

A GOOD WEED



Newsletter of The Weed Society of New South Wales Inc.

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#66 Autumn 2014



Orange hawkweed, *Hieracium aurantiacum* subsp. *carpathicola*, is a Class 1 noxious weed. In NSW it is found only in Kosciuszko National Park and is the subject of a large eradication effort. It is capable of spreading on wind dispersed seeds and vegetatively via runners. The plant is covered in white hairs on the leaves and darker hairs on buds and flowering stems.

Image: Mark Hamilton.



President's report

Welcome to the autumn edition of A Good Weed for 2014.

Following the Annual General Meeting in November, we have several new faces on the executive committee, Maria Edmonds, Ruth Armstrong, Reece Luxton and Doug Campbell.

I would like to take this opportunity to warmly welcome these people onto the committee and, also, thank the members of the previous committee for again taking positions on the executive. Several people from the previous committee declined to renominate, and I would like to thank these people for the enormous amount of time and energy they have contributed to the Society over many years.

I would like to congratulate Peter McMaugh for being the recipient of the *The Weed Society of New South Wales Medal for Excellence in Weed Management* for his contribution to the turf industry. Peter has been a long-time member of the Society and has been an active participant in Society activities. Congratulations & well done Peter.

The Society asked members to read the review paper, Review of Weed Management in NSW – co-ordinated by the Natural Resources Commission (NRC), and provide their views to me so as to provide a coordinated response. Thank you to the members who provided their comments. Overall, the Society welcomed the greater focus on preventing the arrival of new weeds or eradicating new arrivals in an area and examining ways to coordinate weed management with broader biosecurity initiatives within NSW.

The Natural Resources Commission (NRC) has now released a draft report outlining findings and draft recommendations for its review of weed management in NSW. The draft report has been informed by research, consultation, regional tours and over 200 public submissions from the Issues Paper that was released in October 2013. The Society will be making a submission on the draft report and I would like any member who wishes to comment on this important draft to send their comments to me ASAP so we can meet the deadline of 6 April 2014.

Finally, I would like to personally thank our Immediate Past President, Rex Stanton for being an excellent and innovating leader of the Society.

As most of you are aware Rex has had a difficult time with his health for quite a while now. This resulted in him having to take extended sick leave for the last few months and he had to curtail his commitments with the Weed Society. As a consequence it has been my privilege to take on the responsibility as President of the Society.

Rex has been a loyal and dedicated member of the Society. He became President of the Society in September 2007 and he continued as President until his health problems last year. This demonstrates both his commitment to the Society and the Executive Committee's support and respect for his ability and ongoing enthusiasm for the job. He is the longest serving President of this Society.

Rex undertook his role as a CAWS delegate very professionally and even-handedly during a time when CAWS was considered by many of our executive committee not to be representing the member societies effectively. He has been responsible for our Society's website.

We all trust Rex can make a speedy and full recovery and be able to return to work in Wagga Wagga. We look forward to Rex returning to an active role in the Society and contributing to the future development and success of The Weed Society of New South Wales.

Best wishes Rex from all of us.



Kim Hignell, President.

Welcome to new members

Tony Inkson
Greater Lakes Council
Forster

Christina Day
Blue Mountain City Council
Katoomba

Membership Subscription 2014 Due

Membership Subscription Invoices have been send out to all members with a reminder to those who haven't paid their 2013 membership.

The Treasurer has received payment from over fifty members and would like to remind other members to pay their dues ASAP. Membership fees are the basis of the day-to-day running of the Society.



Three new sponsors. Welcome aboard.



Hunter Central Coast Weeds – dedicated to weed control

Hunter Central Coast Weeds encompasses the following Councils: Cessnock City Council, Dungog Shire Council, Gosford City Council, Lake Macquarie City Council, Newcastle City Council, Port Stephens Council, Upper Hunter Weeds Authority (Muswellbrook, Singleton & Upper Hunter Council LGAs) and Wyong Shire Council.

Hunter Central Coast Weeds

A regional partnership for consistent & effective management of weeds

Our aim is to effectively promote cooperative regional partnerships for the consistent and effective management of weeds in the Hunter and Central Coast regions.

The objectives of the team is to help deliver a strategic and realistic approach to the management of invasive plant species.

The team at Hunter Central Coast Weeds strives to:- (1) promote understanding of the causes of weed dispersal, invasion and establishment, (2) promote integrated strategies for control, (3) develop, initiate and coordinate the delivery of collaborative, multi-stakeholder on-ground regional weed management projects.



&



“Cleaning up Australia’s Waterways”

Australian Catchment Management has expertise in Aquatic Maintenance including the specialised control of aquatic and noxious weeds. Using the very latest of equipment, including a Truxor 5000 Amphibious machine we are able to cut and harvest aquatic weeds. The Truxor has a number of attachments eg. Grip bucket, assorted reed cutting knives, dredge, rakes and sieves as well as a 200lt tank for herbicide spraying. We use all these attachments in the initial clean-up and maintenance of streams, ponds, lakes, gross pollution traps, sediment ponds (SQUIDS), effluent works and wetlands.

ACM has in excess of 10 years experience in the operations described. We also have AQF3 herbicide qualified applicators and a Dual Reel KwikSpray mounted on a Toyota Landcruiser 4x4.

As well as operating the machines, Australian Catchment Management is also the Australian

distributor of the Truxor Amphibious machine with 10 machines operating in VIC, NSW, QLD and the NT. Councils such as Fraser Coast (QLD), Palmerston, (NT) and other private operators eg. Sanctuary Lakes Resort (Vic.) are using the Truxor for their own aquatic weed control solutions.





Regional weeds trailer hits the road



The new Hunter Central Coast Weeds trailer has been built to raise awareness of weeds in the community.

This bright and colourful unit, funded as part of the NSW Weed Action Plan, was purpose-built for community educational displays for the entire Hunter Central Coast region.

The NSW Department of Primary Industries has given the trailer the thumbs-up as it fits with their overall theme for NSW, *“Look out for Weeds”*.

This new theme is supported by a set of display resources and the weeds vehicle and trailer which has been created using a contemporary form of mobile outdoor advertising - known as vehicle wrapping.

Early detection and surveillance of weeds offer the most strategic and cost-effective form of weeds management. Early detection of weeds increases the likelihood that control will be successful and reduces costs as infestations can be treated when they are less extensive. Getting the message out there to the community will now be much easier, thanks to the efforts of all involved.

The Hunter Central Coast Weeds is made up of representatives from Cessnock, Dungog, Gosford, Lake Macquarie, Maitland, Newcastle, Port Stephens and Wyong councils and the Upper Hunter Weeds Authority.

Reece Luxton’s (Clarence Valley Council) ‘wrapped’ vehicle was shown in the last issue of A Good Weed, #65 Summer 2013/14, page 14.

Further information:

www.huntercentralcoastweeds.com.au





19th Australasian Weeds Conference

Science, Community and Food Security: the Weed Challenge

Hotel Grand Chancellor, Hobart - 1-4 Sept 2014



The Australasian Weeds Conference has a long history of bringing together weed researchers from across Australia and New Zealand, and covers all land uses, thereby increasing the knowledge value, breadth and sharing for delegates. The 19th AWC is being organised as a collaboration involving the Council of Australasian Weed Societies (CAWS), together with the Tasmanian Weed Society (TasWeeds), and the annual symposium of the GRDC National Integrated Weed Management Initiative. The Australian Herbicide Resistance Initiative will also be involved. We are planning workshops and training sessions around herbicide use and regulations to support other sessions, such as a keynote address from Kareena Arthy, CEO of the APVMA.

We are also very pleased to welcome two distinguished Keynote Speakers: Dr Daniel Simberloff, the Nancy Gore Hunger Professor of Environmental Studies in the University of Tennessee's Department of Ecology and Evolutionary Biology, where he directs the Institute for Biological Invasions. Dr. Simberloff's research centers on ecology, biogeography, evolution, and conservation biology, and addresses plants, insects, birds, and mammals. He maintains an extensive world-wide field research program focused on issues of biological invasions and global change.

Professor Stephen Hopper, Winthrop Professor of Biodiversity at the University of Western Australia and former Director (CEO & Chief Scientist) of Kew Gardens. Prof Hopper is a botanist, specialising in conservation biology and vascular plants. He

has written eight books, and has over 200 publications. He was Director of Kings Park in Perth for seven years, and CEO of the Botanic Gardens and Parks Authority for five. He is currently Foundation Professor of Plant Conservation Biology at The University of Western Australia.

We are currently inviting speakers from across Australia and New Zealand and should have a draft program available on the Conference website by mid-March. Please **check the website** for more announcements regarding speakers, including keynote speakers, workshops and training opportunities.

We look forward to seeing you at the 19thAWC in Hobart this September!

Organising Committee, 19th AWC, Hobart.

Website: <http://australasianweeds2014.com.au/>





Councils engaged with North Coast Local Land Services with project on Tropical Soda Apple infestations

The battle on tropical soda apple is well underway thanks to the support of the North Coast Local Land Services.

Funding to the value of \$140,000 has been given to a project titled “**Strategic control and management of Tropical Soda Apple in the Northern and Central Socio-ecological Landscapes area**” as a partnership between Clarence Valley Council, Coffs Harbour City Council and Far North Coast Weeds.

The project is part of the implementation of the Northern Rivers Catchment Action Plan 2013-2023. Clarence Valley Council is the lead agency for the project which will go a long way to meeting the objectives of the State Tropical Soda Apple Strategic Plan and the Regional Tropical Soda Apple work plan.

The project will assist landholders with rapid response control work on tropical soda apple in high priority locations (top of catchments and along riverbank areas), as well as promoting early detection, education and awareness and the development of specific property weed management plans.

To date secured agreements have been made with 5 landholders in the Clarence Valley and undertaken rapid response control work has been undertaken along the Tallawudjah Creek and Lower Coldstream areas - a positive step to reaching Councils’ goals in containing this new incursion in NSW.



Tropical soda apple (foreground) at Endless Creek – North Coast Local Land Services staff - Lachlan Stace, Northern Rivers Catchment Management Authority (LHS) - and landholder - Geoff Woods (RHS) inspecting the infestation. Image: Deb Repschlager, Clarence Landcare.

Further works in the first half of 2014 will include delimitation surveys 5 kilometres downstream of known infestations. The project will also build capacity through awareness raising workshops to be held in targeted areas around infestations sites in the next couple of months.



Meeting between (left to right) Greg Wilkinson and Reece Luxton, Clarence River Council; Lachlan Stace, (Northern Rivers Catchment Management Authority) North Coast Local Land Services, and Geoff Woods, landholder Image: Deb Repschlager, Clarence Landcare.

Further information:

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Editor’s Note

From **January 2014**, Local Land Services (LLS) will deliver functions now provided by Catchment Management Authorities (CMA), Livestock Health and Pest Authorities (LHPA), and the agriculture advisory services of the Department of Primary Industries (DPI). Landowners are still able to access existing services from DPI, LHPAs and CMAs in the interim.

Eleven LLS regions, will cover NSW: Central Tablelands, Central West, Greater Sydney, Hunter, Murray, North Coast, Northern Tablelands, North West, Riverina, South East and Western regions.

Each region will deliver services to local industries, enhance natural resources, protect industries from pests and disease and help communities respond to emergencies like flood, fire and drought.

Further information: www.lls.nsw.gov.au



Tropical soda apple *Solanum viarum*



Image: Tony Cook.

Tropical soda apple was first identified on the NSW North Coast in 2010 and efforts have been underway since from councils and other stakeholders to contain its spread.

An aggressive **prickly perennial shrub, one metre to two metres high** - a native of north-eastern Argentina, south-eastern Brazil, Paraguay and Uruguay.

Upright and much branching, it has broad-based, **straight, cream-coloured prickles to 12 mm** long scattered on most plant parts. It reproduces by seed and can regenerate from root material.

Leaves are mostly 10-20 cm long and 6-15 cm wide. The upper and lower leaf surfaces are densely covered in short hairs; mid-veins and primary lateral-veins are cream coloured on both sides of the leaves.

Flowers are white, with five petals 2-4 mm long. They occur in clusters of three to six, off a short stem.

Mature fruit are yellow and golf-ball size (20-30 mm in diameter). When immature they are pale green with dark green veins, like immature water melons.



Image: Bec Miller.

“Identifying weeds” New workshop developed

This one-day workshop has been developed to allow participants to more efficiently identify weeds using comparative techniques. This hands-on workshop is designed for anyone who wishes to more effectively identify weeds in their area using techniques other than just botanical keys or flipping through photos. It is also a useful primer for those wanting to move onto the use of botanical keys (such as covered in the Diploma workshops Identifying Grasses and Identifying Environmental Weeds).

What is covered in the workshop?

This workshop will provide participants with skills and knowledge in:

- *Plant structure and botanical terminology*
- *Plant classification and how it provides shortcuts for identification*
- *The efficient use of comparative techniques*
- *A broad range of identification resources (photos, descriptions, herbariums, keys, plant distribution and environment factors)*
- *Photographic databases*

Participants will receive a range of resources that will assist them to continue practicing and developing the skills they have learnt during the workshop including a Workshop manuals, Internet bookmarks to many useful weed-based sites, Videos on how to upload the bookmarks to your web browser, Digital “further reading” resources and a list of weed identification resources. Participants can be assessed against a Unit of competency if they wish (Certificate III unit AHPCPM303A Identify plant specimens).

When and where are workshops run?

For current dates and locations of workshops, please see the **PROfarm** website. Additional workshop can be made available where there is an identified demand. If no workshops are planned for your area, please enquire with the **PROfarm** course organiser to see if further workshops can be run in your area.

Further information: harry.rose@dpi.nsw.gov.au





Weed Alert Hawkweeds, *Hieracium* spp.

Hawkweeds have the potential to be serious weeds in the temperate areas of south-eastern Australia, including the Australian Alps and Tasmanian grasslands. Prompt treatment of known populations of hawkweeds has limited their spread so far.

Hawkweeds are highly invasive plants forming dense stands of up to 3800 plants per square metre. This is a major threat to biodiversity in conservation areas and native grasslands. Hawkweeds can also be a problem in pastures, on roadsides and in gardens. They are frost-tolerant and competitive across a wide range of soil types, preferring cool climates with an annual rainfall above 500 mm.

The genus *Hieracium* includes several hundred species known as hawkweeds. Hawkweeds belong to the Asteraceae or daisy family and were promoted as cottage garden plants. Hawkweed plants were previously sold by nurseries and these are likely to be sources of further infestations.

Four *Hieracium* species are known to occur in Australia. These include orange hawkweed (*Hieracium aurantiacum*) in Victoria and New South Wales (NSW); king devil hawkweed (*Hieracium praealtum*) in Victoria; and wall hawkweed (*Hieracium murorum*) in NSW. Small infestations have been found around ski fields where seed was introduced on equipment from New Zealand. A small population of mouse ear hawkweed (*Hieracium pilosella*) was found in Tasmania in 2001.

World Status

Hawkweeds are native to the northern hemisphere, South Africa and South America. Several European species have become major weeds of pastures, gardens and natural areas in eastern North America, Japan, Patagonia and New Zealand.

Spread

Hawkweed can reproduce and spread both by seed and vegetatively. Vegetative spread of plants by rhizomes (underground stems) and stolons (above ground rooting stems) is common. Stolons arise from buds at the base of the leaves.

Up to 40 000 seeds per square metre are produced in summer. Seeds have tufts that enable them to attach to hair, fur and vehicles. Seed can also be spread by wind, water, in contaminated fodder and garden waste, and even on ski or hiking equipment. The seeds can survive in the soil for many years.

Hawkweed seed usually germinates in spring after rain. Seedlings establish readily on bare soil and disturbed areas.

Identification

The general appearance of a hawkweed plant is similar to a dandelion (*Taraxacum officinale*) or a flatweed (*Hypochaeris* species). Hawkweeds are perennial herbs of variable height (15–40 cm), and have a milky sap which is seen when their stems or leaves are broken.

Key identification features

- **Leaves** are stalkless, hairy on both surfaces, with smooth or slightly toothed margins and are sometimes 'sticky' to touch. They occur in rosettes. Occasionally 2–4 alternate leaves appear near the base of the upright flower stem.
- **Flowers** are yellow, orange or red and 'daisy-like'. They may be solitary or formed in a cluster of 5 to 30 flower heads. The flowers are 10–20 mm in diameter with square-ended petals, and grow on stems up to 40 cm. The flower stems are covered in short, stiff hairs.
- **Seeds** are purplish-black and ribbed with a bristly tuft up to 6 mm long.

Control

Contact your local council weeds officer for assistance if you suspect you have found hawkweed. A combination of manual removal and herbicides can be used to control hawkweed, but care must be taken to ensure plants are not spread during control, and that follow up control is carried out for many years. Competitive, well managed pastures help to reduce the size and impact of infestations.

Legislation

Hawkweeds are Class 1 State Prohibited Weeds across NSW under the *Noxious Weeds Act 1993*. They must be eradicated and land must be kept free of the plants. As notifiable weeds, all outbreaks must be reported to the local council within 24 hours, and the plants are prohibited from sale in NSW

Source: "Weed Alert: Hawkweed" NSW Department of Primary Industries. 2008 edition prepared by Annie Johnson; 2012 edition prepared by Elissa van Oosterhout; Reviewed: Scott Charlton, Andrew Storrie and Birgitte Verbeek.



Orange hawkweed, *Hieracium aurantiacum*



Orange hawkweed, *Hieracium aurantiacum* subsp. *carpathicola*, growing in Alpine Sphagnum Bog Endangered Ecological Community at Fifteen Mile Ridge, Kosciuszko National Park.
Image: Mark Hamilton, NPWS.



Orange hawkweed, *Hieracium aurantiacum* subsp. *carpathicola*, is covered in white hairs on the stolons and leaves and darker hairs on buds and flowering stems.
Image: Mark Hamilton, NPWS.

Wall hawkweed, *Hieracium murorum*



Wall hawkweed, *Hieracium murorum*, leaves and base of flower stem. Frank Walford Park, Katoomba.
Image: Mark Hamilton, NPWS.



Wall hawkweed, *Hieracium murorum*, typical yellow flower. Frank Walford Park, Katoomba.
Image : Mark Hamilton, NPWS.

Contacts and Further Information

If you find these weeds please help to prevent their further spread by contacting your local Council Weeds Officer or the nearest NSW Department of Primary Industries office immediately for positive identification and further assistance.

Alternatively call the NSW Weeds Hotline 800 680 244 FREE or send an email to weeds@dpi.nsw.gov.au



How did this tropical and sub-tropical sleeper weed, Cupid's flower, *Ipomoea quamoclit*, appear in a Sydney garden???

Westleigh, a north western suburb of Sydney, is on the Hornsby Plateau, an area of poor water-holding capacity, very acidic, low nutrient status and hydrophilic or water repellent soils. No place for a tropical or sub-tropical plant!

It was a surprise when a really attractive scarlet flowering vine appeared in a native garden which has just been covered in a layer of Queensland organic sugar cane mulch (bought from a well-known hardware store).

An internet search revealed the plant to be Cupid's flower, *Ipomoea quamoclit*, a species of the Convolvulaceae family.

Cupid's flower has many common names and the origin is not known but is thought to be native to tropical America.

In Australia Cupid's flower is widely naturalised in northern and eastern Australia, being most common in the northern parts of the Northern Territory, in the coastal districts of Queensland, and in the Kimberley region in northern Western Australia. It is naturalised in the coastal districts of northern New South Wales, near Onslow in north-western Western Australia, and on Christmas Island. Overseas it is found in southern and eastern USA, Vietnam and

on several Pacific islands (e.g. Fiji, Guam, Kiribati, New Caledonia, Western Samoa and the Solomon Islands).

Cupid's flower is an environmental weed in the Northern Territory, Western Australia and Queensland. It is also regarded as a "sleeper weed" or potential environmental weed in northern New South Wales. This garden escape is primarily a problem species in the northern parts of the country, where it invades bushland and competes with native vine species.

In New South Wales it has been found and naturalised north from the Richmond River, including in a Nature Reserve near Ballina. Ballina is 745 kms north of Sydney.

However, two records in the Royal Botanic Gardens Sydney's herbarium have been specimens from Success Inlet, approximately 200 kms south of Sydney on the South Coast. Both records were associated with sugar cane mulch derived from Queensland.

Organic sugar cane mulch production involves harvesting the tops and leaves of the sugar cane plant following harvest. These are field dried, baled and delivered direct to the factory to be stored. The product is then processed, cut, dust extracted, compressed and bagged as sugar cane mulch.



Cupid's flower's, *Ipomoea quamoclit*, twining stems creeping up sandstone rock face and overpowering river or dog rose, *Bauera rubiodes*, and yellow everlasting daisy, *Chrysocephalum apiculatum*, plants as well as out-competing purple twining pea, *Hardenbergia violacea*.
Image: Lawrie Greenup.



How did this tropical and sub-tropical sleeper weed, Cupid's flower, *Ipomoea quamoclit*, appear in a Sydney garden???

This process is used also for pea straw, lucerne and hay mulches.

There is a potential for seeds of significant and invasive weed species to be distributed widely throughout Australia in shop bought mulches. An examination of sugar cane mulch from Queensland by the Western Australian Department of Agriculture & Food revealed thirteen (13) different species of weed, comprising of five (5) grass species and eight (8) broad-leaf species. Samples tested also revealed soil which has the potential to carry plant diseases.

On the 31 May 2013 the Western Australia Department of Agriculture and Food Invasive Species has restricted the import of sugarcane mulch, used by many home gardeners in Western Australia, because of its potential to carry seeds that could threaten the State's biosecurity and agriculture. The Department had been receiving reports from the public about unusual plants germinating from sugarcane mulch, the most serious of these identified was the common sensitive plant, *Mimosa pudica*, a prohibited pest plant in Western Australia.

Careful consideration had been given to dealing with the sugarcane mulch problem and Western Australian import requirements for sugarcane mulch had to be strengthened due to the biosecurity risks posed by this pathway, and an inability to successfully screen for contaminants. Only irradiation is recognised as an appropriate treatment against seed contaminants.

Whilst mulches, to prevent moisture loss, are a desirable part of gardening in the drier areas of Australia there is a risk of inadvertently introducing undesirable weeds and pathogens.

Further information (on the Sydney infestation):
Lawrie Greenup lawriegreenup@ozemail.com.au

Media Release (27 May 2013)

"Sugar cane mulch restricted entry to WA"
WA Department of Agriculture and Food.

Fact Sheet: Cupid's flower, *Ipomoea quamoclit*
Weeds of Australia. Biosecurity Queensland.

Thanks to **Dr. Peter Michael** for the Royal Botanical Gardens Sydney Herbarium's records of Cupid's flower in New South Wales..



Top: Cupid's flower, *Ipomoea quamoclit*, scarlet red flower, star shaped faring open with five lobes.

Middle: Cupid's flower, *Ipomoea quamoclit*, immature fruit which is a round-ovoid capsule containing four seeds.

Bottom: Cupid's flower, *Ipomoea quamoclit*, characteristic scarlet flowers and leaves.

Images: Lawrie Greenup.



The development of a DNA barcode system for species identification of *Conyza* spp.

Karen Alpen, Charles Sturt University

The genus *Conyza* includes numerous species of invasive annual weeds that are a threat to the cropping regions of Australia. *Conyza* spp. are successful ruderal invaders, tolerating a wide range of climates, soils and habitats. There are eight recorded species of *Conyza* in Australia, the most prevalent and invasive being *C. bonariensis* (flax leaf fleabane), *C. sumatrensis* (tall fleabane) and *C. canadensis* (Canadian fleabane).



Flowers of fleabane, *Conyza bonariensis*.
Image: Karen Alpen,

These species exhibit differential susceptibility to commonly applied post emergent herbicides and herbicide resistance has been confirmed in flax leaf fleabane in NSW and other eastern states of Australia. Herbicide application is most effective at an early stage of plant growth before flowering but identification of *Conyza* spp. using morphological characters at these early stages is often only achievable to the genus level.

We therefore attempted to develop a DNA barcode method for accurate and timely species identification of *Conyza* spp. in Australia to facilitate weed identification as well as subsequent management.

A DNA barcode is a short, standardised DNA region that is sufficiently variable to separate different species. A single gene region (mitochondrial CO1 gene) has been established as the standard DNA barcode for species identification in animals but the discovery of a similar single gene DNA barcode for plants has proved more challenging. Multiple gene regions are almost always required. The chloroplastic gene regions of *rbcL* and *matK* have been chosen

by the scientific community as the standard DNA barcode for plants but for some genera, these gene regions are not powerful species discriminators and additional gene regions must be utilised.

This study assessed the ability of one nuclear (ITS) and three chloroplast gene regions (*rbcL*, *matK*, and *trnL-trnF*) to discriminate between *Conyza* spp. from populations of each species collected across Australia.



Top: Fleabane, *Conyza bonariensis* plant near Barmera, South Australia.

Bottom: Fleabane, *Conyza bonariensis* by a roadside near Griffith, NSW.

Images: Karen Alpen.



The development of a DNA barcode system for species identification of *Conyza* spp.

The samples were sourced primarily from herbarium identified voucher specimens. DNA was extracted from fresh and dried plant tissue and amplified at each of the four gene regions of interest using polymerase chain reaction (PCR). DNA samples of appropriate quality were sent to the Australian Genome Research Facility (AGRF) for sequencing. The sample sequences were matched against (aligned to) each other and a number of methods were used to determine which, if any, of the four gene regions were able to discriminate among the species. These methods included the construction of neighbour joining (NJ) trees and a character-based diagnostic method. NJ trees compare the similarity among all sample nucleotide sequences and provide a measure of genetic distance between each pair of sample sequences. Each sample is displayed as a branch on a tree with more closely related specimens clustering together. If a gene region is able to discriminate among the eight *Conyza* species found in Australia, the resulting NJ tree shows eight separate clusters of branches. Each cluster (or clade) consists of an ancestor plus all of its descendants with every descendant being of the same species. The character-based diagnostic method involved searching all sample sequences for one or more nucleotide sites that were unique, and hence diagnostic, for a particular species.

The results showed that a combination of ITS and *rbcL* DNA barcode regions generally provided a suitable platform for potential identification of *Conyza* at the species level. This proposed DNA barcode provides a quick, accurate and inexpensive scientific method of species identification at an early stage of plant growth when separation of the species by morphological means is difficult. It provides a molecular tool for further taxonomic studies of the *Conyza* genus and may potentially aid in the understanding and management of this invasive weed.

Further information:

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DNA barcoding exotic grass species in eastern Australia

Aisuo Wang
Wagga Wagga Agricultural Institute,
NSW Department
of Primary Industries

Invasive grass weeds (such as serrated tussock and Chilean needle grass) can cause severe losses to farmers by reducing productivity of grazing land and livestock, and increasing weed control costs. Young invasive grass weeds are often confused with other native species in the vegetative growth stage, which leads to either control measures needlessly being imposed on the desirable native species, or lack of prompt control of the invasive grass species. Accurate identification of invasive species therefore allows for efficient control and management of potential infestations.

Grass identification traditionally relies on floral material, and may require specialist knowledge of morphological characteristics. With the funding supports from NSW Weeds Action Program, researchers from Wagga Wagga Agricultural Institute, NSW DPI are now developing a novel strategy to address this problem. The use of DNA barcoding technology as a rapid genetic diagnostic tool is currently being evaluated on selected invasive grass weeds at the vegetative growth stage. More than 400 grass samples have been collected from geographically widespread areas across NSW and ACT. Nuclear and chloroplast gene regions in these samples will be sequenced with an aim to identify the best gene marker (s) to distinguish each invasive grass species.

Identification of species unique barcode sequences will allow the development of diagnostic genetic markers that can be used to identify weeds accurately, from samples at all developmental growth stages, and even from degraded or trace amounts of sampled material. Once developed and validated, these DNA barcodes will be publically released with reported protocols to web-based databases and made available as a standard molecular based species level diagnostic for these weeds. This proof-of-concept study will also provide a research platform for further identification of species-specific barcodes for other invasive grass and broadleaf weeds.

Further information:

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Another new glyphosate resistant species confirmed in northern NSW

Tony Cook

Technical Specialist Weeds | Biosecurity NSW
NSW Department of Primary Industries, Tamworth

The world's first cases of glyphosate resistant sowthistle (*Sonchus* spp.) have been confirmed in northern New South Wales. It is now the seventh recognised glyphosate resistant weed in Australia.

Sowthistle is a major summer growing broadleaf weed in many parts of the Australian cropping regions. The two resistant populations come from mixed cropping farms on the Liverpool Plains, the same area that produced the latest glyphosate resistant liverseed grass that was confirmed this January.



Paddock population of sowthistle showing dead susceptible plants with live & green resistant plants scattered throughout. Image: Graham Charles.

Sowthistle and other surface germinating weeds are becoming bigger problems with the widespread adoption of reduced tillage agriculture and an over reliance on glyphosate. Having glyphosate resistant populations will make weed management more complicated, especially with each plant being able to produce thousands of wind-blown seeds.

There is also widespread resistance to Group B herbicides such as chlorsulfuron and metsulfuron in the northern cropping zone, so this reduces the number of successful herbicide options. Antagonism between glyphosate and 2,4-D when tank mixed also reduces control of sowthistle.

Growth stage of sowthistle at the time of treatment had a noticeable effect on the survival rates. The

disparity in control between resistant and susceptible populations was more pronounced once sowthistle surpassed the early stem elongation stage. In essence, it appears that control of glyphosate resistant sowthistle may be feasible if treated at the early rosette stage, even with glyphosate. This interaction between growth stage and glyphosate resistance status is common amongst other glyphosate resistant weed species.

With the barnyard grass and wild radish story, size of plants treated and rate of herbicide applied have a big effect on the level of control. Importantly, the smaller plants are more easily controlled with glyphosate despite having some resistance.

As yet there isn't the extremely high levels of resistance seen in other species where herbicide rate has no effect. This is good for managing sowthistle. Research shows that once a resistant plant grows beyond the rosette stage its ability to survive glyphosate increases rapidly.

These findings have serious implications to grain producers in the northern grain and cotton zone and for those that manage non-crop areas, such as roadsides and railway corridors. These areas have often relied heavily upon glyphosate as their herbicide of choice. The alternative options may not be as effective and as robust as glyphosate.



Effect of 4 L/ha glyphosate (450 g/L) on the two resistant populations (left and centre) and the known susceptible population 8 days after treatment. Image: Tony Cook.



Another new glyphosate resistant species confirmed in northern NSW

Fifty (50) populations of suspected sowthistle from around northern NSW are currently undergoing testing. This is likely to be the start of a much bigger problem with the rapid spread of wind blown seed.

The following points will be critical to successful sowthistle management:

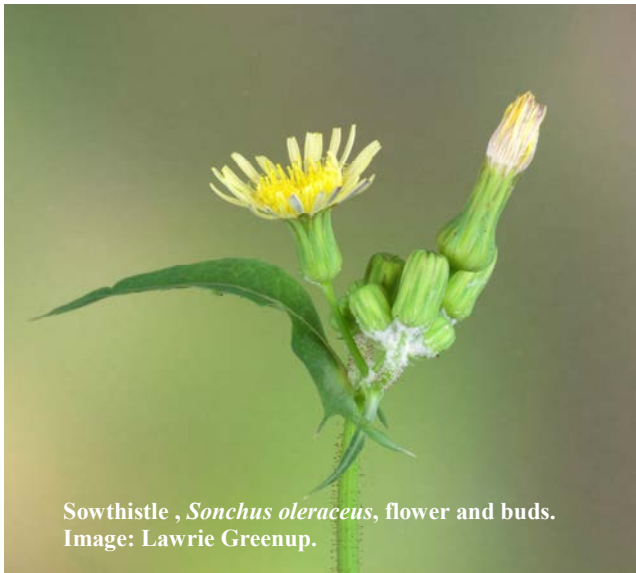
- Get sowthistle tested for glyphosate and Group B resistance
- Spray weeds when rosettes no bigger than the top of a drink can. This may mean spraying more often.
- Use full label rates when sow thistle is present and use appropriate water volumes for the herbicide.
- Have spray rigs properly calibrated to deliver the maximum amount of the herbicide to the weeds
- ‘Double knock’ with another mode-of-action
- Use other modes of action such as Group L, I, L+Q
- Control large survivors with a Weed-seeker® or Weed-it® sprayer or alternatively use other forms of spot spraying, e.g. hand-held applicators
- Control sowthistle and other weeds around fences, buildings, roads, irrigation channels

Further information & reporting suspected resistant weeds:

Tony Cook
 Technical Specialist Weeds | Biosecurity NSW
 NSW Department of Primary Industries, Tamworth
 Phone: 02 6763 1250
 Mobile: 0447 651 607
 Email: tony.cook@dpi.nsw.gov.au

A GRDC Project.

For more information on managing glyphosate and paraquat resistance visit the AGSWG web site www.glyphosateresistance.org.au



register now

Friday 4th April 2014

Sydney Weeds Committees Professional Forum
‘Weed Management: Working Together’

At the NSW Teachers Federation Conference Centre in Surry Hills. A one day event of presentations, networking and capacity building.

Keynote Speaker: Dr Paul Gibson-Roy
 “Managing our natural environment. What goals and can we achieve them?”

Join us and share new technical information, knowledge, strategies and experience.

Booking information www.eventbrite.com.au/e/sydney-weeds-forum-2014-registration-10814278799

This forum is supported by



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NEW SOUTH WALES
 WEEDS ACTION PROGRAM

Local Land Services
 Greater Sydney



Weed Risk Management Assessments for emerging environmental weeds in NSW

Mark Hamilton Project Officer (Weeds)
Pests and Weeds Team, National Parks & Wildlife Service
Office of Environment & Heritage

The management goal for a weed species depends on its stage of invasion, e.g. eradication is only considered for new weed incursions and not for widespread weeds. Once a weed has naturalised, there are three strategic management goals: eradication, containment and/or asset protection, which can be used singly or in conjunction, depending on the scale of the weed invasion. For asset protection in NSW, the Office of Environment & Heritage (OEH) and Department of Primary Industries (DPI) developed a strategy to manage widespread weeds to protect biological assets across the state. The Biodiversity Priorities for Widespread Weeds (BPWW - <http://www.environment.nsw.gov.au/cmaweeds/index.htm>) prioritised sites for weed control based on the impact to biodiversity and the likelihood of successful biodiversity protection.

This strategic approach to the management of widespread environmental weeds highlighted the need for a similar systematic approach to prioritising new and emerging weeds. Accordingly, OEH and DPI embarked on a project to determine the highest priority new and emerging environmental weeds by assessing their weed risk.

A list of 439 weed species thought to be new or emerging threats in environmental areas was assembled. This was compiled from sources such as: the noxious weeds list, regional weed strategies WoNS outlier and containment priorities, information compiled during development of the BPWW, and national lists of new and emerging weeds. The list of 439 was culled to 218 species, to remove weed species that were already widespread in NSW, as well as species not yet recorded in NSW (due to the weed risk management template only allowing for post-border assessments).

Weed Risk Assessments (WRA) are undertaken at a pre-determined scale (e.g. whole of state) and land use. They also contain questions related to the biology, ecology and management of the weed being assessed and potential habitats invaded. Using the NSW Weed Risk Management system, assessments of individual weed species were completed at the state-wide level for conservation areas in NSW. Sufficient information was available to complete assessments for 146 of the 218 species. These WRM assessments allowed the categorisation of the 146 species into management categories, for example 'eradication', 'contain spread', 'manage sites' etc. Thirty-six species were found to pose very high risk and were assigned to the 'eradication' and 'destroy infestations'

categories (the highest categories for new and emerging weeds). Twenty four of these are listed under the NSW *Noxious Weeds Act 1993*. These include boneseed (*Chrysanthemoides monilifera* subsp. *monilifera*), miconia (*Miconia calvescens*), orange hawkweed (*Hieracium aurantiacum*), carrion flower (*Orbea variegata*) and *Leucaena leucocephala*.

All completed and partially completed WRAs will soon be available to the public in an online database that is currently being developed by DPI. In the interim, the OEH website (<http://www.environment.nsw.gov.au/pestsweeds/NewandEmerging.htm>) contains a full list of assessed species, and specific assessments can be requested as needed. The WRAs were performed at a State level, however the information captured in this process can easily be used to perform WRAs at regional or local levels, with minimal effort, to ascertain weed risk and implement appropriate management actions at these scales.

The results of this project are assisting with priority setting to ensure that the highest-risk weeds and those most feasibly controlled are tackled first. For example, results have been used to update weed programs in the National Parks & Wildlife Service Regional Pest Management Strategies (<http://www.environment.nsw.gov.au/pestsweeds/RegionPestManagement.htm>).



Leucaena leucocephala seed pods.
Image: Mark Hamilton.



Weed Risk Management Assessments for emerging environmental weeds in NSW



Boneseed. *Chrysanthemoides monilifera* subsp. *monilifera*, flowers, leaves and fruits. Image: Hillary Cherry.



Carrion flower, *Orbea variegata*, flower. Image: Mark Hamilton.

Further information:

Mark Hamilton, Project Officer (Weeds)
Pests and Weeds Team, NPWS.
Office of Environment & Heritage.

Email: Mark.Hamilton@environment.nsw.gov.au



4th South Australian Weeds Conference

Date: 6 & 7 May 2014.

Venue: Plant Research Centre, Waite Institute, Adelaide.

Keynote speakers: Tim Low, Dr Andy Sheppard, Dr Chris Daniels.

Dr. Andy Sheppard will speak on 100 years of successful weed biological control, Tim Low will address his thoughts for future directions for weed policy, and Chris Daniels, Presiding member of the Adelaide and Mount Lofty Ranges NRM Board will close the conference.

Conference dinner: Edinburgh Hotel, Mitcham, Tuesday 6 May.

Enquiries and registration:
weeds_registrations@hotmail.com



Fifth Victorian Weeds Conference

‘Invasive Plants and Animals – Contrasts and Connections’

Date: 13th-15th May 2014.

Venue: The Mercure Hotel Geelong.

The aim of this series of conferences is to provide information on the latest weed issues and this year we would like to explore the parallels between invasive plants and animals.

Speakers were invited to present and discuss issues, experiences and knowledge across invasive plant and animal management and science, their technical and operational applications, community partnerships and education.

AGM to be held during Lunch, Wednesday, 14 May

Early bird registrations close at COB 31 March

Enquiries and Registration:

Email: secwssv@surf.net.au

Website: wsvic.org.au



Society News

Treasurer's Report (for committee meeting 14th February 2014)

Financial Report.

For the period 1st October 2013 to the 1st February 2014 the society has shown a profit of \$ 4,816.09. The Balance Sheet shows that the society is in a sound financial position with total equity of \$82,787.87 made up of cash - \$7,810.97 and four term deposits totalling \$74,976.90.

The society is in a position to support projects financially that meets its objectives.

It is recommended that we should aim to maintain reserves of \$55,000.00 and as a result we have up to \$27,000.00 available to support approved projects. However we need to ensure that any activities such as seminars return a profit or at least break even as it will be 2015 before we can expect returns of the magnitude we received for the 17th Biennial Weeds Conference.

All accounts – bank and term deposits were reconciled as at the end of January 2014

Membership.

2014 Membership subscriptions payment notices were posted on the 11th February 2014. As at the 10th February 2014 the society has 159 members which include 4 life members. 21 are in arrears for 2013 and the arrears has been included with the 2014 subscription notices.

Payment of membership fees is due for payment by the 1st June 2014

Sponsors.

Tax invoices to sponsors of 'A Good Weed' - Chemcert Australia, Dow AgroSciences, Scotts Australia and Syngenta Crop Protection were posted on the 11th February 2014 with payment due by the 1st June 2014.

Hunter Central Coast Weeds, Australian Catchment Management Pty. Ltd. and Truxor Australia will be sponsors of 'A Good Weed' and 'Punnet Tray' for 2014.

J.M. Swain, Hon Treasurer, 11th February 2014

CAWS Report (Council of Australasian Weed Societies)

I (Kim) participated to my first CAWS meeting as the Society's representative on the 28 February 2014.

Well, I was impressed with the coherent manner that all representatives worked to obtain a positive outcome for all issues brought to the meeting. It is wonderful to see CAWS reps from all state societies stepping up to help the Tasmanian Weeds Society with the Australasian Weeds Conference.

The Conference was the main topic of discussion at the meeting, with CAWS helping Tasmania where we can. Hillary has stepped up and is a major contributor on the program committee, along with Rachel Melland from SA. The conference organising is on schedule and a draft program will be released on the conference website before the end of March.

The CAWS Orator was also discussed, and it was noted that several international names have agreed to be keynote speakers at the conference. CAWS supports Dr. Daniel Simberloff, an internationally recognised invasion ecologist, as the CAWS Orator and major keynote speaker at the AWC.

CAWS also agreed to provide grant funding for a professional development workshop on herbicide use and legislation to run in conjunction with the conference.

Please note that CAWS is now requesting nominations for the CAWS Medal for Leadership. It was documented at the meeting that one nomination has already been received which is from NSW. Nominations for this award close on 1 July 2014.

**Kim Hignell and Hillary Cherry
NSW CAWS Representatives.**



Creeping oxalis (purple leaf form)
Oxalis corniculata var. *atropurpurea*



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.

Let us know about local and regional news, people and events, new emerging weed species, weed management issues, bushland regeneration, bushcare 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 2014/15 are:

- #67 Winter 2014 31 May 2013
- #68 Spring 2014 31 August 2014
- #69 Summer 2014/15 30 November 2014
- #70 Autumn 2015 28 February 2015

Letters to the Editor

The editors welcome members comments on articles that have appeared in 'A Good Weed' or have weed-related issues they would like to bring to the attention of the Society members.

If you would like to contribute a 'Letter to the Editor' it must be under 150 words, submitted by the due date for the issue you would like it to appear and contain your contact details.

The editors reserve the right not to publish a letter. Contact: editor@nswweedsoc.org.au

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Thanks 2013 Sponsors of 'A Good Weed' & 'Punnet Tray'



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Do you wish to be included in the email distribution list? If so, contact the secretary at secretary@nswweedsoc.org.au Also, let us know if you have changed your email address.

Your email will be used only for Society matters and you can unsubscribe at any time.



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

Committee Meeting Details (to be confirmed)

14 April 2014 Executive Committee Meeting
13 June 2014 Executive Committee Meeting
8 August 2014 Executive Committee Meeting
10 October 2014 Executive Committee Meeting
12 December 2014 Executive Committee Meeting
20 November 2014 AGM and Lunch/Dinner

If unable to deliver return to:

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

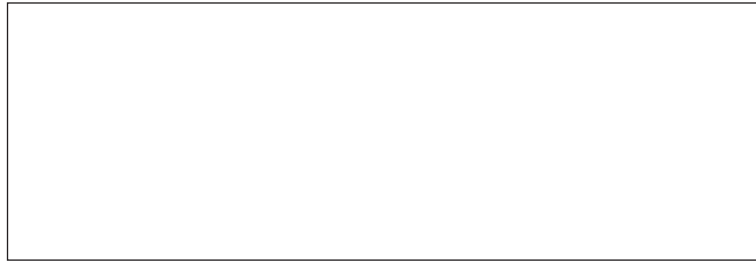
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