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NEYLAN: leads AGCSA Tech Evolution of BENTGRASS The LINKS CONFERENCE Showcase



Official publication of the Millennium Turfgrass Conference, June 2000





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cover

John Neylan - up real close

special features

NEYLAN TO HEAD AGCSA TECH

As part of a plan aimed at broadening member services to include research and diagnostics, former director of Melbourne based consulting firm Turfgrass Technology has been employed by the AGCSA to head the new division.

A LINKS GOLF COURSE IN THE TROPICS

"The Links" is a new TWP designed golf course located 5 km South of Port Douglas. Course Superintendent Steve Williams discusses the management philosophy aimed at ensuring the course remains a tribute to golf in its purest form.

BENTGRASS: THAT WAS THEN, THIS IS NOW

Told by Michael Reese, National Turf Manager for Heritage Seeds, the evolution of modern day bentgrasses is an interesting case study in how plant breeders have been able to respond to the changing needs of turf managers.

THE JEWELL OF THE YARRA

Nearing completion the Heritage Golf and Country Club nestled on the banks of the Yarra River looks set to become an outstanding test of golf. Course Superintendent Wayne Dale discusses specific site details and construction methods.

MILLENNIUM TURFGRASS CONFERENCE – SPEAKER PROFILE

MILLENNIUM TURFGRASS CONFERENCE – SHOW CASE 12

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ON THE WRIGHT TRACK

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Caught in a merry-go-round of toxic chemicals, Anthony Wright and his small staff at the Packenham Golf Club vowed to change their management style and philosophy.

research

BOWLING GREENS: A PRODUCT OF CHANGE 38

The AGCSA's John Neylan reviews how construction techniques and turf varieties have evolved and presents results of research that would tend to explain why synthetic surfaces are not the answer they promised to be.

TOWARDS A NEW GRASS FOR HONG KONG RACECOURSES

44

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Faced with poor surface conditions resulting from a turf species not suited to the Hong Kong environment, the club have embarked on a turf selection program involving the evaluation of 41 different grass types. Results so far are encouraging.

in every edition

REVIEW – PLANNING FOR SUCCESS

Successful turf managers understand the 'business' of turf management and can see the 'power of planning'. A tool used commonly by successful business people is the 'Business Plan'. This month in REVIEW we find out how to write one.

TECH TALK

In this edition of TECH TALK Tim Colmer discusses how the sugars produced during photosynthesis are consumed to produce energy.

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"A Rolling Stone..."

Unless you have been hiding in a very deep, remote hole you will be aware of the AGCSA's intension to expand its range of services to include research and diagnostics (soil and disease analysis etc). This initiative is a response to the needs of our membership and forms a 'perfect fit' with existing operations. With the acquisition of John Neylan to head the new division, the Association is set to embark on an exciting new era focused on finding solutions for Australian turf managers.

Whilst on that theme, in recognition of the fact that Australian Turfgrass Management magazine is seen as the industries leading provider of turf research and technical information, the Horticultural Research and Development Corporation (HRDC) has committed their support to ensure that you continue to receive quality information.

In this edition of ATM we profile the construction of a new golf course at Port Douglas in Queensland and one on the Yarra River in Victoria. Michael Reese tracks the evolution of Creeping Bentgrass and the AGCSA's John Neylan discusses how bowling greens have become a 'Product of Process'.

This month in REVIEW, Business Consultant Matthew Farr discusses the importance of 'Planning for Success", and in TECH TALK, Dr Tim Colmer explains how plants convert photosynthates (sugars), into energy.

The Millennium Conference Trade Show is sold out. To find out who will be there, check out the 'SHOWCASE' beginning on page 32.

Phil George Editor



PHIL GEORGE EDITOR



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"independence is the key"

The AGCSA has announced the expansion of its services to include direct turf research and diagnostic services for the Australian Golf Industry.

This new area of operation will be known as AGCSA Tech and will be launched at the Millennium Turfgrass Conference in June.

Australia's foremost turf consultant, John Neylan (former director of Turfgrass Technology P/L) has been appointed to lead the division.

AGCSA Tech will be self-funding and will enable the AGCSA to embark on an exciting research program directed at providing independent data and solutions to some of the most important problems confronting Australian golf course superintendents.

The addition of research, diagnostic and advisory services to the existing range of AGCSA support services, strengthens the AGCSA's long term viability and achieves economies of scale across all operational areas of the organization. The research and technical / advisory services to be provided include:

- Turf Evaluation Trials
- Soil and Water Testing
- Disease and Pest Diagnosis
- Nematode Counts
- Technical Advisory Services/Problem Solving
- Technical Educational Tools
- Development of Golf Course and Environmental Management Plans
- Project Quality Control

In making the decision, the AGCSA Board has recognised that the Australian Turfgrass Industry is too small to fund a whole range of separate independent agencies, each with a narrow specific charter. The loss of ATRI, and the closure of the Victorian Turfgrass Research Institute are more recent examples of how such agencies are unsustainable.

This is a logical and positive move by the AGCSA Board but also one which has taken a great deal of thought and determination. The new business unit fits snugly within the existing AGCSA structure. John Neylan, whilst primarily employed to manage the research and diagnostic area, will also provide input into the AGCSA's other business areas such as education, publications, conferences and member services.

AGCSATech

With the support of Australia's turf managers The AGCSA will provide an industry owned turfgrass research unit that is truly independent and dedicated to finding solutions to unanswered turf management questions.

The AGCSA is set to launch the new area of operation at the Millennium Turfgrass Conference in June.

Further information can be obtained by contacting Euan Laird at the AGCSA on phone: (03)9886-6200 or e-mail: euanlaird@agcsa.com.au





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Stop and ask yourself, what is the scope of work of the turf manager? Is the vision, knowledge and scope of expertise limited to "growing healthy grass", or should the focus extend to that of "growing a healthy business"? Given the operating capital, infrastructure and development input controlled by many turf managers, there is a strong argument for the latter. What this implies, is that a turf mangers field of thinking can be extended providing a high quality surface to that of a tourism, hospitality and leisure business.

Accordingly, like all businesses there is value in "planning for success". An excellent tool for helping "plan for success" is the development of a Business Plan.

WHAT IS A BUSINESS PLAN?

A Business Plan outlines your future destination and the strategies to get there.

In general, Business Plans are prepared:

- To enhance day to day management of an existing business;
- To assess the viability of new ventures; and
- To provide a case for lending support.

The benefits from business planning include:

- Improved understanding of the Business;
- A Blueprint for future development;
- Improved communication with staff, customers, suppliers and financiers.

Even in their most basic form, a Business Plan can prove an excellent tool for managers to develop a better understanding of their business, define and communicate strategies for the future and measure performance. A Business Plan will also help in obtaining funding from greens committees/financiers, as they will have a robust and articulate information document from which to base their decisions.

DEVELOPING A BUSINESS PLAN

There is no set formula for formulating a Business Plan. However, a framework should be adopted that facilitates a Business Plan:

- With a strategic perspective eg
 - What business are we in?
 - What is happening in the market that could influence or affect the business?
- With an operational perspective eg
 - Do we have adequate resources to achieve our goals and what is the best way to organise them?
- That is action oriented and achievable; and
- That is a living document ie development of the Plan should be on-going and entrenched in management practice.
 An example planning scenario and Business
 Plan framework is included below:

David Brown is the Golf Course Superintendent at Grasses Golf Club on the outskirts of Sydney's Western Suburbs. The course is 20 years old and although it is a little short, when it was built it was considered as one of Sydney's best courses. Membership has never been strong and the course has been in steady decline. The course has recently been acquired by the Farsighted Management Group who intend to upgrade the course and facilities with the aim of attracting more members. They plan to fund the proposed upgrade by increasing green fees, ancillary services and generating sponsorship from businesses in the area. As part of the senior management team, David attended a brainstorming session where the group identified course strengths, weaknesses, opportunities and threats (SWOT Analysis)

David has been asked to work with the courses financial advisor to put together a Business Plan that deals with course improvements and conditions.

The Business Plan was structured as follows:

(1) INTRODUCTION

Mission statement for the project

"By redeveloping Grasses Golf Club will be one of the premier private courses in Sydney adn hold the Sydney Open 2000"

Outline of the purpose of the project, corporate objectives and business goals. Eg. increase membership, green fees, ancillary revenue.

(2) EXECUTIVE SUMMARY

- Current course condition
- Key development objectives
- Resource requirements

- Redevelopment costs summary
- Critical success factors

(3) SITUATION ANALYSIS

- Course history and membership profile
- Inventory analysis of machinery etc.
- Existing arrangements with consulting firms or suppliers.
- Key areas of expertise
- Summary of strengths, weaknesses, opportunities and threats

(4) MARKET ANALYSIS

- Details of other courses in the area that would compete for members and revenue
- Demographic information that supports expected growth of golf in the area.
- Summary of S.W.O.T.
- (5) COURSE REDEVELOPMENT PLAN

David provided details of the course redevelopment project and proposed time frame. The plan contained information such as the order and magnitude of reconstruction work. Where possible supporting details were included eg.

"Tees on holes 9, 10 and 11 need to be increased in size from 300m2 to 400m2 to cope with the expected increase in wear – cost of increase in tee size is \$20,000 up front, and has increased maintenance time which will require an additional 0.25 full time equivalent staff person per year.

(6) MAINTENANCE EQUIPMENT MANAGEMENT PLAN

> David provided a summary of maintenance equipment requirements.

This included details of any changes to current levels of infrastructure and supportstaffing. Supporting costing information was supplied.

(7) STAFF MANAGEMENT

David provided a summary of future anticipated staffing requirements and how they are expected to change from existing levels. This included analysis on the 'mix' between full and part time staff and the use of contract labour in peak periods. Supporting costing information was supplied.

(7) FINANCE ANALYSIS

Readers should note that the financial analysis of any such redevelopment should be performed by a suitabley qualified person and should be subject to stringent sensitivity testing.

The financial analysis should:

- Be used as one of the decision tools on whether to proceed with the project, and if so, under what scenario;
- Provide for sensitivity and scenario testing; and
- Support and form part of a detailed feasibility study/business plan regarding the potential redovelopment.

The financial analysis should be supported by a model based on the principals of discounted cash flow (DCF). DCF analysis is widely used in practice to support investment decision and is the conceptual basis of all valuation but is beyond the scope of this article.

David assisted their Financial Advisor/Finance Manager by providing input and substantive information for all material redevelopment costs and ongoing operating expenses.

- (8) BUSINESS PLAN SUMMARY AND FUTURE ACTIONS
 - Summary of findings and recommendations.
 - Implementation action plan.
 Accountability guidelines established ensure individuals take "ownership" of the plan
 - Updating and revision procedure.
 - Establishment and measurement of Key Performance Indicators

The business plan should be comprehensive enough to give any potential investor or other involved person, a complete picture and clear understanding of the project.

Many business mangers underestimate the effort and time that is required to prepare an effective business plan. However, once the process has begun, the manager will quickly realise that the process is critical in ensuring that the objectives and goals of the business are achieved. The Plan needs to be a "living" document, which evolves with the business environment over time.

Matthew Farr is a Business Consultant with Arthur Andersen, Perth.

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A Links Golf Course

When one thinks of a links golf course the mind fills with scenes of rolling fairways, thin sparse undulating brown roughs, drizzle, wind and cold.

Apart from the cold, The Links, Port Douglas, offers all these images although at times the drizzle is monsoonal and the wind cyclonic.

The Links, Port Douglas, is a Thomson, Wolveridge and Perret designed championship links style course, and was commissioned by Port Douglas Reef Resorts, a publicly listed local company. Club Corporation International have been kappointed course manager. They now manage more than 280 private and public courses.

Golf course architect, Michael Wolveridge, explains that "as a designer, you have a format and philosophy, and you design the layout on site whilst remaining constantly flexible". Michael maintained constant supervision during construction, allowing me to gain invaluable insight in to his design philosophies.

The course is located five kilometers south of the Port Douglas village, directly behind primary sand dunes and north of mangrove wetlands.

Following preparation of a detailed and comprehensive Environmental Impact Statement that addressed issues such as hydrology, flora & fauna, coastal and shore management, as well as social and cultural heritage, construction of the course began in July 1997. The first stage involved construction of five holes and the Driving Range. It was opened for play to invited guests in April 1998. A further four holes were built in early 1999. The remaining nine holes have been recently completed and will be open for play in early May.

Apart from its unique location, other natural features include the spine of pristine wetland forest that splits the course into a 10 and 8 hole component. This forest is composed primarily of Melaleuca leucadendra, Swamp Mahogany and Euodia elleryana known to attract the Ulysses butterfly. Also residing in these wetlands are endemic Gudgeon

fish and the prolific Rainbow fish. These and other species assist in the control of annoying water-incubating insects.

The lakes have been stocked by visiting water birds that have deposited undigested fish eggs of desirable species, including Tarpon, Mullet, Mangrove Jack and North Queensland's premier sport fishing species, the Barramundi. During the excavations of the lakes, ancient coral debris beds that date as far back as the creation of the Great Barrier Reef were discovered.

The lakes and wetlands have become a birdwatchers delight. Most mornings, birdwatching tours gather around the boundary to watch the brilliantly colored Rainbow Bee-Eaters, Magpie Larks, Masked Lapwings, Whistling Ducks, Egrets, Jabirus and many species of waders and birds of prey. Most of these birds have been observed with young.

Eight weeks after completing our first major lake system, the first crocodile moved in. His night jaunts have taken him all over the completed holes and makes one wonder why he would leave a perfectly good water hole for one of lesser proportion.

Nutrient stripping ponds have been created adjacent to the Primary Forest. These are an environmentally responsible addition to ensure man-made activities do not adversely impact on the natural environment.

All greens were constructed using the sands on site, which are classed as being 'fine' with the majority of particles in the 0.05-0.25mm fraction. The sand has good drainage characteristics and the moisture retention is high. The putting surfaces are firm, very fast and have been contoured to resemble features created by wind and sea actions.

Greens and their surrounds are grassed with Tifgreen (328). This gives us the flexibility to alter the shape of the greens as wear develops, or where alterations to playing requirements or conditions are required. Given the more aggressive and undesirable reversion characteristic of Tifdwarf, Tifgreen was selected to turf the fairways. Like all Tifs, Tifgreen is at its best from May to November but suffers a reduction in quality during the wet season due to extensive rainfall and heavy cloud cover.

Alleviating the need for disruptive and heavy annual renovations, greens renovations are frequent, light and include dethatching and dusting. Both organic and inorganic fertilisers are applied as required but the plan in the short term is to revert to traditional "links style" organic fertilisers that include blood and bone and poultry and cow manures.

In keeping with the overall design and management philosophy, diseases and pests are for the most part tolerated and allowed to 'run their course'. They are rarely severe enough to effect playing quality and do not warrant the use of expensive fungicides. The most common fungal diseases are Helminthosporium spp, which is well controlled by maintaining optimum potassium levels and low nitrogen levels. Lawn grubs are prevalent most of the year, however most damage is tolerated and allows natures own control. Mites are a constant pest during the wet season when turfgrass vigor is poor.

Fairways, tees, roughs and mounds are "Greenlees Park" and like the greens, fairway contouring suggests that the sea receded from the site only yesterday only without the associated salt problems. All fairways are linked by a consistent height of cut, and broken only where mounding occurs. This allows the ball to roll on.

There are no tree or shrub plantings to delineate fairways. Definition is obtained by mounding of varying proportion, with the frequency and style of maintenance procedures enhancing definition.

Bunkers have been strategically placed, not to hinder the novice but to challenge the Professional and have them carefully consider





 TOP Aerial view of the site [artistically enhanced].
 ABOVE Our first, very cheeky resident - a two metre long crocodile [only a baby, where's its parents?]. their next shot. All bunkers have a basic, highly efficient drainage system installed.

A highly efficient and cost effective surface and subsurface drainage system has been installed to stop the flow of rainwater over banks into wetlands but ensures that the course remains dry under foot during the most inclement weather and should allow golf to be played 365 days of the year.

The irrigation system has been designed and installed with the intention that only tees and fairway to green is watered. The entire system is controlled by the weather station relative to evaporation rates. Mounds and peripheral areas outside effective irrigation cover are left to natures whim.

The modern golf course has lost many of the characteristics imparted by nature. Today's golfer demands are selling short the original concept of the game. One particular demand is that greens hold a shot. Links style greens allows for a pitch and run shot to be played. Shot holding resilient greens are not called for.

The quality of a links green is depicted by its true, firm, fast and even putting surface, whilst color plays no part. In a recent article by Peter Thomson, 'Golf Course Architect and Golf Professional', golf club committees are cited as being responsible for ruining well designed golf courses for the sake of the misnomer "green grass".

The Links, Port Douglas, will be maintained to how nature originally intended a golf links be presented, and not for the sake of high maintenance and environmental costs, or, the colour green.

To share the philosophy of well known golf course architect Dr Alister MacKenzie, whose book "The Spirit of Saint Andrews" makes inspirational reading for anyone entrusted with the care of a golf course, my links management philosophy too is "simple and natural". This approach will ensure that nature's original concept of a links land golf course, will be duly fulfilled at The Links, Port Douglas.

Steve Williams is the Contract Superintendent at 'The Links, Port Douglas'.

Bibliography: "The Spirit of St.Andrews" Dr Alister MacKenzie, 1995, Sleeping Bear Press, USA.

Acknowledgments: Thomson, Wolveridge and Perret, Golf Course Architects. Golf Course Superintendents Association of America.

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Greensmaster - Soluble

Greensmaster 22:5:19+T/E Greensmaster NK 20:0:20+T/E Greensmaster Slow N 21:0:21+T/E Greensmaster Hi K 14:0:25+T/E

Turfmaster - 0	Granular
Starter	7:10:13+T/E
Builder	10:5:9
Parkman	11:2:11
King	16:4:16+2% iron
Vigour	19:0:19

Sportsmaster - Granular (with slow release nitrogen)

22:1:15+Fe,Mg Gold Royal 20:0:20+Fe,Mg

Renomaster - Renovation

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TECHTALK BY TIM COLMER

Respiration in Plants

WHAT IS THE FATE OF SUGARS PRODUCED DURING PHOTOSYNTHESIS ?

A large proportion of the sugars produced in the leaves are transported, via the phloem, to other organs such as growing shoot tips, roots, or fruits. Sugar must be supplied to every cell in a plant, otherwise the cells will die. The sugars are essential since they are consumed in respiration; a biochemical process in which the sugar molecules are broken down to release energy (see Equation).

> A series of biochemical reactions in mitochondria:

Sugar + O_2 — Energy + CO_2 + H_2O

The energy released is captured in the molecule known as ATP, which can then be used to "drive" a number of cellular processes essential to the maintenance (eg. repair), functions (eg. nutrient uptake and transport), and growth of plant tissues. About half of the sugars produced in photosynthesis each day are consumed in respiration, but this will depend on environmental conditions.

WHAT HAPPENS TO SUGARS NOT CONSUMED IN RESPIRATION ?

Sugars not consumed in respiration are used in the biosynthesis of other compounds. Conversion into starch enables storage of the carbohydrates until required at a later time. The "carbon skeleton" provided by sugar can also be used in the production of amino acids (the building blocks of proteins and in the production of cellulose and lignin components of the rigid walls of plant cells). Synthesis of these, and other compounds, is required during the construction of new cells and tissues.

MITOCHONDRIA - THE "POWER HOUSE" OF CELLS

Mitochondria are the sub-cellular compartments that contain the enzymes and membrane systems required to control the biochemical processes involved in the conversion of sugars to ATP during respiration. ATP is the main energycarrying chemical intermediate in all organisms (bacteria, fungi, plants, animals). Compartmentalisation of the biochemical reactions in separate membrane-bound organelles (eg., photosynthesis in chloroplasts, respiration in mitochondria) enables regulation of these processes (Figure 1). The various compounds consumed and produced in the compartments are transported across the membranes as required. Every plant cell contains hundreds of mitochondria, all working like small power generators in order to provide energy for the cell.

FACTORS AFFECTING RESPIRATION

Temperature is a major factor that determines the rate of respiration in plants. Cooler temperatures cause respiration to decline since the reactions which produce

AT M

and use energy are slowed, leading to an overall reduction in growth rates.

Soil waterlogging, a condition of excess water in the soil, can also inhibit respiration of plant roots. If the gas spaces in a soil become filled with water this greatly impedes the supply of oxygen to the roots since the diffusion of oxygen is 10,000 times slower in the liquid compared to the gas phase. The roots of non-adapted species will die since without a supply of oxygen, respiration is inhibited and the cells suffer a chronic shortage of energy. Death of the root system often results in symptoms of waterlogging damage in the shoots, or in severe cases death of the whole plant.

Waterlogging tolerant species, however, have developed an ingenious adaptation to cope with these conditions - they form their own "snorkel" system inside their roots (Figure 2). The large series of longitudinally connected gas spaces (called aerenchyma) in root and stem tissues provide an internal pathway for oxygen movement down to the roots. Thus the roots can continue to respire and continue to grow and absorb nutrients.

The problem of waterlogging can be avoided by the construction of welldrained soil profiles (eg. for sporting



venues, golf greens, etc.) and by not over irrigating. However, waterlogging can remain a problem in some areas of turf and this greatly weakens the root systems of most turf species.

Figure 1. Schematic diagram showing the flow of energy in plants. Chloroplasts capture light energy during photosynthesis and produce carbohydrates such as sugars. Mitochondria carry out the final steps in the breakdown of the sugars and capture the energy released as ATP in a process known as respiration. This process requires oxygen. With each transformation some energy is lost (eg. as heat), and the carbonskeleton provided by sugars is used in the synthesis of other compounds (eg. amino acids) required in the production of new cells, so that an input of energy from the sun is required for the process to continue.

Figure 2. Photographs of cross sections of rice roots taken using a scanning electron microscope. (A) shows a root grown in well-aerated (drained) soil, (B) shows a root grown in waterlogged soil. The arrows point to large gas spaces in the root cortex called aerenchyma. The aerenchyma provide a continuous pathway for internal oxygen movement from the shoots to the roots. This "snorkel" enables the roots to function even when they are in an oxygendeficient waterlogged soil. Rice is a wetland plant and forms a large volume of aerenchyma, however some grasses used for turf (eg. Kikuyu) can also form aerenchyma. Aerenchyma is formed in the roots and also in the rhizomes, providing a continuous pathway from the roots to the above-ground shoots.

> Photographs courtesy M. Cox, J. Kuo & T. Colmer (UWA). Dr. Tim Colmer is a lecturer in Plant Sciences at the University of Western Australia. Dr. Colmer coordinates the Turfgrass Research at UWA, a program in collaboration with industry.







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ATM

Creeping Bentgrass: That was then and this is now

BY MICHAEL REESE "Life is an adaptation" Whoever said it first could not have been closer to the truth. We all make adaptations

everyday, some take longer than others.

This can be said about bentgrass (Agrostis Spp). It has been evolving and adapting over thousands of years, but the popularity of golf and advances in breeding technology has seen this adaption process increase exponentially over the last 100 years.

The genus Agrostis is comprised of over 100 species, all (with the exception of Redtop) having acquired the common name, 'bentgrass'. The growth habit varies from a bunch type to an extreme stoloniferous system. Some species are annuals but most are perennials, including all those utilised for turfgrass purposes.





There are 3 species of bentgrass used extensively in turf. These include: (i) Creeping bentgrass (Agrostis stolonifera) (ii) Colonial bentgrass (Agrostis capillaris, Agrostis tenuis) and (iii) Velvet bentgrass (Agrostis canina). However, it is Creeping bentgrass (A. stolonifera) that is now used extensively in Australia.

The reality is that we look predominately to the U.S.A. for new developments within the turf industry. And it is the USA that we must go to to determine the evolution of Creeping bentgrass, as we know it today. European material has also been used in the breeding process, but it has been American breeders who have done the work with creeping bentgrass, as identified in the table.

During the early 1900's many of the first golf courses constructed in the U.S.A. were designed by Scottish and English golf course architects who brought with them the grassing concepts they perfected in their native countries.

Bentgrass seed was imported to the States from native strands in southern Germany, Holland, England and Belgium and were used on golf courses in the early 1900's. The term "south German mixed bentgrass" describes seed harvested by farmers and sold to establish greens, tees and fairways on many old classic courses, still in existence today. Its composition may have been 75 - 85% Colonial bentgrass, 10 - 20% Velvet bentgrass and 1 - 5% Creeping bentgrass. On reflection this resembles the Suttons Mix used at Royal Melbourne Golf Club.

The prostrate growth habit of Creeping bentgrass and its adaptation to continuous close mowing meant that it was more persistent and

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the most desirable cool-season grass for putting greens. The others proved to be less adapted to the close mowing, especially in the warmer, humid regions of the U.S.A.

Greens established with south German mixed bentgrass produced a mottled appearance because of the variation in seed composition. Distinct patches or clones with varying leaf textures, colours and growth habits were found on putting greens. You see them today as well, especially where a number of varieties have been blended together or introduced into an established green.

These clones provided an ideal opportunity for the selection of improved strains that could be used in future bentgrass breeding programs or to vegetatively establish new putting greens. These collections still occur and have provided the foundation for Creeping bentgrass improvement programs for more than 80 years.

Some of the first vegetative Creeping bentgrasses were identified in 1916 from the original south German bent mixture. Many others were collected throughout the 20's & 30's with 'Washington' and 'Metropolitan' being the first 2 vegetative varieties released as stolons. These 2 vegetative types provided uniformity and consistency in putting surfaces that was unseen in the south German seeded mixture.

There is no known record of vegetative varieties going through the quarantine process and entering Australia but Highland and Browntop bentgrass were used extensively. Even Fine Fescues in combination with Highland and Browntop were used before Seaside made it to Australia in the 1960's. Velvet bentgrass never really took off in Australia, although it was used to sow Albert Park in Melbourne.

Seaside bentgrass evolved in 1923 and was recognised as a generic name for Creeping bentgrass produced in the United States. It proved to be popular despite its wide variation in individual plants and lack of vigorous growth. Large quantities were produced and sold throughout the world from the mid-1920's until the late 70's.

SEED CREEPING BENTGRASS VARIETIES

Varitey	Year Released for Sale	Developed By	
Seaside	1923		
Penncross	1955	Penn State University	
Penneagle	1979	Penn State University	
Pennlinks	1986	Penn State University	
Cobra	1987	Rutgers University &	
		International Seeds	
SR1020	1987	Unit of Arizona & Seed Research	
Providence	1988	University of Rhode Island &	
		Seed Research	
Putter	1989	Washington State University	
Southshore	1991	Rutgers University & Lofts Seeds	
Cato	1993	Texas A & M University	
Crenshaw	1993	Texas A & M University	
Penn A-1	1995	Penn State University	
Penn A-2	1995	Penn State University	
Penn A-4	1995	Penn State University	
Penn G-4	1995	Penn State University	
Penn G-6	1995	Penn State University	
L-93	1995	Rutgers University & Lofts Seed	

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New and improved varieties entered the marketplace in the late 70's and began to compete with Seaside on the basis of turf quality and performance. With increasing demands on superintendents to provide greater turf quality, the newer varieties outcompeted Seaside when they were introduced in the 1970's and 80's.

Over a 30 year period, Dr. C.R Skogley, University of Rhode Island, collected and evaluated thousands of bentgrass selections, many of which were kept and later used in the breeding of 'Providence'.

FIRST SIGNIFICANT IMPROVEMENTS

Individual bentgrass strains selected from putting surfaces originally seeded with Seaside or south German mixed bentgrass required additional evaluation for performance as a turf under a close mowing regime. Some of the most attractive and disease resistant selections were vegetatively propagated then sold as sod or stolons. This proved popular from the 1920's until the mid-60's.

The increased commercial availability of new and improved seeded varieties over the last 20 years is probably the major reason why greens are no longer vegetatively established. In addition, vegetative varieties were susceptible to a bacterial wilt, referred to as C-15 decline, which was responsible for the death of many golf greens.

THE FIRST BREAKTHROUGH

The first improved seeded Creeping bentgrass was developed by Burt Musser, Ph.D. at Penn State University and was commercially released in 1955 as Penncross. Prior to this, the only seeded varieties available were Seaside and the unimproved south German mixed bent. It did not reach Australian shores until the late 1960's and was a significant breakthrough for turf managers. It was a genetically broader bentgrass that was easy to propagate by seed and provided consistent performance similar to most of the existing vegetative strains.

For decades, Penncross was the only improved seeded variety and superintendents learned to manage the problems associated with it. Ironically



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it was these shortcomings, which helped to create interest in breeding something better.

IMPROVED BENTGRASS VARIETIES

Golf was booming and now that television was bringing the worlds best courses into our lounge rooms, golfers were expecting tournament-playing conditions at their local courses. Fast putting speeds became the goal and the easiest way to accomplish these speeds was to lower cutting heights. However, increased traffic caused greens to suffer and the race was on again to develop varieties capable of withstanding low mowing without spiking. Such varieties would also need improved tolerance to disease, heat and drought stress and traffic.

Cobra, SR 1020 and Providence burst onto the scene in the late 1980's. They took a couple of years to reach Australia but when they did they had a huge impact on the turf industry here. For example, bowling greens did not require heavy oversowing after their introduction. Small amounts of seed could be used to patch up any problem areas.

Currently, we are experiencing an influx of the "new" generation of seeded creeping bentgrass. The Penn 'A' and 'G' series, along with L-93, were all released in 1995 and started to be commercially available in Australia in 1997-98. But, what do we really know about these varieties? We are told that they will do wonderful things, but at what cost? It is American data that is being used to make these claims. The reality is that

these varieties have not been publicly tested in a replicated trial while being subjected to wear. People have done their own assessments and made a judgement call based on visual appearance, but no physical data has been recorded.

The question must be raised, are these new varieties what we are looking for? They are touted as requiring more maintenance but this cost is supposed to be offset by a reduction in chemical use. Is this indeed the case?

Another question hanging over us is whether or not these new varieties are actually suited to Australia? They have no Australian germplasm in their make-up and

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the unfortunate thing is that there is no breeding work going on in Australia. The VGCSA set up a program some years ago and the tragedy is that this work and germplasm was lost when the program was terminated.

History would suggest that it has been the good fortune and the skill of superintendents to adapt their management practices that has and will continue to allow varieties to succeed in Australia, not the varieties themselves.

THE FUTURE

Who knows what the future will hold? The gene transfer technology debate is only going to heat up. It is the way research is headed and a lot of what is being done is only accelerating the natural selection/breeding process. I am relatively comfortable with this aspect of it. However, there are alot of other issues that will need to be overcome before we see them commercially released.

Royal Melbourne maybe the example to follow. Plants were selected from old greens that provided excellent surfaces at minimal inputs. These plants were allowed to crosspollinate and the progeny used to replace the existing Penncross greens. This of course is not a variety but a mix of plants that have adapted to local conditions over the years. Rather than being subjected to commercialism from material aimed at other parts of the world, is this the way of the future?

Michael Reese is the National Turf Manager for Heritage Seeds.

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THANKS TO:

David Nickson, Jim Porter, Bruce Stephens (Photography), Jim Hull, and David Blythe.

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Scotts Australia has been undergoing a major expansion to its Australian operations. In a significant commitment to Australia, New Zealand and Asian markets Scotts has expanded their Turf operations by establishing their Asia/Pacific headquarters in Sydney.

ompany profile

Korbin Riley, previously the Asia Pacific Business Director, based at Scotts' Corporate Headquarters in the USA, has moved to Australia to head up the new operation as the Managing Director. In support, John Cabarrús has joined the company in a new position as Marketing Manager for the region. John's marketing skills will enable Scotts to capitalise on the success of their existing turf products and prepare for the introduction of exciting new specialised technologies due for release in these markets shortly.

A result of the expansion has been the establishment of a new specialised division dedicated to Turf products and services. Richard James is responsible for turf sales in Australia as Regional Sales Manager, with Robert Cooper taking on sales responsibilities for New Zealand as well as continuing his role as Turf Technical Representative in Australia. Nicola Rochester remains the Regional Sales Manager for New Zealand, based in our Auckland office.

In addition, Scotts has recently reviewed their Distributor arrangements throughout the region, has made some changes, and believe they now have the best sales and technical representation possible. Scotts distributors now have a much better focus on their products and will provide Turf professionals with a superior level of service. Increased technical training of all Scotts distributor representatives is being implemented to provide a greater level of expertise in the field.

It has been four years since Scotts took over direct marketing of their products in Australia and New Zealand. Since then sales of their products and market share have grown dramatically, particularly with the introduction of new combination products and technologies. Combination products such as "Fertiliser 31-1-7 with TGR" (Poa restrictor) and "Fertiliser with Pendimethalin" (Pre-emergent weed control) and the latest "Fertiliser 21-1-16 with Dicot Weed Control III" have met with popular market acceptance. These combination fertiliser and herbicide products have made life a lot easier for turf professionals by giving them more treatment options with greater effect that also help relieve them of day to day greenkeeping pressures.



Scotts' increased investment in the Australian, New Zealand and Asian markets does not stop there. Scotts is proud of its longstanding involvement with the AGCSA and is actively involved in the sponsorship of programs and awards such as the Distinguished Service Award. Over 10,000 of the world's top golf course superintendents rely on Scotts leading range of patented slow and control release fertilisers, combination fertiliser and herbicide products and new seed technologies.



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JEWELL OF THE YARRA

The Heritage Golf and Country Club is situated in the Yarra valley at Wonga Park with the Northern boundary on the Yarra River providing a picturesque setting for what will be an outstanding and unique test of golf.



BY WAYNE DALE

+ LEFT View from 5th tee playing down towards the river

BELOW Tees were finished to dead level with laser levelling equipment
 ROTTOM Clubhouse



The golf course is a Jack Nicklaus design with the construction contract awarded to Melbourne based Golf Course &Landscape Construction Company, Muirfield. Including this project, Muirfield have been involved with the construction of five golf courses and worked with Architects including Jack Nicklaus, Greg Norman, Neil Crafter and Phil Ryan.

With the aim to finish the construction of the golf course by the end of April, Muirfield have 47 staff on site with the support of 30 pieces of construction equipment and numerous pieces of turf machinery.

Remaining to be completed is the construction of six greens, drainage, grassing and sand capping to four fairways and five tee systems. The bunker systems on four holes including the sodding are still yet to be built.

Fairway construction involves cutting into the sub-base at 3–10m spacings depending on the slope, then capped loosely with 300m of sand. The sand is supplied by Burdett Nominees Pty Ltd and will take in the order of 3,500 truck and trailer loads to deliver on-site to a stockpile area. It is then moved from this stockpile by Moxy dump trucks and spread to thickness on fairways using D3 – D4 swamp tracked dozers. The only amendments to the sand are agricultural lime and N.P.K. fertiliser before Hydro-mulching with Santa ana sprigs.

Greens are constructed to USGA specifications with agricultural drains at 3-4m centers, covered with a 100mm layer of 5mm gravel with 300mm A.C.I. sports 40 sand with 10% sphagnum peat which was incorporated at the pit before delivery to the site. As with fairways the sand was moved from the stock-pile with Moxy dump trucks and spread with a D3 swamp track dozer. The greens are being planted with SR1019 and SR1020 at a 1:1 ratio by method of drop seeder followed by a tyre roll with the bunker rake. The average size of the greens is 650m² and before planting, applications of trace elements and high phosphate N.P.K. fertilisers were applied.

Tees are slightly different in construction as they are intended to be dead level when finished. A 'v' is cut in the base starting from the edge with 1-3% fall to the centre where an agricultural drains is installed. The finished 'v' surface is bought up to level using a free draining course sand and is then laser leveled using a modified bunker rake. Another 100mm (compacted) of Burdett's sand is spread and laser leveled to complete the finished surface. The rootzone was then amended with lime and N.P.K. fertiliser before being hydra-sprigged with Santa ana couch.

The rough areas are topsoil capped with 150mm of material stripped and stock-piled from site at the commencement of the earth works construction. All the finishing work was undertaken by a Nicklaus endorsed shaper who used a bobcat and smudge. The shaper has also used the bobcat to finish all greens and fairways with the exception of tee tops.



The grass species selected for roughs and surrounds of greens and tees was 'Torpedo' Tall Fescue. The outer roughs or those areas outside the reach of irrigation have been planted with a general pasture mix to give the effect of dry wispy grass in summer months.

We have found that due to the nature of Tall Fescue and its height of cut limitations, some maintenance problems on bunker faces in terms of selecting machinery capable of doing the job have been experienced. The bunkers are generally very deep, very steep with grass faces and shallow bowled bases with many intricate shapes and tongues. The Flymos do not seem to be very successful on high height of cut areas so much of the cutting is being done with rotary mowers and a Toro side winder surrounds mower but we do intend to continue experimenting with different machines and methods.

The irrigation system includes approximately 1150 Rainbird Eagle 700 and 750 sprinklers (the 750 part circle heads are used back to back around putting greens). The control of the system is by the means of decoders activated from a central computer operating Rainbird's Cirrus software. Water is supplied by a pump station situated in a wet well on the edge of one of the many lakes incorporated in the design and it consists of four submersible pumps with variable speed drive and a total capacity of 72lps at 750 kpa. Water is contained within seven lakes throughout the golf course and this

system is presently charged by the means of the Chirnside Park Creek. As the project develops further, reclaimed water from the effluent treatment plant on site will make the course capable of meeting all of its irrigation needs.

As the golf course is situated adjacent to the Yarra River, we have had considerable trouble with ducks causing damage to newly seeded areas and I foresee them continuing to be a constant problem.

A feature of the waterways, located throughout the golf course is the final exit into the Yarra through a large man made wetland established very early on in the project. This wetland strips any nutrient from the water flowing off the golf course before it enters the Yarra and regular analysis of out-flowing water is confirming the success and effectiveness of this wetland system.

Its proximity to the Yarra means that considerable efforts have been made to secure the site in the event of a flooding thus protecting the main features of the golf course in the event of 1 in 15 and 1 in 100 year floods.

During the Christmas period in 1999, very heavy rainfall in a short period of time caused some considerable heartache to all involved in the project. Many newly seeded and planted areas were heavily washed out and scoured. This resulted in the need for major repair work to reinstate features at a time when the project was really beginning move forward. There was a direct hit by lightning on the irrigation system which took out the interface unit between the computer and the field which left us with only manual control for several days. We find that as work proceeds it is increasingly necessary to erect silt fencing to protect finished work prior to and after planting.

The course is associated with a large residential development that is selling well and golf course membership is growing strongly. Continued warm weather in Melbourne is really pushing the couch along and at this stage we are confident of hitting our opening date set for the end of November.

Wayne Dale is the Golf Course Superintendent at the Heritage Golf and Country Club.



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speaker profiles



DR. ROBERT CARROW



When it comes to research and the 'extension' of that research to turfgrass managers, few have done more than Dr. Robert Carrow, Professor of Turfgrass Science at the University of Georgia.

Dr. Carrow has written 88 refereed scientific publications, 176 popular articles for turf mnagers, and is coeditor of 'Turfgrass', Agronomy Monograph No. 32 (Amer. Soc. Agron). Dr. Carrow is also co-author of three books, 'Salt Affected Turfgrass Sites: Assessment and Management', 'Seashore Paspalum: The Environmental Turfgrass' and 'Turfgrass Soil Fertility and Soil Chemical Problems and Management'.

He has also made 382 presentations to scientific and professional turf audiences in 36 states and 7 countries and has presented 2-day workshops for the GCSAA for 20 years. An accomplished plant breeder, Dr. Carrow has also been a cooperator on the release of 3 couchgrasses, 1 tall fescue, and 2 seashore paspalum cultivars.

His main areas of research include;

- (a) turfgrass environmental and soil stresses and plant stress resistance mechanisms (drought, temperature, salinity, nutrient, low light and low soil O²)
- (b) turfgrass traffic stress (resistance and alleviation) with special emphasis on seashore paspalum, creeping bentgrass and tall fescue.

Dr. Carrow is a Fellow of the American Society of Agronomy and VP of the International Turfgrass Society for turfgrass scientists and has served in numerous offices, committees, and editorial roles in professional societies and turfgrass organisations.

Dr. Carrow will deliver two presentations at the Millennium Turfgrass Conference. One will cover the use of plant tissue analysis as a management tool, the other will discuss fertiliser efficiency and mode of action.



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Globe Australia P/L are a major supplier of pesticides, fertilisers, turf seed, application equipment, protective clothing and golf course accessories to the recreational turf market.

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Globe have had a year of solid growth, particularly in Western Australia where Danny Hambelton joined the group. In Wagga Wagga, Garry Clark has recently become a full time representative and in Sydney, Roy Spinks has joined the ranks to add a focus to the turf farm market. The growth has led to some internal promotions with Andrew Knox becoming General Manager and Alan Shields, State Sales Manager for NSW.

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A little over twelve months ago I became sick and tired of having a club dependant on toxic chemicals. The greens were almost totally Poa *sp* and despite regular renovation they had up to 8cm of thatch and seemed to struggle from one disease to another.

Built 15 years ago on a clay flood plain by an enthusiastic group of locals, is the Pakenham Golf Club, 55 km South East of Melbourne. The majority of greens can be classified as 'push-ups' that have a clay base with a covering of a sandy loam material and obviously, are without drainage. Five of the greens are sand based and were designed to have a perched water table but I would not classify these as terribly successful.

It would seem that I had been swept up in a sea of information and chemical technology and had forgotten the basic principals of plant health. It is no secret that the cycle in turf management is an ever evolving blend of the new with a greater understanding of the old. Given all the resources presently available I had missed the obvious. I became aware of this when I retrieved an old text on Plant Biology.

Taking a broader more lateral view towards turf management with assistance from Ian Ward of Burbank Resources and Ward Penwarn of Petrik Australia, who are experts in agriculture and soil science, and have experience outside of turf. Together we came to the following conclusions;

As with all things in life balance is essential. Upset that balance and there will be a cause and effect. The expectations we have of our fine turf forces us to push that balance to the limit but by nurturing the basic fundamentals of plant physiology we are allowing the plant to adapt and use its own mechanisms to cope with stresses such as pests and diseases.

Providing the support that ensures the healthy functioning of the plant is the soil. The two are unequivocally linked and in many ways they are co-dependent. The mistake I was making is that I failed to recognise this link and was treating the soil as a static entity. The fact is that soil is a 'product of process'. Not recognising this perpetuated the nightmare of chemical dependence, its related financial burden and the necessity to attend every lecture on pests and plant diseases. My experience suggests that we perpetuate this cycle by not recognising the disease as a signal of imbalance but as a sign to run to the chemical shed. How many turf managers, myself included, treat the same disease year after year without truly addressing the real issues of the imbalance?

My records indicate that in the 12 months from July 1997 there were 21 applications of various pesticides. In July 1998 we began to implement the new management style and in that year the number of chemical applications were reduced to just four. The majority of these treatments were made in the early stages of the program to treat Winter Fusarium, Dollar Spot and Stem Weevil.

Due to the dominance of Poa sp. on the putting surface, diseases such as Fusarium are a problem when growth rates are slow but I have found that by setting and sticking to realistic threshhold levels, these diseases normally disappear without intervention after



(left) and Anthony Wright (right)

a short period of time.

Since July 1999 no chemical intervention has been required. There has been a noticeable reduction in thatch levels and I would estimate that the bentgrass population in some greens has increased by as much as 50%. The bentgrasses that have colonised seem well adapted to the soil type and cope with disease and heat stress much better that the wintergrass. Our policy of not collecting clippings has had no effect on playing quality and is returning valuable plant nutrients (that have taken time and money to produce) to the soil.

It is important to realise that chemicals do have a role to place in a properly integrated pest management programme but the results we have obtained in a short period of time are very pleasing. We have taken a minimalistic approach relying on nutrition and biotechnology to advance this far. I am please to say that a substantial wedge has been driven into the toxic chemical merry-go-round.

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Bowling Greens:



WHAT HAS CHANGED?

Over the past 15 years there have been many changes affecting bowling greens including; year round play, introduction of synthetic surfaces, use of different soil types and construction techniques and the introduction of new turf varieties.

The introduction of year round play has been most significant in the southern states (particularly Victoria) where traditionally bowling greens were renovated and rested from late April until late August. With the increased demand for winter play on natural grass greens, to compete with the synthetic surfaces, the rest period is now reduced to just a few weeks. Recent experiences and observations would indicate that as a result, these greens, are now very difficult to manage throughout the summer months. The bentgrass is unable to sustain a deep, vigorous root system, making it difficult to produce a dry, hard and fast surface without placing the turf under excessive stress. The loss of the root system is due to several factors including, nematodes, soil compaction and root borne diseases.

Soil compaction would appear to be the main cause, as it results in reduced aeration and root deterioration, which in turn makes the turf more susceptible to disease. Damage caused to roots by nematodes and root diseases such as Pythium sp. and Rhizoctonia sp. is very slow to recover and observations would indicate that there is no recovery, rather increasing deterioration. S • Of all the turf areas prepared as a playing surface, none come under greater scrutiny than bowling greens. The expectation is that they will be fast, level and even paced whenever they are used for play. To achieve these high quality surfaces they require low, regular cutting, frequent grooming, low fertility and minimal water. Ideal bowling greens can be described as being "on the edge of death" and require very skilled green keeping to provide a high quality surface without losing turf cover.

BY JOHN NEYLAN



The bentgrass variety "Cobra" has been used extensively since its introduction about 10 years ago. There have been comments made recently that it is the cause of the problems due to a "greater" susceptibility to disease and other pests. There is no tangible evidence to confirm this but anecdotal evidence is strong. It is interesting to note that there were several changes that occurred with bowling greens around the same time that Cobra was introduced. These included the introduction of sand profiles and increased winter play. I suspect that all are contributing to the current concerns.

GREENS CONSTRUCTION

There has been a major shift in the type of soils used in the construction of bowling greens. Traditionally constructed from fine loamy sands that produced hard, fast surfaces, increased play, reduced renovation periods and a requirement to be less affected by wet weather caused a shift towards sands with little or no silt and clay content. The sands used are medium to fine with the majority of particles in the 0.15 - 0.50mm range but coarser USGA type sands (0.25 -1.00mm range) have also been used. Trials comparing various soil types including a USGA type sand and a fine, loamy sand have been undertaken (Robinson and Neylan, 1994). The trials showed that the USGA sand, with a bentgrass surface, can produce green speeds comparable to the finer soil types. The successful use of USGA sands with bentgrass depends on developing a deep root system and a complete grass cover so as to produce a dry, firm surface. Experience would indicate that the USGA sand is ideally suited for couchgrass, whereas a finer sand type is preferred for bentgrass.

SYNTHETIC SURFACES

Synthetic greens have been introduced over the past 10 years or so for two main reasons:

- (i) Economic
 - Perceived high cost of maintaining turf greens
 - Potential for increased income from an extended playing season
 - No loss of play due to renovation and rain.

(ii) Surface performance

 An expected improvement in standard and pace for small clubs dependent on voluntary labour for greens maintenance.

Synthetic surfaces have proven to be similar to natural surfaces, "those that are good can be excellent and those that are not are terrible". There are a variety of construction techniques used and many are poorly engineered with little consideration given to water movement and drainage. There are performance standards for synthetic surfaces that have been compiled by the World Bowls Board but this offers little advice on construction methods. From a club perspective this is unacceptible as the performance of the green is somewhat unknown until it has been constructed. It further emphasises the need for clubs to investigate the available products and to specify what they want.

Research undertaken by Robinson and Neylan (1994) compared the characteristics of several synthetic greens with a couchgrass and bentgrass surface. The synthetic surfaces consistently had a greater green speed and 'draw' compared to the natural turf surfaces. In fact, the control of green speed has proven to be difficult with a number of synthetic greens considered too quick. Surface hardness is a major issue with synthetic surfaces and is influenced by the density of the underlying base, depth of the synthetic pile and the type of synthetic backing. Surface hardness has a significant impact on 'player comfort'. A hard, non-resilient surface causes tiredness of the lower limbs and feet. The synthetic greens had a surface hardness of 250 - 1000g (impact value as measured by the Clegg Impact Soil Tester). The hardest surface (800 - 1000g) was on a concrete base with the remainder of the synthetics being 250 - 525g. The natural turf was between 130 - 200g. The World Bowls Board guidelines indicate that a surface hardness less than 320g is desirable.

Temperature is another factor influencing player comfort. At an ambient temperature of 39.7°C one synthetic surface had a temperature of 62°C while the couchgrass surface was 41.2°C. On a day of 30°C a second synthetic was 50°C while the bentgrass surface was 29°C. Buskink et. al (1971) also studied the heat transfer from the surface through the sole of a shoe. They found that the heat transferred is dissipated by blood flow and this relative heat gain contributes to greater physiological heat stress,



which may ultimately result in serious health problems such as heat stroke.

There have been a number of new turfgrass varieties introduced into bowling greens over the years in the search for the perfect grass. When "Tifdwarf" was introduced into the southern states it was quickly decimated by Spring Dead Spot, and in South Australia it was replaced by "Santa ana" which is now being replaced with "Tifdwarf". Despite the fact that over 50 varieties have been identified. "Greenleas Park" has been a great success in bowling greens. "Cobra" creeping bentgrass replaced "Seaside" and "Highland" with some Penncross, SR1020 and Providence all used successfully.

As with many turf surfaces, bowling greens are influenced by fads and opinions and unfortunately not enough by facts. Whether natural or synthetic turf, if a new green is to be constructed do your homework. Establish the required performance criteria for the surface and build a specification around these requirements. Go and look at similar surfaces and examine the current maintenance and usage practices to determine what influence they have on surface performance. Good results do not come without hard work and at a cost and there is also a desperate need to generate much needed facts rather than being influenced by ill-informed opinions. 34 At the time of writing this article John Neylan was a director at Turfgrass Technolgy P/L but is now empoyed by the AGCSA to manage

 The hardness of synthetic bowling greens causes tiredness of the lower limbs and loet to older players in particular.

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Towards a New Grass for Hong Kong Racecourses

Recognising the limitations of turf species used on race tracks in Hong Kong, the Hong Kong Racing Club has enbarked on an extensive turf selection programme aimed at identifying more suitable grass types.



The current turf cover on the two racecourses in Hong Kong (Happy Valley and Sha Tin) is based on Tifton 419 Hybrid Bermudagrass (Couchgrass). As a turf, this grass is only partially successful in the Hong Kong environment. For racing it is quite unsuccessful as it bruises and discolours easily, does not repair itself in divots and has poor growth in spring. Some of these characters are typical of Bermudagrass, but the poorest of the characters are made even worse by the very low light intensities often experienced in the Hong Kong environment.

A.A.A.-1-44-4

The Hong Kong Jockey Club has recognised the need to upgrade the grass cover and has embarked upon a 'far-sighted' program of grass testing and selection in order to identify a more suitable grass type for racing. The Club has contracted the services of Melbourne-based consultant lan Chivers to oversee a three to four year trial of a range of grasses with the eventual aim of isolating one type that meets the demands of racing in this very specific and difficult environment. The work is in its second year and already some interesting observations have been made.

The approach taken so far has been to firstly, identify a range of candidates, some from turf backgrounds but many from agricultural and revegetation backgrounds. The initial batch of 41 grasses came from a disparate range of environments from the USA, Australia, South America, South Africa, other parts of Asia and, of course, some local grass weeds. Some were propagated vegetatively whilst others came from seed. All have been grown in 1 square metre pots and maintained as if they were part of the racecourse.

The characters assessed in this stage were persistence, growth form, presence or absence of rhizomes or stolons, tolerance to clipping or mowing, leaf texture and rate of growth. After a year of testing lan Chivers and the local staff of John Ridley, Pako lp and Shirley Law decided upon those grasses that would proceed to the second stage of testing. Of the original 41 grass types, 17 were immediately considered as suitable, 11 were considered as unsuitable and the remainder will be maintained in pots for further evaluation.

The second stage of the project is now underway with the 17 "first round winners" transferred to larger pots for further evaluation. An additional 4 grasses considered as quite likely to be successful eg. sisters to some of the first round winners, have also been included.

As the plots went in during the autumn the performance of each grass over winter (it can get cold in Hong Kong) and recovery after dormancy in spring will be monitored. Assessments at this stage will include rate and ease of establishment, winter growth, spring 'green up', turf strength and divot recovery.

As these plots are replicated four times it will be possible to assess their performance under two other major treatments - shade and overseeding. The layout of the trial





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That stage will see plots of several hundred square metres go into a separate galloping strip for the 'acid test' of horse usage. It is thought that only a handful of grasses will make it to this stage of testing after the thorough testing they will have received in stage 2.

Stage 3 plots will really determine the suitability of each of the grasses as a horse racing surface.

Results so far give strong grounds for optimism about the final product, as the weakest of all of the grasses tested so far is the grass currently used on the tracks. This leads to the thought that if this grass can produce a 'mostly satisfactory' surface, then the grasses that are currently outperforming it in the trial will surely be able to produce a far better surface than is currently provided. THE GREEN HORTICULTURAL GROUP

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AAA news

Stadiums Sport New Surfaces

Working day and night to recover time lost through the succession of union work bans and weather restrictions, the StrathAyr team lowered the last SquAyr in place at the Colonial Stadium on Sunday 5th March, just 4 days prior to the clash between AFL sides Essendon and Port Adelaide.

With scant regard for the tender turf, the venue held 3 AFL matches and 3 concerts in its first 10 days. The surface performed every bit as well as was hoped and StrathAyr who have a 6-year maintenance contract are looking forward to putting the ShAyr the WAyr system to the test.

Although trailed successfully at Parramatta Stadium in Sydney, Colonial Stadium is the first to fully utilise the square modules (2.4m x 2.4m x 110mm deep). Even during construction, shade effects from the closing roof clearly demonstrated the critical need to be able to replace or exchange turf subjected to almost total shade.

StrathAyr wish to thank McMahons Pty Ltd, Chapman & Rivet Pty Ltd, ACI Industrial Minerals, Abcor and CSR Construction Materials for their dedication to precision and quality throughout this project.

On the other side of the city, just minutes away on Melbourne's new CityLink, Joe Motz and HG Turf have been busy replacing the hallowed turf wickets at the MCG with the 'Motz System' in readiness for AFL and Olympic Soccer.

On the 10th March the wickets were





excavated out (along with old heating cables) to a depth of 350mm. New drainage and irrigation was installed, a gravel drainage layer was put down followed by 260mm of a 'USGA type' sand.

Five days later, 700m² of couchgrass grown at HG Turf in Alexandra (Vic) to 'Motz' specifications was then rolled out in large sections to complete the 300mm deep reinforced profile.

This work follows the installation of a smaller section of 'Motz' to the northern end of the ground some months ago, which appears to be performing extremely well.

From the 2nd September, HG Turf and the staff at the MCG have 5 days to replace the entire surface of the soccer pitch in preparation for the Olympics most watched sport.

HG Turf have also just completed the resurfacing of the GABBA in Brisbane and have received glowing reviews from players and officials

Sounds like a tough ask but these days, a 'can do' policy is essential to manage a large multi functional stadium.

Installation of turf at Colonial Stadium

Congratulations to Green Maw on the completion of the construction of the new Thompson, Wolveridge & Perrett designed Ocean Course at the National, featuring Legend couchgrass.

www.strathayr.com.au Telephone 1800 622 455

Installation of turf at the MCG

Blackwood Completes Couching Program

To allow for the expansion of the clubhouse, car park and practice facilities, the Blackwood Golf Club (25 km south east of Adelaide) has recently completed a major course redevelopment that commenced in 1991.

The club had a 7.5 hectare block of land adjacent to the existing course. One existing hole was realigned, a par five was changed into a par three and four new holes were built. Windsor green couch was selected to grass the fairways and new greens (sand based SR 1020) were built on all the new holes.

Due to Blackwoods less than ideal growing conditions (heavy clay soil and cold wet winters), four years after the completion of the new holes we decided to trial Santa ana on half of the 18th fairway.

The excellent vigour of Santa ana seemed to give us an extended growing season (compared to the Windsor green). This prompted us to further trial the grass on our practice fairway using a row planter. This proved to be an outstanding success and as a result it was agreed to plant ten and a half of the remaining fairways to Santa ana couch in October 1999. The remaining two par three's will be sodded with Santa ana taken from our own nursery in November 2000.

The process used to establish the Santa ana in this current season was;

- In early September, fairways were sprayed with Glyphosate at 5 L/ha. This was then repeated two weeks later.
- (2) Over-plant with the Santa ana into the existing thatch layer using a sprigging machine at the rate of 1m² (sprigs) to 20m² of fairway.
- (3) After planting, apply Ronstar as a pre-emergent herbicide (Poa annua is our main weed species)
- (4) After new Santa ana shoots emerge apply organic manure at 2 ton / hectare.
- (5) One week later, apply on an alternating basis, Ammonium nitrate and 20-0-16 at the rate of 100kg/ha at weekly intervals.

As of the first of March this year we had coverage of approximately 90% and if the current rate of establishment continues we should have a complete couch coverage before it goes into dormancy.

In addition to the couch establishment program we have also recently installed an injection system that allows us to pump a highly concentrate solution of gypsum through the irrigation system. The calcium ions displace the sodium ions from the 'exchange sites' of the heavy clay sites which allows the soil to 'floculate' thus improving water infiltration.

The system is linked up to a 'site pro' control system and we are able to use it to distribute fertiliser and fungicide.

Peter Harfield Golf Course Superintendent Row Planter >

Announcement



John Illingworth, author of Differences between 'Wetting Agents in the Australian Turf Industry' – Volume 2.1, has absolutely NO connection with the product advertised on page seven of the same issue. Some people have suggested that it was a 'pretty crude' attempt to promote his own product range. If those people bothered to read the article they would have found that it was completely unbiased and contained excellent technical information.

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AAAnews

TEE V Coverage?

Due to a shortage of landfill, the Byron Bay Council have been forced to double tipping charges. As a result, people have resorted to dumping illegally under the cover of darkness.

Michael Trivett, Golf Course Superintendent at Byron Bay GC found this TV left on one of his tees. Unfortunately it didn't work but his initial thought was that he could use it to educate the golfers on how to repair pug marks etc.





80 New Electric Club Cars For Bonville

As part of a major upgrade, 80 brand new Green Electric 'Regenerative Braking' golf cars were installed at Bonville International Golf Resort.

The new fleet of Electric Cub Cars has brought a peace to the resort allowing golfers to take in the scenery.

The pre-delivery arrangements undertaken by Bonville included the installation of over 450 amps of power, 80 power points and the installation of a complete air-ventilation system.

GM Geoff Cohen and Professional Brad Daymond were more than happy with the new fleet that includes a delux 19th Hole Drinks Vehicle, complete with pie warmer. The cars can easily do 36 holes a day if needed and have a number of features that set them aside from the others, such as onboard computer that controls all the power supply functions and re-charging process.





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- Finale is a very fast acting, non-systemic total knockdown herbicide, ideal for total vegetative control in areas like line marking, path edges, sprinkler heads, around garden beds or mature tree bases. Finale only controls the green part of the plant that it contacts therefore it will not creep into untreated areas, which can be a problem with other non-selective herbicides. Finale is not soil active so there is no residual activity.
- Prograss provides selective pre- and post-emergent control of winter grass (Poa annua) in ryegass, Kentucky blue grass, Queensland blue couch, Kikuyu and bent grass (as such, it is not recommended for use on greens).

Prograss controls wintergrass through root and shoot absorption. It should be applied every month for 3 months from early autumn to control winter grass though its peak growing period.

 Illoxan is a selective herbicide which gives excellent post-emergent control of crowsfoot grass in couch, Kikuyu, Queensland blue couch, carpet grass and buffalo. Illoxan is safe to use on a wide range of warm-season turf species, but it will cause severe damage to ryegrass.

For more information on the Aventis Chipco herbicide range - Chipco Ronstar G[®], Chipco Dimension[®], Chipco Kerb[®], Chipco Fairway, Illoxan, Prograss and Finale - please call our toll-free Customer Service hotline: 1800-627-621.







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State REPORT President's Pen

As all members would now be aware, the AGCSA has announced it will become a direct provider of research and analytical services to the golf turf industry. The new division will be called AGCSATech and John Neylan, formerly a director with Turfgrass Technology, has been appointed to lead the division.

With the focus of AGCSATech being primarily to undertake turfgrass research, the AGCSA Board has moved quickly to initiate the establishment of trial site regarding greens maintenance in both warm and cool season turfs and phytotoxity trials for contract research.

Whilst John Neylan commenced with the AGCSA on March 27th, AGCSATech will not be formally launched until the Millennium Turfgrass Conference in June and will be fully operational from mid June. While the minority have expressed some concern over the decision of the AGCSA Board believes that its task is to represent the broader interests of all its members. An extensive consultation process, including a detailed member survey, was undertaken, and there was ample provision for input into the decision making process.

On other AGCSA matters, the recent roving workshop, "Water Management on Golf Courses" presented by Dr. Ali Harivandi provided a very worthwhile and informative educational day. Toro Australia and the HRDC sponsored the event and deserve our thanks. Ali was certainly a unique individual and made many new friends whilst in Australia.

State Presidents met for their annual combined meeting with the AGCSA Board in March. Matters discussed included the impact of the GST on member subscriptions, Recognition of Skills package, national training framework and the new AGCSATech service. The meeting also provided an opportunity to discuss ATM design, content, layout and future direction. The feedback and input we had from all in attendance was excellent.

The Millennium Turfgrass Conference is approaching fast with all aspects of the conference coming along well thanks to the ongoing support and effort of the Steering Committee. Having just tried to book accommodation for the event for my staff and being told that room availability is reducing. I would suggest you 'get in quick'.

I look forward to catching up in sunny Melbourne in June.

Regards,

Peter Frewin President AGCSA

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FNQGCSA

Cyclone Steve a severe category 2 with wind gusts of 186 km/h came in at the northern beaches of Cairns at approximately 7pm on Sunday 27th February. As the ground was at absolute saturation point, tree damage was enormous. The cyclone centre was pinpointed at Paradise Palms Golf Course, Clifton Beach with trees down, power out, roads blocked, the Northern Beaches were a disaster area.

The next day revealed the massive damage. Luckily very little structural damage had occurred. At Paradise Palms we have over 1600 mature trees down or badly damaged and severe creek bank erosion.

Halfmoon Bay Golf Club and Novotel also reported many trees down and a big clean up lay ahead.

Luckily there was only minor damage to housing and no loss of life.

Paul Earnshaw

FNQGCSA President

GCSAQ

The cooler conditions seem to have prevented any re-occurrence of the 'Summer Decline' problems experienced in the summer of 1998. While this is good for those previously affected it still leaves a question mark over the likely hood of the return of these problems. Hopefully further research will prove fruitful.

With research in mind the GCSAQ committee has met with representatives of the Department of Primary Industries with the intention of getting some trial sites operative and addressing a variety of turf related problems. Paul Bevan has been very active as our Research Officer trying to bring this project together and with the support of the rest of our Association we should be able to reap valuable rewards in the future.

New developments are taking place at Springfield West of Brisbane where another Greg Norman design course is under construction. Pelican Waters on the Sunshine Coast steadily approaches it's opening date under the guidance of David Nichols. The other relatively new Sunshine Coast course is Noosa Springs, venue of our April field day.

Still on the Sunshine Coast, Glen Dunstan has left Mt Coolum Golf Club to take up a position with Toro Irrigation. Keppera Golf Club has made further changes, since losing Chris Giles they have run with a management team structure, now Peter Hill the popular Second in Charge and golfing guru has left the club after a stint in the pro shop.

That's all the news that's fit to print so good luck and favourable weather to all.

Jon Penberthy

President, gcsaq

GCSAWA

In response to the survey sent out earlier this year, again the AGCSA executives should be commended for their positive approach to broadening the horizons of the association in such a dynamic industry fuelled by service, needs and demands.

US turf expert Dr. Ali Harivandi's recent visit to Perth in March proved to be very successful with the WACA providing the venue for the roving workshop. It was pleasing to see some new faces supporting this event.

The John Deere Super Series continues to be well supported by our members with some terrific prizes on offer throughout the year.

The two major prize events are the WA open 18th – 21st May at Karrinyup Golf Course and the WA PGA championship 25th – 28th May at Joondalup Country Club.

We look forward to seeing you all at the Millennium Turfgrass Conference in June.

Rob MacDonald President, GCSAWA

NSWGCSA

Hot dry conditions prevailed for January and February in particular, with some areas receiving only 7mm of rainfall for the month (unusual for Sydney at least!).

The tournament season came and went with full credit going to Peter Brown (The Lakes Golf Club) and Martyn Black (Castle Hill Golf Club) for the magnificent condition of both courses during their respective tournaments. The 'Preliminary Survey of Water Quality on NSW Golf Courses' has been finalised with the final report by Jyri Kaapro now completed. Results are encouraging with some sites demonstrating an improvement in the quality of water passing through their courses. Many people were responsible for the project including the 44 participating golf courses from around NSW, and the HRDC who funded the project on a dollar for dollar basis. Credit must also be given to Jyri and to David Sciafe who was the driving force in instigating the project.

Scott Armstrong of Mona Vale Golf Club has been carrying out reconstruction to various greens and tees, whilst Geoff Phillips at Ryde-Parramatta can now relax after completing the course reconstruction. Robert Ashes has successfully resurfaced all 18 greens with A1 creeping bentgrass, whilst Gary Smith at Bonnie Doon Golf Club is overseeing the continuation of their Master Plan.

The next NSW Association field day will be held at Cypress Lakes Golf Club on Monday 8th May. An open invitation is extended to Superintendents who may be travelling in the area.

Mark Parker President, NSWGCSA

VGCSA

Hot, dry conditions during February kept numbers down at our Heidelberg meeting. The theme of discussion for the day was organic and biological products in putting green management. This topic generated spirited debate with most Superintendents revealing at least some experimentation with these products.

Ted Boltong from Active Safety was our breakfast sponsor providing a magnificent barbeque meal to start the day's proceedings. Thankyou to Ted, John Neylan, Heidelberg Golf Club and Mark Burchell.

We are fortunate to be having our AGM at Royal Melbourne on Monday 8th May and look forward to a strong attendance. At least 2 Committee vacancies will need to be filled so give some consideration to nominating for the VGCSA Committee. The two new courses at the National are progressing with the Norman course in the "grow in" stage and the Thompson course well advanced with grassing. Work on the Moonah Links project has commenced and work on the new privately owned course at Barwon Heads is well under way. Amstel Golf Club are about to commence their new 18 hole course and the Sanctuary Lakes development was officially opened in February. These new courses are all exciting projects and reflect the growth and confidence in golf, which has benefits for us all.

Richard Forsyth ·

President, VGCSA

SAGCSA

Since our last report SA has had a hot and dry summer.

Up coming events for 2000 include:

April: Toro and Cooper Cup at Murray Bridge

- May: Bus Trip to Port Pirie Port Augusta and Whyalla.
- June: AGM at Kooyonga.

New Appointments:

- Neville Owen to Super at Gawler Golf Club
- Eddie Ruis from Roxby Downs to Portland Golf Club
- Matthew Dunn 2 I C at Kooyonga and congratulations to Paul Cameron as winner of Rotary Scholarship to USA for a 15 month study tour.

Bob Dellow

President, SAGCSA

TGCSA

Tassie Supers seem to have weathered the extremes of the summer elements without too much heartache. Wetting agents and insecticide applications will be relaxed now as we concentrate more on autumn renovation and disease prevention.

The Millennium Turfgrass Conference is almost upon us, so those who have not booked – get cracking.

The Irrigation Seminar held at Claremont Golf Club was well received, with Andrew Price from Controlled Sprinkler Supplies discussing sprinkler uniformity amongst other interesting aspects of irrigation.

Work is already being prepared for our next

seminar; all members will be notified with the next mail out.

Phil Hill President, TGCSA

TGAA (VIC)

What a big night the Superbox Seminar turned out to be.

The boys from Frankston cleaned up all the prizes on offer for the second year running and we learnt about the new online computer package lawnguide.com.au.

Thanks to those who attended and to Simone, Tony and Peter for all their hard work.

AUSTEP Ryegrass Trial Information morning co-hosted by the TGAA is set for Tuesday May 2nd. This will be held at Werribee Golf Club. Details of transport arrangements and cost will be our Autumn Newsletter. The trials are comprehensive and having supported the work with our research allocation we recommend you see them for yourself.

Millennium Turfgrass Conference delegate registrations are mounting and all is well for our Stream of activities. Remember to tick the Conference Dinner box as this is the finale to a great week.

The committee has been working tirelessly on a business plan. Some interesting selfassessments have been realised, and commitment to our members professional development is paramount in our goals.

Hope all is healthy with your turf

Robert Savedra

President, TGAA(Vic)

TGAA (ACT AND SURROUNDING REGIONS)

Thanks to Turfgrass Technology, association members will be please to hear that copies of the 'Green Pages' will be distributed to all members.

I trust that everyone hoping to attend the Millennium Turfgrass Conference in Melbourne has now registered and is eagerly awaiting the event.

The consideration of setting up evaluation trials of differing turf varieties by the TGAA and Canberra Institute of Technology (CIT), similar to that of Austep, is becoming more of a reality every day. We have located a suitable area within the grounds of CIT that has possibility to support up the 30 varieties. Justin AK Haslam

Committee, TGAA (ACT)

VGA

After a scorching February, greens will be looking for rest and renovation. With one of the driest spells on record and some areas already on severe water restrictions, we must do our best to exercise restraint.

Members are requested to get their application forms into the AGCSA for the Millennium Turfgrass Conference, which is a must for all Greenkeepers.

Planning for next seasons calendar is well under way but with some committee members leaving, the VGA would like to see some more interest from members wishing to join the committee. One place vacant will be mine (Vice President). I am about to leave for England for 18 months to work on different turf situations. I wish everybody well for the next season, and will be writing some reports for the VGA and TGAA, so stay in touch.

Toby Lumsden

Vice President, VGA

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