

# Keeping it Green



October 2009



## AUSTRALIAN GOLF ENVIRONMENTAL INITIATIVE NEWSLETTER

### 2009 ENVIRONMENTAL MANAGEMENT SYSTEMS AWARDS

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#### Keeping it Green Editorial Enquiries

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The AGCSA would like to congratulate Mr. Darren Wilson, golf course superintendent of The Wembley Golf Complex on winning the 2009 Environmental Management Systems award, (local Government category) presented recently at the national EMS conference held in Bunbury, WA.

The Award, sponsored by drumMuster for the government category, recognises the efforts made by users of EMS in a range of applications.

Darren has implemented the e-par Environmental Management System program to develop an EMS for Wembley Golf Complex, being the first golf course in Australia to gain EMS certification. In another first, Darren is the first golf course superintendent in the country to achieve certification as an e-par EMS Certified professional.



**Darren Wilson (left) is presented the 2009 EMS award (local Government Category) by Graeme Passmore from drumMuster**

In his submission Darren highlighted how the EMS has helped the golf complex protect and ensure the ongoing protection of the natural environment.

The Wembley Golf Complex which is owned and run by The Town of Cambridge has one of the densest populations of Tuart trees and grass trees in the Perth metropolitan area. When auditing the course and its surrounds it was highlighted that there needed to be a buffer zone between the high maintenance playing surfaces such as greens, tees and fairways and the close proximity of the natural bushland.

With signs of decline of some of the grass trees and native trees, buffer zones were established via reduced irrigation and part circle sprinklers to limit the

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irrigation to these trees. Pesticides and fertilizers were also reduced or termed as no go zones in these areas to help minimise damage.

The EMS also identified the need to upgrade the complex's washdown bay as well as the chemical and fuel storage areas. As a result a new washdown bay has been constructed that treats waste water and allows the waste to meet guidelines by the WA Water corporation.

A new chemical storage area has also been designed and constructed which meets the standards set out in the Health (Pesticides) Regulations 1956.

To complete the upgrade a new Fuel Storage and Dispensing Area has been constructed which complies with the appropriate Explosives and Dangerous Goods acts.

Speaking at the award presentation Genevieve Carruthers, President of the EMS Association said "The Awards seek to highlight the achievements of EMS users,

and demonstrate that both environmental management and profits can co-exist in the one approach"

The paths taken to develop their EMSs differ, but all Award winners and runners-up had focused on delivering environmental outcomes through a strategic and planned EMS approach, using a range of innovative methods to achieve their aims. All demonstrated a strong focus on community input and collaboration and the Association congratulates Darren, and all other entrants to the Awards program, on their achievements.

The EMS awards are held annually and golf clubs interested in applying in 2010 are advised that all details of entry requirements will be posted on the EMS website [Environmental Management Systems Association Inc](#) » with the awards to be presented at the annual conference, to be held next October in Victoria.



**New Washdown Bay**



**Old Washdown Bay**



**Old Discharge Sump**



**New fuel storage**



**Old Fuel Storage**

## Vic Smart Water Fund - Round 7 applications called for

The Victorian Government's Smart Water Fund has announced the availability of \$2 million in grants to help find and develop smarter ways to conserve Victoria's water supplies. The Smart Water Fund is calling on businesses, community groups, research organisations and individuals with innovative water conservation, water recycling and biosolids management ideas to apply for funding. The aim of the Fund is to provide support to organisations or individuals with innovative new ideas about water management that can act as demonstrations for others to follow and implement more broadly. Kingswood Golf Club in Melbourne's south east has been one such golf club to benefit from the Smart Water Fund, receiving a grant to aid its investigating into the development of an ASR scheme.

The funding application period is open from

Tuesday 29 September 2009 until Friday 20 November 2009. As a general guide the assessment period takes approximately eight weeks to complete and successful applicants will be notified in early 2010. [Click here for more information on how to apply for Round 7 Smart Water Grants.](#)

### Inaugural Smart Water Conference

The Victorian Government will conduct the inaugural Smart Water Conference at the Melbourne Convention Centre on Thursday 22 October. The conference will showcase the innovative water management projects supported by the Smart Water Fund.

[Click here to download a programme and registration form.](#)



The Wembley Golf Complex  
The Boulevard  
Wembley Downs  
Perth WA 6104

**Attn: Mr Darren Wilson**

### Achievement of Certification

Dear Darren

On behalf of the e-par organisation I congratulate you for achieving individual certification. I would also like to congratulate your dedicated staff and management on the successful certification of the Wembley Golf Complex.

You are the first Superintendent to achieve certification as an e-par EMS Certified Professional by leading the way to environmental excellence through your Environmental Management System. This Certification recognises your significant knowledge of, and advanced level skills in, the e-par® Environmental Management System. It also affirms your competence in the development, implementation and management of the e-par® EMS and an in-depth knowledge of the principles of systems based environmental management.

We again congratulate you for being a leader and a model to other Golf Course Superintendents around the world who want to strive for continuous environmental improvement and enhance the sustainability of the industry.

We also congratulate your staff and the management at Wembley on the successful completion and verification of the requirements for certification of the golf facility. This Certification recognises the EMS at Wembley was developed and implemented in accordance with the e-par EMS requirements and the principal elements of the Wembley Golf Complex EMS conform to the provisions of ISO 14001:2004 Environmental Management Systems Standard.

In another first, Wembley is the first to achieve this distinction. I have a detailed understanding of the effort that has been made to satisfy these requirements and we believe that your audited facility will be viewed as a model by other golf facilities following the same EMS path.

e-par are very pleased to have The Wembley Golf Complex as a leader in golf's international sustainability effort.

Sincerely

**Terry J Muir**  
**Managing Director**

# THE POWER OF WORMS

## WHAT DO I DO WITH ALL THESE CLIPPINGS...???

This is a question that often arises following fairway renovations. Well there is an answer.

Allan Devlin - Golf Course Superintendent, Secret Harbour Golf Course.

I remember my first major fairway renovation at Secret Harbour way back in 1996 and the shock at the amount of debris from the first few passes with the scarifying machine. It was an amazing sight as more and more thatch and debris was produced as the machine did its job. I only had the machine set at a depth of 12 mm and thought we could easily clean it up with our sweeper and once it was all picked up we would get it taken away to the tip in a couple of truckloads. This theory was soon demolished as I saw the huge pile of debris mounting up on the tip site after just a few passes with the machine.

We did eventually get the fairways renovated but I was left with a pile of rubbish that measured 30-35m long, 6-8m wide and 6-8m high even after running over and over it and compacting it as we tipped. The major shock was when I enquired about getting this pile removed from site to the tip. The best price I had for removal was around \$30,000 which was unaffordable and also unacceptable. The one thing in my favour was I was able to store this pile adjacent to the maintenance shed while I decided how to dispose of it.

As usual I did the phone around to other guys who had various ideas but most were mainly just disposing of it in site in bush areas on the course. The phone call that solved the problem and saved us a heap of money was to Rob McDonald, the Superintendent at Joondalup Country Club. Rob had also had this inherent problem of debris removal at Joondalup, even worse than mine as he was renovating his Santa Anna fairways twice a year. This produced about 4 times the debris as I had to deal with so I was interested to see how Rob dealt with it. Rob had been experimenting with an onsite worm farm and the results from this were very promising. I visited Joondalup the next day and was amazed to see what Rob had achieved with the introduction of his worm farm and the transformation from a pile of grass clippings and de-thatchings. There were several piles of debris in various stages of decomposition with the end result

being a very good loamy compost of exceptional quality. Rob explained the system to me which was so simple and virtually turned grass clippings into compost in 6-8 months.

I decided this was the answer and asked Rob how to proceed. He gave me a simple step by step program which I put in place and the results were outstanding.

### This program consisted of:-

- Prepare suitable area that can accommodate the total amount of debris.
- Install basic irrigation as worms have to be kept cool.
- Place debris in area (try to avoid dumping weeds).
- Once all debris is in place cover pile with composted worm farm material from other source.
- Keep irrigated as this cools pile which can get extremely hot.
- Once a month turn material to help speed up composting process.
- Try to remove weeds on regular basis.
- Wait 6-8 months and you will end up with a superb composted soil.

I was lucky to have access to Rob's worm farm and he generously gave me enough composted material to start my farm, I only had to pay for the haulage of the material from Joondalup to Secret Harbour. Once you have your own material you can easily start new worm farms on your site.

Both Rob and I used the finished composted product as a Public Relations tool as we both had golf courses that were in residential golf course estates. We both offered the compost free of charge to residents who are only keen to take advantage of this soil to build and enhance their gardens. This gesture proved to be a great way of informing the residents of just another way of doing something environmentally positive.

I would recommend the installation of a worm farm for any golf course as it solves the problem of debris removal while providing a great garden product for the public.



**Worm Farm at Joondalup  
(Clippings in decomposition)**



**Worm Farm at Joondalup  
(Composted debris ready for use)**



**Worm Farm at Secret Harbour  
(Composted product ready for  
public to use)**

# GOLF COURSES, BIODIVERSITY, LANDCARE AND CARBON

**W**e know you'll have roos and possums, but doubtless your golf course is also home to numerous native birds.

Over two decades, a Barwon Heads friend has counted 45 species on that thin stretch of tea-tree and dune – the classic links. He saw his first orange-bellied parrots (Jeff's 'trumped-up budgies') grazing on native tussock grass at Queenscliff. Rosanna has a resident powerful owl. Some Riverina courses have bush stone curlews – one brazenly comes in and sleeps by a clubhouse fire, a reliable source told me. As for plants, Axedale is proud of its drought-tolerant native grasslands, and numerous courses harbour greenhoods and leek orchids and other intricate wildflowers.

Many provincial courses and even some urban ones will have neighbours who are keen members of Landcare or are agroforesters. The virile and semi-formal Landcare movement has now spread to over fifteen countries, from Iceland to the Philippines, from South Africa to Virginia, from New Zealand to Germany.

I always encourage superintendents to make contact with local Landcare people. The wholesome, friendly and intelligent enthusiasm that pervades Landcare encourages many members to go that bit further, to think, learn, experiment, pass on knowledge, initiate new projects, run workshops and other training, write and publish. Author Stephen Murphy is a good example. He is also an agroforester – as a landowner and proprietor of an indigenous nursery at Meredith, Victoria, he works hard to integrate tree growing and farming, which is what agroforestry is all about.

There is a lot more agroforest than we thought; a new study by the World Agroforestry Centre reveals one billion hectares of tree cover on agricultural land globally. Using detailed remote sensing, scientists found that half of all farms have over ten percent tree cover, while 160 million hectares have more than fifty percent tree cover. (This is the first study to quantify the extent to which trees are a vital part of agricultural production in all regions of the world.)

Stephen's book takes a long-term view and challenges Australian landowners and land managers to try new ways of reversing the relentless decline and disappearance of Australian plants and animals from rural landscapes. Integrating conservation and production is a contemporary catchcry, but what can be practically done? This book is a guide to adding and improving wildlife habitat and designing more 'wildlife-friendly' properties, and that includes golf courses.

Murphy believes that even the most well intentioned shelterbelts, Landcare plantings or mixed species farm forests lack the features to make them rich in critical habitat for wildlife, let alone capable of self-perpetuation for centuries to come. To overcome this, he puts forward ten design principles, observed from nature, which set out to bridge the gap between farm forestry and environmental plantings and bring back the bush into rural landscapes.

I said this about Stephen when the book was launched: Steve Murphy, working amongst trees, observing, thinking, analysing, making hypotheses, recording and rethinking, and compiling this useful and gutsy book, has made an important contribution to our craft – land and forest management

## Finally carbon...

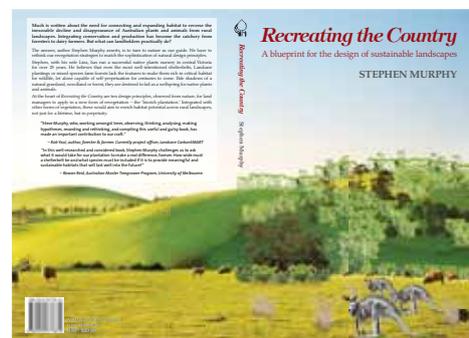
I work for Landcare CarbonSMART. The Kyoto Protocol is explicit. Carbon credits can only be claimed from new forest vegetation established since 1 January 1990. So your bushland remnants won't at this stage be a source of carbon income. However, our team believes that corporate Australia's need for carbon credits, through the coming Carbon Pollution Reduction Scheme, can fuel a major national revegetation program, with support from government. We will build on our experience with our pioneering Pay-as-you-Grow program, selling carbon from biodiverse sinks to Australian businesses and governments.

We expect to work with parcels of land from 20-100 hectares and more. We know there are thousands of landowners with spare land in this size-range from rain forest and ash-group sites in the mountains and coastal catchments to box-ironbark and mallee woodland in the Murray-Darling basin.

For me, encouraging more sensitive land management is where Steve Murphy's book comes in. Steve is saying, 'Agroforests and shelterbelts needn't be like long lines of giant dunny-brushes! Here's how you add biodiversity! You manipulate your vegetation to provide cover, roosts, food and nesting opportunities. You foster rare plant and animal species, including grassland biota. You visualise what you want to lie ahead and plan accordingly.' That includes varying rotations, building up strata complexity and managing litter levels by creatively using fire. And he's urging landowners to make generous provision for stock and crop shelter, which of course climate change will necessitate.

This is an excellent book, well designed and readable.

**Rob Youl**



**Published by Australian Forest Growers on behalf of Ballarat Region Treegrowers – 142pp, full colour. The book can be ordered for \$25 (inc p&h) through the Australian Forest Growers website: [www.afg.asn.au](http://www.afg.asn.au) or by ringing Christina Staderman on 02 6162 9000. Copies also available from Ballarat Business Centre, 15 Dawson Street South, Ballarat Vic 3350**

# SOIL HEALTH AND PLANT HEALTH

Phil Ford, 2009

In the June issue of 'Keeping it Green' Phil Ford spoke on how turfgrasses can produce resistance compounds to provide resistance against pathogens and insect attack.

In this issue he explores the relationship between soil health and its effect on overall plant health.

One of the big changes in Turf Management over the past 20 years has been the way we think about soil health and its effect on planet health. Consider these facts. It is estimated that 4.65 billion individual microbes live on or under every square centimetre of soil surface. That's nearly the population of humans on the planet under every square centimetre. An often quoted report by Cole and Turgeon (1978) found that the soil and thatch of a Kentucky Bluegrass lawn supported an estimated 280 million bacteria, 6 - 9 million actinomycetes and up to 2.8 million fungi per gram of soil and thatch. We should look a little more closely at these organisms:

**a) Bacteria:** these are single celled organisms, with no capacity to form larger organised structures. They are the most numerous organisms found in the soil. While it is possible that one or two species are pathogens (although this is rare in turf), the remaining species derive their nutrition from simple organic and inorganic materials found in the soil including pesticides and simple sugars. Some species extract nitrogen from the atmosphere for their own use. This N is added to the soil pool when these cells die and decompose. Other species are involved in the cycling of nutrients from one form to another. And some species are pathogenic on soil insects and nematodes. Being the simplest type of microbe in the soil, bacteria are often at the base of the food chain, being used as food by higher organisms.

**b) Fungi:** the vast majority of fungi are saprophytes and only a few are pathogens. Fungi have cell walls similar to plant cells, but lack chlorophyll. Mostly they source their nutrients and carbohydrates from soil and organic matter, but some species parasitise living plants and even nematodes or other soil microbes. Fungi are multi-celled organisms, and grow by producing fine strands called hyphae.

**c) Actinomycetes:** these have been described as a cross between bacteria and fungi, or branched bacteria. They produce a slender, branched hyphae similar to fungi, but are much smaller in size and extent. Most are saprophytes with particularly good ability to decompose lignified, resistant organic matter. Some species are nitrogen fixing (eg: Frankia), and others may cause diseases in plants, although no turf diseases are noted.

**d) Nematodes:** this group in particular has an important

role in soil health. We are familiar with Plant Parasitic Nematodes (PPNs), but there are many species of beneficial nematodes, including Entomopathogenic Nematodes (ENs) that kill insect pests, Predatory Nematodes (PNs) that eat other nematodes, and general beneficial nematodes (BNs) that eat fungi, bacteria, actinomycetes and organic matter. A healthy soil should contain all these, and the law of the jungle keeps them all in check. An application of Nematicur, however, will kill all nematodes, not just the PPN targets, and the soil nematode balance will be well out of whack for some time.

**e) Others:** there are various forms of microflora (eg: algae) and microfauna (eg: worms, springtails and other insects) that colonise the soil, some affecting turf, others beneficial in reducing thatch and suppressing disease causing organisms.

Soils with a healthy, active and diverse microbial population may be suppressive to diseases, particularly soil-borne diseases. The mechanisms for this include:

**a) Food Source Competition:** where the beneficial microbes compete with potentially pathogenic organisms for nutrients and carbohydrates. This competition ensures that no individual species dominates the population. There is also evidence that potential pathogens are less likely to infect plants when actively competing for soil food resources.

**b) Antibiosis:** the production of antagonistic materials such as enzymes and antibiotics that prevent the growth of competing organisms. For example a prevalent actinomycete, Streptomycetes, is known to produce anti-fungal and anti-bacterial compounds that suppress its competitors in the soil. One particular fungal species, Trichoderma, has been shown to suppress a number of turf pathogenic fungi, including Rhizoctonia solani, Sclerotinia spp, Fusarium spp. and Pythium.

**c) Mycoparasitism:** the diverse species of microbes in the soil often attack and eat each other. ENs and PNs are good examples, but many bacteria and fungi also kill and 'eat' other microbes in the soil.

These effects make the soil 'suppressive' which means that the population remains balanced, and pathogens and pest populations are not as likely to explode and dominate. Non-suppressive soils, such as new sand-based greens, often experience dramatic disease (eg: Take All, Brown Patch, Pythium) and plant parasitic nematode problems in their first few years. This is especially true if the surface was fumigated before planting. Nutrient imbalances in these greens can contribute to the problems. It can take several years for organic matter to build up and for the full diversity and activity and balance of the microbial population to stabilise.

There is quite a lot of interest in the inoculation of turf surfaces, especially sand-based surfaces, with beneficial micro-organisms. Some of these species infect the plant

roots to form a symbiotic relationship (eg: mycorrhizae), while others are free-living in the soil with various roles such as thatch reducers (eg: Bacillus spp), or nitrogen fixers (eg: Azospirillum spp), or pathogen-suppressors (eg: Trichoderma spp), or cross-protectors (eg: Psuedomonas spp) which encourage the plants to become more resistant to disease.

It's all very well adding such products, but will they survive? One technique (the Bioject System) involves brewing up the beneficial organisms in a nutrient culture and then injecting them into the irrigation water so that the microbes can be added as frequently as you want. Another school of thought suggests that the right microbes will find their way into the turf, but need encouragement with the right type of soil conditions (ie: neutral pH, and good levels of oxygen and moisture) and the right nutrition. Simple carbohydrates such as fructose, molasses and ordinary sugar are used specifically to encourage bacteria. Being at the bottom of the food chain, increasing bacterial numbers has the potential to increase microbial activity right up the line.

Dusting is one technique that can improve the soil conditions for microbes, and the benefits in improved thatch decomposition and reduced disease damage has clearly been demonstrated.

### Further reading:

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**Harris, J. (1992):** Topdressing Greens with Bacteria? TurfCraft Australia, May 1992. p 15.

**Nelson, E.B. (1992):** The biological control of turfgrass diseases. Golf Course Management, April 1992.

**Nickson, D. and Ford, P. (2003):** Dusting of golf greens in Victoria. Victorian Golf Association report. [www.golfvic.org.au](http://www.golfvic.org.au) link to Resources, Turf trials.

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## NATIONAL TREE DAY - LAKELANDS GOLF CLUB

**N**ational Tree Day is Australia's biggest community tree planting event which is aimed at inspiring and educating Australians to actively care for our unique land and create future generations of committed environmental custodians. This year's event, held on Sunday 2 August, saw more than a million native trees and shrubs planted at over 3,000 sites around the country. This wonderful achievement is the result of thousands of schools, community and green groups, as well as hundreds of local councils who facilitated tree-planting projects in their local area.

Lakelands Golf Club located on Queensland's Gold Coast participated in this years event by organising a working bee of members, families and friends. Led by golf course

superintendent Phil Soegaard, approximately 120 people turned up for the day, planting in excess of 300 plants.

When speaking to Phil he stated "the day was a great success with a variety of native plants being used including Grevillea's, Melaleuca's, Callistemon's, Lomandra's and Juncus. We had Paul Gale from Sea FM MC the day which included a sausage sizzle, lucky door prizes, face painting for the kids and a jazz duo for entertainment. It was a great community based day which created some positive environmental PR for the club."

For anyone interested in participating in next year's event, information can be gained via the National Tree Day website at [National Tree Day](http://NationalTreeDay.com.au)



# AGEF SUPPORTER PACKAGES

The Australian Golf Environment Foundation (AGEF) has a range of supporter packages to suit corporate, club and individuals that may wish to contribute to fostering future research and knowledge into golf and the environment. For more information on how to become involved with the AGEF, contact John Geary at the AGCSA on (03) 9548 8600 or email [jgeary@agcsa.com.au](mailto:jgeary@agcsa.com.au)

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