



Spring News 2019

Welcome to the spring news from the NSW Weed Biocontrol Taskforce. The Taskforce is a voluntary collaboration of members from a number of like-minded agencies responsible for managing weeds in NSW. This Newsletter is designed to summarise key information from Taskforce biannual meetings. Our meetings are designed to build an environment for sharing information and facilitating collaboration on current and future biocontrol programs. We hope you enjoy this spring issue.

Biocontrol of weeds and drought

Some weed species are adapted to low rainfall conditions and thrive under drought conditions. During these times, you may notice the resurgence of weeds in your area that are under current management by biocontrol agents.

Paterson's curse is an example of a weed, that has been more prolific this year. The current drought conditions may provide a competitive edge over less drought-tolerant species, particularly in heavily grazed pastures with limited groundcover and pasture regrowth.

But don't stress! Even though this toxic weed appears to be having a resurgence take a closer look. Two of the most damaging agents - the flea beetle and crown weevil - are still there doing their job. They just need a little time to catch up to continue controlling the population.

Remember that biocontrol will not eradicate a weed, but is used to reduce populations to levels that are manageable and, ideally below an economic/damage threshold.

Six biocontrol agents including:

- the leaf-mining moth, *Dialectica scariella*
- crown weevil, *Mogulones larvatus*
- root weevil, *Mogulones geographicus*
- flea beetle, *Longitarsus echii*
- stem beetle, *Phytoecia coerulescens*
- pollen beetle, *Meligethes planisculus*

were released against Paterson's curse and have established and spread well in the landscape. These agents act synergistically against Paterson's curse with plants often dying before they flower. The agents reduce seed production, seed banks, plant density and plant vigour which has led to a significant reduction in the impact of Paterson's curse. Those 'seas of purple' landscapes will hopefully be a scene of the past.

Photos

Top: Paterson's curse before the release of the first biocontrol agents in the late 1980s (photo of Tallangatta, North East Victoria by M. Moerkerk).

Bottom: Successful biocontrol of Paterson's curse (photo R. Kwong).

Tallangatta 1980's prebiocontrol



Tallangatta 2018



continued... Biocontrol of weeds and drought

As all effective biocontrol agents for Paterson's curse are widespread, there is no need for redistribution. Paterson's curse fluctuates seasonally, so agents are not abundant during the winter period. Substantial agent populations can take a while to build up during spring and summer, which are then able to do a robust job attacking the weed.

Photos clockwise from right: Crown weevil adult; A sea of Paterson's curse before biocontrol; Crown and root damage on Paterson's curse by the crown weevil (wide larvae) and flea beetle (thin larvae); Flea beetle adults and the shot hole damage they inflict.



Invasive Cacti Field Guide

The new 'Invasive Cacti Field Guide – Identification and control of invasive cacti, North West NSW' is now available. This publication is a deliverable under the NSW DPI / NW LLS "Releasing the Hounds project" and has been a great collaboration between all players.

The guide is available online at:

https://northwest.lls.nsw.gov.au/_data/assets/pdf_file/0004/1192396/5537_Cacti-Booklet_VeryFINAL_WEB.pdf



North West Cactus Quarterly Newsletter

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The Weeds Society of New South Wales Inc.

Promoting the awareness, understanding & control of weeds.

For more information: <http://www.nswweedsoc.org.au/>

Bridal Creeper smashed by the leafhopper in an ecologically endangered saltmarsh community at Lake Macquarie

Saltmarshes are listed as endangered ecological communities in NSW, and threatened globally. Weed invasion, damage by domestic and feral animals, human disturbances, altered fire regimes, climate change and the widespread invasion of saltmarshes in southeast Australia by mangroves has reduced the habitat availability for a diverse array of flora and fauna. Saltmarshes provide protective habitat for a variety of species like migratory shore birds. They support commercial and recreational fishing and provide a buffer against storm surges.

Released in 2007 by CSIRO, the bridal creeper leafhopper is now having a significant impact against bridal creeper in the saltmarsh community at Toronto Lions Park situated in the Lake Macquarie Local Government Area. "I've never seen a saltmarsh so prolific with bridal creeper"; quoted Dennis Gannaway (National Bridal Creeper WoNS Co-ordinator, 2009) a few years after the release of the leafhopper. We knew this agent would take a while to have an impact on the weed, however, the observed benefits as demonstrated through native species recovery are superb (see images below). There are only two columns of bridal creeper growth left over the entire saltmarsh area!

Both nymphs and adults feed on cell contents, from the underside of leaves, with their piercing and sucking mouthparts. Damage initially appears as small, white/yellowish flecks on leaf tops and develops into merged zigzag patterns causing discolouration and whiteness. Feeding reduces the growth and production of seed and continual damage exhausts tuber production, leading to the decline in bridal creepers competitive ability.

Over the years, this site alone has produced enough leafhopper numbers for adequate redistribution around NSW. This demonstrates the importance of recording release site information and observations in the Australian Biocontrol Hub (<https://biocollect.ala.org.au/biocontrolhub>). Recorded dispersal is around 10 km from the release site. Our little 2.5mm friend is still 'on the hop', assisting with the management of bridal creeper in surrounding areas.

Further redistribution around the state today is unnecessary and only recommended at specific sites with heavy infestations, or sites that may have year round above ground bridal creeper foliage. Your local weed or biosecurity officer can assist you with these decisions.

We are incredibly happy with the great achievement of our little leafhopper friend!



Top left: First release of the bridal creeper leafhopper at Toronto Lions Park, Lake Macquarie (NSW).

Top right: Saltmarsh infested with bridal creeper (pre-2007) at Toronto Lions Park

Bottom left: Close up of the bridal creeper leafhopper *Zygina* spp. on bridal creeper.

Bottom right: Damage inflicted by the leafhopper causing white flecks on leaves leading to complete discolouration.

The Australian Biocontrol Hub: an important home for information on agent redistribution

Don't forget to upload your agent release site information and observations to the Australian Biocontrol Hub. You can use your smartphone, or alternatively enter information at your desktop. This platform is integral for finding information on where agents have been released to assist others with collection for redistribution. Please add photos as well. <https://biocollect.ala.org.au/biocontrolhub>



bio control hub

research & action in partnership

How do I know what agents are already present on my weeds?

What tools and information are available to help me get started?

Are there biocontrol agents available for my weed?


When is the best time to collect them and how do I do it?

The Australian Biocontrol Hub is a web-based tool that enables the general public, weed professionals and scientists to record data on biocontrol agent releases, field observations of biocontrol agent spread, while providing easy access to biocontrol information and references.

Step 1
 Register with the Atlas of Living Australia
www.ala.org.au

Step 2
 Log in to the Australian Biocontrol Hub
www.biocollect.ala.org.au/biocontrolhub

Step 3
 Select your weed from the list

Step 4
 Each weed has a homepage with information about the biocontrol project

Step 5
 Select the biocontrol agent you are interested in

Step 6
 View maps of where agents have been released or observed

Step 7
 Fill out the survey form and tap on the map to select your location

Step 8
 Download the Biocontrol Hub app to record data in the field using your smartphone

AGRICULTURE VICTORIA

The Australian Biocontrol Hub was funded by the Commonwealth Government's Rural Research and Development for Profit program, conducted in collaboration with Meat and Livestock Australia and Agriculture Victoria.

Workshops: strong interest in biocontrol in the central tablelands

The Central Tablelands LLS, Landcare, DPI and the NSW Weed Biocontrol Taskforce partnered to deliver an introduction to biocontrol course in the central tablelands in late September 2019. There was strong interest in the day with over 70 people in attendance from a range of backgrounds (state and local government, cropping and grazing enterprises as well as hobby farmers).

Dr Andrew McConnachie was the presenter for the day giving the participants information on what weed bio-control agents were available locally, along with explanations of how they work. Information was also given on how best to spread these biocontrol agents locally, with NPWS and Forestry staff bringing in samples of broom gall mite that participants were able to take home and introduce to their local broom populations. Evaluations on the day showed that the day not only increased participant's knowledge and understanding of local weed biocontrol options, but also clearly showed that participants were more confident to make decisions about weed biocontrol.

Four weeds were identified as most serious for the Central Tablelands area through survey responses – these being blackberry, serrated tussock, St John's Wort and blue heliotrope. The biocontrol options for St John's Wort and blue heliotrope were addressed on the day, along with updates on research into biocontrol agents suitable to use on blackberry and serrated tussock. More workshops and field days on biocontrol and weed identification were identified as activities that were needed in the region into the future. Central Tablelands LLS is currently working with Dr Andrew McConnachie to design a series of smaller follow-on workshops that would include field visits to survey for local weed biocontrol agents.

More workshops across the state will be running in the New Year. Stay tuned for registration details.



Dr Andrew McConnachie addressing the participants at the Bathurst Weed Biocontrol day.

Facebook



To join the **NSW Weed Biocontrol Taskforce** facebook page simply search for 'NSW Weed Biocontrol Taskforce'. This page is a great outlet for sharing information, including the latest developments in weed and biocontrol research.

NSW Weed Conference

The NSW Weeds Conference this year had a great turn-out with 284 delegates, 25 sponsors and exhibitors, and 60 speakers across nine themes, showcasing new research and ideas for controlling and eradicating weeds. The theme for the conference was to put the 'we' in WEEEEEDS.

Our keynote speaker Professor Kristine French highlighted the importance of working together, reporting metrics, and in particular, the need for highlighting our good news stories so the public receives the right information. Following on from this, Taskforce representative Dr Andrew McConnachie gave a smashing plenary, demonstrating how we are building capacity across the state and internationally in weed biocontrol. Mr Troy Brown provided a talk on how the Taskforce collaborates with land managers and community to maintain a functional biocontrol agent delivery pipeline.

The Taskforce had a strong presence and our stall was a great hit. We do not have the resources to do things on our own, so this collaborative effort was very valuable. Our presence and the many talks on weed biocontrol strongly demonstrated that the partnerships we are building across the state and in working with the community are integral for building a sustainable future.

Thank you to all Taskforce members for facilitating engagement at our stall - well done!



Top: Andrew McConnachie's plenary, putting the 'We' in Weed Biocontrol

Bottom: The NSW Weed Biocontrol Taskforce stall

Want to be involved in Biocontrol Research?

The initial stages of biocontrol research are often done by scientists overseas or behind closed doors within quarantine facilities. But there are ways in which weed officers can be involved and make a valuable contribution to science! Are you interested? Then read on....

1 Collection of weed samples for genetic testing.

The genetic diversity of weed populations can influence the effectiveness of biocontrol agents. If we can determine how many different genetic populations occur in Australia and compare these to populations overseas where the weed is native, we can focus our search for natural enemies on weed genotypes of the closest match.

2 Collection of weed propagules for ecological studies.

Why do introduced plants become invasive? One possibility, known as the Enemy Release Hypothesis, is that introduced plants lack natural enemies and therefore, can put their resources into growing bigger, stronger and more reproductive. Scientists wishing to study the mechanisms behind weed invasion often set up "common garden experiments", where populations of the weed from native and invaded ranges are grown side by side and various plant traits compared. Such studies are often linked to the population genetic studies mentioned above, to see if there is an underlying genetic basis for the weedy traits of some introduced plants.

Both studies often require plant samples to be collected from multiple sites and multiple locations across the weed's invaded and native range. For genetic studies, the samples require preservation in silica gel. For ecological studies, viable propagules such as seeds or tubers are required.

Requests for plant samples are listed below. Please contact the relevant scientists to express your willingness to help and to obtain further information on the collection technique.



Weed: Nodding thistle, *Carduus nutans*

Purpose: PhD student wanting to grow nodding thistle from the UK, NZ and Aus in a common garden experiment in the UK.

Contact person: Quentin Paynter Manaaki Whenua – Landcare Research New Zealand PaynterQ@landcareresearch.co.nz



Weed: Serrated tussock, *Nassella trichotoma*

Purpose: Population genetic study to determine the genetic diversity of invasive Australian and New Zealand populations, compared to native populations in Argentina

Contact person: Raelene Kwong Agriculture Victoria Rae.kwong@agriculture.vic.gov.au



Weed: Sagittaria, *Sagittaria platyphylla*

Purpose: Common garden experiment to be conducted in the USA (native range), comparing native populations with those from Australia and South Africa.

Contact person: Raelene Kwong Agriculture Victoria Rae.kwong@agriculture.vic.gov.au

New Taskforce Priorities

Looking forward, new priorities for the Taskforce include the biocontrol of African lovegrass, African boxthorn, silverleaf nightshade, privets, Harrisia cactus, Cape and Scotch broom, gorse, broadleaved pepper tree, blue heliotrope, sagittaria and wandering trad.

Become a Taskforce member and register with NSW DPI's Weeds Extranet to find out more information on biocontrol agent availability and Taskforce priorities (see Table 1).

Table 1. Current agents available for redistribution in NSW

Weed	Weed scientific name	Agent common name	Agent scientific name
Alligator weed	<i>Alternanthera philoxeroides</i>	Flea beetle	<i>Agasicles hygrophila</i>
Cat's Claw	<i>Dolichandra unguis-cati</i>	Jewel Beetle	<i>Hylaeogena jureceki</i>
Creeper		Tingid bug	<i>Carvalhotingis visenda</i>
Crofton Weed	<i>Ageratina adenophora</i>	Crofton weed rust fungus	<i>Baeodromus eupatorii</i>
<i>Cylindropuntia</i> spp. and <i>Opuntia</i> spp.	A range of species (and in some cases various lineages) are available for cactus biocontrol. See the weeds extranet for more details	Cochineal Moth	<i>Dactylopius</i> spp. and their lineages <i>Cactoblastis cactorum</i> .
Madeira vine	<i>Anredera cordifolia</i>	Madeira beetle	<i>Plectonycha correntina</i>
Salvinia	<i>Salvinia molesta</i>	Salvinia weevil	<i>Cyrtobagous salviniae</i>
Wandering trad	<i>Tradescantia flumenensis</i>	Smut fungus	<i>Kordyana brasiliensis</i>
Water hyacinth	<i>Eichhornia crassipes</i>	Water hyacinth weevils (temperate) (sub-tropical)	<i>Neochetina bruchi</i> <i>Neochetina eichhorniae</i>
Water lettuce	<i>Pistia stratiotes</i>	Water lettuce weevil	<i>Neohydronomus affinis</i>
Weedy Sporobolus grasses	<i>Sporobolus pyramidalis</i> , <i>S.fertilis</i> , <i>S.africanus</i>	Crown rot	<i>Nigrospora oryzae</i>

See the Weeds Extranet for more details: <https://extranet.dpi.nsw.gov.au/weeds>

Many thanks for your support this season
Steering Committee: NSW Weed Biocontrol Taskforce

For further information about the Taskforce please contact Executive Officer
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