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Names like Bradman, Benaud, Taylor and Waugh are part of the essence of cricket history at the SCG and in recent years, famous AFL names like Lockett, Roos and Kelly have also become synonymous with this great ground. But the man that makes it all possible is SCG curator, Tom Parker.

Since joining the SCG in 1997, Tom has seen many great sporting moments during his time. He has had the privilege of watching milestones such as Shane Warne capture his 300th test wicket on Tom's very first SCG pitch, Tony Lockett's record breaking 1300th AFL goal and most recently, Steve Waugh's century from the last ball of the second day's play against England in the recent test series. "The SCG is such a special place," says Tom. "I still get a buzz every time I walk out on to the ground".

The SCG plays host to a wide variety of events including domestic and international cricket, AFL, rock concerts and corporate launches and events. With such a broad range of events to accommodate, Tom has to vary his maintenance program accordingly. During the cricket season, Tom's main focus is on preparing and protecting the centre square area, which contains nine pitches, with up to three of them being in use at any one time. One of the main factors with preparing wickets is the weather and Tom has faced his share of meteorological challenges. "In February last year we suffered torrential rain and hail which impacted on our preparation of the wicket for the One Day finals. As a final resort we constructed a marquee over the pitch to be prepared, and covered the wicket square with tarpaulins. The marquee was dismantled the day prior, and a helicopter was brought in to dry the pitch further and the wicket square", explains Tom. Despite this major obstacle, Tom and his team were able to prepare a pitch that brought praise from both captains.

Once the cricket season is finished, Tom then turns his attention to football and the different maintenance techniques that will be required to prepare the ground for the Sydney Swans home games. During the AFL season, Tom reduces the mowing routine from daily during the summer to twice weekly and he oversews the centre square area and outfield with Rye Grass Caravel. "By oversewing the square, we are able to disguise the wicket area for AFL matches, and also offer a bit more cushioning for the players. We also pay very close attention to the condition of the entire ground by taking regular Penetrometer readings and submitting them to the AFL to ensure that they meet their standards," says Tom.

The SCG also plays host to various events like rock concerts and corporate launches during the year as well. "Most of our work takes place once the event has been packed up. After the recent Bruce Springsteen concert, we had to vacuum the surface to remove any debris, and then sweep the ground with a magnet to pick up any screws, bolts or pieces of metal. Then we aerated the surface and replaced the turf in any worn areas. The whole process takes about 7 days to get it back to its playing condition," states Tom.

In order to maintain the Legend couch surface of the SCG in first class condition, Tom uses a fleet of equipment that includes John Deere 3235B Light Weight Reel Mowers, 2653A Utility Reel Mowers, 6 x 4 Gator Utility Vehicles and 4 x 2 Turf Gator Utility Vehicles. "The John Deere equipment has been excellent, but the biggest thing for us has been the excellent service that we have received from our local dealer, Cess Hill Industries. Downtime is something that we can't afford, especially during the summer with our daily mowing routine, and Cess Hill certainly helps us out there. We had an instance on New Year's Eve where there was a split in one of the unit's radiator and it was crucial that we got the unit running to prepare for the upcoming test match. Even though the dealership was closed for the holidays, they opened up especially for us and had the part delivered to us within hours", explains Tom.

John Deere salutes Tom Parker and his team at the Sydney Cricket Ground and looks forward to continuing its partnership long into the future.



The SCG in all its glory for the first day of the Fifth Test between Australia and England

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Main Image, Adelaide Convention Centre. National Turf Industry Census promotion, photography by Robert Johnson. Model is Karri from Scene Model Management.

special features

Why we need to understand herbicide 'mode of action'

James Royal recaps a familiar topic that will be useful revision for most.

Special Report – BIGGA Conference In January, John Neylan from AGCSATech formed part of the educational program. This is his report on what was a great week.

Fertigation – Maximizing the Value of Your Irrigation Management

As turf managers up-date and improve the uniformity of their irrigation systems, fertigation is becoming a real option! Charles Burt from the irrigation Training and Research Center (ITRC) is a world leader in the field and this is essential reading.

19th Australian Conference and Trade Exhibition, Conference Floorplan and Program

FEGGA International Summ

Following the BIGGA Conference (see page 12), John Neylan attended the International Summit 2003, organized by the Federation of European Golf Greenkeepers Association (FEEGA) and return with some interesting global perspectives on the turf industry.

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research

 Spring Dead Spot: A Major Bermudagrass Disease
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 Researchers at Oklahoma State University and
 Kansas State University are using molecular techniques to investigate the causes of Spring Dead Spot, a serious disease of couchgrass.
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This is Big!

If you haven't already realised, this edition of ATM aunches the NATIONAL TURE INDUSTRY CENSUS. This is the biggest project of its type ever conducted for the turf industry and with your support the benefits will be huge.

As the industry grows in size and significance, so to does the level of responsibility and expectation. To meet these challenges and to protect its future the industry requires a much greater understanding of exactly how it is made up and how it functions.

With these challenges in mind the Australian Gol Course Superintendents Association (AGCSA) with support from the Australian Golf Union (AGU) and Golf Management Australia (Secretary Managers Association), has partnered industry to launch the 'National Turf Industry Census'.

The information will assist companies to research and develop products more suited to Australian conditions and requirements but the industries supporting bodies will be much better placed to encourage industry development and to generate funding for turf research and education.

Not only that, but by simply completing and returning this form as requested, you will received two (2) free tickets to see a movie of you choice at any Village Cinema. You also go into the draw to win one of five all expenses paid trips to the 20th Australian Turfgrass Conference that will be held in Melbourne in June 2004.

The success of the 'National Turf Industry Census elies completely on your support so please take the ime to contribute. You will be doing something for yourself and for your industry.

On another note, this will be my final edition as editor of Australian Turfgrass Management (ATM) magazine. To leave behind the best job in turf wasn'i an easy decision but I have given my best and feel hat I need new challenges.

I am very proud of the magazine we have created and I would like to thank everyone connected with ts success. The trade have supported ATM from day one and to them I will be forever grateful but the real strength lies with you the readers. Thank you very much for your support, I hope the magazine has in some way helped you become better.

Best regards

Phil George Editor



PHIL GEORGE EDITOR



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National Turf Industry Census!

To receive your 2 free tickets to the movies, simply complete and return the National Turf Industry Census enclosed in this edition.



President's Pen

As I sit to pen this report Australia has just gone to war. Unfortunately, this is not a war of the sporting kind that involves in some way, shape or form a battle of wits to overcome an opponent in the pursuit of pleasure or one upmanship on the green expanse of sports turf that we become accustomed to over the sporting calendar of each year. The ramifications and outcomes of this contest will only come in the fullness of time.

As I mentioned in my last report the AGCSA are undertaking an upgrading of the constitution to bring it into line with current times and wordings/legislation. At our board meeting in February the board looked at the membership structure and fee structure and these are being worked through at present for presentation to the members at the AGM to be held in Adelaide in June during the 19th Australian Turfgrass Conference.

The state presidents and the board have just met in Adelaide to discuss and review the programme for the Conference and the feelings amongst all in attendance was one of anticipation for the team building day that is being held on the Tuesday of the week. A brief update was presented to all of us, and without giving too much away, I am sure that there will be some stories to tell at the Cocktail Party on the Monday evening. Also discussed was the educational workshop that is planned whilst in Adelaide at the conference to clearly define the educational pathway for the turf industry in conjunction with the recently endorsed National Training Package. The AGCSA Accreditation programme will also now be reviewed to align with the new Package as well.



Mark Couchman, AGCSA President

For our South Australian readers in particular, there is to be a one day workshop held at the conference that will be run by the South Australian Golf Association that will encompass some great educational presentations for Club Managers, Greens Chairpersons, Presidents and/or Captains, so make sure that the people that need to know are "in the loop" and don't miss out on this great day. Last year in Brisbane the same format/day was a huge success.

Everyone should by now have received their registration package, so take the time to fill it out and get it back ASAP so as to get the early bird registration discount. The AGCSA Award nominations are also out and I am sure that there are many worthy nominees out there, so certainly don't be shy in nominating one of your peers for these most prestigious awards.

Also, it is with much regret that I announce that Phil George has decided to resign from his position with the Australian Golf Course Superintendents Association (AGCSA) as the Editor of Australian Turfgrass Management (ATM) magazine.

The magazine has become well known for the outstanding quality of its presentation and content and is held up as an example to other related industries.

As of 31st March, Phil will be employed as a Stock Broker specializing in international (US in particular) equities with Melbourne based Fortrend Securities.

On behalf of AGCSA Members and the Board, I thank Phil for the tremendous contribution he has made to the turf industry and wish him all the best in his new career.

Yours in Golf,

Mark K Couchman AGCSA President Superintendent Tewantin-Noosa Golf Club #

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Why we need to understand herbicides' 'mode of action'



Introduction

Similarly to farmers over recent decades, turf managers are facing growing community concerns, as well as pressures from environmentalists and regulatory bodies about the way they use pesticides.

In response to these concerns and recently introduced regulations, turf managers have been putting more effort into maximising both the efficiency and environmental safety of their inputs, of which herbicides form a large part.

Clearly, any changes to input usage requires something of a balancing act, especially if the needs of an increasingly discerning and demanding playing public are also to be met.

While this balance can be achieved, at least in part, through better management practices (ie. encouraging healthy, pest and disease resistant turf), major effort needs to be applied to reducing pesticide volumes by reducing or eliminating the need for repeat applications.

Understanding how herbicides work (herbicide activity) often makes it easier to find ways to limit their usage. However, herbicide activity is driven by many different factors.

One of the most important of these is herbicide 'mode of action'. 'Mode of action' is a term which describes how herbicides interfere with specific physiological processes within target plants (Turgeon, 1994). Understanding 'mode of action' can give valuable clues to working out optimal herbicide timings, spray placement, and pre- and post-application management.

Understanding 'mode of action' also gives important clues about herbicide selectivity (ie. turf safety) and resistance development. The aim of this discussion is to stimulate interest in how the major groups of turf management herbicides function and how turf managers can relate and use this knowledge to improving the way they apply and use these important products.

Different types of herbicides have different 'modes of action'. These are driven, in large part, by the chemical make up of their active ingredients and, for convenience, different products have been 'grouped' according to the ways in which they affect target plants.

In this discussion, we will look at each of the main groups of herbicides and how they work. Within some groups, there are different sub sets or 'families' which share common chemical makeups which, in turn, can affect the way we can best use the products that contain them. Importantly, the degree of 'family chemical commonality' is greater in some groups than in others, and this needs to be taken into account. More importantly than that, however, is the fact that the similarity of 'modes of action' within each group mean weeds which may develop resistance to one member of a group will, almost inevitably, be resistant to other members of the group as well!

Disrupters of plant cell growth

Often termed 'growth regulator herbicides', this group contains the active ingredients most widely used for control of broadleaf weeds, both in turf and agricultural cereal crops.

Plant cell disrupters work by changing the normal hormonal balance in plants which, in turn, disrupts processes such as cell division and protein synthesis (Hall et al, 1999). This is why treated plants generally display easily recognisable malformed growth, such as stem twisting and leaf curling, because their cell growth and division have gone haywire.

Active ingredients in this group come from three main chemical families: the phenoxies (eg. MCPA and 2,4-D); benzoic acids (eg. Dicamba); and carboxylic acids (eg. Clopyralid).

While there are some slight differences between the modes of action of the different 'plant cell disruptor families', these are generally too specialised to consider from a practical viewpoint.

More important is the impact on the performance and environmental characteristics of the individual herbicides. For example, the active ingredients contained in the carboxylic acid family tend to have greater soil residual activity than phenoxy actives (Turgeon, 1994).

Inhibitors of photosynthesis

This 'mode of action' group contains active ingredients from nine different chemical families, of which only three contain actives registered for turf use. These are: bromoxynil, bentazone and siduron.

Interestingly (and importantly) these three actives alone demonstrate the huge variability amongst the chemical families in this group. Bromoxynil and bentazone are both foliar (absorbed through the leaf) and act on contact (ie, mainly affect the parts of the plant onto which they are sprayed, as opposed to 'systemics' which are carried around to and affect other parts of the plant). Both are primarily active against broadleaf weeds. Siduron (present in the product Tupersan), on the other hand, is absorbed mainly through the

JAMES ROYAL

roots and is mainly active against warm-season grasses such as summer grass, couch and kikuyu.

By inhibiting photosynthesis, herbicides in this group affect the target weeds' ability to produce carbohydrate.

Interestingly, they do this by blocking the physical transfer of electrons which have been 'energised' by light falling on exposed plant cells in leaves and green stems (Hall et al, 1999). This is relevant because it helps explain how resistance has occurred to Atrazine and Simazine (both from the 'triazine' family) which belong to the same group (photosynthesis inhibitors). Resistant plants have developed a way to shield their cells from the effects of triazines and continue to allow light-energised electrons to pass through to activate the photosynthesis process.

Another point of interest is that the symptoms that develop following application of some of the photosynthesis inhibitors are too rapid to be caused purely by the blocking of carbohydrate production. A case in point is bromoxynil which, depending on weather conditions around the time of spraying, usually produces noticeable symptoms within 24 hours). What happens in this case is that the disruption to photosynthesis causes the build-up of toxic radicals in the plant cells. These toxins, in turn, attack proteins and membranes, leading to the loss of membrane structure and cell functioning (Hall et al, 1999).

Inhibitors of cell division

A number of the soil applied, pre-emergent herbicides act on germinating weeds by inhibiting cell division (mitosis). The dinitroaniline herbicides (DNAs) — the family to which pendimethalin belongs — act by stopping the synthesis of tubulin, which is crucial in separation of dividing cells (Hall et al, 1999). Indeed, pendimethalin is effective as a pre-emergent herbicide because it acts against the root development (cell division within the emerging roots) of newly germinating seedlings.

As with all pre-emergent herbicides however, cell division inhibitors must not only be biochemically active but also have all the necessary physical attributes. This includes having the ability to bind to the soil, thereby providing a zone that acts as a barrier to germinating weeds.

Unique to this group of herbicides is the fact that their selectivity is not based on metabolism (ie. ability of tolerant plants to metabolise the active ingredient to a non-harmful form). Instead, their selectivity relies on their inability to actually translocate into plants (ie, they cannot get into the plants' systems). Instead, they remain trapped outside the meristematic (active growth) zone of the roots of established plants.

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Dithiopyr (a 'pyridine' and the active ingredient in Dimension), also acts by inhibiting mitosis. Dithiopyr causes the 'microtubules' responsible for forming the 'spindle fibres' that separate chromosomes during mitosis — to shorten and become ineffective during this important phase of cell development (Turgeon, 1994). This is what makes dithiopyr effective as a pre-emergent herbicide. However, dithiopyr can also act as a post-emergent on very young weeds, also by affecting root growth.

Propyzamide (Kerb) is another herbicide believed to cause a shortening of the microtubules, which gives it a similar pre-emergent effectiveness (Ware, 2000). Propyzamide (an amide) is present in the group of herbicides listed as having multiple sites of action. The amides as a group also exhibit an effect on photosynthesis (Turgeon, 1994). Propyzamide is absorbed by the roots of plants and translocated throughout, acting as both a pre-emergent and an early post-emergent (Ware, 2000).

Inhibitors of amino acid biosynthesis

A. Inhibitors of acetolactate synthase (ALS)

ALS inhibitors include the 'sulfonyl ureas' (SUs). While SUs were first developed some decades ago and been used in agriculture over many years, chemical companies have recently developed a number of new active constituents which belong to the same family. Some of these have recently been registered for turf in the United States.

At present, the only SU active registered for turf use in Australia is halosulfuron-methyl, the active in Sempra herbicide.

By inhibiting the ALS enzyme, these herbicides reduce the production and availability of a number of 'essential' branched chain amino acids, including leucine, valine and isoleucine (Hall et al, 1999). As a result of these resultant deficiencies, cell division and plant growth is stopped.

While symptoms such as a cessation of plant growth can occur quite soon after application, plant death is usually a slow process.

Adsorption of these herbicides can be via the leaves and roots, with translocation in the plant both via the phloem and the xylem (plant 'arteries' and 'veins'). Many of the SU herbicides persist in soil, providing a residual effect against newly germinating weeds.

Tolerant plants are able to withstand application of SU herbicides by rapidly metabolising the active ingredient before they become toxic (Hall et al, 1999).

B. Inhibitors of EPSP synthase

This group contains glyphosate, one of the best-known herbicides in the world. It is different from the SUs because it effects the enzyme 5-enolpyruvylshikimate acid-3phosphate synthase. This enzyme is used by plants in the production of aromatic amino acids (Hall et al, 1999).

Glyphosate is a non-selective herbicide because plants are not readily able to degrade glyphosate to a non-toxic form. Variation in the control of plants by glyphosate is usually caused by an inability of the herbicide to penetrate the waxy cuticular layer on these plants (Hall et al, 1999).

The use of an adjuvant therefore becomes most important in these situations.

Inhibitors of fat (lipid) synthesis

Another major group of herbicides is the lipid inhibitors or, more specifically, inhibitors of acetyl co-enzyme A carboxylase (ACCase). Fatty acids have several vital functions in plants, including the storing of energy, and the formation of cuticles. The ACCase enzyme fires up the initial stages of fatty acid synthesis. (Hall et al, 1999).

Two herbicides from the family called aryloxyphenoxypropionates (known widely as 'Fops') are used in turf. One is diclofop-methyl (Illoxan) and fluazifop-p-butyl (Fusilade).

Herbicides in this group only have activity on grasses. Fusilade is used as a non-selective grass herbicide, while diclofop is used to selectively control crowsfoot in warm-season turf.

Both these herbicides are absorbed through leaves, and are translocated to the meristematic (growing point) regions of grasses found in the leaf bases and crowns. It is there that most of the plant's ACCase is also found (Hall et al, 1999).

Translocation of Fops is relatively slow, and along with the fact that the effect on cell division is not immediately deadly, symptoms and eventual death of susceptible plants is usually very slow (Hall et al, 1999).

Because herbicide mode of action is a very complex topic, this discussion has only touched on the major factors within the main herbicide groups. These days, understanding of the major issues of herbicide action is fast becoming knowledge that is crucial to the progressive turf manager. Obviously, a more in-depth understanding will be of even greater use in helping turf managers make the best possible decisions about what herbicides to use where and, importantly, how to use as little herbicide as possible under a wide range of conditions.

James Royal is a plant protection Product Manager with Nuturf P/L

Reference list is available from author.



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SPECIAL REPORT BIGGA CONFERENCE

JOHN NEYLAN



In January I was privileged to represent the AGCSA at the British and International Golf Greenkeepers Association (BIGGA) conference. The AGCSA has had a long association with BIGGA with the exchange of speakers to the respective conferences. In most recent times, Elliot Small and Martin Gunn from BIGGA have attended our conferences.

Second only in size to the Golf Course Superintendents Association of America (GCSAA), BIGGA has a membership of about 7000 in 3 - 4 classes of membership. BIGGA has an administration staff of 15 (has been greater), with departments covering education, membership, marketing and publications.

The BIGGA Conference week is always held at Harrogate, about a 1 hour flight north of London, in North Yorkshire. Harrogate specialises in conferences and exhibitions.

The education program is provided in several different formats including the:

- (i) National Education Conference
- (ii) Workshop Programme
- (iii) Seminar Programme
- (iv) A three day trade show (BIGGA Turf Management Exhibition).



John Neylon presents a discussion on IPM

The National Education Conference programme is similar to the AGCSA conference and consisted of a series of technical presentations on Personnel Management and Golf Course Management.

The topics covered were typical of those that are of interest to Australian Superintendents including; Staff Recruitment, Staff Discipline, Interviewing, Woodland Management, Foliar fertility, Drainage Design and Tournament Course Preparation.

The workshop programme consisted of three workshop topics and coincided with the conference programme.

The workshop topics were as follows;

- 1. Soil Science (1 day workshop)
- 2. Environmental Management (2 day workshop)
- Golf Course Design (2 day workshop) Workshops are restricted to about 20 delegates.

I attended the soil science workshop and the most interesting aspect was discussing the soil issues that affect Superintendents from the UK, Ireland, USA and Scandinavia such as ground freezing, frost heave etc.



Environmental Awards Presentation

The Golf Course Design workshop was run by BIGGA and the British Institute of Golf Course Architects. You needed to have attended a Golf Course Design 1 workshop to attend.

The Environmental workshop was conducted by Bob Taylor, Senior Ecologist, STRI and representatives from the Scottish Golf Environment Group. Bob Taylor will be attending and presenting workshops at the AGCSA conference in Adelaide.

The seminar programme is part of the exhibition and takes place at the conference halls where delegates can elect to attend (and pay for) up to nine seminars.

The seminar topics vary widely including tree management, OHS, course preparation, professional development and the rules of golf. I made a presentation on Integrated Pest Management during the seminar series. The venue was very interesting in that it was a very old (100 years old) theatre that required a lot of refurbishment (_10million) and the sound technicians had to enter their area wearing hard hats.

As with the AGCSA, BIGGA have award presentations. There are environmental awards and green keeping awards. The environmental awards give prizes (_500 and a plaque) for the regional winners and _2000 for the overall winner. The winner this year had won the award previously.

There was also a Master Greenkeeper award presented (like the GCSAA Certified Superintendent Award) of which there are only 32 in the world (including at least one American). They receive a jacket with a logo that proclaims that they are a Master Greenkeeper.

Immediately after the awards, there was a keynote address by Debra Veal, MBE, a young lady that rowed across the Atlantic Ocean. It was a 60 minute spell binding presentation that left the audience stunned and amazed. If the UK was not so far away she would be at the top of my list of guest speakers!

John Neylan Manager, AGCSATech 🔺





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

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Fertigation - Maximizing the Value of Your Irrigation Management



We now have excellent irrigation hardware, with even better features to come in the future. With the proper design, installation, and maintenance, irrigation systems are now capable of applying the correct amounts of water with a very high degree of uniformity. We are able to monitor the weather and soil moisture with precision, and new advances in irrigation scheduling theory allow us to predict the vegetation water requirements quite well. Fertigation is the application of fertilizers through the irrigation water. Although fertigation is widely practiced today, it should be noted that the fact that it is practiced does not mean that it is fine-tuned. Irrigation was practiced several thousand years ago in the Middle East; just as irrigation practices have recently advanced, fertigation practices will also become much more sophisticated in the future. The next revolution in irrigation will occur with improvements in fertigation. Precision fertigation will provide next major improvements in turf quality and appearance per unit of water consumed. This article will provide the reader with some basic rules on how to get started properly.





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Why Use Fertigation

The correct question is: Why <u>NOT</u> use fertigation? It is easy to automate, plants can be spoon-fed, and fertilizer bills generally decrease when fertigation is used in contrast to mechanical spreading. Turf, in particular, shows an outstanding response to spoonfeeding – resulting in uniform color, vigor, and stand health. A real plus is that with proper fertigation, turf can be maintained green and healthy with less water. Almost all plant growth is governed by a combination of water and fertilizer; fertilizer deficits require more water to achieve the same turf appearance as properly irrigated and fertigated turf.

Differences between Turf and Agricultural Fertigation

DU_{lg} =

Most fertigation references have been written for agricultural applications. There are several notable differences with turf. These include:

 Turf is almost always irrigated with permanent, solid-set sprinkler systems. This makes fertigation much easier with turf than with many agricultural applications.

- The turf "crop" is not usually harvested and removed from the field, as with agricultural crops. With agricultural crops, the fertigation applications must compensate for leaching and volatilization of nitrogen, plus harvested crop removal of N, P, K, and other nutrients.
- Because phosphorus (P) and potassium (K) are not easily leached from soils with irrigation and rainfall, once a turf field has sufficient levels of P and K subsequent fertilizer needs consist mainly of nitrogen (N) and micro-nutrients.

Irrigation System Uniformity

Fertigation can apply the fertilizers as evenly as the water is applied to plants. We have measures of irrigation water uniformity typically we use a ratio called the "Distribution Uniformity", or "DU". DU is defined in the table shown below.

A DU₄₁ of 1.0 means that all "elements" or plants in the field receive the same amount of water. A DU₄₁ of 0.80 means that compared to the average of all the plants, the 25% of the plants that receive the least amount of water

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CHARLES M. BURT, P.E., PH.D.

(i.e., average of the low quarter) only get 0.8 times as much water.

New drip/micro irrigation systems should have a DU_W of greater than .88 - 0.90, as a rule of thumb. For turf sprinkler systems it is not uncommon to have DU_W values of 0.50 or less – meaning that there is very bad uniformity of water application.

Rule # 1: When purchasing a new turf sprinkler system, extract a written guarantee of DU₉ from the irrigation contractor. The DU₉ is not just the "overlap uniformity" in non-wind conditions.

It must consider flow rate differences, edge effects, and overlap uniformity in the field. Cal Poly ITRC has procedures, training classes, and software that have been used for over a decade in evaluating the field DU of turf sprinkler systems.

Rule # 2: Pay for a competent assessment of your field DU_N and improve the uniformity so that both fertilizer and water are applied evenly.

Learn About Nutrient Balances

All of the plant nutrients must be available in not only the proper amounts, but also in the proper *balance*.

Unfortunately, we do not have good values for all the nutrient ratios (e.g., N:P, K:S, N:S). We do know a few simple ones, though. For example, the Calcium:Magnesium ratio should be about 2:1 or higher.

To identify the proper nutrient ratios and irrigation timing, you will need to do some record keeping on your own turf.

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Fertiliser bills generally decrease when fertigation is used

Rule # 3: During the year, obtain plant tissue test results of nutrient ratios in poor and excellent areas (visual appearance). Use this information to help decide which nutrient ratios you are striving to achieve over the whole area for best appearance and health.

Which Fertilizers Should Be Applied with Fertigation?

This depends on the costs of the fertilizer materials, the type of injection equipment used, and the Distribution Uniformity (DU) of the

irrigation system. Because phosphorus and potassium do not move in the soil, the least expensive method of applying them is sometimes mechanically. Furthermore, phosphorus in particular can cause sprinkler plugging problems in some water, and mechanical application avoids those problems. If, however, the irrigation system DU is excellent, all fertilizers can be applied through the irrigation system.

In any case, all nitrogen should be applied through the irrigation system. A common mix

in the U.S. is UAN-32 (urea-ammonium-nitrate), which contains all three of the basic nitrogen forms. Urea and ammonium will both remain close to the ground surface immediately after irrigation. Turf uptakes both ammonium and nitrate; the balance is good. Eventually, both the urea and ammonium will be converted to nitrate and move further into the soil with additional irrigations. The beauty of fertigation is that since it can be done on a daily basis, one does not have to worry about the sudden flushes and declines in growth that occur with



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Basic Guidelines

We have some basic guidelines for injecting fertilizers. Some of these pertain to safety of equipment and humans, others pertain to feeding the plants properly, and others pertain to avoiding chemical precipitates.

Some of the rules are:

Rule # 4: Always conduct a jar test before mixing one chemical with another, or before mixing a chemical with water. Using a clear jar, mix the chemicals and/or water in the dosage that you expect to apply. Let the jar stand overnight. If there is any cloudiness or precipitate, be glad you conducted the jar test and now know the combination is not good.

Rule # 5: When mixing a chemical with water, always add the chemical to the water, not the water to the chemical.

Rule # 6: Never mix acid directly with chlorine

Rule # 7: Do not mix concentrated fertilizer solutions directly with other concentrated fertilizer solutions.

This often causes precipitations. Even though you may know which chemicals should be compatible, you should avoid direct mixing in the same tank.

Rule # 8: Use a different chemical injection pump (and port) for each different chemical. This keeps hoses and fittings clean, minimizes plugging problems, and simplifies calibration of injection rates.

Rule # 9: Use the same safety hardware (backflow prevention valve, check valve on the injection line, filter on the fertilizer tank outlet, etc.) as is required by law for pesticide injection.

Rule # 10: Spoonfeed chemicals throughout the whole irrigation duration, and during all irrigations.

By spoonfeeding, the plant is supplied with the fertilizers as they are needed, and most chemical compatibility problems disappear due to the low concentrations.

Rule # 11: Get a water quality analysis. Learn how much nitrate is already in the water, as well as how much calcium and magnesium might be in it.

Rule #12: Absolutely, use proportional injection pumps with turf systems. Proportional injection pumps have electronic controllers that are tied into both the pump and the flow meter (any decent management requires a good flow meter). As the flow rate increases, the injection rate increases proportionally.

When you buy such a system, be sure to ask hard questions about how easy it is to understand the controller programming.

Also, don't use a cheap flow meter, use a flow meter that samples the majority of the pipe flow. Excellent meters include full-pipe propeller meters, magnetic meters, and some ultrasonic meters.

Rule #13: Always inject chemicals upstream of the filters.

Rule #14: Always inject upstream of the filters.

Rule #15: Always inject upstream of the filters. I assume you get the idea on this one.



How About pH Control?

There are many reasons that people control water pH by making the water more acidic. These include enhancing soil infiltration, and reducing plugging of nozzles and emitters. But managers need to be aware of several fundamentals about acidifying water:

Rule #16: Do not use strong, occasional dosages of acid. Not only are these less effective than continuous injections; they can also dissolve metal fittings, nozzles, etc.

Rule #17: Monitor your soil pH. Acidifying water and applying nitrogen fertilizer will both reduce the soil pH. Plant nutrients are most available at a neutral pH. It's easy to drop the pH below that; it's a lot more difficult to raise the soil pH.

If your soil pH is too acidic, do NOT inject lime through the irrigation system. Instead, apply it to the soil by mechanical means. Lime will precipitate in the irrigation system and will ream out nozzles.



Many courses in Australia have installed simple fertigation units for the purpose of applying wetting agents

Charles M. Burt, P.E., Ph.D.

Irrigation Training and Research Center (ITRC) California Polytechnic State University (Cal PolySan Luis Obispo, CA 93407 e-mail:cburt@ calpoly.edu Note: This information was extracted from the following ITRC publication, which is available for purchase through the ITRC: FERTIGATION. 1995. Burt, C.M., K. O'Connor, and T. Ruehr. ISBN 0-9643634-1-0. 295 p. contact ITRC at (805) 756-2434 or at www.itrc.org





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CONFERENCE PROGRAM

GOLF COURSE MANAGEMENT STREAM

SUNDAY JUNE 22ND 2003
 08.00am
 AGCSA Awards Judging Stamford Plaza Hotel

3.00pm Registration Desk Opens -Fover Hall H. Adelaide Convention Centre

MONDAY JUNE 23RD 2003 7.30am - 9.00am AGCSA Awards and Breakfast -Hall E. Adelaide Convention Centre

9.00am - 10.00am Partners Coffee and Chat Club Lounge -Stamford Plaza Hotel

9.00am – 9.40am Blokes Business – Balancing work, family and leisure Iain Duguid, Lifegrowth Pty Ltd, Hall B & C Adelaide Convention Centre

9.40am - 11.00am The Golfing Experience in 2020 -Hall B & C, Adelaide Convention Centre

11.00am - 11.20am Morning Tea

11.20am – 1.00pm Award Winners Presentations -Hall B & C Adelaide Convention Centre

1.00pm - 1.40pm Lunch

1.40pm – 2.00pm Turf Industry Survey -Hall B & C Adelaide Convention Centre

2.00pm - 3.00pm Plant breeding and the ramifications for turf managers -Dr Leah Brilman, Hall B & C, Adelaide Convention Centre

3.00pm - 3.30pm Afternoon Tea

->

3.30pm – 5.00pm Staff Operational Management -Venture Corporate Recharge, Hall B & ⊂, Adelaide Convention Centre

7.00pm – 9.00pm Welcoming Cocktail Reception -Adelaide Festival Centre, Presented by Chipo

TUESDAY JUNE 24TH 2003 08.00am - 5.00pm Team Building & Leadership Development Course -Venture Corporate Recharge

WEDNESDAY JUNE 25TH 2003
 08.00am - 9.00am
 Workshop 1A
 Meeting Rooms 1 + 2
 Managing Problem Staff Terri Clementson, Reardon Rothbard

Workshop 1B Meeting Rooms 10 + 11 Advanced technology for water conservation and maximization of irrigation efficiency -Stan Kostka, Aquatrols Corporation of America Workshop 1C River Room 3 AGCSA Research Wrap

9.00am - 1.30pm Trade Show Opens - Morning Tea / Lunch

1.30pm - 2.30pm <u>Workshop 2A</u> Meeting Rooms 1 + 2 The fate and behaviour of pesticides in turfgrass ecosystems - Dr Mark Zajac, Syngenta

Workshop 28 Meeting Rooms 10 + 11 Advances in understanding and managing water repellent soils - Stan Kostka, Aquatrols Corporation

<u>Workshop 2C</u> Meeting Rooms 4 + 5 Challenging Staff with Creative Target Setting -Terri Clementson, Reardon Rothbard

2.30pm - 5.00pm Trade Show - Afternoon Tea

5.00pm – 6.00pm AGCSA Annual General Meeting Meeting Rooms 1 + 2 Adelaide Convention Centre

-> THURSDAY JUNE 26TH 2003

8.00am - 9.00am Workshop 3A Meeting Rooms 1 + 2 Pest Control - A global perspective on product development - Dr Mark Zajar, Syngenta

Workshop 3B Meeting Rooms 10 + 11 Habitat Management - Joellen Zeh, Audubon International

Workshop.3C River Room 2 Imagine your life in perfect balance lain Duguid, Lifegrowth Pty Ltd

9.00am - 11.00am Trade Show Morning Tea

11.00am - 12.00pm <u>Workshop 4A</u> Meeting Rooms 1 + 2 Thinking Superintendent Session Communication Up and Down the Line -Daryl Sellar, Norm Ashlin, Mark Gahan

Workshop 48 Meeting Rooms 10 + 11 Australian Golf Course Design - A minimalist approach -Graham Papworth, Society of Golf Course Architects

Workshop 4C River Room 2 Organic Products – What's the hype about? Rich Taylor, STR/

12.00pm - 3.00pm Trade Show - Lunch / Afternoon Tea

3.00pm – 5.00pm Workshop 5A Meeting Rooms 1 + 2 Golf Course Ecology -Bob Taylor, STRI

Workshop 58 River Room 2 Water Movement In Plants -Andrew Peart, AGC5ATech Workshop 5C Meeting Rooms 10 + 11 The Golf Course as a model for environmental sustainability Joellen Zeh, Audubon International

7.00pm – 9.00pm Toro Golf Champions Function -Adelaide Oval

FRIDAY JUNE 27TH 6.00am AGCSA Golf Championships -Royal Adelaide Golf Club

AGCSA Corporate Cup The Grange Golf Club

8.00am – 2.00pm AGCSA Turf Tour -The Grange Golf Club, Kooyonga Golf Club, Glenelg Golf Club

7.00pm 19th Australian Turfgrass Conference Dinner -Adelaide Convention Centre

GENERAL TURF MANAGEMENT STREAM

MONDAY JUNE 23RD 2003
 7.00pm – 9.00pm
 Welcoming Cocktail Reception Adelaide Festival Centre

WEDNESDAY 25TH JUNE 2003
 8.00am – 9.00am
 Keynote Presentation
 New grass varieties and there performance Dr Leah Brilman, Seed Research Institute

9.00am - 1.30pm Trade Show Opens - Morning Tea / Lunch

1.30pm – 2.30pm Keynote Presentation Biologically based weed management -Dr. Ice. Neal. NCSU

2.30pm - 5.00pm Trade Show - Afternoon Tea

THURSDAY 26TH JUNE 2003 8.00am - 9.00am Keynote Presentation Don't keep us in the dark - turf management for shade -Andrew Peart. AGCSMPech

09.00am - 11.00am Trade Show Morning Tea

11.00am - 12.00pm Keynote Presentation Can communication make your male life easier? fain Duguid, Lifegrowth Pty Ltd

12.00pm - 3.00pm Trade Show - Lunch / Afternoon Tea

3.00pm – 5.00pm Keynote Presentation How to avoid herbicide injury to turf and landscape plots -Dr Joe Neel NCSU

5.00pm Summary and Close

NB: Program Subject to change without notice



SPEAKERS

THE 19TH AUSTRALIAN TURFGRASS CONFERENCE IS SET TO BE A REWARDING EXPERIENCE FOR ALL DELEGATES. Keynote speakers will include:



Bob Taylor, STRI – With over ten years experience Bob will present a series of lectures discussing the latest developments in organic products and golf course ecology.



Dr Leah Brilman – Leah will discuss plant breeding – the ramifications for turf managers along with new grass varieties which will be available in the future.



Iain Duiguid – Iain will discuss issues which effect each delegate whether personal or professional -Balancing work, family and leisure. Iain will also focus on men's health.

VENTURE CORPORATE RECHARGE

VENTURE CORPORATE RECHARGE – A key part of the 19th Australian Turfgrass Conference is the Team Building / Leadership Development Course on Tuesday 24th June.

A full day of learning and communicating with fellow delegates is assured. Delegates will have a series of challenges to complete on the day, to

gain the "Treasure Chest" with all delegates able to participate in various activities. All activities are designed to use your skills as a team player, use your communication and leadership skills to achieve challenges.

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generate a powerful environment where significant personal and team learning occurs. All delegates are guaranteed a day of exhilaration and challenges that will develop your interpersonal and management skills.





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AGCSATech : Update

By John Neylan



Construction work in progress

CONSTRUCTION

Despite the knowledge and experience we have and the equipment available, it is disappointing to witness another botched construction project. In recent weeks we have investigated the construction of several new golf holes that have been very poorly built. In simple terms it was a matter of poor construction technique, lack of quality control of materials and poor worker supervision by the contractor.

The correct construction specification for greens, tees and bunkers is well documented and you only have to go to the USGA website (www.usga.org) for a recipe that will work.

The basics are:

- · A correctly shaped and compacted base
- Agricultural drainage system
- · Gravel drainage blanket (greens and tees)
- Properly selected rootzone sand or bunker sand

In the particular project under investigation, the base was not correctly compacted, drainage pipe did not have the correct fall, the gravel contained excessive fines and the rootzone sand was too fine and of variable depth. In short, the constructed areas were never going to perform satisfactorily.

What went wrong? As with most problems, it was as a consequence of several factors;

- · A poorly written specification
- Poor soil analysis and advice on rootzone sand selection
- · Lack of quality control testing of materials
- · Lack of staff supervision by the contractor
- Lack of hold and sign-off points during construction
- Lack of an independent technical advisor to assess the quality of work and compliance with the specification

The turf industry to a large extent still operates on relationships and trust. While to some degree this is admirable, it neither protects the client nor the contractor. If a project is to work, there must be a tight specification and diligent project management to ensure all components of the specification are achieved.



Phil Ford (left) and Dr. Jim Moore (USGA) discuss the changes to the USGA Specification for greens construction.

SOIL TESTING

At a recent Victorian Golf Course Superintendents Association meeting, Phil Ford (NMIT) discussed his recent trip to the USA and in particular issues related to soil physical testing. The USGA has a system of accrediting laboratories that follow the USGA methodologies for testing construction sands. This accreditation is to provide consistency of testing and interpretation of results.

This raises the importance of laboratory accreditation in general. In Australia, laboratories can obtain accreditation through the National Association of Testing Authorities Australia (NATA) or through ISO9001 accreditation. To achieve this accreditation the laboratory must conform with internationally recognised standards of good laboratory practice and technical expertise. This requires the laboratory to have certain quality control procedures in place to ensure consistency in testing techniques. This involves written methodologies, running check samples of known characteristics, and double checking of results. It also involves keeping statistics that allows confidence limits to be calculated for each test parameter. Confidence limits provide useful information on what can be considered to be a realistic result and what can be the expected variation. When Jim Moore (USGA Greens section agronomist) was in Australia last year, he discussed confidence limits for soil testing and provided a chart for particle size distribution, hydraulic conductivity and porosity.

Interpretation of results is also important and for construction sands the parameters are well defined. However, what is a problem are "personalised" interpretations that do not



consider industry best practice. One such example is rejecting sands because they have a high drainage rate, presuming that this is associated with low moisture retention. Not necessarily so. For construction materials you must test for moisture retention (volumetric water content) as well as hydraulic conductivity, particle size distribution etc.

While there are critics of the USGA Greens Section specification for golf greens, they are guidelines based on 40 plus years of research and refinement and are supported by a well researched analytical package. In fact the specification is presently going through another review and AGCSATech has been invited to be part of the panel to make comments on the latest refinements.

In conclusion, by following the USGA green specification criteria and the testing methodologies, you will be able to make sound judgements about the suitability of materials for construction. Also, make sure that your laboratory has some form of independently recognised accreditation.

DR BRIAN HOLL VISITS AUSTRALIA

At the 9th International Turfgrass Society Conference (in Toronto, Canada) dinner, a jovial Canadian, Dr Brian Holl, hosted a table of Australians. Brian went on to assist with the post-conference tour and all that met him appreciated his company and local knowledge.

Brian is presently in Australia and working out of the University of Melbourne, Burnley Campus and putting his expertise to good use. Brian's expertise is in soil microbiology and while in Australia is undertaking trials at two golf courses in conjunction with David Aldous (Burnley) and AGCSATech. John and Andrew are assisting with the trials by securing trial sites and applying the treatments.

The trials being run involve applying various organic soil/turf conditioners and then measuring the microbial response. The technique involves taking soil samples, extracting the soil microbes, incubating them and then measuring their metabolism. It is a very interesting project in that we often apply various organic products in order to stimulate microbial activity. However, we do not know what magnitude the response will be. These trials will hopefully answer some of these questions. The trials are being undertaken at:

- Werribee Park Golf Club (Course Superintendent Michael Russell) on a sand profile and a "pushup" style putting green.
- Patterson River Country Club (Course Superintendent Michael Riordan) on a new sand profile putting green. These sites provide us with a range of situations:
- A new profile with a juvenile microbial population
- An old and mature sand profile with a developed microbial population
- An old soil 'pushup' green where it would be expected to have a more active microbial population

The treatments selected include products used in the industry and are;

- · Kelpak and molasses
- Kelpak
- Amniogrow
- Carboaid
- · Supa humus
- Essential
- Untreated control

The trial will be completed in late April and some of the results will be presented at a seminar at Burnley College on the 9th April 2003.



Brian Holl



A and B: Phoma sp.

DISEASE OF THE MONTH

At AGCSATech, we recently became aware of a 'new' disease and the devastation it caused. Others had diagnosed this damaging fungal organism as *Phoma spp.*

Phoma spp. is a fungal organism associated with damaged plant tissue caused by any number of factors such as heat stress, other fungal pathogens and turf damage in general. It is an organism that develops in the dead or dying leaf tissue and is rarely associated with living, healthy tissue and is easily detected when looking for other plant pathogens.

Is it a problem in its own right?

All of the authoritative references say no and its presence indicates the presence of some other casual organism or factor. Is it causing any damage? Again the literature says no, stating that it is taking advantage of the weakened plant tissue, where it can easily penetrate and grow and is only living in plant tissue that would die any way. The literature does not discuss any specific fungicide treatments because of its association with other causes. However, most systemic fungicides clear it up. If *Phoma spp* has been diagnosed other causal factors need to be investigated as it is most unlikely that it will be the primary problem.



Spring Dead Spot: A Major Bermudagrass Disease



Researchers at Oklahoma State University and Kansas State University are using molecular techniques to investigate the causes of Spring Dead Spot, a serious disease of bermudagrass.

SUMMARY

Research continues at Oklahoma State University and Kansas State University to gain a better understanding of Spring Dead Spot, a major disease of bermudagrass, (Couchgrass) Developments include:

- Three root-rotting fungi cause the disease: Ophio-sphaerella herpotricha, O.korrae, and O.namari.
- Bermudagrass varieties with greater winter hardiness also better resist SDS infection.
- Factors that delay fall dormancy, such as excessive fall fertilization, as well as poor drainage, and excess thatch promote SDS.
- Resistant bermudgrass varieties include Guymon, Midlawn, Midfield, Midiron, Yukon, Marage and Sundevil, although no varieties are immune.
- Researchers are investigating whether certain bacteria can act as biocontrol agents to help control the disease.
- Researchers are also investigating the infection process under controlled conditions to gain insight for improved control.
- Work is being conducted to document bermudagrass gene expression during SDS infection. With this knowlege, researcher hope to incorporate resistance genes into future varieties using advanced microbiological techniques.

Spring dead spot (SDS) is a major disease that affects bermudagrass in the United States and worldwide. Within the United States, the disease is most prevalent in the northern range of bermudagrass adaptation (Figure 1) (5,7). Researchers at Oklahoma State University and Kansas State University are focusing their efforts on gaining a better understanding of the way bermudagrass is infected with the ultimate goal of developing improved control options.



Figure 1. Range of bermudagrass growth (yellow and green) and SDS infection (yellow). Note that SDS is predominant in the northern range of bermudagrass adaptation. (Adapted from A. Gould, editor. Turfgrass Patch Diseases Caused by Ectotrophic Root: Infecting Fungi. APS press, St. Paul, Minn.)

The Pathogens

The disease was probably first noticed as early as 1936, and fully described by 1960 (14). Today we know three root-rotting fungi cause the disease: Ophiosphaerella herpotricha, O. korrae, and O. narmari (2, 4, 12, 15). All three fungal species are found in the USA (16). O. herpotricha is the most abundant causal agent in the Midwest.

Ophiosphaerella korrae has been located throughout the USA and Australia. O. narmari has been isolated in California, Oklahoma, Kansas, and is a major pathogen in New Zealand and Australia (16). Furthermore, O. korrae infects several other plants including Kentucky bluegrass, annual bluegrass and red fescue where it causes the disease known as necroticring spot (3, 17).



Figure 2. Typical symptoms of Spring Dead Spot on a susceptible bermudagrass variety.

Symptoms and Resistance

Symptoms of the disease include circular bleached and depressed thatch areas from six inches to three feet in diameter (Figure 2). The fungus usually takes from two to three years to become fully established. Once established, the below ground roots and rhizomes are typically covered with dark brown to black fungal hyphae . Like many root-rotting fungi, this fungus is most active in the early fall and spring when temperatures and moisture favor fungal growth and when bermudagrass growth slows down. In the fall, infection weakens the bermudagrass root system and predisposes it to winter injury. For this reason the disease is more common in northern colder climatic areas and during years of severe winter (10).

Resistance to the disease has been identified in many bermudagrass varieties. Researchers have shown there is a close association between resistance to SDS and resistance to cold temperatures. In other words, bermudagrass



Michael Anderson, Arron Guenzi, Dennis Martin, Charles Taliaferro, and Ned Tisserat

varieties that resist the cold also resist SDS infection (1). Since freezing temperatures tend to increase damage, it stands to reason that cold resistant varieties would show less damage then non-resistant varieties. Nus and Shashikumar (11) showed that infection with *O. herpotricha* and *O. korrae* reduced the ability of a single bermudagrass line to adapt to cold temperatures.



Figure 3. Dr. Dennis Martin has evaluated most commercial bermudagrass varieties and several elite breeding lines for their resistance to Spring Dead Spot.

With the coming of spring and warmer temperatures, bermudagrass breaks dormancy and spring growth continues. In the diseased areas, damaged tissue often fails to regrow leaving the characteristic circular patches containing dead and dying tissues. However, regrowth can occur from the margins of the infection zone and from surviving plants within the patch resulting in a recolonization of the dead areas. Often recolonization by aggressive varieties may cause the patches to completely disappear. This seasonal cycle of infection and recolonization results in a variation in patch size from year to year. For some unknown reason, after five to six years, the symptoms usually subside and can even disappear.

Control Measures

What can be done to reduce the damage caused by SDS? Unsightly patches of infected bermudagrass often require expensive remedies. Severity of disease symptoms increases with a number of environmental conditions and cultural practices. Generally speaking, factors that delay fall dormancy, or reduces winter hardiness tend to promote the disease. Excessive fall fertilization and an accumulation of thatch will increase SDS infection.

Bermudagrass growing on soils that are poorly drained or have been compacted also show greater symptoms. Dr. Ned Tisserat recommends dethatching and core aerification to reduce damage cause by SDS (12).

What about fungicides? Unfortunately, chemical fungicides have been erratic with respect to disease control. Control varies from year-toyear and usually requires more than one application.

One of the best approaches for reducing SDS where O. herpotricha is the casual agent is the use of resistant bermudagrass varieties. The program of Dr. Dennis Martin has been very active in evaluating SDS response in commercial varieties and elite breeding lines (8, 9; Figure 3). Resistant varieties such as Guymon, Midlawn, Midfield, Midiron, Yukon, Mirage and Sundevil typically show less damage due to SDS. However, none of these varieties are immune to the disease and some do not offer the quality demanded by golfers. Susceptible varieties include Arizona Common, Cheyenne, Jackpot, NuMex Sahara, Oasis, Poco Verde, Primavera, Princess, Sonesta, Shanghai, Tifton 10, Tifway and Tifgreen, Tropica, Vamont, and Sunturf.

Biocontrol

Researchers are also investigating other potential means of controlling SDS. One such means is through the application of a biocontrol





agent. Biocontrol agents usually consist of microorganisms that kill or inhibit the growth of specific plant pathogens. Several biocontrol agents have been successful in controlling specific plant diseases.

Recently, a bacterium was found by the laboratory of Dr. Michael Anderson that dramatically suppressed the growth of *O. herpotricha* in the lab (Figure 4). Perhaps incorporation of an aggressive bacterium into the soil may suppress the infection process enough to tip the balance in favor of the bermudagrass plant. The bacterium could be applied as a soil drench during the fall when the fungus is most active, or in the spring to improve the rate of recovery during spring green-up. Plots are currently established for the testing of this biocontrol agent in the field and results should be forthcoming in a couple years.

Basic Biology

Research to better understand the basic biology behind the infection process is also continuing. There are many constraints in studying SDS and in breeding for resistant varieties. One of the major constraints is that it takes two to three years to establish the disease in the field, and an additional three years to collect and analyze the data. All in all, at least three to five years of work are required before field trials can provide meaningful data. Breeders, especially commercial breeders, are reluctant to tackle this problem directly if it takes five years to evaluate the material after each round of genetic selection. There has to be a better way.

Conceivably, controlled environmental studies could take less time. However, results

from controlled studies often fail to correlate with those from the field. In other words, varieties showing resistance in the field often fail to do so under controlled conditions. This indicates that certain factors that contribute to resistance may be missing in the controlled studies.

At Kansas State University, Dr. Ned Tisserat is studying the infection process under controlled environmental conditions in order to identify



Figure 5. Diagram of the basic steps involved in genetically engineering a plant with a piece of foreign DNA. Small pieces of bermudagrass flower tissue are grown in media and then bombarded with gold particles containing the DNA of interest (i.e., resistance to SDS). After bombardment, transgenic tissue is selected and regrown to encourage both shoot and root regrowth. Ultimately a transgenic plant is recovered and evaluated for the presence of the new DNA.

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these missing factors. Dr. Tisserat is primarily focusing on low temperature applications and inoculum levels in order to simulate field conditions. Other factors such as differences between the microbial composition of field soils or the presence of a heavily infested thatch layer may also be associated with resistance manifestation. Successful identification of the missing factors will provide valuable information concerning the infection process and allow the construction of a more rapid screening system.

Understanding Genetic Resistance

Finally, a better understanding of the infection mechanism at the molecular level could lead to novel and improved control methods. In the laboratory of Dr. Arron Guenzi research is being conducted to identify genes that are activated and deactivated during the infection process.

Genes direct the biological activity of all living organisms. The pattern of activation or deactivation of specific genes drives all biological processes. Research has shown that many plant defense genes are activated in response to fungal infection. The idea behind this research is that if one could identify the pattern of gene expression one could better understand how the plant defends itself against pathogen attack and ultimately engineer a better defense response. By analyzing patterns of gene expression, Dr. Guenzi hopes to uncover important genetic relationships that are associated with the SDS infection process and resistance mechanisms.

In addition to the work on gene expression, the laboratory of Dr. Guenzi has also been active in developing techniques to incorporate new genes into bermudagrass through genetic transformation (Figure 5). There are great barriers when working with a plant species such as bermudagrass that has never been effectively transformed. Although many attempts have been made in the past with little success, the successful and efficient transformation of bermudagrass will allow for the incorporation of new and important genes into current cultivars.

This team approach by researchers from Oklahoma and Kansas State Universities should yield greater knowledge of the infection mechanisms and provide new tools to combat this costly disease. As we advance into the future, it is our hope that research supported by the USGA will ultimately bring to producers and users improved turfgrasses, management procedures, and biotech nological and microbiological tools to make SDS a subject of history.

Acknowledgements

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MICHAEL ANDERSON, ARRON GUENZI, CHARLES TALIAFERRO are faculty members in the Department of Plant and Soil Sciences at Oklahoma State University; DENNIS MARTIN is a faculty member in the Horticulture and Landscape Architecture Department at Oklahoma State University; and NED TISSERAT is a faculty member in the Plant Pathology Department at Kansas State University

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FEGGA International Summit



Following the British and International Golf Greenkeepers Association Conference, I was fortunate enough to attend the International Summit 2003, which was organized by the Federation of European Golf Greenkeepers Association (FEGGA) and held at St. Andrews. FEGGA is an umbrella body for the greenkeepers associations in Europe.

FEGGA only has a short history, however, it was established about 1996/97 in response to the need to be represented on environmental issues in the European Union. The European Union were not prepared to deal with individual associations but preferred to discuss issues with a peak industry body that could then disseminate relevant information. FEGGA is funded through an annual membership fee paid by individual, national greenkeeper associations. There are about 25 member associations with additional funding coming from patrons (usually companies that have an international focus) and the Royal and Ancient Golf Club. FEGGA has a part time executive officer, Dean Cleaver, who was chairman of BIGGA in 1996. The chairman

of FEGGA is Joseph Bedford, a Golf Course Superintendent from Ireland and the current board has representatives from Holland, Germany, Italy and Finland.

The international summit has previously been held in the USA as part of the GCSAA conference. In 2002, it was decided that the summit should be more representative of the international scene and therefore FEGGA took on the task of organising the 2003 Summit.

The objective of the summit was to explore the issues of;

- (i) The Environment
- (ii) Professionalism
- (iii) Education
- (iv) Promotion of Greenkeepers/Superintendents
- (v) Improving relations between Associations

The venue was Rusucks Hotel at St. Andrews, 20 metres from the 18th Fairway of the old course (what a buzz!!). The venue was chosen because of the tradition and the support of the R&A. Key issues from the presentations were;

Education

Education and in particular on-going education is absolutely at the top of the agenda for all countries. It was interesting to note that the GCSAA has a very advanced education program strategy whereas there are many European countries that are only just establishing their traineeship programs. To a certain degree this is a reflection of the advancements in the game of golf and its popularity and the demands on those producing the playing surfaces.

The GCSAA is developing the Professional Development Initiative (PDI) and the aims of the PDI are: "to improve knowledge, skills and abilities of the professional superintendent that will contribute toward improved playing conditions and the enjoyment of the game of golf". The PDI is to provide a measure of the superintendent's abilities rather than just be a title. That is, moving away from giving a class 'A-membership' status for a membership fee. The PDI is aimed at making Superintendents more valuable to their employers by increasing their skill base. That is, greater skills in nonagronomic areas e.g. HR, interviewing etc. They have established 48 criteria/skills that Superintendents must have in order to achieve this status. Higher education is definitely required to achieve this level of accreditation.

Environment

There were three papers presented, two of which detailed the two most recognised environmental accreditation programs in the world. That is, Committed to Green and Audubon International.

The committed to Green program is European based and the Program Manager is David Stubbs and can be viewed at www.committedtogreen.org.

The Committed to Green program has a relatively short history as follows;



JOHN NEYLAN

- 1997 Committed to Green established
- 1998 Lund University (Sweden) developed environmental indicators.
- 1999 Valderrama Declaration signed. This document outlined the co-operative commitment of the USGA, European Golf Association, Royal and Ancient, European Commission and other agencies to promote environmentally responsible and sustainable golf courses.

The Committed to Green program is very rigorous and appears to be more demanding than the Audubon Program. The one obvious difference over Audubon is that the golf course has to be independently audited. The value of the independent audit is that it has greater credibility with the broader conservation movement.

Dr. Charles Peacock (North Carolina University) discussed the Audubon International program and compared to the Committed to Green program is relatively "simplified" by developing a self-assessment manual and a series of checklists. The Audubon program relies on self assessment and there is no independent verification.

The Valderrama Agreement was signed under the auspices of both Committed to Green and Audubon International and acknowledges the work of both programs for promoting good environmental stewardship. The general consensus was that irrespective of the program adopted, a proactive approach to the environment is good for the promotion of golf courses as environmentally well managed.

During these presentations, a group that is against golf courses, called 'Global Network Anti-Golf Course Action' was discussed. If you type this name into your search engine on the Internet, you can have a look at what this group is on about and see what perceptions and prejudices our industry needs to change.

There was much discussion regarding environmental issues and in particular the banning of many pesticides in Europe. In the Netherlands there has been a ban on the use of fungicides and insecticides. The key point to come out was that the golf industry must be prepared to lobby very strongly to sell its message. This is at all levels including Politicians, Green Groups, Government Departments, Golfers, Golf Associations and the media. It is also important that the greenkeeping industry is represented in any decision making process e.g. review of pesticide regulations. There also needs to be a greater commitment to communicating golf's contribution to the environment.

Professional Development

The main emphasis of this session was 'selling yourself' and your profession. It was an extension of the education session with the emphasis on professional development and the importance of selling these skills to your employer.

Communication

This session was aimed at creating an awareness of the many common factors that exist between countries and reinforcing the fact that information sharing can improve the skill base of Greenkeepers/Superintendents. It is important to understand that even with with limited resources we can build on the strength of the individual Associations.





For example, linking websites between all Associations can do this.

As far as communication goes it was identified that we need to keep communicating with Golf Associations, Golfers "The tour", Employers and Environmental Groups and golfers were considered to be a major challenge in selling the message of what greenkeepers do and their importance.

Some golf organisations (e.g. Gleneagles) and associations offer internships so that young greenkeepers can participate in technical and cultural exchange. This is seen as essential in developing a wider skill base and sharing of information.

The GCSAA is developing an "International" Membership. This is a low fee membership that will have limited benefits. (e.g. the magazine) but is aimed at creating a wider network. This membership would be dependent on the individual being members of their own National Association.

History of our Profession

This session was about the St Andrews Links Trust and involved an inspection of the Old Course and without doubt was the highlight of the trip.

The Links Trust involves 5.5 golf courses; The Old Course, The New Course, Jubilee Course, Eden Course, Strathtyrum Course and Belgrove Course with a new course to commence this year.

A brief history of the Links was provided by Links Superintendent, Gordon Moir and is summarized as follows;

- 1457: Golf banned on Sundays by King James so that people would practice archery. The Old Course is still closed on Sundays.
 1764: Old course reduced from 22 to 18 holes.
 1864: Old Tom Morris returned to St Andrews.
 1895: "New" Course reconstructed by Old Tom Morris and paid for by the Royal and Ancient Golf Club.
 1897: Jubilee Course constructed (12 holes initially) at a cost of _18/12/6. In the 1980's it was redesigned and is now
- considered to be a challenging layout. 1914: Eden course constructed
- 1974: Links trust formed by the government. Trustees include; 3 from the R&A, 3 from the town council plus others.
 1993: Strathtyrum course constructed.
- 2003: 7th course to be constructed.

The St Andrews Links Trust (i.e. 5.5 courses) is on 270 hectares (675 acres) of land. There are 18.4 hectares (46 acres) of turf nursery of which most seems to be used for bunker construction (i.e. revetted faces). The largest green on the course is the 5th / 13th double green that takes two men, 2.5 hours to cut with walk behind mowers. The distance traveled is about 4.4km (7 miles).

The maintenance of the course(s) is in the true links tradition but seeks to balance tradition with playability. There is judicious use of water and fertiliser so that the surfaces are kept firm and maintain acceptable turf quality.

Sand is a big part of the maintenance program and continues the long held tradition (who said dusting was new?). The fertiliser program is organic based with about 20 -90kgN/ha applied per year. There has been little or no fungicide and no insecticide applied since 1990 with fungicide applied maybe once a year. There is some judicious use of herbicides to control *Bellis perenus* (English Daisy). However, any pesticide use is limited to very specific areas.

Following the formal presentation about the St Andrews Links Trust we were fortunate to have a tour of the Old Course with the Old Course Superintendent, Eddie Adams. It was a privilege to tour the old course with all the traditions that are associated with it; the undulating landscape; revetted faced bunkers; the wind and the classic road hole and hell bunker. The turf condition is interesting and reflects the low input, minimalist approach to greenkeeping. Even though it was winter, the surfaces were firm and well grassed (predominantly fine fescue). The lazy wind (goes right through you!!) is certainly a feature of the area.

Social Events

All meals were provided and this was an excellent way of meeting and talking to people. It was humbling to notice that all of the Europeans were multi-lingual and one representative from Finland spoke seven languages! The highlight of the weekend was the cocktail function organised at the Royal and Ancient Golf Club Clubhouse. It is a rare privilege to be able to enter the R&A and it was a huge buzz. As a rare privilege we were granted special permission to roam about and view the Open trophy and the memorabilia associated with the history of golf.

Where does Australia fit in?

The tyranny of distance is both an advantage and a disadvantage for Australia. By being a long way from Europe in particular, we are not subject to the general environmental, anti-golf course movement. However, the disadvantage for Australia is that we only have occasional contact with Europe and the USA and therefore miss out on being part of a global family. Discussions throughout the conference made it clear that the golf industry needs to be very proactive in selling the positive message about golf and the environment. It needs to be



unified, well informed and prepared to lobby at government levels.

In terms of professional development, the GCSAA representatives made it clear that Superintendents must learn to sell their profession to the golfer, PGA, golf administrators and the wider community. While we are good at self-congratulation, Superintendents have not been good at outward promotion.

Attendees at the Summit

The attendance was very good with 25 countries represented and included;

England, Scotland, USA, Australia, Austria, Slovenia, Czech Republic, Finland, Netherlands, Spain, Italy, Germany, Denmark, France, Republic of Ireland, Iceland, Norway, Portugal, Sweden, Switzerland.

John Neylan Manager, AGCSATech 🚢

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Each year sudden cardiac arrest strikes approximately 30,000 Australians. Unfortunately, fewer than 5% of people survive, often because the ambulance service cannot reach them in time.

Sudden Cardiac Arrest (SCA) can happen anywhere, anytime to anyone. It is normally caused by an electrical malfunction that makes the heart quiver ineffectively in an abnormal rhythm called Ventricular Fibrillation (VF). It is sometimes triggered by a heart attack, but can also happen even without any blockage of blood flow to the heart. A lifesaving pulse of electricity must be delivered quickly to restore the heart's natural rhythm and pump blood throughout the body. Defibrillation is the only effective treatment for sudden cardiac arrest caused by VF. **Time is of the essence.** Typically only 5 to 10% of people struck down by sudden cardiac arrest survive. But, if people in VF get the lifesaving shock within 3 minutes of collapsing, the survival rate improves from an expected 5% to over 70%.

For every minute defibrillation is delayed, the chances of survival decrease by 10%. Note that the average ambulance response time in all capital Australian cities and major rural regions is 8-11 minutes, let alone allowing for the time it takes to call for help and reach the patient.

Technology is changing

Gone are the days where heart defibrillation was only used in hospitals. Now, in Australia, there are small portable devices known as Semi Automatic External Defibrillators (SAED) available in growing numbers for public use.

PETER BAILEY

All defibrillators on the Australian market are designed for use by the layperson with little first. aid knowledge. They are easy to use devices with audio and visual prompts.

A defibrillator monitors the heartbeat through pads that are applied to the chest. Each device has an internal computer that assesses the patient's heart rhythm and audibly guides the user of the correct treatment. The SAED determines if a shock is needed, and if so, a pulse of electricity is delivered to the patient via pads placed on the patient's chest. If a shock is not needed, the defibrillator will ask the operator to check for a pulse and commence CPR if required.

All defibrillators have built in safety mechanisms to ensure they will only operate when the patient is in need of defibrillation.

Growth through success

In Victoria, the Bracks government recently implemented a public access defibrillation pilot. This involves the placement of defibrillators in 10 key public locations where large numbers of people meet. Should the pilot prove successful, it is likely the number of defibrillators available will increase.

Furthermore, leading Australian organizations from the gaming, entertainment, manufacturing and sporting industries have implemented defibrillation programmes.

The Melbourne Cricket Ground is one of the forerunners in implementing a defibrillation programme. In 1999, a study was conducted to measure the cardiac arrest outcomes at the MCG and Shrine Of remembrance using a tiered response strategy.

The article documents 28 cases of cardiac arrest at two locations in Melbourne, Australia from 1989 to 1997. The response to these cardiac arrests was a tiered approach using a First Aider who provided basic life support. supported by a specially trained First Aider capable of defibrillation. Of the 28 cardiac arrest patients, 24 (86%) left the venue alive and 20 (71%) were discharged from hospital. Of the eight fatalities, four died at the venue.

This 71% survival rate result is remarkable given the current survival rate for a cardiac arrest outside of hospital is 3%. This article clearly demonstrates the potential for the use of SAED by appropriately trained First Aiders at venues, workplaces or events where large numbers of people are expected, or where the likelihood of cardiac arrest is high. This outcome of 71% has been repeated in other studies completed around the world.

In the US, laws require that all major federal buildings have a defibrillator installed with all staff trained in their use. In the UK, more than 800 defibrillators are in public places with another 3000 still to be installed.

Australia now has the technology to deal with cardiac arrest early and we need to follow suit in addressing the most common cause of unexpected death in our community.

Acknowledgements

Written by Mr Peter Bailey, Managing Director of First Intervention with over 20 years experience in first aid and pre-hospital emergency care.



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- · Ensure you have an emergency procedures plan & all staff are aware of it.
- Ensure ambulance numbers are handy.
- Ensure you have a defibrillator and staff that are trained to use it.
- Re-enact emergency scenarios to measure staff efficiency.

The Courier Mail PUSH FOR HEART STARTERS TO BECOME PAR FOR THE COURSE

By Siobhain Ryan

28 October 2002

RODNEY Gibson has spent half a lifetime as a Royal Queensland Golf Club member.

Now he owes the club the other half as well.

Two months ago, when Mr Gibson collapsed with a heart attack on the 6th hole, it was more than luck that brought him back.

It was a defibrillator, donated by club members, that re-set his heart rhythms and saved his life.

"The simple fact is that if it hadn't been there I'd be dead now," Mr Gibson said. "The chances of recovering outside hospital are very low and I don't have any doubt that I'm talking now because of the attention I got."

Of the thousands of Australians who die each year from heart attack, most go into fibrillation, where the heart quivers but can not regain its rhythm without electric shock.

Even with shock treatment time is critical, with the chance of survival dropping by 10 per cent for every minute delay.

Mr Gibson, who was resuscitated eight minutes after collapsing, was lucky. But more medicos want the life-saving devices to become par for the course in other public places.

In the US, laws require that staff be trained and defibrillators

installed in all major federal buildings and all passenger airplanes by mid-2004.

In the UK, more than 800 defibrillators are in public places and another 3000 are to be installed.

Orthopedic surgeon Dr Fergus Wilson, who was Mr Gibson's golf partner on the day of his attack, said automatic defibrillators should be more widely available in Australia.

"Nowadays we have the technology to deal with these sorts of things early if we can get to them," he said.

Within five minutes of his attack, Mr Gibson had not only Dr Wilson, but four other doctors in attendance - all golfers playing nearby.

RQ general manager Ross Bishop, who dialled 000, said Mr Gibson had turned blue by the time the defibrillator was retrieved from the clubhouse by golf buggy.

Mr Gibson, 66, returned to the golf course two weeks ago, but while his heart may have suffered, his game certainly hasn't. "He took \$15 off me on the weekend," Dr Wilson said. "He's hitting the ball better than he was before."

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We are focused on satisfying the equipment hire needs of professionals involved in the construction and renovation of greens, turf and the general maintenance of grounds. We seek a competent, energetic, Customer Service Technician to join our newly established Groundcare Equipment Hire business based in Richmond Victoria. Ideally, applicants should be experienced in the use, application and maintenance of turf equipment, utilised in the upkeep of golf courses and sports grounds.

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AAA news

MICK FINDS GREENER PASTURES WITH DENSAL



mset. Mick o Shallnessy and Graig Party

Preparing playing fields for major competitions has been a lifelong challenge for Mick O'Shannessy. During 40 years spent at the coalface Mick

has experienced the ups and down of any successful career.

But the little man with the big smile loves what he does and is eager to keep going.

A stint at the old AFL Park in Waverley stands out in the resume, as does Hidden Valley Golf and Country Club.

Mick looked after the turf that staged some of the biggest Aussie Rules games, including yearly preliminary finals and a host of matches throughout the seasons from 1993 to 2000.

When that door closed at AFL headquarters following the ground's demise, Mick looked around for opportunities to return to his first love, golf course maintenance.

He rang an old mate Chris Young to see what was available and was told about a new development being branded as Hidden Valley, the evolving golf course that was previously owned by the late Robert Holmes a Court.

"I went for a drive out there to have a look at what was happening," said Mick.

"On the way back, I said that if I was going to get back into the business then this was as good as anything."

Only three greens had been constructed at the time, but such was Mick's enthusiasm for the job he committed himself to making the round trip from Ferntree Gully each day.

Mick O'Shannessy arrived on the doorstep of the club when the course and its residential project where both very much in their infancy.

"It's all I've ever known all my working life," he said.

"And now I'm back in it, I'm really loving it. "We'd have 16 of the best santa anna

"We'd have 16 of the best santa anna fairways you'd find anywhere. That Phil Ryan suggested we use this grass in the first place was one of the bonuses for the property.

Some grasses wouldn't have tolerated the conditions we've just had over summer.

But the santa anna just thrives."

Mick uses a very simple analogy to compare the differences between preparations for a football match and a golf event.

"Waverley was only two hectares of ground, which is about the same as one fairway," Mick explains.

"With the footy ground, you only had one day to prepare for, that was match day.

So you're leading up to that all the time. It's all about making sure everything is safe and sound and then marking it up and getting ready for play on the day.

That's a lot different to a golf course that must be in pristine and prime condition 24 hours of the day, seven days a week."

Mick, who is both the construction and maintenance superintendent of the development, is satisfied with his efforts so far.

"The greatest enjoyment out at Hidden Valley has been overseeing the transition from a farm property to a basic country course and essentially then evolving into a three star course and then a four star course.

"We have a separate crew on construction that can vary from two, to seven eight our nine depending on what's happening.

"And our maintenance staff is four and they work to a plan each day. We need to, there's so much going on."

Mick O'Shannessy began his career in the golf industry at 14, taking up an offer to work on the ground staff at Keysborough Golf Club.

He stayed there for 16 years before moving on to Tirhatuan Park and then Waverley Golf Club before moving to AFL Park. HIRE FIRM BREAKS NEW GROUND -Kennards Groundcare Hire has expanded into Victoria.



The company, which specialises in equipment for the professional upkeep of golf courses, bowling greens and sporting fields, has acquired the hire operations of ASPAC Golf and Turf, based in Melbourne.

"The acquisition is in line with our plans to expand nationally," said Steve Joseph, who operates the business, which opened in Sydney late last year as an off-shoot of general equipment rental firm, Kennards Hire.

"It will provide us with a good platform in Melbourne for further development of our service to professionals involved in the construction and renovation of turf, greens and general maintenance of grounds.

"An important aspect of the acquisition is the formation of a closer relationship with ASPAC Golf and Turf to secure the supply of machines, parts and accessories for our rental fleet as we expand.

"Correspondingly, this will allow ASPAC to focus more on their expanding turf equipment and seed sales business."

Kennards Groundcare Hire has all kinds of specialty mowers, aerators, scarifiers, renovators, turf cutters, tillers, trenchers, turf gators, compact tractors and attachments.

It is operating in Melbourne from premises at: 12 Glasshouse Street, Richmond.

Contact John Atkinson: Phone: (03) 94214499. Fax: (03) 9421 4496

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AAA news

JOURNEY BEGINS FOR TWO OF BRISBANES FINEST



Adam Mortimer and Angus Mahoney

For most professionals within the turfgrass industry, a change of job is a stressful time with many feelings about the past, present and future. When that job involves relocating to a new town it can be even more stressful. But when relocating to a new country to commence a new position, it is completely different experience with many unknown factors. This is the challenge facing two greenkeepers from The Brisbane Golf Club who are embarking on an overseas programme, at two of the world's finest golf clubs where the expectations don't come much higher.

On March 10, 2003, Adam Mortimer will commence his new position at Pine Valley Golf

Club, New Jersey. While this may sound like another private country club with another stock of pine trees framing the course, it is different, for Pine Valley has been ranked the world's No. 1 golf course annually for well over the past decade. Adam is one of 8 interns taken in this year at Pine Valley from around the world. "Pine Valley has 50 full time staff caring for the main 18 hole course, the 12 hole practice course designed by Tom Fazio and its extensive practice facilities" says Mortimer. "They have decided to assemble a team of interns from around the world this year to concentrate on the greens and take them to the next level, as the internal management have not been happy with them throughout the previous 12 months. It's reassuring to know that we are not going all the way to the United States to rake bunkers, but be part of a team committed to ensuring Pine Valley remains the world's No. 1 course for the next decade."

Like Adam, Angus Mahoney starts the next stage in his career on April 1 at Oakmont Country Club, Pennsylvania. Oakmont is a private 18 hole club with a famed layout, previously hosting numerous majors over the past several decades. This year Oakmont is hosting the United States Amateur, a tournament made famous by Jack Nicklaus and more recently Tiger Woods and his 3 straight victories from 1994 – 1996.

"Oakmont is ranked No. 16 in the world and has a full time crew of 35. We expect that to swell for the tournament with volunteers in August, purely because of the size and magnitude of the tournament" says Mahoney.

Both have been fortunate to be placed at their respective courses by Mike O'Keefe at The Ohio State University. Over the past decade, numerous interns from Australia have been placed at some of America's best courses and is a background which more employers throughout Australia are finding favourable when selecting new team members. Adam and Angus will contribute a column to Australian Turfgrass Management every edition so readers can follow the high and low points through their exciting journey.



Your path to healthier turf.



AGRICHEM APPOINTS IAN PERRYMAN



Ian Perryman has been appointed regional manager for eastern Victoria, with Agrichem Manufacturing Industries.

Leading turf care supplier, Agrichem Manufacturing Industries, has appointed Ian Perryman as area manager (turf & agriculture), to maintain the company's healthy 50% share of turf markets nationally.

A seasoned turf professional and longtime member of the Australian Golf Course Superintendents' Association, Mr Perryman brings more than 20 years experience in all facets of Victoria's sports turf industry.

Mr Perryman began his career as a turf management apprentice at La Trobe Golf Club where he worked for 15 years. With an advanced certificate in turf care, he then moved to a sales position with Simplot Partners, where he received an excellent grounding in sales and marketing - and gained valuable product knowledge on the Agrichem range.

"In this new role with Agrichem, I will continue to service end-user customers, as well as provide support to the turf distribution network, such as sales and technical advice and generally building business relationships," he said.

"As part of this role, I will also provide support to Agrichem's agricultural distributors in rural Victoria." he said.

Mr Perryman's position with Agrichem became available following the promotion of Owen McCarron, who is based in Shepparton, to the position of national sales and marketing manager late last year.

Based in Melbourne, Mr Perryman can be contacted on: 0402 290 481.

FAREWELL TO PHIL



It is with much regret to announce that Phil George has decided to resign from his position with the Australian Golf Course Superintendents Association (AGCSA) as the Editor of Australian Turfgrass Management (ATM) magazine.

Phil was employed by the AGCSA four years ago to create and build the industries only truly independent turf management publication and in that time it has become well established as the industries leading publication.

The magazine has become well known for the outstanding quality of its presentation and content and is held up as an example to other related industries.

The magazine is recognized by the Federal Government as a valuable tool in the extension of turf research and technical information to industry and is heavily used by the trade to communicate with their market.

Over the last four years Phil has worked very hard to complete a Graduate Diploma in Applied Finance and Investment and as of 31st March, Phil will be employed by Melbourne based Fortrend Securities as a Stock Broker specializing in international (US in particular) equities.

On behalf of AGCSA Members and the Board, we thank Phil for the tremendous contribution he has made to the turf industry and wish him all the best in his new career.

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Golf Architecture – A Worldwide Perspective Compiled and Edited by Paul Daley

Have you ever thought about the placement of hazards on your home course, or wondered about the bunkering on a dogleg corner? Just what do the terms strategic, heroic, and penal really mean for a golfer? Is the championship course the model for all? Golf is a game that turns ever the weekend hacker into an armchair architect, an enthusiast for the possibilities of course design. Striking the balance between the natural form of the land and the eye of the artisan is the stuff of golf architecture.

Leading golf architects from fifteen countries present their ideas in this first of two volumes, providing a much-needed international assessment of the principals and practices of golf architecture. Daley has gathered architects' and writers' thoughts on diverse topics such as the impact of equipment technology on design, the effects of hazards on the golfer's psyche, the influence of pioneer designers on contemporary architects, the practice of Tiger-proofing layouts, and much more.

The cool thoughts and heated passion expressed throughout Golf Architecture: A Worldwide Perspective will make you a thinking golfer and enhance your enjoyment of golf.



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NEW RAIN BIRD EAGLE 1100/1150 ROTORS MEET LARGE SPACING NEEDS



Rain Bird's Golf Division expands its proven line of EAGLE rotors with the addition of the EAGLE 1100 / 1150. Rain Bird's newest closed-case, valve-in-head rotors provide an easy solution for quick coupler system upgrades and are designed for larger single row or double row irrigation systems with sizable spacings. At the largest nozzle, these new rotors throw 30.5m at 560Kpa and 33.5m at 770Kpa.

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EABLE 1100 Features and Benefits

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For further details refer to the full-page ad on page 37 for a full list of contact details. Alternatively visit our website: www.rainbird.com

CERETEC CRESDENDO



OPGG Seeds is pleased to announce the release this Autumn of a brand new transitional ryegrass Ceretec Crescendo.

Ceretec Crescendo transitional ryegrass is a low endophyte perennial ryegrass that has been specifically developed for use as a winter over seeding grass into warm season grasses such as couch and kikuyu.

Ceretec Crescendo has been bred by the breeding and agronomy team based at the Ceres research centre in Christchurch New Zealand. Trial work and evaluations conducted in Australasia have showed that Ceretec Crescendo consistently outperformed leading competitors in all areas including, establishment speed, winter performance and spring transition.

One of the unique features of Ceretec Crescendo is the ability to be cut very cleanly and show no signs of shredding. This will be of particular benefit to golf courses and football ovals that require a superior finish.

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ADVANCEMENT IN KERB FORMULATION



Kerb, well recognised for its outstanding winter grass control is now available to Australian turf managers as **Riverdale Kerb**.

The change to the Riverdale brand coincides with a significant improvement to the Kerb formulation. The advancement in the formulation, (now a lower bulk density), increases the uniformity of mixing in the spray tank. The risk of nozzle clogging is therefore greatly reduced. As a result, the problems associated with non-uniform application such as 'missed' areas and damaged turf are minimised.

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Kerb is the brand that Australian turf managers can trust for winter grass control.

Any questions regarding Riverdale Kerb should be directed to your Nuturf territory manager.



THE NEW ALLEN 446 PROFESSIONAL HOVER MOWER

Allen Hover Movers are world class machines developed over many years to give operators the finest and most advanced technology in their class.

They are recognised as the best in terms of performance and reliability and with a wide cutting width all applications from the golf course greenkeeper and landscape contractor to the domestic user are covered.

The new Allen 446 Professional Hover Mower is powered by a 5.5hp 4-stroke, petrol HONDA engine.

The usual features of Allen Hovers have been retained in the 446; strong duty handlebar fixing to the deck and engine mounting frame gives less vibration and less damage to the engine /deck in heavy duty conditions.

The tapered cone fixing of impeller to crankshaft means this item can be removed easily without the use of pullers with resulting damage.

The new ergonomically designed handlebars give a more comfortable and hence less tiring grip, enabling easier side to side mowing. For increased safety, the new 446 is fitted standard with an Operator Presence Kit.

The clean cut, quick change, safety blades are quick and easy to change and are Safe for use with a rope and the Hi-rise kit allows longer grass to be cut and simply bolts to the existing deck.

The Allen 446 Professional Hover Mower is proudly distributed by Toro Australia.

For more information call Toro on: 1800 356 372.



state HL



GCSAQ

Okay, this time the weather has finally gone wet. Rainfall for January was 3mm, February 404 mm with over 500mm falling in the southeast corner of the state. March is something similar so I can now start whinging about how wet it is. The 4th fairway has been completely underwater four times this month, one time for three days which made for the awful stink of rotting grass when it finally receded. Also a levee wall broke one night which resulted in a fair bit of surprise in the morning as the flood water seemed to be coming back upstream after no overnight rain. Once again, the unsung hero's of the Golf Industry, the grounds staff, to the rescue with some fast shovelling and lost boots in the mud and after a few more hours of using the 12 inch flood pump, the fairway was open for play again.

While it certainly saved the day coming in the nick of time, the rain caught plenty of people on the hop with renovations under way and dragging on through the wet weather. The local supply company reps have reported an upsurge in sales of fungicide and are certainly looking a bit more hopeful as they come driving through the puddles. Perhaps the rain will see T&I man Luke Peers back on the road to cope with the upturn of sales you would expect.

Recently, the GCSAQ has been involved in a Financial Management Field Day at Gainsborough Greens featuring Tony Kent who presented a wide ranging workshop dealing with the Superintendents role in Budgeting, Machinery Purchase Options and the different benefits to clubs of leasing, renting or purchasing machinery out right. He also managed to cover staff employment options and the role of consultants and contractors in the Golf Industry. Barry Cox from Ocean Shores is intending to run this workshop session again on the north coast and judging by the amount of discussion and feedback the talk generated it is a very worthwhile topic. The input into the general discussion was interesting with Chris Goopy from Kepperra Country Club outlining their system of staff management with hours in lieu used through the year while the practice of staggering hours to get more use out of machinery seemed to be a common practice. As a presenter, Tony Kent was able to call on his time as the Manager of Indooroopilly Golf Club and his ongoing involvement in Golf Management to give us an insight into

the way of thinking a Secretary Manager may have. The discussion really heated up when the contracting topic arose with plenty of input from the floor.

With three clubs in NSW recently going to a contracting company it appears there is room for improvement in the lines of communication between Secretary Managers in that state and those further North who could perhaps have pointed out that you only get what you pay for. And sometimes you get to keep on paying.

In March a turf industry information day at Redlands Research State was held to raise funds for the Queensland Turfgrass Foundation and to report on progress made with trial plots on the site and research projects underway at both Redland and down on the foreshore of Moreton Bay. Plots of salt tolerant grasses are lined up alongside a variety of commonly used species. While some struggled there were some that hold great promise. Some of the golf related people at the day were Loch Ledford, Ross Watson, David Nickson, Warren Langlands, David Burrup, Phil Ford, Andy Date, Jeff Einam, Kevin Harris and a cast of thousands. This was followed on the Saturday with a Public Open Day at which many facets of turf management applicable to the home lawn were on display with plenty of information to the public.

At Pacific Golf Club a one day lecture by Dr Elaine Ingham was staged with the support of the Tryton Environmental Products group, with attendees from as far south as Grafton and that great spot for a holiday, Yamba! If you are able to hear this lady speak, she certainly knows her stuff and has some great slides. Her field is micro fauna in soil and her passion seems to be with micro organisms that exist in soil and how to boost your levels to benefit your turf.

Upcoming events include our first golf day for the year at Dave Morrison's course. the Hills International School. This is on Monday 12th May and should be attended by all members to try out what is commonly regarded as the longest par 5 in the world! A big statement I know but this and the catering facilities are reported to be second to none and not to be missed. Now with plenty of water, the course is sure to be in first class condition and I for one am keen to get out and have a look at a golf course again after so many days inside being educated. Make the effort to support your association and nominate a colleague for the awards.

Jon Penberthy President, GCSAQ



Most of NSW has had some decent rain in recent weeks. However, follow up falls are needed to get things moving prior to winter.

Congratulations to Peter Watts, the newly appointed Golf Course Superintendent at Terrey Hills in Sydney. Peter and his staff had the course in immaculate condition for the Ladies Australian Open and players and members alike said the course was the best it had ever been - great work!

Interesting to see Nick Faldo come out against the continued spiral of new technology, with golf balls and clubs combining to make more and more classic golf courses obsolete. The governing bodies better get their act together soon, otherwise we could see Royal Melbourne need the entire area of the two courses to make one.

800 metre par 5 600 metre par 4 250 metre par 3 - It could happen!

In some good news for a change, our own Brad Marsden is soon to become a "MEXICAN" having secured the position of Course Superintendent at a new project in 'very flash' Torquay; good luck mate!.

Brads' move to the south of the border creates a vacancy on the board of the NSWGCSA so I would like to hear from any person keen to hop in and give us a hand.

Martyn Black President, NSWGCSA.

C VGCSA

With the arrival of the New Year comes the good news that Melbourne once again played host to two International Golf events worthy of praise.

Congratulations to Michael Freeman and Jim Porter in the way they presented both Huntingdale GC and Royal Melbourne respectively. A special mention to Michael, who achieved a terrific result given that it was his first effort as Superintendent for that annual event. I'm sure John Spencer, long standing super at Huntingdale and now retired, would be well pleased with his presentation of the course.

I would also like touch on another positive move that the AGCSA has initiated recently by setting up preliminary talks with the education faculty at Northern Metropolitan Institute of Technology. This shift from the previous stand off, I believe, can only be of benefit to our education endeavors, with an end result leading to all providers working together to achieve the same outcomes.

Pertaining to that topic, the VGCSA is also progressing nicely with Primary Skills Victoria in gathering information from the state run colleges and relevant industry bodies to uniform the Certificate 3 run courses.

Our education representative, Chris Grumelart (Cape Schanck Resort) is doing a fine job chairing those meetings. An outcome for that project is expected in the closing stages of this year.

The February course meeting held at the Dunes GC was an outstanding success with 85 members and guests participating in the day. It was especially gratifying to note the number of country members who made the effort to view, what is now acknowledged as one of the best links style courses in the country. A special thanks to Phil Ford from NMIT who once again presented topics that were interesting and added to a worthwhile day for all.

Events coming up are the AGM at Commonwealth GC on April 28th and The Turf Research Day at 13th Beach.

In closing I would like to pass on my thanks to two of our outgoing committee members being, Clayton Howell (Eastern GC) who served as Secretary for 3 years and Tim Pierce (Greenacres GC) who maintained the membership portfolio for the same period. Their effort and the support of their respective clubs has been duly noted and much appreciated.

We will be seeking nominations for two general committee people with the release of the bi-monthly Newsletter and I would encourage any enthusiastic Superintendent wanting to stay abreast of current trends to consider nominating for one of these vacancies.

Michael Picken President, VGCSA

SAGCSA

First off, a big thank you to Steve Walsh. Steve was Superintendent at the South Lakes GC until early March, Steve has left for pastures greener just over the bridge at Goolwa to the Hindmarsh Island marina development as Horticultural Manager. Steve's enthusiasm on the SAGSA committee has been infectious to us all and he will be sorely missed in the future. Good luck Steve with your new venture.

A big congratulations to Steven Newell and all his staff for the presentation of Kooyonga GC for the resent Jacobs Creek Open held at the end of February. For those people who took up the opportunity to walk the course on the Wednesday with Steven had nothing but praise for the condition of the course, particularly after the sort of summer that we have just gone through. Well done to Steven and his crew.

What a relief it was to see rain again!!! Most of our State received excellent steady rainfall over February 20-21, some areas in the north of the state received over 120mm with around 60-70mm being recorded over the rest of the state. For the driest State on the driest Continent at that time of the year it was like pennies from heaven. Some superintendents were down to buying water to water greens and tees only and the situation was looking grim indeed. Additional follow up rains will be needed to ensure a welcome early break in the season, but my gut feeling is that there will still be some more hot days to come before we see the end of the summer season.

As I right this article I have been informed that the SAGA and the AGCSA have come to an arraignment whereby Clubs in this State will be subsidised for a visit by an AGCSATech consultant to the tune of \$???, this is a fantastic initiative by both the South Australian Golf Association and the AGCSA so as many clubs in the state can take advantage of this offer as is possible. I strongly urge all Superintendents to make their clubs aware of this opportunity and to take full advantage of this offer. This offer will be offered to metropolitan clubs initially but will be expanded to include country courses later in the year.

Upcoming meetings for the diary are;

- Glenelg Golf Club on April 10th Host Superintendent Daryl Sellar.
- SAGSA AGM, June, Murray Bridge Golf Club - Host Superintendent Mal Grundy.

With the National Turf Conference fast approaching I urge all Supers to register early to get the workshops they will be interested in, and look forward to seeing you all in Adelaide in June.

Peter Harfield President, SAGSA



The weather continues to be a major headache for many courses here in the west and I'm sure we will all be glad to see some cooler days with a decent shower of rain, remember rain!

We kicked off our 2003 calendar in February with a half day seminar sponsored by Best Simplot. This was held at Royal Perth Golf Club and consisted of a social 9 holes of golf followed by some interesting guest speakers. These included Danny Potter from Best Simplot who gave us the latest on the new products from Simplot and Dr Louise Barton who gave us an update on the University of WA turf research trials. The work that Louise and her staff are doing will be a great help to turf managers in the future. The golf course was presented in beautiful condition by Tony Johnston and his staff and Peter Fleming from Burswood found it especially to his liking as he won the day with a fine putting display.

Our next event will be the AGCSA roving workshop in April which will be a popular event as it will involve computers in the workplace, so make sure you all book your places early.

Congratulations to Trevor Strachan and his guys for the superb presentation of Lake Karrinyup CC for the Johnnie Walker Classic. From all accounts the course was in top condition as was evident by the superb scoring, particularly from Mr Els.

Construction has commenced on the new golf course at Port Bouvard, a residential golf course and Oceanside estate about an hour south of Perth. It is great to see Geoff Osborne back on the scene and with a guy of Geoff's experience driving this project I'm sure Western Australia will soon have yet another quality golf course. All we need now is a few more golfers to play all these courses!

Congratulations to Brad Sofield at Melville Glades who recently got engaged to his girlfriend Kirsten, all the best for the future to you both.

Well let us hope that by the time this report is published we have had plenty of rain and yet another hard summer is behind us.

Allan Devlin President, GCSAWA



It's been a tough summer for everyone with the water situation getting worse. Hopefully the weather will break before the football season gets underway.

The TGAA has been working hard on putting together events for members.

The next date on our calendar is the Occupational Health and Safety day on 1st April 2003. This day will be held at Trinity Sports Fields, Cohan Centre, Bulleen Rd, Bulleen, Melways Ref 32 E8. The theme of the day is Personal Health and Safety and will be sponsored by Active Safety Supplies. The day is free to all members and I would encourage everyone to attend.

Other dates on the calendar include;

- Bursars day 7th May 2003 at Marcellin College.
- Cricket Wicket Seminar 16th July 2003.
- AGM 26th August 2003.

See you there. Hope it rains where you are,

Matt Scott Activities Committee, TGAA

VGA

TGAA (ACT & Surrounding Region)

Turf managers throughout the district have benefited from good rainfall during the past months, which gave some relief to parched soils. This benefit also carried through to many turfies in the area who took the opportunity to carry out renovation practices on their more intensively used areas. An excellent way to gain access to the latest up-to-date information on renovation equipment, products and techniques is the Internet. It is apparent that many greenkeepers are not using the service to its full potential & that increases in services are being given on line. If you are interested but having difficulty in locating particular information, the ACT Turf Grass Association has put together a database of turf related web sites. To receive a copy of this please contact the Association.

The most recent news to send a shock wave through the turf management industry in the Canberra district has been the outsourcing of maintenance at a local club. For many involved with maintenance of fine turf surfaces, the very sound of the word "contractor" sends a shiver down the spine. Although this is a common practice in other states and the public sector in the ACT has been tendering maintenance contracts for years, it is a relatively new concept for recreational grounds within the ACT. As greenkeepers we are witnesses to fact that Clubs throughout the country have been closing their doors for the last time more frequently every year. Common beliefs for this have been reduced memberships, rising maintenance costs, increased capital expenditure, higher costs for public liability & insurance. In many cases clubs feel they have no option but to cut costs to stay viable and the highest cost is grounds maintenance so it is the first to go.

What does this mean for those of us working in the industry? Who knows, but what we do know is that a new concept for grounds maintenance is sweeping through the trade. We should all be prepared, therefore, to make changes to the way we look at and do things if we are to stay ahead of this trend and to maintain our position in the industry.

Justin A K Haslam (Committee, TGAA ACT & Surrounding Regions) #



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