

A GOOD WEED



Newsletter of The Weed Society of New South Wales Inc.

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Formosa lily *Lilium formosanum*

The Formosa lily has become naturalised on the NSW coast & central tablelands. The flowering raceme may have from one to ten flowers. Read Bev Debrincat's article on pages 5 & 6.

Image: © Lawrie Greenup



President's Column



Welcome to a new year. The committee is keen to be proactive in ensuring that the society remains relevant to the general membership, and that we are able to continue achieving worthy goals. I would welcome feedback from any society member on initiatives that should be considered, or other ways in which the society can better serve the membership.

This year several major weeds conferences are being held. The International Congress will be held in China in June, and the Australasian Conference will be held in October. Society members should note that there are opportunities to apply for travel support from both the Society and from CAWS. Details are provided in this newsletter on how to apply. I would also encourage anyone who attends major functions to consider providing a brief report for inclusion in this newsletter.

I would also draw attention to the CAWS Medal for Leadership. This medal recognises the lengthy and influential career of someone involved with weeds. Details on previous recipients and the nomination process can be found on the CAWS website (www.caws.org.au). The society secretary would be glad to receive nominations over the next few months.

It is now several years since the last Weeds CRC (Cooperative Research Centre) finished. Since then, there has been \$15 million of federal funding provided as a stop-gap measure until a replacement entity (Australian Weeds Research Centre) could be formed. These funds were administered initially by Department of Agriculture and Forestry (DAF), who distributed around \$4 million in funding for a range of short term projects. More recently, Rural Industries Research and Development Corporation (RIRDC) have administered the distribution of the remaining funds on projects due for completion by mid year.

Unfortunately, there has been limited attention focused on what will happen beyond mid year, either in terms of on-going federal funding or the realisation of a new weeds research centre. The challenge for all weeds workers is to ensure that weed management retains a strong profile.

The NSW Government has recently announced \$2.5 million program for invasive weed control on government land. Weed control, monitoring and coordination across 36 million hectares of NSW Government land will be targeted with this initiative. This follows on from the \$8 million regional Weeds Action Program and the roll-out of 13 regional weed management projects across the State, demonstrating an increasing awareness within state government of the importance of weed management.

The society executive has discussed the recently formed Invasive Species Research Chapter for the Ecological Society of Australia. There may be scope for linkages to be built between the two organisations, as understanding the ecology of weeds is the first step in developing successful management plans. More detail on this subject is provided in this newsletter.

Happy Weeding.

Rex Stanton (Dr)
President

New Members

The Society would like to welcome the following two new members:

Christopher Indyka

Ecobiological, Warners Bay.

Md. Asaduzzaman

CSU PhD student.

Members' benefits include:

- a quarterly newsletter
- reduced registration fees for Society functions,
- reduced membership fees for students, and
- the opportunity to become involved in all of the Society activities.



Major Project Funded by our Society

Transferring Significant Weed Collection from University of Sydney to National Herbarium of New South Wales

The society's new project, "Moving part of the Weeds Herbarium from the Department of Agronomy & Horticultural Science, University of Sydney to the National Herbarium of New South Wales, Royal Botanical Gardens, Sydney", has been underway since late January 2012 with over 200 herbarium boxes examined. This examination is a preliminary sort listing the contents of each box, culling inadequate or damaged material and re-arrangement of specimens, if necessary.

Following the initial sorting all specimens will be entered on a database, a requirement of the National Herbarium of New South Wales.



Peter Michael inspecting a box of *Xanthium* specimens during the initial sorting to cull out inadequate or damaged samples. The student collection, which is to be retained by the University, is in the white herbarium boxes in the background.

The Weeds Herbarium has a collection of *Echinochloa* of world-wide significance and an outstanding collection of *Oxalis* which will be the first to be entered into the database. Other weedy genera include *Amaranthus*, *Conyza*, *Gnaphalium*, *Gamochoeta*, *Senecio*, *Xanthium*, *Onopordum* and *Verbena*. The herbarium, consisting of some 4 000 to 5 000 specimens, was put together from 1970 onwards by Dr. Peter Michael including not only his own collections but also from students and other sources.

A formal contract, listing terms and conditions, was drawn up between Dr Peter Michael and the Society. This was to ensure transparency and good governance. One of the conditions of the contract was having written permission from the University of Sydney to allow the transfer of the specimens and a formal acceptance from the Royal Botanical Gardens, Sydney, to receive them. Both agreements have been obtained.



Mike Barrett is assisting Peter in this work.



Peter Michael explaining to Jim Swain the difference between a native *Senecio* and *S. madagascariensis*.





Parthenium Weed New Infestation found in the Riverina Paula Bosse

An extensive infestation of Parthenium weed, *Parthenium hysterophorus*, has been discovered on the Conargo-Jerilderie Rd by Geoff Portbury (Jerilderie Shire's Weeds Officer), on the 1st February 2012. The infestation starts approximately 3km west of Jerilderie and extends for a further 7km towards Conargo. The main infestation is on both sides of the road extending west of a rather rough patch of road. It could be that a vehicle has hit the rough patch and shaken the seed loose. Many of the plants discovered were in full flower. This infestation has been controlled using mechanical removal and chemical treatment.



Parthenium weed *Parthenium hysterophorus*.

Image: Geoff Portbury

Parthenium weed has not been located in the Riverina since April 2003 according to the Riverina's New IncurSION Database. Parthenium weed has been found previously at:

- 1995 Narrandera, Newell Highway
- 1999 Carrathool, Kidman Way
Carrathool, Mitchell Road
Carrathool, Sloans Road
- 1980 Central Murray County Council, Cobb Highway
Jerilderie, Newell Highway
- 2001 Urana, Newell Highway
- 2001/2002 Wakool, Tueloga Road
- 2003 Jerilderie, Newell Highway.

One of New South Wales' most serious weed threats Parthenium weed is a Class 1 (State Prohibited) noxious weed.

It is a vigorous coloniser of bare ground, degraded pastures and disturbed sites being a fast growing annual plant with prolific seed production. Once established, Parthenium weed very quickly builds a huge seed bank in the soil which makes eradication difficult and expensive.

Parthenium weed contains powerful allergens that cause a range of human health problems, including asthma and severe contact dermatitis in sensitised individuals.

It is a threat to agriculture because it is unpalatable to livestock and competes with pastures and crop seedlings. Livestock carrying capacity is significantly reduced in areas where it becomes established and it adds to weed control costs for grain producers.



Riverina's Rapid Response Plan in Action!
Cooperative arrangements - neighbouring Weed Officers assisted with the surveillance and removal of the recent incursion of Parthenium weed.

Clockwise from top left: Alan Gundrill - Lockhart Shire, Rodney Anderson - Urana Shire, Geoff Portbury - Jerilderie Shire, Patrick Minogue - Corowa Shire

Image: Neil Hibberson

Further information:

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Parthenium Weed 'Wash-down Bays'

A step in reducing the weed's spread
from Queensland

Jonathan Lawson

Parthenium weed is declared a Weed of National Significance (WONS). It currently infests more than eight million hectares of land in Central Queensland and has the potential to infest much of the eastern half of New South Wales.

Grain harvesting machinery is recognised as a major potential carrier of Parthenium weed seed into NSW from Queensland and, on average, 600 headers enter NSW from Queensland each year.

A national strategy was proposed in 2001. Its vision is that "Parthenium weed is confined to Queensland and its social, economic and environmental impacts are reduced to a minimum". One step in achieving this national vision is the establishment of clean-down sites at the main border crossing points of Goondiwindi, Mungindi, Hebel and Tallwood. Goondiwindi and Mungindi have blow-down and wash-down facilities; Hebel and Tallwood had dry facilities only which require the contractors to have their own cleaning equipment.



Mungindi Parthenium weed wash-down facilities with banded concrete slab and shed.
Image: Jonathan Lawson

Until 2010 Goondiwindi was the only blow-down and wash-down site in operation but the increase in crossings at Mungindi necessitated the building of an additional wash-down site.

The building of the Mungindi wash-down facility was funded by the Border Rivers-Gwydir Catchment Management Authority in collaboration with NSW Department of Primary Industries (NSW DPI), Northern Inland Weeds Advisory Council and Moree Plains Shire Council.

Inspectors employed by NSW DPI at the Queensland border carry out mandatory inspections of grain harvesting machinery under the Noxious Weed Act. On average, over 200 headers cross the border at Mungindi and harvesting operators have welcomed the wash-down facilities and this is reflected by the increase of header crossings at Mungindi since 2010.

Most contractors like the blow-down and wash-down facilities, blowing the headers down first and finishing with a wash down. It's better if they present clean equipment the first time, otherwise they are made to wash down again and present the headers for inspection. This takes time so it's in the contractor's best interest to present clean equipment at the first inspection. The wash-down bay helps them to do that.

The wash-down bay is banded and the water and plant residues, including seeds, are collected in a sediment basin. The sediment basin is sprayed regularly with a herbicide to kill emerging seedlings.

Further information:

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Border Rivers-Gwydir CMA
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Young plant of Parthenium weed *Parthenium hysterophorus*.
Image: North Coast Weed Advisory Committee



Consequences? Bev Debrincat

While driving recently (February 2012) from Sydney to Crescent Head, along the Pacific Highway, the clumps of flowering Formosa lilies with their dramatic big white flowers caught my eye and started me wondering about the consequences of our actions.



Formosa lilies on the roadside of the Pacific Highway between Port Macquarie and Kempsey, NSW.
Image: Bev Debrincat

The Formosa lily or more correctly *Lilium formosanum* is originally from Formosa, now known as Taiwan. It has a very typical trumpet-shaped lily flower, white inside with a pink, purple or even brownish tinge on the outside. Flowers appear late summer. The flowering stems are erect and can reach from 1.2 to 1.8 metres in height. The leaves are alternate (but sometimes may be opposite or even whorled), on an unbranched reedy stem and are glossy, long and narrow. The above ground part of the plant is annual whereas the bulbs are perennial.

These plants produce long cylindrical seed capsules (5-8 cm long) with flat disc-shaped seeds. The seeds are dropped over a period of time from the capsules around the plants. This keeps new plants close to the parent plant. Some may be washed further away with rain water picking up the seed and moving it.

The Formosa lily has underground scaly bulbs and sometimes produces bulbils in the leaf axis, which also drop near the parent plant when the stems are moved by the wind.



Formosa lily, *Lilium formosanum* flowering inflorescence.
Image: Bev Debrincat

Observing the plants along the road-side it was obvious that the lilies were in clusters some much bigger than others and they also appeared intermittently along the centre of the dual carriage-way, often as a single plant. They were more numerous on the older sections of the highway, with none apparent in the newer sections. Around the Gosford turn off there was a greater concentration. And along the older strip of dual carriage-way from Port Macquarie to Kempsey was the greatest concentration. How did they get there?

As these plants don't move by themselves far from the parent plant, they have obviously had some help.

Observing the sad white crosses along the Pacific Highway and knowing that lilies are a symbol of purity, peace and a popular funeral flower one wonders if the floral tributes of old have become the roadside weed of today.



Consequences? (Contd)

Once the first little cluster of plants grew some of the seeds and bulbils may have waited patiently for a car to pull up. Then, mixed with roadside mud, the seeds may have been wedged in the grooves of car or truck tyres. After a short or perhaps not so short journey these chunks of mud and seed may have been flicked off the tyres to find a nice new place to grow and to start a whole new little road-side colony for flowering lilies.

Think of the amount of road works carried out along the Pacific Highway over the years – how many maintenance vehicles, work trucks and graders etc may have also picked up seed or bulblets and deposited them in new locations along the road verges?

On this same journey I also observed striking yellow sunflowers along the road edge on the section of highway close to Wyong. Every couple of kilometres there was 1 or at most 2 plants with their happy yellow faces turned to the sun. Where did these come from? I had an image of a relaxed and happy family having a snack of sunflower seeds as they drove back to Sydney after a relaxing holiday. Every so often the spent seed capsules and the odd seed were flicked out of the window.....

Next time you are out driving or doing anything involving plants, flowers or other plant parts think about the consequences of our very simple and innocent actions.

References:

Flora of NSW – Editor Gwen J. Harden
Botanica – Publisher Gordon Cheers

Further information:

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Formosa lily seed

Image: Lawrie Greenup



NS4W a shady success!

Weed awareness messages from the NSW Department of Primary Industries weed awareness campaign have spread to new sites.

Car windscreen shades printed with one of the key messages from the current campaign ‘make a difference’ have been distributed across NSW. The Department made a special offer of sunshades for all local council weed professionals work vehicles in NSW. Requests for the sunshades were received from all over NSW and a total 175 sunshades were sent out!

The sunshades feature the key message ‘make a difference at work – vehicles, machinery, equipment and livestock can spread weeds’.

Spreading the weed message in a unique way these sunshades provide a highly visible space easily viewed by a lot of people and serves an important dual purpose of keeping the vehicles nice and cool!



Malcolm Ross with the car windscreen shade printed with one of the key message of the NS4W campaign.
Image: Robert Brooks

Further information:

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Is the Society's logo Scotch Thistle, Cotton Thistle or Heraldic Thistle?

Peter Michael (Dr)

In the Australian Weeds Research Newsletter No. 5, February 1964 p.34 I wrote a brief note as follows

“In Australia, the common name “ Scotch thistle “ has been used at the same time for a number of thistles including *Cirsium vulgare*, *Silybum marianum* and *Onopordum acanthium*. Botanists have commonly stated that the name “Scotch” is wrongly applied to *Cirsium vulgare* and that the “true Scotch or heraldic thistle” is *Onopordum acanthium*.

This, however, cannot be substantiated for the earliest representations of the thistle on Scottish coins are clearly of *Cirsium vulgare*. But, since these early times, the character of the heraldic thistle has changed. Undoubtedly the artists have been influenced by other thistles, real or imaginary. At present, the thistle, in its various representations, cannot be recognized taxonomically. The name “Scotch thistle”, should then, be used only for heraldic or other artistic impressions of the thistle.

If one wishes to use common names for the three thistles mentioned above, it is better to use spear thistle for *Cirsium vulgare*, variegated thistle for *Silybum marianum* and cotton thistle, the long-established English name for *Onopordum acanthium*.”

Unfortunately there were no references given. I had received a letter from the Regius Keeper of the Royal Botanic Garden, Edinburgh, Dr. H. R. Fletcher dated 11 June 1963 in which he referred to the thistle-head groat on a coin of James III's reign on which the thistle is clearly recognizable as *Cirsium vulgare*.

Dr. Fletcher also appended an extract from G. Johnston's The Natural History of the Eastern Borders pp. 130-132 (1853) in which he quoted lines from Burns who considered the rough Bur-thistle (*Cirsium vulgare*) to be the “Scotch thistle”.

“The rough Bur-thistle spreading wide
Among the bearded bear,
I turn'd the weeder-clips aside,
And spared the symbol dear.”

For those who are interested in seeing a drawing of a silver groat from the period 1471-c.1483, showing clearly heads of *Cirsium vulgare* see “What is the Scottish Thistle ?“ by J. H. Dickson and A. Walker in “*Glasgow Naturalist*” 20 (2) 101-121, p.107 (1981).

Further Information:

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Cotton thistle
Onopordum acanthium

Image: Zachi Ebenor
Flickr



Variegated thistle
Silybum marianum

Image: Ellis McAllister
Flickr



Spear thistle
Cirsium vulgare

Image: Lawrie Greenup



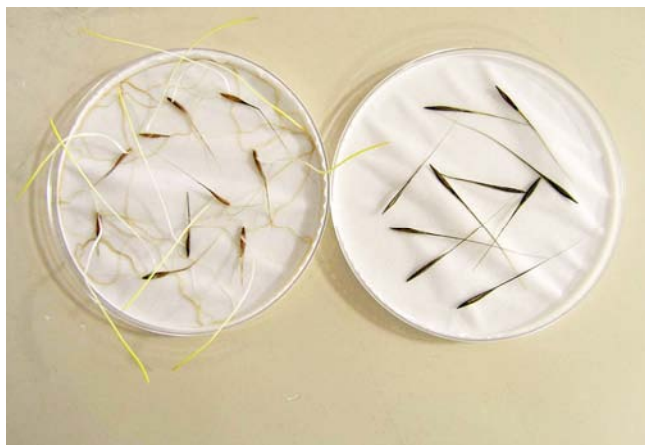
Adapt or Die

How grass weeds evolve to adapt to our farming systems

Professor Gurjeet Gill

Speaking at recent Grain Research and Development Corporation (GRDC) and Syngenta supported 'What's new in weed management workshops', Professor Gurjeet Gill, University of Adelaide, showed new data on how weed populations can adapt to survive our farming systems. His work showed how changing germination patterns in key 'southern' grass weeds of brome and barley grass enabled these weeds to escape control and prosper in our farming system. While these are not key weeds in the north, the principles of weed evolution are likely to also apply to weeds in northern farming systems.

Great brome, *Bromus diandrus*, and barley grass, *Hordeum glaucum*, plants in a continuous cropping paddock have changed their emergence patterns compared to the same species collected in fence lines no more than 50m away. These weeds used to have negligible seedbank dormancy and were thus well controlled by early season control tactics. Now they have been selected by our cropping system and have developed significant seedbank dormancy with a much later season emergence pattern that is likely to escape traditional early season control measures.



Great brome seeds collected from the same field and exposed to simulated autumn germination conditions. 100% germination of the seeds collected from the fence line (traditional population) and no germination from the infield sample as dormancy was not yet broken.

Seed samples recently collected from fence line populations are still behaving in the same manner with little to no seed dormancy and a single major early season flush.

This increase in seedbank dormancy in cropped paddocks appears to be a response to farming systems that have effectively controlled the 'typical' populations with early season strategies. This has selected individuals that germinate later in the season, after the knockdown application has been applied. Unfortunately there are no effective residual options currently available in cereals where these weeds are causing major concern. Thus growers in these areas are finding that they now need to apply more post emergent Group A and B selective herbicides, which are now under resistance pressure from these weed species as well.

The mechanism the plant uses to confer this dormancy is very similar in great brome and barley grass. In both species seed dormancy is broken by exposure to chilling with barley grass populations requiring longer exposure to chilling than brome grass. Interestingly, weed seeds from populations of these two weed species sampled from cropping paddocks need more cold days before they can germinate as compared to those from fence-lines of the same paddock.

Further information on brome or barley grass:

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Further information on management workshops:

'What's new in weed management workshop':

Mark Congreve
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Email: mark@icanrural.com.au



The application allows users to search, identify, compare and email photographs of weeds to their networks.

To download the App - www.grdc.com.au/apps



Torpedo Grass Get your lifejacket!*

Geoff Sainty

Torpedo grass, *Panicum repens*, flowers year round and grows to about 1.2 m high. Seed heads are 25 cm long and spikelets 2.2 to 2.6 mm long. Leaf blades are up to 25 cm long and hairy toward the base. The ligule is up to 8 mm long. It is most readily distinguished by rhizomes with tips and buds covered with hard scales, hence its common name.



Lower part of the leaf blade, leaf sheath and spikelets of torpedo grass.

Image: WEEDeck image(2004) © Geoff Sainty

This grass is summer growing and is found on the margins of wetlands and watercourses but can extend out into water and may form dense floating mats (GISD 2004). It is a major weed here and overseas. Plants are palatable to stock when young and are capable of surviving heavy grazing and trampling but there are more nutritious grasses for this environment (Waterhouse 1994). It is usually not planted as a pasture species although it is sometimes grown for stock fodder in parts of Asia (FAO undated).

Based on herbarium specimens *Panicum repens* is widespread on the NSW north coast and in south east Queensland. It grows in shallow water, alongside watercourses in ephemeral wet areas and in poorly drained pastures that remain wet for extended periods of time. It spreads mainly by fragmentation and by rhizome growth. Seed abundance and viability has been questioned (Holm *et al.* 1977, Langeland *et al.* 2008) and given the importance of this weed in Australia this probably needs study.

Torpedo grass is reported as a weed of 17 crops in 22 countries and considered one of the more serious grass weeds (Holm *et al.* 1977). There is uncertainty as to when it was introduced to Australia. The first collection for NSW, according to specimens at the National Herbarium of NSW, was made by G. Mort on 18 February 1954 (although according to records from the Queensland herbarium an E. Officer made a collection from southern inland NSW [Zara, Wanganella] in March 1917). The first collection for Queensland, at the Queensland herbarium, was a collection by C.E. Hubbard made in September 1930, while WA collections are more recent. Torpedo grass is likely to have first been brought to Australia during the period when livestock and their feed were often transported by ship, or by someone attempting to see if it was a reasonable stock feed.

How invasive is this grass? It is widespread on the central coast of NSW, notably around Raymond Terrace, Shortland and Williamtown. Next time you drive down the Pacific Highway just a few kms north of Raymond Terrace, stop and have a look at Grahamstown Reservoir, a 180 000 megalitre storage built to supply water to Newcastle. Its 50 km shoreline has been taken over by torpedo grass and the area covered is at least 100 hectares, increasing as storage levels drop and this grass adapts to the changes. Compare this with Florida where it was introduced from Africa or Asia in the 1920s for livestock to graze. There is an ongoing programme to control a 5 700 ha infestation in Lake Okeechobee, Florida. By 1992, 70% of Florida's public waterways had been overtaken by torpedo grass. In Florida \$2 million is needed each year to control it in waterways (Langeland *et al.* 2008).

Little attempt is made to control torpedo grass in NSW and probably Australia. It has a root system that makes control difficult and many applications of herbicide are needed to kill it. Growth in places like Grahamstown Reservoir will not be controlled with



herbicides as it is a water storage used for drinking—similar to Lake McDonald, Queensland, where herbicides also cannot be safely used to control the invasive aquatic glush weed, *Hygrophila costata*. Town water storages remain a major source for further expansion of both of these weeds.



Grahamstown Reservoir, Hunter Water Supply, where 50 km of shoreline has been taken over by torpedo grass.

Image: Geoff Sainty

Management is difficult. It is often not identified, merging with other grasses such as *Eragrostis curvula* and species of *Paspalum*. It is moderately palatable to livestock, but not a recommended pasture species and there are instances of it taking over more palatable species and then becoming, in practical terms, unmanageable. Mechanical control, mowing or cultivating is likely to end up encouraging its growth. Chemical control using the aquatic formulation of glyphosate has been shown to be effective in Florida. Because it grows in or next to streams or wetlands approval to use any herbicide should be sought if control is contemplated.

Acknowledgement The author would like to thank Dr John Hosking, NSW Department of Primary Industries, for his input into this article.

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Waterhouse, D.F. (1994). *Biological control of weeds: Southeast Asian prospects*. Australian Centre for International Agricultural Research: Canberra.

WEEDeck 2004 Torpedo Grass *Panicum repens* Card G18. Sainty and Associates Pty Ltd, Sydney.

Further Information:

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*** The title! Think of being on a ship with an approaching torpedo and what you would do? Get a lifejacket!**

18th Australasian Weeds Conference 2012
The Sebel and Citigate Albert Park,
Melbourne, Victoria, Australia
8 October – 11 October 2012

Developing Solutions to Evolving Weed Problems

There's a lot of activity happening behind the scenes. The Conference Program, Guide to Authors, and field trips itineraries should be completed by the end of April, after which they will be on the Conference website. The organisers have asked that any group who want to hold a workshop should contact the Conference organisers as soon as possible. Another request - they want anyone who can help out with refereeing!

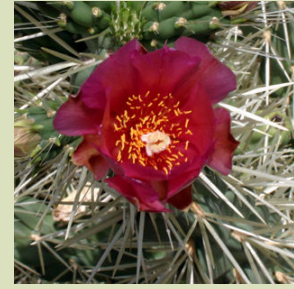
Conference Website: www.18awc.com



Hudson Pear, *Cylindropuntia rosea*

A weed with the potential to colonise large areas of inland Australia.

Royce Holtkamp



Cylindropuntia rosea (Hudson pear), is an invasive cactus of central Mexican origin which poses a threat to agricultural enterprises, biodiversity conservation and human and animal health. Individual plants have been recorded reaching 1.5 m in height and 3 m across. Stems consist of rope like segments which are armoured with many extremely sharp spines up to 4.5 cm in length. These spines are covered by a detachable sheath which may remain embedded in a wound even after the body of the spine is removed. The spines are capable of causing serious injury to humans, livestock and working animals such as horses and dogs and may present a severe impediment to mustering operations. *C. rosea* also poses a threat to native fauna and has caused deaths of native animals such as koalas. Infestations of *C. rosea* may also displace native flora with a possible consequential impact on biodiversity.

Pink-purple flowers are produced in late spring although the resultant fruits do not form viable seed. Plants spread vegetatively by segments which root where they contact the ground with segments commonly being spread by animals, humans, vehicles and other equipment and water.

The current Australian distribution of *C. rosea* is north-western NSW (primarily around the opal mining areas of Lightning Ridge, Grawin and Glengarry and at Cumborah, although infestations have also been reported from Brewarrina, near Coonamble and Goodooga), South Australia (from the Flinders Ranges south to Morgan), in Western Australia, in the Northern Territory and in Queensland. Estimates of the infested area in NSW range from 60 000 to in excess of 100 000 hectares. *C. rosea* has the potential to colonise large areas of inland Australia including the Darling River basin. *Cylindropuntia rosea* has also naturalised in South Africa and Spain.

Another *Cylindropuntia* species, *C. tunicata*, is often mistaken for *C. rosea* and shares the common name Hudson pear in some areas. Although they co-occur in parts of north-western NSW *C. tunicata* can be distinguished from *C. rosea* by the following charac-

teristics: *C. rosea* has pink-purple flowers compared to the yellow, yellow-green, to yellow-pink flowers of *C. tunicata* and the spines of *C. rosea* are white compared to the yellow, straw or tan coloured spines of *C. tunicata*.



Stems, buds, flowers and spines of Hudson pear, *Cylindropuntia rosea*.
Image: Royce Holtkamp

There are no effective control methods for *C. rosea*. Current control strategies for *C. rosea* rely on use of herbicides. There is a current APVMA permit (PER 10544) for the use of Grazon DS, Grazon Extra and Garlon 600. Use of herbicides is made more difficult by the types of terrain and vegetation in which *C. rosea* infestations are located. *Cylindropuntia rosea* spreads by movement of segments and fruit that root



Hudson pear (Contd)

where they come into contact with the ground. As the plant occurs over an extremely large area there is no possibility of successfully locating and destroying all potential propagules in an area. The use of herbicides over the large areas involved may incur considerable costs for landholders, often exceeding the value of the invaded land, and may also result in off-target damage to native species.



Infestation of Hudson pear, *Cylindropuntia rosea*, Morendah Plain, near Lightning Ridge.
Image: Royce Holtkamp

Physical removal, while successful for isolated plants, is not recommended because of the danger of serious injury occurring during the process of removal. Physical removal also necessitates correct disposal of weed material to avoid initiating new infestations. Techniques commonly used include burying and burning. However, no adequate depth for burying has been determined. Currently some opal miners dispose of plant material down disused mine shafts. Burnt material also requires re-checking for any regeneration. Physical removal of larger infestations is not viable because it would be extremely labour intensive and any missed plants or plant parts have the capacity to form new infestations if they come into contact with the ground and form roots.

An integrated control campaign against *C. rosea* would benefit from the addition of a potential biological control agent, *Dactylopius tomentosus*, a cochineal insect from Mexico which is currently being evaluated for host specificity in quarantine.

The prospects for successful biological control of *C. rosea* are good as previous biological control programs targeting species in the Cactaceae have proven highly successful. Another biotype of *D. tomentosus* specific to *Cylindropuntia imbricata* (rope pear) was introduced into Australia as a biological control agent in 1924 and is now widespread throughout areas where *C. imbricata* is present. There are no signs of any “off-target” effects attributable to this species other than feeding on some other weedy *Cylindropuntia* species.

Recent South African research has shown that there are several biotypes of *D. tomentosus* present in Mexico, at least one of which is likely to be more damaging to *C. rosea*. There should be few host specificity issues associated with the introduction of additional *D. tomentosus* biotypes as there are no native species of Cactaceae in Australia. Additionally, *D. tomentosus* is already present in Australia so relatively little quarantine testing should be required prior to the release of a different biotype of this insect. Cochineal insects used to control cactus all appear to be very specific and this is likely to be the case with the biotype for *C. rosea*.

Further reading:

Johnson, S.B., Hosking, J.R., Chinnock, R.J. and Holtkamp, R.H. (2009) - The biology of Australian weeds 53: *Cylindropuntia rosea* (DC.) Backeb. and *Cylindropuntia tunicata* (Lehm.) F.M.Knuth (Cactaceae). *Plant Protection Quarterly* **24**, 42-49.

Further information:

Royce Holtkamp
Strategy Leader Invasive Species | Biosecurity NSW
NSW Department of Primary Industries
Email: royce.holtkamp@dpi.nsw.gov.au



It's time to do the de-heading of your Agapanthus!

Agapanthus seed is maturing and seed drop has started.

The seed heads need to be removed and disposed of to prevent dispersal into adjoining bushland.

It appears there has been less de-heading than in previous years.



Spraying Weeds with an Unmanned Aerial Vehicle (UAV)

Liam Quigley



25 years ago Japan had the dubious honour of the highest number of manned helicopter fatalities in the world. Thousands of small rice fields, surrounded by buildings, the short spray season and the huge number of obstacles meant that spraying was an expensive, high risk activity.

To address this the Japanese government asked several companies to develop unmanned helicopters for agricultural spraying. An UAV, Yamaha RMax, quickly dominated the Japanese market.



Yamaha RMax Unmanned Aerial Vehicle (UAV).

The current model Yamaha RMax has been around for 15 years, has 2 700 units flying and has just cropped up a combined 2.3 million flight hours.

How does it operate?

Operation is a two man show- one operator (pilot) and one navigator (essentially a spotter).

In a typical operation the unit will fly at 3 metres above the canopy, at 20kmh and operates within line of sight.

The centre sprayer is used for a 3.5 metre swath, or the two outside sprayers for a 7.5 metre swath. The spray nozzles are standard Tee Jet units. Payload is 27kg.

The Rmax flies for 1 hour on 6 litres of two stroke. The pump can be set at a constant rate or can be set

up as ground speed sensitive. Typically it covers 6.1 hectares per hour- regardless of terrain.

How will it be used in Australia?

Yamaha Australia has embarked on a program to use this technology to spray small acre crops and weeds in Australia.



Unmanned Aerial Vehicles are used to operate in dirty, dull and dangerous situations.

Typically, UAV's are used to operate in dirty, dull and dangerous situations and Australia is no exception. This includes areas where manned aircraft aren't allowed, where it's too dangerous or inefficient for ground spraying, or where OH&S requirements make it too hard to get personnel on the ground.

The RMax units are being franchised to operators who'll then go contracting with them. Most potential operators are existing ground spray businesses looking to increase their capability.



Do you need to be trained to operate an UAV?

Whilst flying an RMax is a lot easier than the toy store models, operators need to be certified both by the factory and by CASA. In total this is a three week course.

The business will also need to be approved by CASA for air operations and the operators will need chemical handling certification.

How does an UAV fit in with Australian farming practices?

With only 16 litres of chemical on board the RMax is hardly going to replace a broad acre boom sprayer, It is however particularly suited to steep, rocky or difficult access areas. Without the need to cross fence lines and no pilot at risk the RMax can access difficult areas quickly and easily.



The RMax needs to be carried either on a trailer or in a van.

Initial research is focusing on aquatic weeds, blackberry and serrated tussock. Later, other weeds will be then looked at as well as specific crops, such as bananas, macadamias and cherries.

Further Information:

Liam Quigley
National Business Development Manager
Yamaha Sky Division Australia
Email: l.quigley@yamaha-motor.com.au
Website: <http://max.yamaha-motor.com.au/>



Leah Garnett Awarded the Society's Student Prize for 2012



Leah is originally from Victoria and has lived in NSW, QLD, NT and SA. Although not from a farming background she has spent time on a cattle station in the NT.

Initially interested in the Arts, she was drawn to Agriculture and hopes to forge a career in Extension.

Leah obtained a High Distinction in PSC301 Weed and Pesticide Sciences and was awarded the highest grade in her class.

She gained enjoyment from collecting samples for the Weed Collection assessment and said she was surprised to be awarded the Prize, but is "honoured to be the recipient of this award".



Professor Nick Klomp (Dean, Faculty of Science) presenting Leah Garnett with the 2011 Weed Society of New South Wales Student Prize.

Further information regarding the award:

The Secretary
Weed Society of New South Wales Inc.
PO Box 438,
WAHROONGA NSW 2076



NATURALISED PLANTS & CLIMATE CHANGE: ASSESSING THE RISK ACROSS AUSTRALIA

Rachel Gallagher (Dr)

A new nationally funded project examining how naturalised plants will respond to climate change has been launched at Macquarie University in Sydney. Naturalised plants are those which have formed self-sustaining populations in the landscape, but are yet to become invasive. This project, funded by the National Climate Change Adaptation Research Facility, will model the distribution of 300 naturalised plants across Australia under a range of future climate scenarios. Models will be built using data from the Australian Virtual Herbarium, targeted weed surveys and georeferenced infestations provided by weed managers and researchers. A link to the full list of species being targeted can be found at <http://bio.mq.edu.au/dept/centres/pirel/index.html>. We urge any readers who can provide information about any of these species to contact the principal scientist, Dr. Rachael Gallagher, email: rachael.gallagher@mq.edu.au

Over 29,000 exotic plants have been introduced across Australia in the last two centuries. The first challenge for this project is identifying those which have formed naturalised populations, but have not yet become invasive, in order to assess the risk they pose under climate change. The team have developed a set of criteria for identifying these species using a range of published resources and consultation with weed risk assessment experts.

The criteria are:

(1) exotic plants identified as naturalised, but not invasive in "The Introduced Flora of Australia and its Weed threat" (Randall, 2007). This publication is the most comprehensive compilation of introduced plants in Australia and uses references in published literature to classify species into naturalised or invasive category. Researchers liaised directly with the report's author (Rod Randall, Department of Agriculture and Food WA) for access to the dataset and clarification of data standards,

(2) the species must not be listed as a noxious weed in any state of Australia,

(3) species must not be native to Australia - we intend to focus solely on exotic species, rather than investigate the potential spread of native plants beyond their established range boundaries,

(4) species must be terrestrial. We are choosing to exclude aquatic species as constraints other than climate may be more important in determining their distributional limits, and finally

(5) species must have more than 100 georeferenced distribution records (latitudes and longitudes). This criterion is essential for building reliable species distribution models.

Alongside this modelling work, the interdisciplinary team of researchers and government agencies are developing a searchable database containing a comprehensive collation of traits and relevant environmental information for each species. This database will include information on factors such as dispersal mode and spread, growth form and leaf/seed characteristics, flammability, soil associations, and tolerance or sensitivity to other key stressors and will be online in late 2012. The website will allow users to interrogate individual species responses to climate change and their life-history traits, or to gauge the exposure of different IBRA and NRM regions and vegetation types to naturalised plants under both current and future climates. The aim is that this website will become a 'one-stop shop' for weed managers, land-holders, bush regenerators and government agencies that need information on the threat posed by naturalised plants.

The project has grown out of a previous collaboration between NSW Office of Environment and Heritage and Macquarie University which investigated the responses of invasive plants to changing climate. A key finding of this work was that the south-east and south-west of Australia are 'invasion hotspots' for the both the Weeds of National Significance and the Alert List species. These findings were published this month in the high-impact journal *Global Change Biology*.

References:

Randal, RP (2007). *The Introduced flora of Australia and its weed status*. CRC for Australian Weed Management, Glen Osmond, SA. 528p.

Further information:

Dr Rachel Gallagher, Postdoctoral Research Fellow
Macquarie University
Email: rachael.gallagher@mq.edu.au



CAWS Report

Rex Stanton & Hillary Cherry CAWS Delegates

The CAWS Executive Committee met on Friday 9th March.

A strategy is being developed to source, scan and upload digital copies of missing papers from past conference proceedings.

The final report from the 17AWC in September 2010 was tabled and will provide some feedback to assist future organising committees.

Planning for the 18AWC in October 2012 is on track. Eight keynote presentations, 86 oral presentations and a similar number of poster presentations are being considered. The deadline for submitting a poster paper has been extended to the end of March.

The bid by Western Australia to host the 7th IWSC in 2016 has passed through the penultimate round of considerations, with only one other bid remaining in contention.

A discussion was raised on the previous attempts to encourage the establishment of a Northern Territory society. A sub-committee will consider options for how some form of society services can be provided to weeds workers in the Northern Territory. No progress has occurred on the Strategic Plan. This matter has again been deferred until next meeting.

CAWS has agreed to provide \$250 Associate Sponsorship for The Weeds News website. Four member societies (Tas, Vic, NSW and Qld) also sponsor this website. The WA society voted against providing sponsorship.

An update was received on the RIRDC Weeds Portal project. Unfortunately funding for this project will cease shortly, however CAWS continues to support the concept in principle. A number of points were raised on the structure, content, purpose and target audience of the proposed website and these need further clarification.

CAWS is supportive of potential collaboration between weed societies and the Ecological Society of Australia. Opportunities for joint forums or symposia associated with conferences will be investigated.

CAWS Student Travel Award

Applications are invited from students for attending national or international conferences, or for specific overseas study tours of a short duration. The award of up to \$3,000 is available to assist with part of the total travel costs.

CAWS Early Career Travel Award

Applications are invited from early career weed scientists (within five years of their last degree) for attending national or international conferences, or for specific overseas study tours of a short duration. The award of up to \$2,000 is available to assist with part of the total travel costs.

Applications for both these awards should be submitted through an affiliated society to the CAWS secretary by **1st May** each year.

The awards will be made by 1st July for travel during the following 12 months.

Further information:

Application forms are available from the CAWS website <http://www.caws.org.au/> or write to:

Weed Society of NSW Travel Study Grant

Applications are invited for attending national or international conferences, or for specific overseas study tours of a short duration. Applicants must be over 18 years old, reside in New South Wales or the ACT, be involved with weed research, management, advisory, regulation or practice, and have been a current member of the Society for at least one year.

Applications for the CAWS Awards and the Society Grant should be submitted to the Society Secretary by 1st May each year.

Grants will be made by 1st July for travel during the following 12 months.

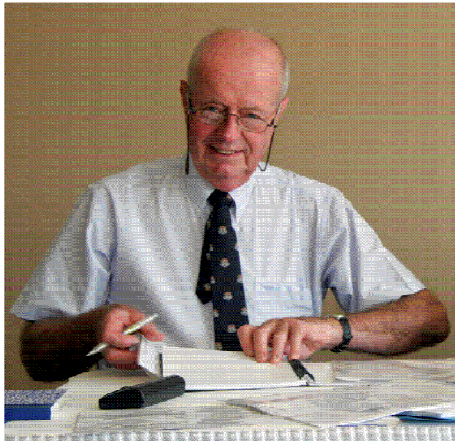
Applications for awards or grants to attend a conference are expected to be supported by an abstract of the paper being presented. On return, successful applicants are expected to provide a report to the Society for publication in *The Good Weed*.

Application forms at: www.nswweedsoc.org.au or write to:

**The Secretary
The Weed Society of New South Wales Inc.
PO Box 438
WAHROONGA NSW 2076**



Treasurer's Financial Report



For the period 1st October 2011 to the 6th February 2012 the society has shown a profit of \$14,269.44.

The society is in a very sound financial position with total assets of \$86,089.00 as at the 6th February 2012. The society is thus able to consider allocating additional funds to projects that meet its objectives and \$6,000.00 has already been allocated to Dr Peter Michael to prepare his weed collection for transfer to the herbarium of NSW.

The NSW Weeds Conference Future Fund which is being administered by this society has a balance of \$4,439.18 following the establishment of 4 term deposits as approved at the last committee meeting giving it total assets of \$54,439.18.

These funds will be used to support the next NSW Weeds Conference which will be held in 2013.

Membership.

As at the 6th February 2012 the society has 185 members.

There are 19 members who have not at this stage paid their 2011 subscriptions.

Renewal notices for the 2012 subscriptions were sent out this week and will include those who are in arrears.

Invoices were also sent to the sponsors of the newsletter *A Good Weed* and the committee acknowledges the support of our sponsors and looks forward to their continuing support.

Jim Swain
Treasurer
February 2012

Linking on-ground weed management and ecological research

An exciting new event at this year's Australasian Weeds Conference will be a weed management and ecological research "round-table" workshop. This event will be co-facilitated by the Ecological Society of Australia (ESA) (www.ecolsoc.org.au) and the Council of Australasian Weed Societies (CAWS) (www.caws.org.au), and aims to strengthen links between weed management practice and sound ecological research.

If you are interested in presenting or discussing particular ideas at the workshop, please contact Hillary Cherry (hillary.cherry@environment.nsw.gov.au) or Ben Gooden (bg662@uowmail.edu.au).

For more information, please also visit the Society website www.nswweedsoc.org.au



Seminar & Annual General Meeting

Weedy Interactions: from Sub-Microscopic to Species and Communities

When: 19 April 2012

Where: Kansai & La Guardia Room, Best Western Airport Motel and Convention Centre 33 Ardlie Street, Attwood

Commencing: 0920 hrs

Registration: 0830 - 0920 hrs

Speakers: **Prof. Roger Cousens, Assoc. Prof. Ed Newbigin, Prof. John Forster, Prof. Jim Pratley & Matt Hayes, Monsanto Australia**

46th Annual General Meeting

The 46th Annual General Meeting of the Weed Society of Victoria will be held on April 19, 2012 at the same venue at 1300 hrs.

Further information contact:

Ros Shepherd, Secretary, 03 9576 2949

Email: secwssv@surf.net.au or

visit the website, www.wsvic.com.au



Office Bearers for 2012

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Lawrie Greenup [Westleigh]

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General Committee

Hillary Cherry [Forrestville]

Tony Cook [Tamworth]

Kim Hignell [Speers Point]

Jonathan Lawson [Glen Innes]

Deirdre Lemerle [Wagga Wagga]

Brian Scarsbrick [Dangar Island]

CAWS Delegates

Rex Stanton [Wagga Wagga]

Hillary Cherry [Forrestville]

Committee Meeting Dates

8 June Annual General Meeting will be
10 August held in November 2012.
12 October All dates need to be confirmed.
14 December

Society Contact Details



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WAHROONGA NSW 2067

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Treasurer: treasurer@nswweedsoc.org.au
Editor: editor@nswweedsoc.org.au
Website: www.nswweedsoc.org.au

From the Editors



How about providing material for the newsletter?

The newsletter is the major source of information to our members and we are sure they want to read about all the exciting, interesting and unusual things you are doing in weed management.

We want local and regional news about people and events, new emerging weed species, weed management issues, bushland regeneration, bush-care programs, weed research summaries, noxious weeds, legislative issues and book reviews.

We prefer short & interesting articles of about 200 to 500 words with good quality images which will reproduce well in colour.

If you want to submit material or discuss possible articles email - editor@nswweedsoc.org.au

Submission dates for material for 2012 are:

#58 Autumn 2012	29 February
#59 Winter 2012	31 May
#60 Spring 2012	31 August
#61 Summer 2012/13	30 November

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If you are please contact the editor or treasurer at:

editor@nswweedsoc.org.au
treasurer@nswweedsoc.org.au

If unable to deliver return to:

**The Newsletter of
The Weed Society of New South Wales Inc.
PO Box 438
Wahroonga NSW 2076**

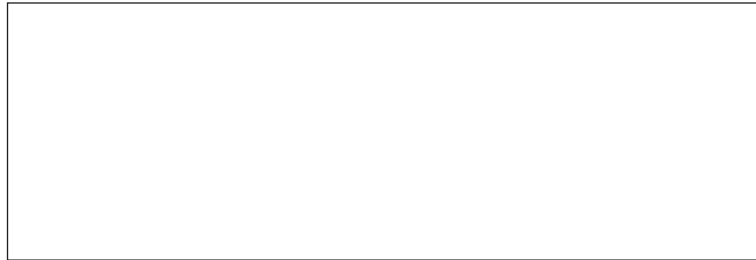
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