, landscape and wider movement areas assist the designer in minimising impacts.

Phil Ryan is a director of Pacific Coast Golf Design



ADDITIONAL NOTES ON GOLF COURSE PATH CONSTRUCTIONS OF A MORE GENERAL NATURE.

By Stuart Laing, Construction Manager with Grove Constructions

There is no set method or type of construction that will meet the needs of all golf courses. Every facility has different issues to consider such as terrain, soil type and drainage, intended use, visual impact, financial constraints and material availability.

Here are some points to consider with pathway construction;

DRAINAGE AND SOIL TYPES:

Soil types will determine the degree or type of drainage that is required to create an acceptable path.

The sub-base can be constructed out of local materials such as clay or stable sands, creating a firm base for surfaces such as gravel or bark. Paths constructed with concrete or asphalt will require a 75mm sub-base of a material such as crushed rock.

Paths must be cambered correctly or sloped to allow surface water to shed from the surface and into drains. Unless the required drainage is installed when paths are constructed, damage will occur and extensive maintenance will be ongoing.

TERRAIN

Undulating golf courses have several issues that need to be considered. These include, use of a 'non-slip' surface in areas that slope severely or are likely to remain damp for extended periods.

INTENDED USE

Will heavy machinery use concreted cart paths? If so, reinforced concrete will have to be used. If this is not achievable within your budgetary guidelines, specific cross-over points for heavy machinery may have to be an option? Staff and any subcontractors will then have to be directed to those specific sites.

Some turf equipment has minimal ground clearance and will continually bottom out (damaging blades etc) on paths that have been shaped incorrectly.

VISUAL IMPACT

Trying to design and construct a path or network of paths on a golf course that meets all of your requirements and is visually pleasing is a difficult task and you will never please everyone. Choosing a surface that blends into the style or the theme of your environment, achieves required objectives and is generally acceptable to golfers should be the goal.

SURFACE TYPES

There are many different surface materials that can be used to meet the needs of most golf courses. For example, during my time as Course Superintendent at Long Reef Golf Course on the Northern Beaches of Sydney, hardwood timber paths were selected to blend into this natural environment, along with sandstone bridges crossing all the waterways. A 500mm 'poured rubber' walking stripe was applied to the timber walkways in sloping areas where extra grip was required. Crushed rock had been tried with little success due to heavy rainfall, which continually resulted in washouts. Superintendents have indicated their satisfaction with polymerzed sands. #

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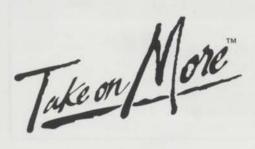
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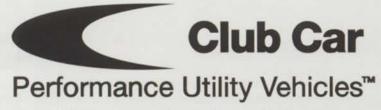
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Mnews

AGCSA ANNOUNCES AWARD FINALISTS

AGCSA President Peter Frewin announced he finalists for the 2001 AGCSA Awards program in May. He stated that the new look AGCSA Excellence in Golf Course Management Award, presented in partnership with John Deere, created a renewed interest amongst the golf turf fraternity with more nominations received than the previous three years.

Judging for all AGCSA Awards will take place on Sunday June 17th, with the awards being presented during the opening session of the 17th Australian Turfgrass Conference on the evening of Monday June 18th at the Sydney Convention Centre.

FINALISTS FOR THE 2001 AGCSA AWARDS PROGRAM ARE AS FOLLOWS;

AGCSA Excellence in Golf Course Management Award

Mark Gahan – The Dunes Golf Links

Danny Gilligan – The Tasmania Golf

John DEERE

ClubStephen Seckold – Windsor Country Golf Club

AGCSA Claude Crockford Environmental Award

Chris Grumelart - Shearwater Cape Schank Resort

Andrew Baker – Sanctuary Cove Jeff Austin – Ell Caballo Resort



AGCSA Graduate of the Year Award

Scott Carruthers – Pennant Hills Golf Club Brenton Coulthard – Ivanhoe Golf Club

The AGCSA Board has also selected the recipient of the AGCSA Distinguished Service Award, presented in partnership with the Scotts company. This special award will be announced at the Awards ceremony and is sure to please the industry when an individual of this caliber finally receives recognition for their life long efforts.

NEW FACE FOR OASIS

Oasis Turf has appointed Scott Irving (formally at Riversdale Golf Club) as their new Sales Representative. Scott will be servicing both Metropolitan and Country customers and brings a wealth of experience in both Golf and Bowling Green knowledge.

Scott can be contacted on 0412 225 659.

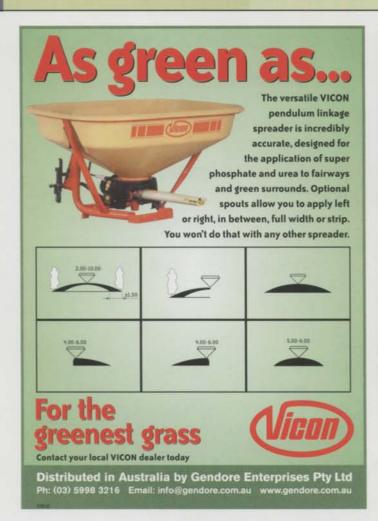
NUTURF PTY LTD APPOINTED AS DISTRIBUTOR FOR VICON PENDULUM SPREADERS

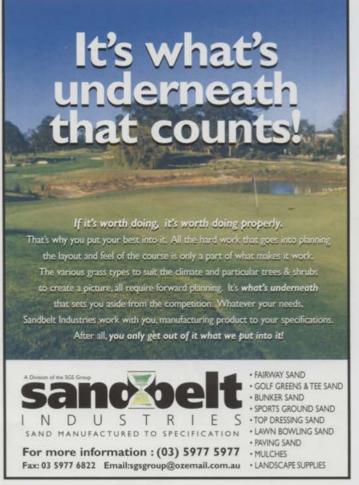
Nuturf Pty Ltd, the nations leading supplier of turf care products and Gendore Pty Ltd, the National distributor of Vicon products have reached agreement that will see Vicon pendulum spreaders distributed through Nuturf Pty Ltd.

Mr Jason Henry, Marketing Manager for Vicon said, " the appointment of Nuturf as our distributor to the turf industry recognizes that turf managers have specific service requirements that need to be addressed by an organization that has a long standing vested interest in the industry. By any standards Nuturf meets these requirements."

Nuturf Marketing Manager, Mr Mark
McNamee commented, " for Nuturf it's a nice
fit. Our range of turf management products
requires application equipment of very high
quality. Vicon spreaders are the industry leaders
and we look forward to working with them. "

Nuturf will handle all sales, service and spare





1 70



parts enquiry's. Over the coming months Nuturf sales and customer service personnel will undergo extensive product training.

For further information please contact Nuturf on 1800 631 008, alternatively, Jason Henry from Vicon on (03) 5998 3216

DYING FOR A GAME!

Recent statistics say that golf courses are the fifth-most likely place to have a heart attack.

Airports are revealed to be the most likely place to have a heart attack but if you can't avoid those, stay away from Prisons, Shopping Malls and then Stadiums.

Pittsburgh physician and chairman of the emergency medicine department at the University of Pittsburburgh School of Medicine, Dr Paul Paris has been well aware of the dangers ever since a friend of his was struck and killed by an errant golf ball but aside from this risk, golfers must dodge lightning bolts, threat of asthma attacks, diabetic shock, heat stroke, allergic reactions and insect bites.

However, ask to see the first aid kits and at

most courses, says Dr Paris, "there will be three Band-Aids and two Tylenol".

In an attempt to help remedy this situation, Dr Paris conveigned 100 doctors from around the United States to attend a three day golf medicine symposium that was held at the end of May. The objective of the conference was to develop a list of medical must-haves for emergencies on golf courses.

AVONDALE GOLF CLUB RECOGNIZED FOR ENVIRONMENTAL EXCELLENCE

Avondale Gold Club has achieved designation as a "Certified Audubon Cooperative Sanctuary" by the Audubon Cooperative Sanctuary System (ACSS), the educational division of Audubon International. David Warwick, Superintendent, has led the effort to obtain sanctuary status on this course and is being recognized for Environmental Stewardship by Audubon International. Avondale Golf Club is the third course in Australia and the 212th in the world to receive the honour.

Said David Warwick, "we are absolutely thrilled to get this recognition and I would like to pay special thanks to the committee and to Horticulturist, Alex Palmer who planted about 32,000 native trees, shrubs and grasses.

The program is endorsed by the USGA and provides information and guidance to help golf courses to preserve and enhance wildlife habitat, and protect natural resources. Golf courses from the United States, Canada and Europe have also achieved certification in the program. Audubon certified courses in Australia also include The Palms Course and the Pines Course at Sanctuary Cove Resort located in Queensland.

For further details on the program visit, www.audubonintl.org.



Can you see where the Antonio Carraro tractor has been on this golf course?



Nobody else will either.

At around 7psi (50kpa)* ANTONIO CARRARO tractors exert less pressure on your precious turf than most utility vehicles, let alone other tractors. If you're serious about keeping you're course in top codition there's only one choice to make.







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...makes more sense!

* Depending on tyre configuration.



BCS LOW PROFILE TRACTORS



Low profile small tractors of 26 to 48 horsepower from BCS were introduced in March and are already making their presence felt in many of the applications requiring versatility and low horsepower.

Turf company StrathAyr have one in action in a project involving the resurfacing of a training track at the Flemington Racecourse in Victoria. Steve Cole from StrathAyr said he was "most impressed with the machines extremely low ground pressure and the ease with which it handled the heavy maxi-rolls".

The BCS Vanguard 400 has a reversible console and is sure footed even on steep terrain and their extraordinary versatility is due to a balanced weight distribution and compact size.

BCS is distributed by Valpadana Australia Pty Ltd. And their Australian dealers, Ph# 03 9898 5985, or email admin@valpoz.com.au, for further information. performance, while offering huge savings in Energy, Water and Maintenance.

Where demand is variable the "PumpMaster" is capable of 40% to 80% power reductions, while water savings are achieved by matching hydraulic performance to system demand for accurate distribution through the network. Smooth hydraulic operation reduces wear and potential failure of pipes and valves resulting in reduced system maintenance costs.

An outstanding feature of "PumpMaster" is the versatility to operate a wide range of pump types including vertical multi-stage,

single stage end suction centrifugal, multistage submersible borehole and line shaft turbine pumps.

Visit the Tyco Stand at the Show, call our National Customer Service Centre on 131 786 or email sjohnstone@typac.com.au for further details.

The 1600 also features a two-function, mechanical, on-demand four-wheel drive system. In the on-demand position, four-wheel drive automatically engages when needed for increased traction and disengages when not needed for sharper turning and maximum trimming ability.

For high-quality cutting performance, the 1600 powers three commercial mower decks – one 62-inch centre-mower deck and two 42-inch wing decks. The decks are rear discharge and have a unique baffling system that reduces clumping and provides uniform clipping dispersal. Height of cut can be easily adjusted from 2.5-14cm (1 to 5.5 inches). Each wing deck has four castor wheels that follow ground contours to prevent scalping and gouging.

For further information see the WAM 1600 on the John Deere stand at the AGCSA Turfgrass Conference in June this year, speak to your John Deere front mower dealer, or freecall 1800 800 981.



MOW 8.5 ACRES AN HOUR WITH SPEEDY JOHN DEERE 1600 WIDE-AREA MOWER

With almost 3.4m (11 feet) of cutting width and a powerful engine, the John Deere 1600 Wide-Area Mower scampers over large, open spaces at a blistering clip of 8.5 acres an hour at 10.5km/h.

It's designed specifically for use by councils, parks and recreation departments, golf courses, educational facilities and other institutional applications where speed equals economy.

The 1600 is energized by a 51-hp diesel engine that's liquid-cooled for quieter operation and more consistent power on a long job. This is a 4-cylinder powerplant with fuel injection and overhead valve design to reduce engine emissions and boost fuel economy.

To increase productivity on the job, a hydrostatic transmission and two-speed transaxle allow mowing speeds up to 13.8 km/h. To get from job to job faster, the transmission allows transport speeds up to 23.2 km/h.



NEW REMOTE HUNTER COMPATIBLE

Following on the success of the Commander and Sidekick remote controls for irrigation, Remote Control Technology have made their new units compatible with Hunter Irrigation Controllers via the use of a Direct Controller Interface module.

Ideal for sprinkler maintenance on the golf course, the new Sidekick and Commander Remote Controls used with the DCI module will allow users to activate stations via their Hunter ICC controllers whilst in the field.

The DCI module makes connection to the Hunter ICC controller simple and enables access to all stations, even when all expansion modules are fitted to the controller.

For more details contact Irrigation Solutions, phone 03 9740 4882.



NEW PUMP CONTROLLER FOR AUSTRALIAN MARKET

Tyco Flow Control Pumping Systems will be demonstrating the new "PumpMaster" multiple pump control system which will be of particular interest to all Golf Course Superintendents looking to upgrade their irrigation pumping system.

The new Tyco "Pumpmaster" incorporates the latest pump control processor for superior reliability, flexibility and very stable hydraulic



SYRINGING MADE EASY

Reelcraft Industries have introduced the Direct Underground Maintenance Hose Reel System, or DGM, which is specifically designed for syringing golf course greens.

The DGM system features a 75-foot, _" I.D. retractable water hose installed underground at each green and allows the superintendent to quickly and easily syringe the green when necessary then retract the hose out of site when finished.

The product is the development of an invention by Rhode Island Superintendent, David G. Mihailides who will introduce the product on Exhibit #38 at the 17th Annual Turfgrass Conference and Trade Show.

For further details, contact Strata Group on (02) 9621 8988 or visit www.strata-aust.com.au



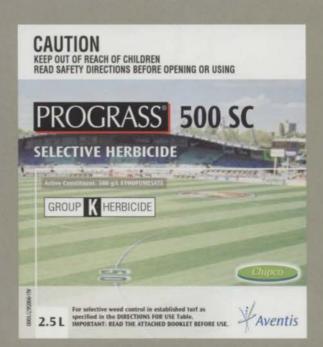
LANDA UNVEILS BIOREMEDIATION SYSTEM

Landa, North America's largest manufacturer of industrial pressure washers and water cleaning systems, has introduced the WaterStax, a bioremediation wash-water treatment system for golf courses and other turf facilities which are coming under increased EPA scrutiny because of the oily water runoff from washing mowers and other grounds equipment.

The WaterStax uses enzymes, or controlled bacteria, which have proven to be very effective in "eating" the oil, grease, hydrocarbons, grass clippings, and even pesticides in the typical turf or golf course wastestream. The resultant water can either be discharged to the sanitary sewer or irrigated back onto the course.

WaterStax, known as model WS-1000D in the Landa line, consists of three tanks, a grass clipping removal assembly, and automated pumps for controlling the use of BioStax GC, the proprietary solution of microbes that breaks the waste into harmless substances consisting mainly of carbon dioxide and water. BioStax GC is free of pathogens and meets all current and proposed EPA regulations for bioremediation.

For Further details contact Landa Australia on (02) 9316 9612



NEW HERBICIDE FROM CHIPCO

With the wintergrass season already upon us, Chipco are pleased to announce the introduction of Prograss 500 Selective Herbicide. Prograss is a new turf registered herbicide for post and pre-emergent control of some grasses and broad leaf weeds. In turf, Prograss is registered for the control of wintergrass (Poa annua) in most turfgrass varieties except couchgrass. Prograss should not be applied to common couchgrass (Cynodon dactylon) and to hybrid couchgrass (C. dactylon x C. transvaalensis). Prograss is safe to use on ryegrass, Kentucky bluegrass, Queensland blue couch, kikuyu and bentgrass. However, is not registered for use on golf and bowling greens. Seeding of treated areas should not occur within one month of spraying.

Prograss should be applied at 800ml/ha in 400-600L of water. Best results for wintergrass control are achieved with a programme of 3 to 4 sequential monthly applications. This allows wintergrass control to be gradual and for the desirable turf species to take over without having unsightly bare patches from large areas of dead wintergrass.

Further details can be obtained by contacting Aventis CropScience on (03)9248 6888.

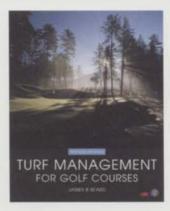
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TURF INDUSTRY BOOKSHOP

A Field Guide to Australian Frogs	\$49.50	Managing Wildlife Habitat on Golf Courses	\$104.50
A practical guide to Ecological		Masters of the Links	\$60.50
Management on the Golf Course	\$60.50	Manual of Grasses	\$99.00
A New Tree biology & Dictionary (Two book set)	\$170.50	Modern Arboriculture	\$141.90
Arborculture 3rd Edition	\$115.50	Native Australian Plants: Horticulture & Uses	\$77.00
Australian Weed Control Handbook: Tenth Edition	\$77.00	Native Plants of the Sydney District	\$88.00
Biological Control of Weeds	\$44.00	Natural Turf for Sport & Amenity	\$121.00
Bird Conservation on Golf Courses	\$66.00	Noxious Weeds of Victoria	\$55.00
Birdwatcher's Guide to the Sydney Region	\$24.20	Nursery & Landscape Weed Control Manual	\$88.00
Color Atlas of Turfgrass Diseases	\$187.00	Organic Control of weeds	\$17.60
Color Atlas of Turf Weeds	\$187.00	Practical Golf Course Maintenance	\$115.50
Compendium of Turfgrass Diseases	\$104.50	Practical Greenkeeping	\$181.50
Confidential Guide to Golf Courses	\$110.00	Rough Meditations (HB)	\$65.50
Controlling Turfgrass Pests	\$220.00	Salt-Affected Turfgrass Sites: Assessment & Management	
Cricket Grounds	\$132.00	Sands for Sports Turf Construction & Maintenance	\$55.00
Creeping Bentgrass Management	\$127.05	Simplified Irrigation Design	\$99.00
Crop Weeds	\$71.50	Sports Fields	\$170.50
CSIRO Handbook of Australian Weeds	\$55.00	Sports Grounds & Turf Wickets	\$33.00
Destructive Turfgrass Insect: Biology, Diagnosis & Pests	\$163.90	Sports Turf: Science, Construction & Maintenance	\$159.50
Disease, Insect & Weed Control in Turf	\$65.45	Spotting Soil Salting	\$27.50
Diseases of Turfgrasses	\$264.00	Superintendents Handbook of Financial Management	\$88.00
Drainage for Sportsturf and Horticulture	\$38.50	The Care of the Golf Course	\$104.50
Effluent Water for Turfgrass irrigation (leaflet)	\$5.50	The Committed to Green Handbook for Golf Courses	\$33,00
Encyclopaedia of Australian plants Vol 1	\$99.00	The Complete Handbook of Pruning	\$29.70
Encyclopaedia of Australian plants Vol 2	\$143.00	The Golden Age of Golf Design	\$148.50
Encyclopaedia of Australian plants Vol 4	\$143.00	The Golf Course- planning, design, cons and maintenance	
Encyclopaedia of Australian plants Vol 5	\$143.00	The Links	\$132.00
Encyclopaedia of Australian plants Vol 6	\$143.00	The Mathematics of Turfgrass Maintenance	\$88.00
Encyclopaedia of Australian plants Vol 7	\$143.00	The Sand Putting Green: Construction &	1
Fertilisers for Turf	\$49.50	Management (leaflet)	\$19.80
Field Guide to Eucalyptus Vol2-S.W. & S. Australia	\$104.50	The Spirit of St. Andrews	\$71.50
Field guide to Eucalyptus Vol3 N. Australia	\$170.50	The Turfgrass Disease Handbook	\$121.00
Field Guide to weeds in Australia	\$82.50	Tree Anatomy	\$198.00
Flora of NSW Volume 3	\$108.90	Tree Basics	\$16.50
Flora of NSW Volume 4	\$143.00	Tree Maintenance Sixth Edition	\$115.50
Fundamentals of Turfgrass Management	\$121.00	Tree, Turf Ornamental Pesticide Guide	\$66.00
Fundamentals of Weed Science	\$148.50	Trees-Contributions to Modern Tree Physiology	\$275.00
Golf Architecture	\$88.00	Turf Management For Golf Courses	\$297.00
Golf Course Architecture: Design, Construction & R	\$170.50	Turf Irrigation Manual	\$137.50
Golf Course Design	\$188.75	Turf Spraying - A Practical Guide	\$27.50
Golf Course Management & Construction	\$231.00	Turf Weeds and their Control (HB)	\$185.90
Golf Course Tree Management	\$108.90	Turfgrass Diseases and Associated Disorders	\$71.50
Golf Courses of Australia Software	\$85.75	Turfgrass Water Conservation	\$47.20
Golf Facility Planning	\$170.50	Turfgrass: Agronomy Monograph 32	\$132.00
Golf Has Never Failed Me	\$66.00	Turfgrass: Science & Culture	\$176.00
Grasses	\$24.20	Wastewater Reuse for Golf Course Irrigation	\$198.00
Grasses of New South Wales	\$39.60	Waterplants in Australia	\$49.50
Growing Australian Native Plants from Seed	524.20	Waterplants in New South Wales	\$38.50
Growing Media for Ornamental Plants and Turf	\$55.00	Weeds an Illustrated Guide to Weeds of Australia	\$115.50
Guide to Golf Course Irrigation Systems Design		Weeds in Australia	\$82.50
& Drainage	\$170.50	Please note: Prices are subject to change without notice.	
Handbook of IPM for Turf & Ornamentals	\$231.00		
Human Resource Management for Golf Course	200.00		
Superintendents	\$88.00		
IPM Handbook for Golf Courses	\$137.50		
International Turf Management Handbook	\$209.00		
Links Golf - The Inside Story	\$60.50		

Turf Management For Golf Courses

By Dr. James Beard



Over 30 years of Dr. Beard's research, and the combined field-experience of the entire USGA Green Section!

Dr. James B Beard is the world's leading turfgrass agronomist, and has published several best selling books on turfgrass management and maintenance. He has spent the past 16 years compiling his scientific research to update the best selling "practical book" ever published for the golf

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industry, and for golf course superintendents
— Turf Management for Golf Courses: 2nd
Edition. Commonly referred to as "Beard's
Bible", the original sold over 50,000 copies!

the text to this edition is completely revised, and boasts hundreds of new color photographs, color drawings and useful tables to illustrate his research-proven techniques. It is written in conjunction with the USGA Green Section and covers every practical and technical aspect of turfgrass management, maintenance, and operation.

The book is extremely comprehensive and chapter headings include:

- Golf and Turfgrass
- . Designing and Building a Golf Course
- . The Putting Green
- The Tee
- The Fairway
- The Rough

- · The Bunker
- · Golf Course Equipment and Facilities
- The Irrigation System
- · Pests and Stresses
- · Golf Course Management Other Golf
- Course Operations
- Please note this book will be available at the end of July



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FNQGCSA



With warm, mild, sunny days and the rain now behind us, its time to say "its great to be in the turf industry". Weather conditions are perfect and with no cyclones the year ahead looks bright. All courses in the north are reporting good conditions and supers are looking forward to a productive first half of the year for a change.

After the long wet season many courses are reporting heavy infestations of crowsfoot, nutgrass, mullumbimby couch and summer grass in fairways, tees and surrounds.

Spraying programs will be first off the rank with warm, fine, still weather ahead to combat the problem.

Another successful NRL game was staged at "Cazalies" (Bundy Rum Stadium) with all involved saying the surface was first class and looking forward to more games up in Cairns in the future. An AFL round is also being looked at for Cairns as well.

That's all from the North.

Paul Earnshaw

President, FNQGCSA

GCSAQ

Weather in Queensland has become very pleasant as temperatures have come down and grass growth has slowed giving us all a chance to pay some attention to those little jobs you can't seem to find time to tackle through the hotter months. Here at Gainsborough Greens we are planning to tackle some drainage works around the course that are crying out for attention when we get a good drop of rain. We have been on a tee reconstruction program that should see us get through rebuilding the last of the seriously warped tees that have gone out of shape over the years as the marine mud they are built on settles down.

Our last general meeting was the combined superintendents / secretary managers day held at the Nudgee Golf Club where host superintendent David Brushfield presented the course in immaculate condition as usual. It was a good opportunity to have a look at the extensive new works they have undertaken topped off by their much publicised new clubhouse, a monument to the efforts of the staff that will be long remembered. Nudgee Golf Club was fortunate enough to win the Queensland Golf Industry Awards for Manager of the Year (Max Mason) and for Metropolitan Golf Club of the year in 2000 and lived up to its high reputation on the day. Presentations by Peter Williams on his experiences with the Australian Open in 1987 at Royal Melbourne and by Rod Cook of the Grand Golf Club on their preparations for the 2001 Australian Open were well received and our

thanks go to our field day organiser Barry Cox for his efforts on the day.

In the excitement leading up to the 2001 Sydney Turf Conference it would be easy to forget the rest of the years important activities, but our July field day will be Monday July 2nd, the Toro Golf Championships to be held at Indooroopilly Golf Club with host Peter Sawyer as one of our guest speakers. In July we are also planning to run an irrigation workshop forum in conjunction with the Irrigation Association to be held on the 23rd, 24th and 26th of July at Horton Park Golf Club, Gainsborough Greens Golf Club and Yamba Golf Clubs respectively so keep that in mind. In August our AGM is to be held at Southport Golf Club and sponsored by Textron on Monday August 13th.

September 1st, 2nd and 3rd is our planned Tablelands tour with local boy Rod Cook providing an educational commentary on local sites of interest. November 12th is the Glades Golf Club, John Deere sponsored day.

Lately there have been a few changes of location for some turf related identities, the superintendents position has been advertised at Headlands Golf Club on the Sunshine Coast over looking a lovely part of the world. Stewart Poole has left the Gertrude McLeod Ladies Golf Club after arriving from North Queensland and is now working for David Golf and Country Club International. Dave Traves late of David Golf and Country Club International and Hope Island before that has now gone into business providing massage and body piercing on the Golf Coast so there's hope for us all outside the industry!

Hope you enjoy the Sydney Conference and the hospitality of the locals.

GCSAWA

At last! some drought breaking rain has put a smile on the faces of many West Australian's after the longest dry period in over 120 years.

Since the last edition of ATM we have played round 5 of the CJD super series at Royal Perth Golf Club. Congratulations to Dixie Joy on his outstanding victory in round 5. Best of luck to Tony Johnson and staff at Royal Perth who are now busy preparing the course for the W.A. PGA Championships in late May.

On Tuesday the 8th of May our annual Management Challenge was held at Secret Harbour Golf Links. It was good to see the legends team consisting of Trevor Strachan, Neil Adams, Geoff Osborne and Mark Claes enjoying themselves on the day along with the other 17 teams from Golf Clubs in W.A. This years format was modified to include the national John Deere teams Challenge event.

state #PORT

All the best to Lake Karrinyup and Cottlesloe teams on their 1st and 2nd place wins at Secret Harbour. They will be representing W.A. in the National John Deere teams Challenge play off in Sydney at a date and venue to be confirmed. With the eventual winners representing Australia in a play off later this year in the U.S.A.

Look forward to seeing you all at the conference in Sydney.

Rob Macdonald

President, GCSAWA



NSWGCSA

As I write this report many courses in NSW are closed due to flooding. Vice President Kevin Wellard at Nelson Bay Golf Club north of Newcastle has just informed me he has had 400mm of rain in just 9 days, this has led to a major "sand movement" on his 13th hole. It appears there is always something to test our resolve and resourcefulness?

Our most recent field day was a 2 day event comprising education and golf, 65 people enjoyed the quality of Gold Creek and Royal Canberra and those from coastal areas really enjoyed walking on firm dry courses. AGCSA President Peter Frewin attended at our request and spoke about his term at the helm. John Neylan gave a very informative lecture regarding all things fungicidal and Major Grant Leeson from the Australian Army and Roy Masters spoke about "team leadership" and time management respectively.

This event was so well received by those in attendance that our board is keen to make it an annual event taking us to other regional areas of NSW.

I am very pleased to say that our state has nominations for all categories in the awards programme at the upcoming conference and there is also more than one person who has made themselves available for election onto the board of the AGCSA.

To all those involved good luck with your nominations. Speaking of awards, finalists for the Nu-turf Trainee Greenkeeper of the year award are being judged at Pennant Hills Golf Club in May.

See you all at the conference!

Martyn Black

President, NSWGCSA.

VGCSA

Earlier this year the Victorian Golf Association announced funding for a Victorian Golf Course Superintendent to attend this yea International Turfgrass Research Conference to be held in Toronto, Canada. After calling for expressions of interest and conducting interviews I'm pleased to announce that Mick Russell, Course Superintendent of Werribee Park Golf Club has been judged the winner.

Congratulations Mick, no doubt we will hear from you upon your return. I would also like to publicly thank and congratulate the V.G.A. on such an initiative. Hopefully other state and national golfing bodies can learn from the V.G.A. and give greater support to their Superintendents.

This years VGCSA Annual General Meeting has come and gone with a successful day held at Woodlands Golf Club on April the 17th. Numbers were down a little on past years with around 65 members in attendance, however due to the timing (Easter Tuesday) its probably understandable. Our first guest speaker Peter Thomson gave an enthralling talk on his experiences in the golf industry over the past forty years. Next up Paul Daley

gave an excellent visual presentation on Links Golf, which was also very well received. Thank you to our long time A.G.M. sponsors in Toro Australia and in particular to Alan Philips for his help on the day. Congratulations also to host Super Glenn Stuart who had the golf course looking a treat.

The VGCSA's incoming committee for the next twelve months consists of

President: John Geary Frankston Golf Club

Vice President: Michael Picken Riversdale Golf Club

Secretary: Clayton Howell Eastern Golf Club

Treasurer: Michael Riordan Patterson River Golf Club

Committee: Brett Balloch, Anglesea Golf Club,

Tim Pierce, Greenarces Golf Club Tennyson Blake, Shepparaton Golf Club

Chris Grumelart, Cape Schanck Golf Club

Golf Results from the Annual General Meeting held at Woodlands Golf Club on April 17, 2001.

Bill Powell Trophy Winner: B. Balloch Winner: B. Balloch Toro Cup **Presidents Shield** R. Stanic

Commonwealth Golf Club was also looking superb for the VGCSA's annual Golf Turf Research Day held on May 14. Over 100 players assembled for a 7.30 am shotgun start on a beautiful Melbourne Autumn day. The day was a hugh success with over \$4,000. raised which we will put towards turf research projects over the coming year. Thank you to our sponsors in

- Rocla Sands
- · Glenmac Sales & Service
- · Anco Turf Supplies
- · Globe Australia
- Wrightons Seeds

for their valued support. Needless to say congratulations to host Super Mark Prosser on the condition of the golf course.

Golf Results from the Annual Golf turf Research Day held at Commonwealth Golf Club on May 14, 2001.

Overall Winner

B. Balloch

A Grade

S. Balloch



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With rain finally coming in mid-may, we all thought we were in for a dry autumn as well, but most of the Adelaide districts have had some good falls, although outlying areas have had very little.

It was disappointing that we had to cancel our bus trip to the Mildura area at the start of May. With no rain in sight, most Supers were too worried about their courses. We will organize another day sponsored by Metropolitan Machinery and Turf and Irrigation in the future.

The AGCSA workshop was of great benefit, being on the topic of Summer Stress Management. After our summer, it was fresh in everyone's mind.

Our AGM is on 7th June at Royal Adelaide Golf Course and all positions will be declared vacant, so if you feel you have something to offer the Association, here's your chance.

Shaun Stanfield

SAGCSA



TGCSA

The TGCSA is very proud to have two nominees for the AGCSA awards program.

- Chris Hay Kingston Beach Golf Club was nominated for the Claude Crockford Environmental award, "Well Done Chris".
- Danny Gilligan Tasmania Golf Club was nominated for the Excellence in Golf Course Management. The latest we heard was Danny had been selected by the Judging panel as one of the finalists, "Good Luck Danny".

As I mentioned in my last report, lets get our act together and become more pro-active in our national awards and activities.

The committee will meet on 17th of May to discuss the activities for the remainder of this year 2001.

At present, proceedings are well under way for our joint day with TGAA on the 18th July.

Our own AFL stadium – York Park looks likely to be the venue, however details on Topics – lecturers will be disclosed at a later date.

The winter conditions will have us on full alert for diseases – Fusarium etc, so good luck with your management programmes.



TGAA (VIC)

Have you checked your soil moisture levels in the past fortnight? Do you know your infiltration rates? Is the pump working to its optimum? These are a few easy things that will help with your management over the winter months. It can help with planning spring renovation requirements also. It is easy to get caught up with technical turf management practices and forget the basics. Simply digging a hole or taking random plugs around your surfaces can tell you a lot about what is happening with the current conditions. By knowing what is happening below the surface can help you get through the winter, avoiding compaction and maintain a healthy root system.

Following on from our highly successful OHS Morning in April and Administrators Day at Hailebury College on May 9th, I would like to remind members of our forthcoming and major event for the year;

"VCA/TGAA Annual Turf Seminar incorporating the Cricket Wicket Seminar."

A slight change in format where we have a theme and answer the questions to produce a final result. This year's theme is RENOVATION.

We will cover: (a) Deciding what level of renovation is required (b) Seed, Sprig or Sod (c) Topdressing material, and (d) The use of chemical tools to help optimise your chances of success. It will cover both wicket and broad acre renovations. To complete our day a panel of experts will answer any questions. It's on at the MCG, Wednesday July 18th. Details will be forwarded to members, any enquiries please see our website www.tgaa.asn.au or ring Simone

on 98426392.

Please visit the TGAA Stand at the conference if you are lucky enough to attend.

We wish everyone good luck with their winter routines and may the weather be kind.

Rob Savedra

TGAA (Vic) President

TGAA (ACT & SURROUNDING REGION)

You wouldn't believe it, already half way through the first year of the new millennium. This is an exciting time for many involved in the industry. The AGM is upon us, this means the search is on for prospective new committee members. Anyone who has, or knows of someone having a keen interest in the trade and wants to make a difference, or just help, should apply for nomination. This is also the time for application or renewal of membership. As our member numbers increase so do the benefits of becoming a member. Our current members receive 3 different magazines, discount to mid-year seminar, seasonal newsletters plus more. There is a great involvement within the turf industry by the association and being a part of the TGAA is a positive, productive and rewarding experience. Such associations are important representatives to the turf industry, acting as diplomats between the industry and public/private sector.

Planting turf or converting strain?



CONSIDER THE ROW PLANTING SYSTEM

Designed to plant and over-plug turf areas Fresh A grade, uncontaminated sod is used No pre-made scarifyings - increasing growth potential A trailing roller settles the newly created surface A proven and highly successful method

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The need for support is vital.

This time of year also means registration time for the mid-year seminar. This year's topic will cover Renovations, speakers include Dr Martin & Peter Semos. Areas such as thatch management, seed vs sod & soil conditions will be discussed. The seminar will be held on the 25th of July in Canberra and the cost is \$65.00. Remember to register quickly as seating is limited and if previous years are anything to go by positions will go like hot cakes. There is also the chance to renew memberships or become a new member on the day. For further details email Paul Janssens on: paul.janssens@aph.gov.au.

In local news, congratulations goes to Stephen Heskett in accepting the superintendents position at Queanbeyan Golf Club. "Fester" was formerly 2IC at Federal Golf Club before making the transition. We wish him great success for the future.

Till next time, Agrostologists.

Justin A K Haslam

Committee, TGAA



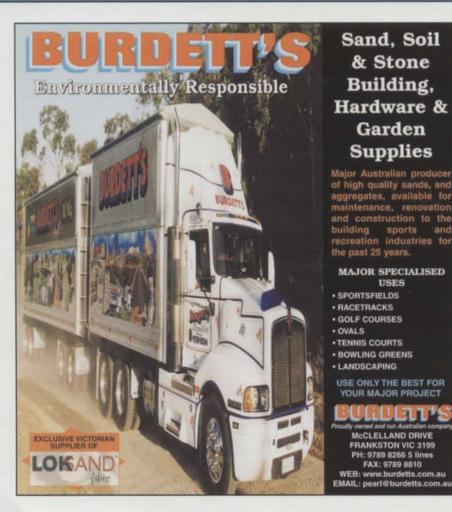
Back to turf for East Bendigo Bowls Club. East Bendigo have decided to remove their synthetic green and replace it with Tiftdwarf.

The VGA will be holding a turf seminar on the 7th August. There will be quality guest speakers with valuable information about our trade so call David Sharp on 0438 700 119 to book you seat.

Our AGM will be held on the 23rd of August 2001. We would like all members to make an effort and come to the AGM, which will be held at the MCC bowls club at 1pm.

Peter Rasmussen

Committee, VGA



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with the AGCSA offers a Skills Recognition service for turf managers throughout Australia



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Now you can own the World's Number One in golf course equipment.

Acquiring a new piece of Toro turf maintenance equipment or an entire package of Toro equipment can become a challenging decision for you.

You need to have the course at or near tournament condition, while ensuring that you watch the budget. Not only must you identify the proper turf products to meet your current needs and future growth, but also the best financial acquisition plan. This can often lead to anguish on what is the best course of action.

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Leasing can be the single easiest way to manage your equipment, and there is a plan that will be suitable for all situations.

All Toro Commercial sales staff, both direct and dealer, are equipped with leasing software to provide you with various scenarios for your course.

For further information please contact 1800 356 372



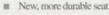
Toro Finance Solutions



TORO Greensmaster 3250

Unmatched diesel power, innovative design and a lighter footprint make this the ideal greensmower for greens and surrounding areas.

- 21 hp (15.7kW) Briggs & Stratton*/Daihatsu* engine
- Diesel, 3-cylinder, liquid cooled
- Industrial wide-finned radiator, less plugging heavy duty
- Relocated Donaldson® air filter, easier service cleaner environment
- New cutting unit suspension system (retains steering feature)
- Improved grass collection with new basket
- Easy removal of centre cutting unit
- New medium penetration front Whiele® rollers for reduced marking
- Larger tyres: 19" x 10.5 8"
- Gentler on turf than other greensmower tyre because of more flexing ability
- Reduced compaction
- Less scuffing in turn around
- Easy add-on 3WD option





From \$177 Per Week



loro Finance Solutions

TORO Groundsmaster

For over 25 years, the Toro Groundsmaster 300 series has remained the preferred choice of commercial mowing professionals. These proven riding rotaries handle even the most extreme cutting conditions with unmatched productivity.

- 28 hp (18.1 kW) Kubota* engine
- Diesel, 3-cylinder, liquid cooled
- Industrial wide-finned radiator, less plugging heavy duty
- Relocated Donaldson[®] air filter, easier service cleaner environment
- New cutting unit suspension system (retains steering feature)
- Easy removal of centre cutting unit
- Improved deck gearbox
- Larger tyres: 19" x 10.5 8"
- Gentler on turf than other groundsmaster tyres because of more flexing ability
- Reduced compaction
- Less scuffing in turn around
- New, more durable seat



From \$140 Per Week





TORO Reelmaster 6500 4WD

These first true mid size fairway mowers offer power, durability, consistently superb quality of cut and up to 10 acres per hour productivity.

- 46 hp (34.5kW) Kubota® 4-cylinder, turbo-diesel provides maximum power for year round performance
- Manually adjustable hydraulic reel speed control system allows you to adjust the mower's performance as conditions change throughout the year.
- Toro" designed "Same-Side-Service" for visibility and easy service access to all normal maintenance items
- Planetary gear final traction drive allows for efficient use of the hydraulic system and better traction power.
- 7" (17.8 cm) diameter reels in either a 5.7 or 11-blade configuration to perform in many different applications
- Exclusive Single Point Adjustment (SPA) cutting units for easier bedknife-to-reel adjustment
- Deep groove, machined front rollers so clippings and debris do not accumulate
- Adjustable Turf Compensation Springs to maximise your mower's performance through changing conditions all year



From \$364 Per Week





TORO Workman 2100

Built around Toro's revolutionary Active In-Frame®, these powerful utility vehicles literally twist over your terrain to provide incredible traction, coupled with an unequaled smooth and stable ride.

- Extraordinary traction and ride provided by a unique Active In-Frame's suspension coupled with independent front suspension
- 16 hp, pedal-start Vanguard¹¹ engine
- Highest payload in class up to 767 kgs total capacity
- Dentless and corrosion resistant hood and bed .
- Flotation tyres (standard)
- Large integrated storage areas
- Easily customised bed
- Beverage/radio holder
- Power outlet
- Two year warranty



From \$76 Per Week



TORO Multipro 1250

A dedicated sprayer that offers unprecedented application precision and consistency.

- Spray Pro" proportional drive spray control system is uniquely tied to the drive wheels - the flow rate instantly and proportionally adjusts to changes in the speed of the spray vehicle maintaining a precise application rate
- Front torsion joint suspension gives operator a smooth ride and minimises vehicle wear and tear
- Controls are easy to reach many are lit for increased visibility and assessment of system status
- Excellent gradeability and hill side stability even with a full load
- 4-wheel brakes are standard equipment and allow quick, reliable stopping response when needed, even on a slope
- Plenty of power with the Kohler® 20 hp V-Twin engine
- CVT "automatic" type transmission with 3 speed ranges provides the right speed for any spraying task
- Convenient electro-magnetic accelerator locking device allows stationary pump operation for mixing & hand spraying
- Perfect size for greens, tees, sports fields and surrounds



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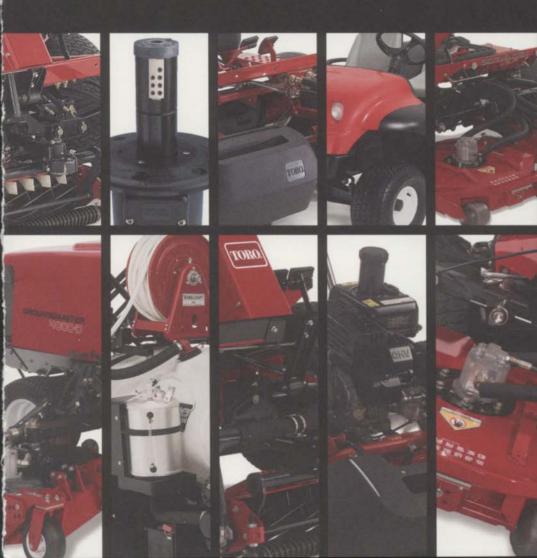
For more information contact your Toro Representative or call

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These values are based on a monthly rental agreement over a period of 5 years as at 24th May 2001. Subject to approval and based upon current Toro prices. Subject to change without notice.

TORO

NEW PRODUCTS GUIDE



GREENSMASTER° FLEX 21



Engine Kawasaki, 4-cycle, 3.7 hp (2.7 kW), air-cooled OHV engine, 3600 rpm. Displacement: 7.57 cu in. (124 cc). Cast iron cylinder sleeve. Electronic ignition. Maximum noise suppression muffler, 83 dB(A) at operator's ear.

Firel Capacity 2.64 quarts (2.5 liters) regular grade unleaded gasoline.

Cocar Box Traction Drive: Integral gearbox assembly directly mounted to the engine. The traction drive consists of a constant mesh planetary gear reduction incorporating a wet bath band-type clutch and brake driving a Peerless* differential assembly integrated into the gearbox assembly. Positive drive belt to traction drum. Implement Drive: Consistent mesh gear driven countershaft with integral cone wet clutch. Drive shaft consists of two stainless-steel beam couplings for angular misalignment combined with a molybdenum disulfidenylon extension member to accommodate axial movement. Positive drive belt to reel.

Mowing: 1.3-3.5 mph (2.1-5.6 km/h). Transport (maximum): 5.3 mph (8.5 km/h).

Dual cast aluminum, 7.5" (19 cm) diameter, tapered on outer 1/3 of length.

Key Advantages

- Independent traction unit and flexible 21" (53 cm) cutting unit closely follows undulations, virtually eliminating scalping
- Innovative design and constant bedknife attitude allows a remarkable 1/16" (1.6 mm) height of cut
- New single lever control makes it easy to engage the traction and reel drive with a twist of the wrist
- Grass basket attaches to the traction unit, not the cutting unit, to distribute weight evenly over two rollers rather than one, reducing gouges or ridges
- Simple two-bolt connection allows for quick removal of the cutting unit for grinding or changing units after topdressing
- Unique traction drum tapers at the outer edges to alleviate overlap marking
- No grease zerks, plus multi-lip seals and a new gear box keeping grease off the green and sets new standards in ease of maintenance
- An extruded-aluminum cutting unit frame offers strength, rigidity and creates the industry's shortest footprint with a mere 8.75" (22 cm) between rollers

CONSTORS Engine mounted: on/off switch, recoil starter, choke. Handle mounted: throttle lever, dual function traction/reel control lever, service/park brake lever. Safety devices: neutral interlock system, servicing/park brake, enclosed drive system.

Handle Loop style, 1" (2.5 cm) diameter with easy pull pin height adjustment, operator selected.

Transport Tires/Kickstand Two quick detachable pneumatic tires; 3.00 x 3.25-6" (8.25 cm) tread width Kickstand standard equipment.

**Recol Construction 5" (12.7 cm) diameter, 11 blades (high-strength, low-alloy steel, through hardened, impact resistant).

September 1. Semi-floating cutting unit separable from drive unit pivoting around reel centerline (pitch axis) and pivoting around bedknife centerline side-to-side (roll axis).

GREENSMASTER° 3250-D



Engine Briggs & Stratton/Daihatsu 850D, 3-cylinder, liquid-cooled, diesel engine, 51.9 cu. in. (850 cc) displacement. Full-pressure lubrication, oil filter. 21.0 hp (15.7 kW) at 3600 rpm. 14.5 hp (12.3 kW) at 2600 rpm. Engine governed to 2750 rpm high idle, 1500 rpm low idle (no load).

Fuel Capacity 6 gallons (22.7 liters)

Traction Drive Hydrostatic piston pump, closed loop system. Foot pedal forward and reverse; infinitely variable. Two front-wheel orbit motors, 10.3 cu. in /rev. displacement.

Ground Speed Forward-mowing speed is variable from 2-5 mph (3.2-8 km/h), adjustable. Mow speed setting does not affect transport speed. Maximum transport speed is 8.8 mph (14.1 km/h), may be reduced without affecting mow speeds. Reverse is 2.5 mph (4.0 km/h) maximum.

Key Advantages

- = 21 hp (15.7 kW) Briggs & Stratton*/Daihatsu* engine
- = Diesel, 3-cylinder, liquid-cooled
- Industrial wide-finned radiator, less plugging heavy-duty
- Relocated Donaldson® air filter, easier service cleaner environment
- New cutting unit suspension system (retains steering feature)
- Improved grass collection with new basket
- Easy removal of center cutting unit
- New medium penetration front Whiele® rollers for reduced marking
- Larger tires: 19 x 10.5-8
- Gentler on turf than any other greensmower tire because of more flexing ability
- Reduced compaction
- Less scuffing in turn around
- = Easy add-on 3WD option
- New, more durable seat

Turi Compaction 8-12 psi (.68 bar) depending on tire pressures, with a 200 lb. (91 kg) operator, and cutting units down.

Sicceling Power steering. Open center, circuit, 13" (33 cm) round steering wheel. No-tool quick adjust steering arm position, with arm motion allowing a wide range of operator sizes. Steering cylinder with through shaft design for accurate straight line steering.

Circurcols/Caugus Raise/lower-mow lever. Functional control lever (neutral, mow, transport). Foot operated traction drive and brakes. Hour meter and 4 bulb warning cluster. Hand operated throttle. Mechanical engine speed control. Water-in-fuel warning light.

REELMASTER° 5500-D



Engine Kubota liquid-cooled turbo diesel, 3-cylinder, 35 hp (26.1 kW) gross @ 3000 RPM, 68.5 cu. in. (1123 cm) displacement. Pressurized lubrication system with 4.0 quart (3.8 liter) capacity. Heavy duty three stage, radial seal air cleaner with dust bowl and restriction indicator. Fuel filter/water separator with visible bowl.

Traction Drive Power to the front drive wheels is via a hydrostatic transmission coupled to a mechanical drive axle. Toro 4-Matic, on-demand, 4-wheel drive, consists of drive shaft connected to mechanical tear drive axle.

CITOLITIE Speed 0-10 mph (0-16.1 km/hr) forward for transport or mow; 0-4 mph (0-6.4 km/hr) reverse.

10-68. 26.5 x 14-12 front drive tires provide maximum traction ability while minimizing turf abrasion, 20 x 10-10 rear tires.

Key Advantages

Tractor:

- 35 hp (26.1 kW) Kubota® turbo-diesel for abundant power and long engine life
- High floatation front and rear tires for a low PSI on the turf and minimal tire marking
- 2WD or 4WD models available to meet your needs
- Ergonomic operators platform for comfort and productivity
- Manually adjustable hydraulic reel speed control to meet a wide range of mowing conditions

Cutting System:

- 7" (17.8 cm) diameter reels in either a 5, 7 or 11-blade configuration to perform in many different applications
- A productive 100" (254 cm) width of cut
- Single point bedknife-to-reel adjustment for ease of maintenance

Controls Power steering, adjustable seat position, single forward and reverse traction podal, traction speed limiter, individual brake pedals, parking brake latch, ignition key switch, PTO switch, throttle, joystick control for cutting unit raise and lower, reel speed and backlap control knobs.

Cranges Hour meter, speedometer, fuel gauge, temperature gauge, cluster gauge with glow plug and charge indicator lights, low engine oil pressure and high coolant temperature warning lights (high temperature safety shut off).

Cutting Units Five 22" (56 cm) wide cutting units with 7" (17.8 cm) diameter reels. 5, 7 or 11-blade reels available. Manually adjustable variable reel speed.

REELMASTER° 6500-D



Engine Kubota model V1505T, liquid-cooled, turbo-diesel, 4-cylinder, 46 hp gross @ 3000 RPM, 42 hp net. 1.5 liter displacement. Heavy-duty, two-stage air cleaner with inner safety filter and standard restriction indicator.

Traction Drive Power to the front wheels via hydrostatic pump powering axial piston wheel motors connected to planetary gear final drive assemblies. 4-wheel drive models powered by a hydraulic motor driving a mechanical rear axle.

Ground Speed 0-10 mph (0-16.1 km/hr) forward for transport or mow; 0-4 mph (0-6.4 km/hr) reverse,

Three 29 x 14-15 front drive tires provide maximum traction ability while minimizing turf abrasion. 20 x 10-10 rear tires.

Key Advantages

- 46 hp Kubota® 4-cylinder, turbo-diesel provides maximum power for year round performance
- Manually adjustable hydraulic reel speed control system allows you adjust the mowers performance as conditions change throughout the year
- Toro® designed "Same-Side-Service" for visibility and easy service access to all normal maintenance items
- Planetary gear final traction drive allows for efficient use of the hydraulic system and better traction power

Cutting System

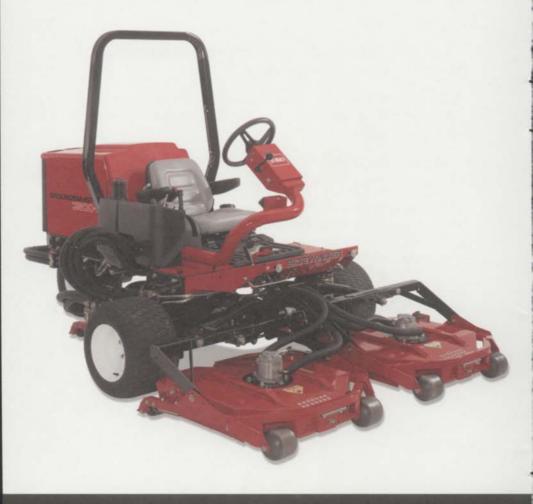
- 7" (17.8 cm) diameter reels in either a 5, 7 or 11-blade configuration to perform in many different applications
- Exclusive Single Point Adjustment (SPA) cutting units for easier bedknife-to-reel adjustment
- Deep groove, machined front rollers so clippings and debris do not accumulate
- Adjustable Turf Compensation Springs to maximize your mowers performance through changing conditions all year

Controls Power steering, adjustable seat position, single forward and reverse traction pedal, traction speed limiter, individual brake pedals, parking brake latch, ignition key switch, PTO switch, throttle, joystick control for cutting unit raise and lower, reel speed and backlap control knobs.

Gauge. Hour meter, speedometer, fuel gauge, temperature gauge, cluster gauge with glow plug and charge indicator lights, low engine oil pressure and high coolant temperature warning lights (high temperature safety shut off).

Cutting Units Five 22" (56 cm) wide cutting units with 7" (17.8 cm) diameter reels. 5, 7 or 11-blade reels available. Manually adjustable variable reel speed.

GROUNDSMASTER® 3500-D



Engine Kubota 35 hp (gross) turbocharged, liquid-cooled, 3-cylinder, diesel engine.

Configuration Rear mounted engine, front operator position. Rear mounted radiator. Two post ROPS, seat belt and slope indicator standard. Sidewinder system.

Traction Drive Series/Parallel hydraulic traction circuit provides continuous 3-wheel drive in mow and transport. Hydrostatic traction drive provides infinitely variable ground speed in forward and reverse.

Ground Speed Mow: 0-6 mph (0-10 km/h), mow speed is factory preset at 6 mph but is adjustable; Transport; 0-9 mph (0-14 km/h); Reverse: 0-4 mph (0-6 km/h).

Controls Forward and reverse traction control pedals; mow/transport foot lever; hand-activated parking brake; ignition key switch; tilt steering wheel lock: PTO switch; throttle; joystick control for deck raise and lower as well as moving decks side-to-side; cutting deck transport lock.

Key Advantages

- Excellent cutting performance thanks to three independent, 27" (68.6 cm) Contour™ Plus semi-recycling decks that deliver a 68" (173 cm) width of cut
- Superior power provided by a 35 hp Kubota® turbo-diesel
- Superb trimming capabilities and the ability to vary tire tracking are two benefits of the Sidewinder™ cutting system, which allows decks to slide 12" (30 cm) left or right of center, 24" (61 cm) full travel
- Unequalled traction thanks to the patented Series/Parallel™ 3-wheel drive traction system
- * Attractive striping is effortless with rear rollers
- Operator comfort is ensured by power steering, tilt steering and adjustable seat

Gauges Hour meter, fuel, cluster gauge with glow plug and charge indicator lights, low engine oil pressure and high coolant temperature warning lights (high temperature safety shut off).

Theorrical & Interlocks Traction pedal, operator presence in seat, PTO engage or disengage, and cutting deck mow or transport safety interlock switches. Parking brake set prohibits movement through traction pedal.

Width of Cut 68" (173 cm), standard and 72" (183 cm) optional. Deck overhang for trimming is 12' (30 cm) at 68" (173 cm) width of cut and 14" (35 cm) at 72" (183 cm).

Height of Cut 1/4-4" (1.9-10.2 cm) in 1/4" (.6 cm) increments.

GROUNDSMASTER° 4000-D



Engine Kubota 2003T, 4-cylinder, turbo diesel, 122 cu. in. (2.0 liter) 60 hp gross.

Finel Carmeiro 19 cellone (72 livers)

Traction Drive Full-time bi-directional 4-wheel drive hydrostatic transmission powers a hydrostatic motor at each front wheel w/ planetary drive reduction, rear mechanical axle powered by a hydrostatic motor.

Ground Speed 7.7 mph (12.4 km/h) mowing: 15 mph (24.14 km/h) transport.

Gauges Hour meter, fuel gauge, engine temperature gauge, indicator lights for high temperature, oil pressure and glow plugs. Audible alarm for low oil pressure or high coolant temperature.

Key Advantages

- A highly productive, 11' (3.35 meter) rotary mower for high acreage and tight trim areas
- Abundant power from 60 hp Kubota® diesel engine
- * Sure-footed traction with bi-directional 4-wheel drive
- Convertible rear-discharge/Guardian™ Recycler decks
- Unmatched maneuverability in a compact traction unit

Controls Tilt steering, ignition switch, throttle, foot-operated traction pedal, mow/transport selector switch, lockable individual brake pedals, park brake lock, individual deck lift/lower levers, counter balance adjustment, tow valves, cup holder, toolbox, 12-volt power outlet, and radio holder.

**Overall Dimensions Height: 81" (205.7 cm) w/ROPS; Length: 135" (343 cm); Wheel Base: 55" (140 cm) Width/Transport: 71" (180 cm) @ 2" (5 cm) HOC.

Weight 3860 lbs. (1754 kg) w/full fluids and without cab.

Height of Cut 1"-5" (2.54 cm-12.7 cm) in 1/2" increments.

GROUNDSMASTER° 4500-D

Product Preview





1-006

Key Advantages

- Excellent cutting performance delivered by five independent, 27" (68.6 cm) Contour[™] Plus semi-recycling decks
- = Powerful 50 hp Kubota® diesel engine
- Productive 9' (2.7 meters) width of cut for both open areas and trim applications
- Excellent footing assured by 4-wheel drive traction while mowing
- Friendly operator area provides easy visibility and use
- Attractive striping is effortless with rear rollers

MULTI PRO° 1200&1250



Vehicle 4-wheel, rear wheel drive, front steer, single operator turf sprayer.

Engine 20 hp Kohler V-Twin horizontal shafts governed to 3,350 rpm, w/30 amp alternator, accelerator pump carburetor.

Fuel Capacity 6 gallon (23 liter).

Front Suspension Fully independent rubber torsion swing arm.

Rear Suspension Rigid.

Steering Hydraulic power, center pivot linkage, 60° turning angle, 96" (2.4 m) inside turning radius.

Brakes 4-wheel hydraulic drum type with dual chamber master cylinder.

lights Twin halogen headlights.

Universities him Integrated transaxle with 3 forward speed ranges and reverse.

Clintel Centrifugally engaged variable belt drive (CVT).

Key Advantages

- Spray Pro™ proportional drive spray control system is uniquely tied to the drive wheels—the flow rate instantly and proportionally adjusts to changes in the speed of the spray vehicle maintaining a precise application rate
- Front torsion joint suspension gives operator a smooth ride and minimizes vehicle wear and tear
- Controls are easy to reach—many are lighted for increased visibility and assessment of system status
- Excellent gradeability and side hill stability even with a full load
- 4-wheel brakes are standard equipment and allow quick, reliable stopping response when needed, even on a slope
- Plenty of power with the Kohler® 20 hp V-Twin engine
- CVT "automatic" type transmission with 3 speed ranges provides the right speed for any spraying task
- Convenient electro-magnetic accelerator locking device allows stationary pump operation for mixing & hand spraying
- Perfect size for greens, tees, sports fields and surrounds

Ground Speed 1st speed range: 0-3.1 mph (0-4.9 km/h), 2nd speed range: 0-5.0 mph (0-8 km/h), 3rd speed range: 0-11.0 mph (0-17.6 km/h),

Spracer Jauls 160 gallon (605 liter) polyethylene tank, inductive agitation. Low profile w/large 7 gallon (27 liter) deep sump. Translucent w/fill level gauge.

Spray Pump Dual diaphragm pump, proportional ground speed control system. 30 gallon (11.4 liter) per minute output. Capacity range up to 250 (15 bar) psi max.

Speak Controls Electronic switches on Multi Pro 1250, Manual levers and dial on Multi Pro 1200.

Spray Monitor Spray Pro" system, multi-function with liquid crystal display. Back lit for late evening/early morning operation.

Base Weight Base unit: 1.575 lbs. (715 kg); With standard spray system and operator: dry 2.875 lbs. (1.305 kg), full 3,100 lbs. (1409 kg); Maximum Gross Vehicle Weight: 3,500 lbs. (1.589 kg).

Measurements (with spray system) Overall Width: 56" (142 cm), Overall Length: 120" (305 cm), Height: 43" (109 cm), Ground Clearance: 4.5" (11.4 cm), Wheelbase: 62" (157 cm).

WORKMAN° 1100/2100



Engine 1100: Kohler 12 hp, single-cylinder: 2100: Vanguard 16 hp, 2-cylinder

Transmission Constantly variable belt drive.

Rear Suspension Proprietary torsional Active In-Frame.

Many speed 15 mph (24 km/h) governed.

Brakes Merallic rear wheel mechanical

Ground Clearance 1100: 5.1" (13 cm); 2100: 6,6" (16.8 cm).

Tires 1100: Front - 20 x 10-8, 4-ply Rear - 22.5 x 10-8, 4-ply 2100: Front - 22.5 x 10-8, 4-ply Rear - 22.5 x 10-8, 4-ply

7 gallon (26.5 liters)

44" L x 52" W x 10" H (112 x 132 x 25 cm), double walled, polyethylene.

Key Advantages

- Extraordinary traction and ride provided by a unique Active In-Frame™ suspension coupled with independent front suspension
- Quiet 12 hp Kohler® or 16 hp, pedal-start Vanguard® engine
- Highest payload in class—up to 1,690 lbs. (767 kgs) total capacity
- Dentless and corrosion resistant hood and bed
- Floatation tires (standard)
- Large integrated storage areas
- Easily customized bed
- Beverage/radio holder
- Power outlet
- Two year warranty

Width 59" (150 cm)

115" (292 cm)

Wheel Base 79" (201 cm)

Towing Capacity 800 lbs. (363 kg) trailer, 100 lbs. (45 kg) tongue weight.

Turning Radius 64" (163 cm) inside, 238" (605 cm) outside.

Optimal Accessories Cab, canopy, windshield, electric bed lift, refreshment center, Rahn* groomer, snow plow, stake sides, brush guard, heavy-duty bumper winch, roll over protection, off road lighting, signal lighting.

Warranty Two year limited warranty. Refer to the Operators' Manual for further details.

720 SERIES SPRINKLERS



Radius 22' 48' (6.7-14 6m)

Flow Rate 2.06-11.46 GPM (9.8-43.3 LPM)

Adjustable Trajectory 7º-25°

Operating Pressure Range Normally open: 40-90 PSI (2-6.2 Bar), Check-O-Matic: 40-90 PSI (2-6.2 Bar), Electric: 40-120 PSI (2-8.4 Bar).

Oprimum Nozzle Performance 65 PSI (4.5 Bar)

Built for the tough requirements of the golf market, the 720 Series with a radius of 22'-48' (6.7-14.6 meters), is the perfect complement to Toro's complete line of golf sprinklers. It gives you the precision coverage you need for tee boxes, approaches and other difficult-to-irrigate areas. In fact, Toro's exclusive, proven MultiMatrx™ technology allows you to customize turf coverage. A twist of a screwdriver adjusts flow, arc and radius—all from the top of the sprinkler.

That's not all. With the patented TruJectory™ adjustment system, you can make adjustments from 7° to 25° to compensate for slopes, mounds, windy conditions, or to spray under low-hanging tree branches.

It's available as a complete sprinkler or as a conversion assembly to upgrade existing 1" (2.5 cm) golf bodies.

Standard Pressure Regulation 65 PSI (4.5 Bar) (electric models only).

Julia Now 1" (25mm) female-threaded inlet.

Check Valve Maintains up to 37' (11.2m) of elevation change.

Dimensions Pop-up to center of nozzle plate: 2.78" (73mm), Body Height: 10" (250mm).

SITEPRO® 2000 IRRIGATION CONTROL SYSTEM

Picture-Perfect Irrigation Control.

SitePro was designed to accommodate a short learning curve and a long list of features. We based it on the popular, easy-to-use Windows® 95 and 98 operating systems and eliminated tedious keystrokes and layers of spreadsheets—replacing them with point-and-click simplicity.

Whether your system is wireless or wireline-based, uses one-way or two-way communication, or requires advanced field sensing, Toro has you covered. Simply choose the Toro field hardware that meets your needs, and all the benefits of SitePro are yours. Toro pioneered centralized



irrigation control—developing features that set the standard for productivity in the industry. Now, those same features are all in a single software package for picture-perfect irrigation control.

	System Compatibility Field Hardware			
	SitePro® CDS	E-Series™ OSMAC®	Network LTC™ Plus	Network 8000*
Centrals • SitePro* • TouchNet*		1	5	1
Accessories • Network Hand-Held • Network Radio-Link**	1		4	/
• Sensors (MCU) • Prism	1	(Radio Ready) ✓	4	1

SITEPRO° CENTRAL DECODER SYSTEM

Lower overall system cost. Vandal resistant. Easy to expand. Invisible to the landscape.

This versatile irrigation control system is ideal for all types of small-to-medium turf systems with varying irrigation requirements, including golf, municipal and commercial applications. It is reliable too with a proven track record—over 70,000 Toro Decoders have been sold



worldwide. With its lower overall cost, SitePro Central Decoder System is a simple central control system for applications where value counts.

E-SERIES™ OSMAC° FIELD SATELLITE (DIGITAL WIRELESS PAGING)

Compatible with SitePro® and TouchNet™. Enhanced. Easy. Economical. Expandable.

The next generation of OSMAC. E-Series utilizes all the features of OSMAC, including digital wireless paging, making it ideal for retrofits and renovations. Just like OSMAC, there aren't any wires, hardware changes or major site disruptions to worry about. And E-Series offers even more. Added Parallink™ parallel communication output modules, an expanded station count and increased surge protection are just a few of its

enhancements. With the new additions, E-Series reduces installation and servicing costs, offers improved performance and productivity, and it allows for upgrades

> easily as needs change. Best of all, E-Series has the same dependability and reliability that you've come to expect with OSMAC.



MONITOR CONTROL UNIT (MCU)

Sensor Monitoring.

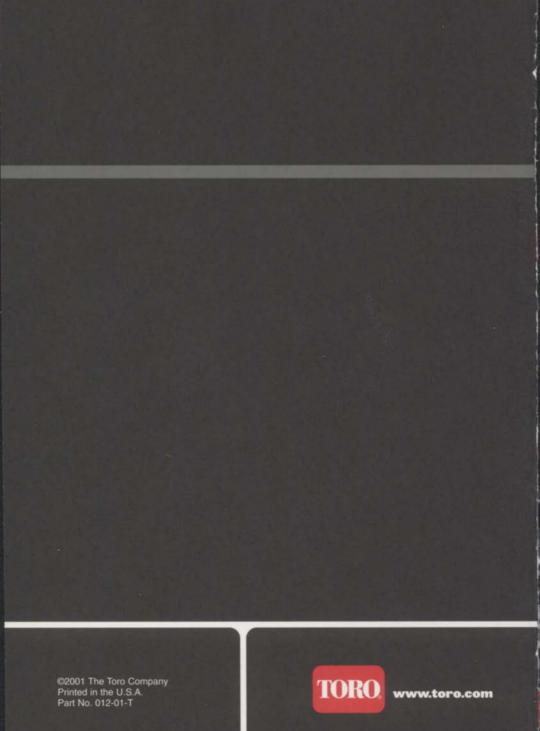
Available with SitePro CDS, Network LTC Plus and Network 8000, the monitor control unit allows sensor hook-ups to existing, in-field wire paths. The satellite monitors sensors,



such as temperature and pressure and uploads this data to the central on an as-needed basis or upon request. If sensor values are out of user-defined compliance, alarms are automatically generated.







... and is the brand used in Australia's top sports arenas, councils & munic

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ANZ Stadium Queensland

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Seagull's Stadium Queensland

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ments are enormous. Toro believes it's their responsibility to help make the most of every minute, every dollar and every ounce of effort

When you are responsible for some of Australia's most beautiful acerage, the personal and financial invest-

To address the critical demands of watering, growing, cultivating and managing, we've developed a portfolio of equipment, irrigation, customer service and support that is second to none.

you put into your course.

Toro's resource is so complete that Toro has become the preferred brand in the majority of Australia's top courses.

Having a playing field in the best possible condition and to stand the rigors of a heavy sports schedule during winter or summer leaves no

That's why many of Australia's best known sports arenas from large scale sports stadiums to Municipal operated sports fields take advantage of Toro products and expertise.

Toro is used by Municipalities throughout Australia because they pride themselves on achieving landscapes that enhance the environment for the broader community, residential, transient and tourists. Their landscape is often their own corporate statement.

That's why Toro is the only solution for irrigation and equipment.

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The Pines Stadium South Australia **TORO** Joondalup

Hockey Stadium

TORO State Sports

Centre

Bondi Beach Reserve

TORC

Lawn

Western Australia New South Wales New South Wales

TORO

Daikyo Stadium Queensland

TORO

WACA Western Australia

TORO

Newcastle No. 1 Sportsground New South Wales TORO

Football Park South Australia Santos Stadium South Australia

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Show New S

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Flemington Victoria

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Ascot Western Australia TORO

Doomben Turf Club Queensland TORO

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City of Mildura Victoria

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For more information on our Commercial Equipment Range please call 1800 033 531.

For more information on our Irrigation Range please call 1300 130 898.

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Joondalup Stadium **Hockey Stadium** South Australia

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Reserve Western Australia New South Wales New South Wales

Football Park South Australia

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Santos Stadium South Australia

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Parramatta Stadium New South Wales TORO

The Pines Stadium South Australia TORO

Joondalup **Hockey Stadium**

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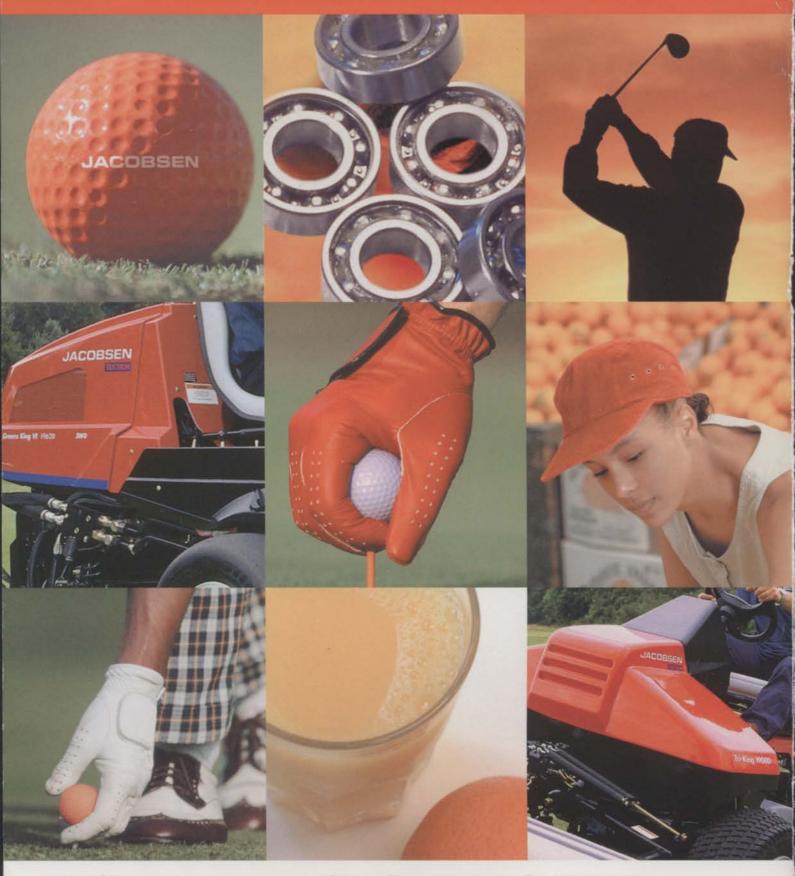
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Head Office: 122 Hume Highway, Lansvale, NSW 2166. Phone: (02) 9724 0344 Fax: (02) 9724 5405

Victoria: 29 Gatwick Road, Bayswater, Vic. 3153. Phone (03) 9720 7622 Fax: (03) 9720 6801

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