



## The Green Challenger

**Willunga Hillsface Landcare Group**

Working towards a healthy, vibrant and sustainable Willunga Basin

Official Newsletter  
of the  
Willunga Hillsface  
Landcare Group

Spring 2013

# Tarantula venom: a new selective, effective edible insecticide

Insecticide resistance is the quieter, lesser-known relative of antibiotic resistance. Anyone who has been to a hospital recently knows about antibiotic resistant bacteria. But how many people think about insecticide resistance when they spray their home garden with insecticides?

In the journal PLOS ONE, our research group has published the first directed-discovery research programme for a new, environmentally-friendly insecticide from the venom of a native Australian tarantula.

Although it is no surprise that spider venoms kill insects, this work is particularly exciting because it is the first time scientists have done oral screens to find new insecticidal venom components...

Perhaps most importantly, OAIP-1 is synergistic with imidacloprid, a currently available insecticide. By using our OAIPs in tandem with existing insecticides, we will be able to better control insect pests. This will be an especially effective approach for insects that are already resistant to conventional insecticides.

### Targeting the bad guys

Determining the degree of interaction with non-target organisms will be an important next step for our work. Minimised toxicity to beneficial insects has become an

*Continued on Page 7*

Come to Willunga on  
**Wednesday, October 16th**  
at 7 pm for a 7.30 start

to see and hear how

## **BIOCHAR BENEFITS AGRICULTURE and ENVIRONMENT**

at the

**Willunga Environment Centre**  
**18 High Street, Willunga**

**Presentation by Greg Butler**

*Greg graduated from the University of Adelaide with Honours in Organic Chemistry. He's a Life Member and former President of the Adelaide University Science Association*

*A short Annual General Meeting of the Willunga Hillsface Landcare Group will be held prior to the talk and a light supper will be provided at the end of the presentation*

**Registration essential:**

Phone 8556 4188 or email [regreen@chariot.net.au](mailto:regreen@chariot.net.au) to register

## Editorial

On 21st June I went to Freeling on the edge of the Barossa Valley, courtesy of the NRM to a Biochar field day which I found very positive and encouraging.

The main speaker was Greg Butler from SA No-Till Farmers' Association. He made a great presentation and was aided by a man that's been working on the machinery side of producing Biochar. (To find out more about Greg, go to: [www.linkedin.com/pub/greg-butler/28/59a/b69](http://www.linkedin.com/pub/greg-butler/28/59a/b69))

We learnt that biochar could be made from almost any waste organic matter, including chicken manure which really surprised me! Naturally, the material used to manufacture the Biochar has an effect on the finished product.

Samples of pelleted and crushed Biochar were handed around. We went out to a local property where grain growth trials were taking place using varying amounts of fertilizer, Biochar and seed which had all been planted in the same furrow. The crop was only between 75mm and 100mm high, so it was really too young to draw definite conclusions. The trials are ongoing. It was a very interesting day and was attended by around 30 people.

As part of the National Tree



Some of the Enviro Kids hard at work planting

Day for Schools on July 26th, I helped with the planting that took place at a property on Edwards Road.

A group of children known as 'The Enviro Kids' from Willunga Primary School, together with teachers and volunteers combined to plant a good mixture of trees and shrubs on a truly beautiful winter's day.

Spots had been sprayed out previously to guide with the planting and to aid survival rates. The site was sloping, but, considering the amount of recent rainfall I was surprised by how dry some of the



Property owner Sarah Crabb with Enviro Kids helping with the planting

sites were.

Thanks to Karen Stroot for the accompanying photos.

An article I saw recently by David Holmes, Senior Lecturer, Communications and Media Studies at Monash University entitled "Four Hiroshima bombs a second: how we imagine climate change," he states that... "the problem with global warming is that with that much heat going into the oceans, every day is Judgement Day."

The article I refer to is too long to include in the newsletter this time, but it's worth a read and can be found at: <http://theconversation.com/Four-hiroshima-bombs-a-second-how-we-imagine-climate-change>

Another article seen recently was entitled: "Hottest 12-month period confirmed – so what role did humans play?" The following is a short quote from this article: *In late June this year, our scientific study published in the journal Geophysical Research Letters showed human-caused climate change substantially increased the likelihood of the very hot 2013 Australian summer. Human influences on the climate system increased the chances of our record hot summer by more than five times.*

The full article is at: <http://theconversation.com/hottest-12-month-period-confirmed-so-what-role-did-humans-play->

**We are still looking for a volunteer to take on the job of Secretary. This is not a very onerous position as we only have committee meetings 11 times a year and write very few letters.**

**Another person's input at meetings would also be appreciated as our numbers are often only just above quorum requirements. Please consider!**

We can make the thesis regarding the bird study available electronically. If you would like a copy, please email me and I will send it:

[2garfy94@gmail.com](mailto:2garfy94@gmail.com)

# REGREEN THE RANGE REPORT

In August last year the Landcare Group approached the Adelaide University to see if it was possible for an under graduate student, wishing to do an honours project, could undertake a survey across the Willunga escarpment to determine which bird species were utilizing the revegetation and woodlots the Landcare Group have established.

To the Group's delight a student agreed to conduct the study under the supervision of David Paton. The study looked at the use by birds of the revegetation and woodlots and compared this to the bird species that were found in remnant vegetation on the escarpment.

Six sites in each of the three different vegetation types (18 sites in total) were surveyed stretching from Sellicks Hill to McLaren Flat. The surveys were conducted from the end of October to mid-December.

Results obtained from the study were both surprising and quite exciting. The revegetated sites had the highest mean species richness of 19 different bird species, 10 of which have been classed as declining species, the remnant vegetation had a mean species richness of 16.5 different species, 13 of which are classed as declining, and the woodlots had a mean species richness of 13 different bird species, 8 of which are classed as declining. Overall the remnant vegetation had the most species present with 50 different bird species observed over all of the sites, the woodlots had 38 different species and the revegetated sites had 37 different species present. The remnant vegetation had the most species (11) that were unique to the remnant vegetation, with four of these classed as declining.

The results obtained from this study provide great encouragement for the Landcare Group to continue and expand the Regreen The Range programme. From this

study the group has some positive results with which to modify and add components which are currently missing from the revegetated sites. The large number of declining bird species that are using both the revegetation and the woodlots gives impetus to the group to try to attract further funding for the programme in the knowledge that the on-ground works being undertaken across the escarpment are making a difference in a positive way and is assisting with the addition of much needed habitat for a number of bird species that are vulnerable to further decline and could possibly be lost to the region altogether.

The Landcare Group have continued to undertake the RGR planting programme across the hillsface this winter with three properties planted with conservation planting along with the continued programme of increasing the biodiversity of planting already done.

A total of 15ha was planted across the three properties with two of the landholders new to the RGR programme and one landholder expanding the conservation planting established on the property some years ago.

It's encouraging to see landholders who participated in the programme previously still enthusiastic to continue to participate in the programme now. It is also pleasing that the Landcare Group is still able to attract new landholders to participate in the programme.

In areas where the conservation planting has been established for over ten years, another 30 enclosures have been constructed and planted out with species that were not in the original programme. This will bring the number of different species in these areas to over seventy, with the aim of establishing over one hundred different species by the end of the funding grant.

The Landcare Group is also continuing with the threat abatement

programme across the Hillsface with funding provided by the AMLR NRM Board.

The Group has managed to remove woody weed threats from the majority of the remnant vegetation across the hillsface stretching from Bangor Road to Pennys Hill Road. The group's aim is to link all properties with remnant vegetation across the Hillsface and remove invasive woody weeds that threaten the integrity of the remnant vegetation.

WAYNE LAWRENCE

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## Penguins can't fly...

Penguins can't fly and a skydiver always falls to the ground. In our minds these are both statements of fact. There is nothing unclear or uncertain about them.

If asked, "Why are these facts so?" We would have no difficulty explaining them. It is obvious that penguins cannot fly. They cannot generate enough lift to support their weight. Similarly, a skydiver is going to hurtle toward the ground when jumping out of a plane. It's called gravity...

As scientists continue to make observations and the body of evidence becomes more and more consistent, the confidence in a scientific theory increases. But in science, absolute 100% certainty is never obtainable because we can never have an infinitely large body of evidence. The best science can do is to provide virtual certainty by weighing up the consistency using a large amount of evidence.

As with any scientific theory, maybe human-caused climate change is not happening. But then again, maybe penguins are just choosing not to fly because they are afraid of heights!

**Edited.** Full article available at:

<http://theconversation.com/penguins-cant-fly-and-humans-are-causing-climate-change-how-scientists-build-theories>

# Profits from forests? Leave the trees standing

In debates about climate change and the mitigation of greenhouse gas emissions, there is a widely-held belief that market mechanisms, like the Labor government's carbon pricing scheme, will reduce emissions in the cheapest possible way. As a matter of pure theory, this is correct but, in practice, it depends on what is included and excluded from the scheme and how it is designed.

One of the most commonly overlooked sources of carbon abatement is public native forestry, which is currently excluded from the carbon pricing scheme and the government's offset scheme, the Carbon Farming Initiative. This is despite the fact that stopping the harvesting of public native forests is one of the cheapest ways to reduce Australia's emissions.

## A struggling industry

For the past two decades, the Australian native forest sector has been in decline, primarily because of increased competition in domestic and international wood product markets. Starting in 2008, an already bad situation took a turn for the worse as the global financial crisis choked-off demand for native woodchips and solid wood product consumption slumped.

Since then, the native woodchip sector has struggled to stay afloat, a fact reflected in the financial performance of state forest agencies. For example, over the period 2009 to 2012, the Forests Corporation of NSW (formerly known as Forests NSW) made a total net loss before tax (excluding net fair value adjustment, asset revaluation and impairment of assets) of \$85 million, or \$21 million per year.

In total, the native forest sector, which takes in growing, harvesting, processing and manufacturing wood products, now accounts for a mere 0.1% of Australian Gross Domestic Product — roughly \$1.5 billion per year.

The emergence of carbon markets offers an alternative use for native forests. Rather than chopping them down for little financial return, the forests could be left standing in order to generate carbon credits.

## Opportunity for carbon credits

The Australia Institute recently conducted a financial analysis on the Southern Forestry Region of New South Wales, which compared the net financial benefits from harvesting and processing native logs to the net financial benefits that could be derived by using the forests to generate carbon credits.

For the period 2014-2033, the Forestry Corporation of NSW and relevant hardwood processors were estimated to suffer losses of between A\$40 million and A\$77 million.

In contrast, stopping harvesting could generate 1.7 million carbon credits per year for the NSW Government over the period 2014-2033, and the sale of these credits (accounting for transaction and management costs) is likely to provide net benefits of approximately A\$222 million.

The simple message is, if the public native forests of this region continue to be used to produce woodchips and sawn wood, the industry and taxpayers will lose money. If the forests are used for carbon credits, they are likely to return a profit for the community.

## Some uncertainties

Of course, any analysis of this nature comes with caveats. For starters, conditions in domestic and international wood product markets could improve, or new markets might emerge, reviving the fortunes of native forest operators. This is possible but unlikely.

There is also the challenge of accessing carbon credits. After recent changes to international

accounting rules, stopping or reducing harvesting in native forests will now provide credits that can be used by the Australian government to meet its international mitigation commitments. However, as noted, projects involving stopping harvesting in public native forests are not currently eligible to generate carbon credits under the Carbon Farming Initiative. The federal government is expected to change this rule in the near future and thereby ensure that state governments are able to benefit from improvements in forest management practices.

Finally, even if the Carbon Farming Initiative is expanded to include these projects, there are uncertainties surrounding the calculation of carbon credits and the price they will attract in relevant markets.

Despite these uncertainties, the analysis shows that even under adverse circumstances, using the forests for carbon credits is likely to bring greater financial returns than continued harvesting.

While debate about cutting greenhouse gas emissions usually focuses on the energy sector, the reality is that some of the cheapest ways we can cut emissions is through changes in the way we use our forests and landscapes. Preserving native forests is no longer just for tree huggers. The time has come when leaving forests standing makes sense for purely financial reasons.

Author: Andrew Macintosh, Associate Professor ANU College of Law and Associate Director of the ANU Centre for Climate Law and Policy at Australian National University

<http://theconversation.com/profits-from-forests-leave-the-trees-standing>

*The change of government could turn this theory on its head. Time will tell.*

BRIAN

# Look to the trees for truly green technology

**G**reen alternatives such as wind and solar may be touted as the solution to our environmental problems such as climate change, but how green are they really?

Wind and solar rely on technologically-sophisticated industries and infrastructure including rare earth batteries, highly-processed composite building materials, computer controlled switching and balancing programs and continuous maintenance.

There are natural alternatives to such technologies that are arguably “greener”. So, why aren’t we looking to make our technologies truly green?

## Wind, solar... wood

Fire is probably the greatest discovery of humankind, if not the discovery that set us on the path to becoming civilised and social.

Wood still fuels the energy needs of millions in Africa, China and India. Perhaps surprisingly, it also fuels the energy needs of many thousands in Europe, Canada, the US and even Australia. Why do we in the developed world seem to have forgotten its power?

Wood fuel has numerous advantages over wind or solar. Wood can be grown right where it is needed – even along the boundaries of residential properties, around commercial enterprises or even in urban and peri-urban parks.

While it is growing, trees look good and provide a temporary home for birds and other wildlife – certainly not something that can be said for every wind farm.

A continuous supply of winter home heating can be produced by selecting relevant tree species (or group of species) and progressively planting them around a “quarter acre” residential block. Each year, one seventh of the boundary could be planted and after seven years the owner could begin harvesting, drying, burning and replanting the

oldest trees.

A suburban house with over one dozen trees, planted at different times around its boundary, which could grow over half a tonne of firewood every year. Google Earth

Changing the trees species and the harvesting rotation lengths could allow co-production of products such as honey or flowers without ultimately endangering fuel reserves. Such a system would however require some management. Neighbourhood groups could coordinate their individual plantings and use of the trees to encourage community projects, including planting in parks, that benefit from trees at different stages of their life or allow longer life spans for selected trees.

Every 27 tonnes of carbon sequestered biologically in soil represents 100 tonnes of CO<sub>2</sub> removed from the atmosphere.

DR CHRISTINE JONES

Such a system could continue pretty much indefinitely and may rightly be classified as sustainable yield: renewable energy with very little need for unnatural elements or practises.

But somehow the use of wood as a fuel source is specifically excluded from a range of renewable energy and environmental improvement schemes, despite its advantages.

## Timber!

The timber industry could benefit from similar rethinking.

Plantations are gaining a reputation as the “green” option for the production of solid timber for use in construction or high-value products.

The management required in plantations includes ploughing, ripping, spraying and fertilising for

preparation, followed by more spraying and fertilising over time. Exotic species are used to avoid losses from local pests and diseases. This intensive management is designed to ensure that final harvest revenues don’t happen so far into the future that the “time cost of money” erodes the net profit.

While not as intensive or invasive as agriculture, and orders of magnitude less intensive than the industries associated with plastic, steel or concrete products, plantations are never-the-less more intense and less natural than native forest management.

In native forests, local or endemic species are kept even though growth is slower. Fertiliser is not applied, partially because its cost cannot be justified but also because the local species are commonly adapted to local soil fertility. Similarly, weedicide application is rare.

Producing wood products in such a forest is slower, and to produce the same amount requires a larger area. One hectare of intensively managed plantation can produce the same amount of solid wood product as 30-to-50 hectares of native eucalypt forest.

The managed native forest will have a greater diversity of tree sizes and stages, and only relatively small areas of disturbance. The vast majority of the forest simply grows and changes in a natural way, which is orders of magnitude better for birds and animals.

There is a strong branch of forest management in Europe called “nature-based forestry” or “near natural silviculture” that attempts to make human induced disturbances during harvesting or regeneration as close to natural-like conditions as possible. Visitors need special training to detect the difference between the human induced

*Continued on Page 7*

# SHRUBS SOUGHT TO PROVIDE SUSTAINABLE GRAZING

By Jeremy Story Carter, ABC Rural

Australian native shrubs are being investigated as a potential solution for sustainable grazing.

The broad-ranging Enrich project, which consists of researchers across several states, has sought to identify local species that perform well in both a grazing and environmental capacity.

Associate Professor from the School of Animal Biology at the University of Western Australia, Phil Vercoe, is one of those involved with the project. He believes native shrubs could play a part in resolving the feed issues for livestock producers.

“Particularly in South Australia, it’s fairly clear during summer and autumn that there is a big feed gap for livestock production,” Mr Vercoe said.

“There’s just very little feed available, if any, so you tend to supplementary feed those animals because there is nothing else for them to eat. It becomes a bit of a moonscape throughout WA at that time of year, if you go for a drive out in the country.”

In searching for a solution, Mr Vercoe says the researchers focussed their gaze on indigenous plant species.

“We started to think about the opportunity to look at some of our Australian native shrubs. So plants that would grow through summer and autumn and stay green, and provide hopefully a reasonable amount of feed during that period, so that we could reduce the amount of supplementary feed that was required.”

Having identified the benefits as a feed source, the project began expanded as the full extent of the environmental benefits of using native shrubs in agriculture land became apparent.

“Shrubs can play a whole stack of different roles. Everything from animal production objectives through to natural resource management and sustainability goals,” he said.

“So by putting in plants that had deeper root systems and different root systems to the traditional annual pastures that are grown, we had plants that could not only provide feed for animals, but also play a role in holding the soil together and

*One man cannot stop the dust from blowing, but one man can start it. Anon.*

stopping run-off. There’s a great value in having a shelter belt, and if that shade and shelter actually provides feed as well, if it’s an edible shelter, that’s a benefit as well.”

The project screened over 100 native plants, including common varieties such as saltbush, with a focus on those that offered salt and drought tolerance.

“Of course, our Australian natives are a pretty good source of [salt and drought tolerance] because of how they’ve evolved and where they’ve evolved to our soil types and climatic conditions. That’s why we wanted to target those species first.”

The difficulty from there for the project team was how to narrow the species down to a select few that could feasibly be employed by producers.

“It is the \$64,000 question,” he laughed.

“To me, the beauty of this system is that not every plant in the system has to do the same thing. There’s no one, silver bullet plant. But in combination, if we value these plants for different reasons,

then we get a little system there that not only provides the nutritional requirements of the animal at certain times of the year, but actually deals with the climatic conditions, holds the soil together – all those sorts of things.”

As a feed source, Mr Vercoe says native shrubs have the potential to provide a range of benefits for the animal and their surrounding environment.

“Because [the native shrubs] are wild, they still have quite a lot of secondary compounds that are part of their feed – what the animals take in. Things that might help reduce the need for drenches for intestinal worms, for example. Or things that might influence gut health,” he says.

“Obviously sheep and cattle are ruminants, and there’s a lot of interest in methane at the moment, so these secondary compounds can also influence the microbial ecology in the rumen, that is responsible for the methane that is produced, but also the productivity of the animal; how much energy it gets out of that feed and how much protein.”

The project has now reduced the number of species to 15 native shrubs, planting them on a larger scale in field sites in Western Australia, Victoria, New South Wales and South Australia. Mr Vercoe says that, ultimately, the shrubs are likely to be of most benefit if implemented on more challenging terrain less suited to agriculture production.

“If you plant them in the 10-15 per cent of the marginal area of your farm, so not your best cropping land... then that’s where you get the most benefit in terms of farm profits.”

[abc.net.au/news/2013-08-19/sustainable-grazing/4895968](http://abc.net.au/news/2013-08-19/sustainable-grazing/4895968)

# Look to the trees...

*continued from Page 5*

changes and the natural ones.

But, like high-technology systems, plantations are seen as the “green” alternative to low-technology native forest management.

## Green values

The “green” alternatives market has been captured by systems that require high levels of technology, energy inputs and processing.

If the ultimate green goal is to leave nature altogether, replacing nature-based solution with technological ones – perhaps ultimately living in space stations powered by solar cells measured in kilometres?

Machines could make our air, water and nutrients out of raw mineral stocks mined from asteroid belts without impinging on natural earth at all. A “green” but precarious future totally reliant on sophisticated technology.

To be green and natural, we must re-engage with nature. Recall battles over battery chickens. The battle against that industry could not have commenced until the connection between the product (the egg) and the system (chickens in backyards or battery farms created by us) was re-established. Many urban children have never seen a farm or even touched a chicken.

Similarly a battle for green and natural alternatives can only be commenced once the connection between natural systems that produce goods and services are appreciated and compared with unnatural and energy demanding systems that they have been replaced by.

*Author:* Cris Brack, Assoc. Professor Forest measurement & management at Australian National University

<http://theconversation.com/look-to-the-trees-for-truly-green-technology>

# Deep soil stores more carbon than thought

By Flint Duxfield, ABC Rural.

A joint Australian-UK study has found that deep soils store up to five times more carbon than previously thought.

The research, conducted by scientists at Murdoch University, shows carbon is stored at depths of up to 40 metres.

The paper’s authors say the findings merit a reassessment of the current measurements used to judge soil carbon stores.

“This finding may have major implications for estimates of global carbon storage and modelling of the potential global impacts of climate change and land-use change on carbon cycles,” the paper says.

Professor Snow Barlow, from the National Climate Change Adaptation Facility, says the findings mean planting trees to sequester carbon may become a more profitable option for farmers.

“There may be value in actually putting those back to some form of woody vegetation which could sequester carbon, at the same time giving you those shelter and biodiversity benefits,” he said.

“In some places in the landscape, particularly Western Australia, that might give you some salinity benefits as well.”

## Tarantula venom... insecticide... *Continued from Page 1*

important feature of any new insecticide. These insects include pollinators (such as bees) and predators (such as ladybugs)...

Tarantulas live for 5 to 10 years or more, but their venom is so potent we only need small amounts to begin our discovery programme.

For future experiments and commercial products, OAIPs will be produced recombinantly in yeast by integrating DNA into the yeast genome.

Many human pharmaceuticals are regularly produced this way, including hirudin (an anticoagulant)



Supported by Adelaide & Mt. Lofty Ranges  
Natural Resources Management Board

18 High St., Willunga. Phone: 8556 4188

Open Mon.–Fri. 10 am–3 pm,

Sat. 9.30 am–1.30 pm.

## COMING EVENTS

**“Current state of  
World biodiversity,  
and our impoverished  
future life support  
system”**

**by Professor Corey  
Bradshaw on**

**Tuesday, 8th October  
at 7 pm**

**Professor Bradshaw is a  
leading expert in the field of  
ecological modelling**

*We are now using the notice board on the outer Eastern side of the building and public and community groups are invited to use the board. Please drop your pamphlets, etc. into the centre for display, and start looking to see what is there!!*

Registration essential:

Phone 8556 4188 or email

[info@willungaenviro.org.au](mailto:info@willungaenviro.org.au) to register

**Free supper provided**

and human insulin. Production in yeast is safe, cost effective, and can be carefully monitored.

We have discovered an effective, selective insecticide that can be produced on an industrial scale at an affordable price.

Given the scarcity of pest management products that have been developed entirely within Australia, our goal is to provide an Australian solution for a global problem.

Full article available at: <http://theconversation.com/tarantula-venom-a-new-selective-effective-edible-insecticide>

BRIAN.



PO Box 215  
WILLUNGA SA 5172

Meeting dates vary, but are usually held on Mondays monthly at 5 p.m. in the Willunga Hub, cnr. St. Peters Terrace, Willunga.

*All members are welcome to attend these meetings.*

If you prefer to receive your copy in PDF format (via email) please let me know at this address: 2garfy94@gmail.com.

- President:** John Campbell ..... 8556 2916
- Chairperson:** Kate Parkin ..... 8323 9275
- Treasurer:** Margaret Morris ..... 8556 2535
- Secretary/Regreen the Range Manager:** Wayne Lawrence . 0423 283 043
- Publicity:** Brian Visser ..... 8556 4292
- Committee members:** Ben Heyward ..... 8186 1607  
Paul McKenzie ..... 0429 095 314  
Brad Smith ..... 0423 283 043  
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**WILLUNGA HILLSFACE  
LANDCARE GROUP**  
Willunga Environment Centre  
18 High Street, Willunga

**MEMBERSHIP FORM**

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**Please return this form together with your joining or renewal fee to:**  
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*Do you wish to continue receiving the "Green Challenger" (Y/N)*