NSW GOVERNMENT Department of Primary Industries

nsw weed biocontrol TASKFORCE

Winter News 2020

Welcome to the winter news from the NSW Weed Biocontrol Taskforce. Our meetings are designed to build an environment for sharing information and facilitating collaboration on current and future weed biocontrol programs. While we are aware that the current COVID-19 pandemic is impacting us all, the Taskforce has been meeting virtually to continue our work during this period. Our essential workers have still been able to attend workplaces, meaning that our containment facility, laboratories and mass-rearing services, are still open for business. While some work is on hold, we have taken the opportunity to focus on a few new opportunities that are shared within this winter issue. We hope you enjoy reading it and stay safe.

The importance of understanding short- and long-term impacts of biocontrol

Eureka prize-winning scientist Professor Kristine French from the School of Earth Atmospheric and Life Sciences at the University of Wollongong joined our meeting to present to us on the importance of evaluating biological control agents post release.

With over 30 years of experience in weed research, close to 100 publications and the supervision of 140 honours and postgraduate students in ecology, we are privileged to have Kris join forces with NSW DPI and the Taskforce.

Kris will be assisting the team with the refining of our practices both within our mass-rearing facilities and through post release evaluation. To improve best practice procedures in weed biocontrol, we are developing standardised release and monitoring protocols so that we can be more strategic in servicing the needs of our Taskforce members, the state and the environment.

Bitou bush (*Chrysanthemoides monilifera* subspecies *rotundata)* was introduced to Australia from South Africa and from 1946 to 1968 was deliberately planted for dune erosion control along the east coast of Australia. By the early 90s it had dominated about 80% of coastal dune communities and nearby habitats. Over the course of two decades, Kris found that bitou 'wins' spaces in native flora. Bitou outcompetes native flora through its strong competitive seedlings and roots that exude chemicals which build up in the soil to prevent native seedling germination, a process known as allelopathy. Kris continues to work closely with land management agencies to deliver some of the much needed ecological information needed for a range of invasive species including the hawkweeds, bitou bush, sea spurge, buffalo grass, lantana and the exotic vines and grasses.

Through one of her recent published works, Kris described the long-term effectiveness of biocontrol agents on bitou bush control. They focused on two of the biocontrol agents released in the 1990s; the bitou tip feeding moth (*Comostolopsis germana)* and the seed eating fly (*Mesoclanis polana).*

cont... page 2

Images
Top: Professor Kristine French (University of Wollongong)
Bottom: Bitou bush

Editors: K. Harvey, A. McConnachie, R. Holtkamp 28/08/2020
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The importance of understanding short- and long-term impacts of biocontrol

(continued from page 1)

These agents were released between 29 and 32 years ago and the team wanted to;
1) understand the impacts of these agents over ecological time,
2) know if these agents are effective over the distribution of bitou bush,
3) understand agent interactions and
4) determine where impact is more pronounced.

The team found that foredune coastal habitats had more tip moth damage than hind dunes and that this impact increased with latitude. Hence southern areas experienced greater impact by the moth. The seed-feeding fly on the other hand, had a greater impact in hind dunes than foredunes, but latitude showed no effect over time. In combination, the moth and the fly were able to reduce reproductive output (measured as decreased seed output) by between 50-70%, with southern infestations on the foredune being more impacted than those in the north.

Key take home messages from this work:

- To justify investment in management, we need to understand impacts over ecological time.
- Monitoring in the short- to longer-term is crucial for evaluation and can better inform management decisions at local scales where agent activity might be less effective.
- We need information on release sites and protocols surrounding release, establishment and dispersal (monitoring) to inform these actions.
- Protocols for post-release evaluations need to be implemented in a more consistent manner.
- If we can model spread and impact, we can better understand where agents do well which can inform release programs and integrated management.

Click here to read the article on this work.

Benefits to biodiversity and ecosystems : A new video

A new YouTube video highlights the inter-agency commitment to providing benefits to biodiversity and ecosystems through weed biocontrol. CSIRO, NSW Department of Primary Industries and NSW Department of Planning, Industry and Environment with financial support by the NSW Environmental Trust have come together to provide potential biocontrol solutions for management of many environmental weeds. These include African boxthorn, African lovegrass, balloon vine, broad-leaved pepper tree, giant rat's tail grass, Hudson pear, leaf cactus, ox-eye daisy, sea spurge, small-leaf privet, and wandering trad.

Click here to view the video.

Also visit https://research.csiro.au/nswweeds/ for further info on research programs.

Biocontrol of wandering trad

In partnership with community stakeholders, CSIRO supported by the NSW Environmental Trust is soon to undertake large-scale releases and evaluation of the leaf-smut fungus *Kordyana brasiliensis* for the biocontrol of wandering trad *(Tradescantia fluminensis)* in NSW.

The program will run from July 2020 to June 2023. CSIRO will provide the fungus to interested community members for release. They will also be setting up a series of monitoring plots to evaluate agent infection levels and effects on the target weed.

Anyone is eligible to register their interest to receive the fungus from CSIRO for release in NSW. CSIRO will send an information package to participants upon registration or receipt of the agent. Participants will be required to provide CSIRO with data on where and when releases occurred including the quantity of material released.

For further information see Appendix 1 of newsletter and at: https://research.csiro.au/nswweeds/wandering-trad/

Releasing the hounds on Hudson pear: Biocontrol of Hudson pear

Hudson pear (*Cylindropuntia pallida)* is one of eight species of *Cylindropuntia* that are invasive in Australia. In order to develop biocontrol solutions for these weedy cacti, NSW DPI collaborated with QDAF (Queensland Department of Agriculture and Fisheries) to source and test appropriate lineages (different types) of the cochineal, *Dactylopius tomentosus*. With funding from the NSW Weed Action Program (a NSW Government initiative) and the federally funded Rural Research and Development for Profit program (rounds one and four), six lineages of *D. tomentosus* were matched against each of the eight invasive *Cylindropuntia* spp. The 'californica var. parkeri' lineage was approved for Hudson pear and the first releases at long-term monitoring sites were made in November 2017.

A biocontrol mass-rearing facility has been constructed in Lightning Ridge using funding from a NSW Governement drought initiative. The funding has also facilitated chemical control of outlying (of the core invaded range) populations of Hudson pear, and the 'Releasing the hounds on Hudson pear' program. This collaborative approach has seen NSW DPI working closely with the North West Local Land Services, Castlereagh Macquarie County Council, Northern Slopes Landcare and the community to deliver a highly effective integrated weed management program against Hudson pear. The program includes:

- community workshops (chemcert and biocontrol)
- creation of awareness materials (Youtube videos, popular articles, fact sheets and general information flyers)
- the co-ordination and documentation of the biocontrol mass-rearing and release program.

The new biocontrol mass-rearing facility at Lightning Ridge. Photo by P. Dawson.

For the next two years, the rearing facility at Lightning Ridge will focus exclusively on mass-rearing the Hudson pear cochineal to tackle the core invasion in north western NSW. To fast-track release of the Hudson pear cochineal, landholders can swap tubs of fresh Hudson pear segments (cladodes) for tubs of segments containing the biocontrol agent.

Please find the latest Hudson pear publications on the Northern Slopes Landcare Association website https://www.northernslopeslandcare.com.au/cacti/resources.html

- Come clean, go clean – Help stop the spread of invasive cacti (generic cacti tourism brochure)
- Seen this plant? Hudson pear
- Biocontrol of Hudson pear using the Cochineal

Photos by A. McConnachie. Left: an infestation of Hudson pear; Right: Hudson pear covered in the cochineal.

Biocontrol of Hudson pear *continued from page 3*

To register your interest with the Hudson pear program, please use our new weed biocontrol agent and release site registration form or contact the NW Cacti Control Coordinator nwcactus@nsla.net.au.

Also tune in to the Cactus quarterly for updates on this and other invasive cacti programs. To subscribe contact Jo Skewes at nwcactus@gwydir.nsw.gov.au.

The Hudson pear rearing, redistribution and monitoring program is further supported by the NSW Environmental Trust, NSW DPI and the NSW Weed Biocontrol Taskforce.

Above: Matthew Savage and Andy Fletcher (Castlereagh Macquarie County Council) inside the new rearing facility.

Right: Andrew McConachie (NSW DPI) and Andy Fletcher showing the Honourable Adam Marshall MP, Minister for Agriculture and Western New South Wales, the impacts of the biocontrol on Hudson pear. Photo by Jo Skewes

Biocontrol release applications have been submitted for the following weeds:

Sagittaria *(Sagittaria platyphylla and S. calycina)*- submitted by Victoria - with the agent *Listronotus appendiculatus* (fruit-feeding weevil).

Cabomba *(Cabomba caroliniana)* - submitted by CSIRO - with the agent *Hydrotimetes natans* (weevil).

Fleabane *(Conyza bonariensis)* - submitted by CSIRO - with the agent *Puccinia cnici-oleracei* (rust fungus).

Sea spurge *(Euphorbia paralias)* - submitted by CSIRO - with the agent *Venturia paralias* (leaf and stem blight fungus).

New research

Biocontrol of silverleaf nightshade (*Solanum elaeagnifolium)* – Greg Lefoe (Agriculture Victoria)
New agents are under investigation in North and South America.

Biocontrol of blackberry - Dr Raelene Kwong (Agriculture Victoria)
The Forests and Pests Research Consortium have approved funding for a two-year project to investigate natural enemies on *Rubus anglocandicans* in the United Kingdom.

New research

Biocontrol of narrow-leaf privet

Narrow-leaf privet *(Ligustrum sinense;* Oleaceae) is a serious environmental weed throughout Australia, where infestations threaten biodiversity. It has been reported that privet pollen (or even the privet perfume) causes allergic reactions and hay fever in humans. Privet berries and leaves have been documented to be poisonous to humans and livestock if ingested. In Australia, narrow-leaf privet invades native and plantation forest industries, orchards and pastures. It has a significant impact on yields in these systems and costs of controlling it are extremely high.

In response to this problem, the NSW Environmental Trust is generously supporting the importation of the privet lace bug *(Leptoypha hospita,* Hemiptera: Tingidae) from New Zealand into the NSW DPI quarantine facilities in Orange, NSW Australia. The privet lace bug has been extensively tested for biological control against small leaf privet in both the USA and New Zealand and as a result, its biology, life history and host range are well documented. This project will directly benefit from the biocontrol investment already made for narrow-leaf privet by Landcare Research New Zealand who imported the agent for testing from its native range in China before its release in 2015.

In its native range (China) the lace bug is reported to attack a range of Ligustrum species. Within the family Oleaceae, there are six genera considered to occur naturally in Australia (comprising 23 species). One Australian native species, *Ligustrum australianum*, is in the same genus as the target weed. As a result, this project will initially focus on testing the lace bug on *L. australianum.* After importation from New Zealand and establishment of a culture of the insect in quarantine conditions, the native *L. australianum* will be tested under no-choice and paired-choice conditions. If the lace bug feeds and develops on *L. australianum* at significant levels, the culture and program will be terminated, with these findings reported. If, however, the tests demonstrate that the lace bug does not pose a threat to this native species, the insect culture will continue to be maintained, and a proposal developed for testing of additional species relevant to the Australian context.

How you can help.

The NSW team are looking for populations of the native Australian privet, *L. australianum* so if you are familiar with it please notify us directly on weed.biocontrol@dpi.nsw.gov.au

Information about narrow-leaf privet is on the Weedwise website: https://weeds.dpi.nsw.gov.au/Weeds/PrivetNarrowleaf

Images

Top: the privet lace bug (*Leptoypha hospita)*. Photo courtesy of Landcare Research

Second top to bottom: Australian native privet *Ligustrum australianum,* flowers, fruit, trees, leaves. Photos from: North Queensland Plants

Update on your biocontrol research contributions

Serrated tussock

The search is on again for microorganisms with the potential to kill serrated tussock (*Nassella trichotoma*). The study is part of an international effort with collaborators in Australia, New Zealand (Manaaki Whenua Landcare Research and Lincoln University) and Argentina, to reinvigorate a biological control program involving native pathogenic fungi.

The Australian component being led by Raelene Kwong (Agriculture Victoria), is charged with the task of pinpointing the cause of a disease suspected to cause widespread dieback in serrated tussock infestations. Previous sightings of the dieback were made over ten years ago near Orange (NSW) and Bulla on the outskirts of Melbourne.

Since October 2019, a total of 12 site visits have been conducted at seven site locations in Victoria. At each site, individual tussock plants were visually inspected to look for signs of pathogen attack and/or dieback symptoms. Plant samples were taken by pulling up plants (diseased plants pulled up easily from the ground), or by grubbing out the plants with a garden hoe or trowel.

Initially, no signs of the characteristic white fungus occurring on the tussock roots and crowns were observed, which may have been due to the dry conditions experienced over late spring and summer. However, in May 2020 signs of the dieback diseases were observed at Brimbank Park, Keilor not too far from the Bulla suburb (image below right). To date, 64 fungi have been isolated from across the sampled sites and DNA extraction is underway to enable isolates of interest to be identified.

To complement this research, Agriculture Victoria are also conducting a genetic study to compare levels of genetic diversity between invasive Australian and New Zealand populations and to see how they might differ with native populations from Argentina. If the genetic diversity between Australia and New Zealand is very different, this may have implications on the possible success of biocontrol. Consequently, future research may need to take genetic diversity into account when selecting biocontrol agents that will be effective against different weed genotypes. So far, Agriculture Victoria have only sampled Victorian populations, but need samples from elsewhere in Australia.

How can you help?

1. Look out for serrated tussock plants that look diseased, as shown in the image below on the left and contact Raelene Kwong to record your sighting.
2. Collect serrated tussock plants samples to be included in the genetic study. Contact Raelene Kwong for instructions and a collecting kit.

Contact:

Raelene Kwong, Agriculture Victoria Email: Rae.kwong@agriculture.vic.gov.au Mobile: 0409 965 471

Images: Brimbank Park, Keilor (Vic) 25 May 2020. (Left) site photo, (right) diseased plant with white fungus.

The ongoing fight against cat's claw creeper

Cat's claw creeper (*Dolichandra unguis-cati*) is a perennial woody vine native to Central and South America and the West Indies. In Australia it is a major environmental weed and has been listed as a Weed of National Significance (WONS). Cat's claw creeper poses a significant threat to biodiversity in riparian areas, rainforests, non-agricultural areas and remnant native vegetation. In densely infested areas, it covers standing vegetation, eventually causing canopy collapse. Two morphologically distinct varieties of cat's claw creeper are present in Australia; the more common 'short pod' variety (found predominantly north of Sydney NSW to northern Queensland) and the 'long-pod' variety (mostly found in south eastern Queensland).

Biological control of cat's claw creeper was initiated in Australia in 2001, and since then three agents, a leaf-sucking tingid (*Carvalhotingis visenda)*, a leaf-tying moth (*Hypocosmia pyrochroma*) and a leaf-mining beetle *(Hedgwigiella jureceki*) have been field released. All three agents have established, but the geographic range and abundance of these agents vary widely. Current research led by Dr Dhileepan Kunjithapatham and his team at Queensland Department of Agriculture and Fisheries is focused on monitoring the establishment and spread of the leaf-tying moth and the leaf-mining beetle; and the testing and releasing of plant pathogens like a leaf-spot disease (*Cercosporella dolichandrae)* and a gall-rust (*Uropyxis rickiana)*.

The leaf-tying moth

The leaf-tying moth (*H. pyrochroma)* was field released from 2007 to 2011, targeting both "short-pod" and "long-pod" forms of cat's claw creeper. The larvae feed destructively on leaves, by tying them together with silk, leading to the creation of silken tunnels. Systematic surveys in Queensland from November 2019 to May 2020 indicated an abundance of larval activity, particularly during the summer and winter period. A CLIMAX model was developed for the leaf typing moth to identify the extent of its distribution.

The leaf-mining beetle

The leaf-mining beetle (*H. jureceki)* was field released from 2012 to 2017. Both the larvae and adults are very damaging - larvae mine within the leaves and the adults feed on young leaves. The beetle continues to spread from release sites to new areas. An unidentified parasitoid of the leaf-mining jewel beetle was collected from the field. Future research will focus on the seasonal incidence and abundance of the parasitoid in the field to determine its overall impact on the biocontrol program. Further studies on the agents overall impact on cat's claw creeper are underway.

Plant pathogens

Three plant pathogens have been identified as prospective biocontrol agents for cat's claw creeper in Australia:

- a leaf-spot pathogen (*C. dolichandrae)* causing necrotic spots and premature leaf abscission
- a gall-rust *(U. rickiana)*
- a leaf rust *(Prospodium macfadyena)*.

Research with two of the pathogens (*C. dolichandrae* and *U. rickiana)* is in progress at CABI-UK. Reliable techniques to develop infection have been developed for the leaf spot disease and the gall rust. Further host specificity testing is in progress.

Images left to right: leaves and the 'claws' that help the vine climb; pods and flowers of cat's claw creeper; a dense infestation covering the canopy of trees.



Upcoming introductory biocontrol workshops

Cowra and Mudgee
Workshops which were originally planned for early September in the Cowra and Mudgee districts have had to be postponed due to the developing COVID-19 situation. Instead, Marita Sydes (Central Tablelands LLS) has proposed the idea of either hosting live events (over Microsoft Teams) or recording YouTube videos of the biocontrol workshop content.

Understanding biocontrol risk better - linking laboratory and field observations

Today several steps are required before biological control agents are released into the environment. First the weed species proposed for biological control research must be endorsed through a national committee called the Environment and Invasives Committee. Later, for any agent to be approved for release, each must demonstrate a very low or negligible risk to the environment via risk analysis undertaken by the Department of Agriculture, Water and the Environment.

The analysis is extensive, and it usually takes several years for an agent to be approved for release. DAWE assesses the risk under the Commonwealth's Biosecurity *Act* 2015 while a parallel process operates under the Environmental Protection and Biodiversity Conservation *Act* 1999. The analysis includes information pertaining to host-specificity testing results, ensuring that the proposed agent is specific to the target, as well as information gleaned from wide consultation with technical, scientific experts and interested stakeholders.

In order to improve the efficiency of decisions surrounding release applications, Agriculture Victoria supported by AgriFutures Australia is developing a data-driven risk model to enable regulators to better anticipate the risks of biocontrol from the results of host-specificity testing. Novel for Australia, it will compare host-testing data from previously established weed biocontrol agents with their host specificity in field surveys. Over the next 12 months surveys will be conducted to determine the presence of weed biocontrol agents on non-target plants in the field. Contact Jackie Steel (Jackie.Steel@agriculture.vic.gov.au) if you would like to get involved in these surveys.

Weed Biocontrol agent and release site registration form

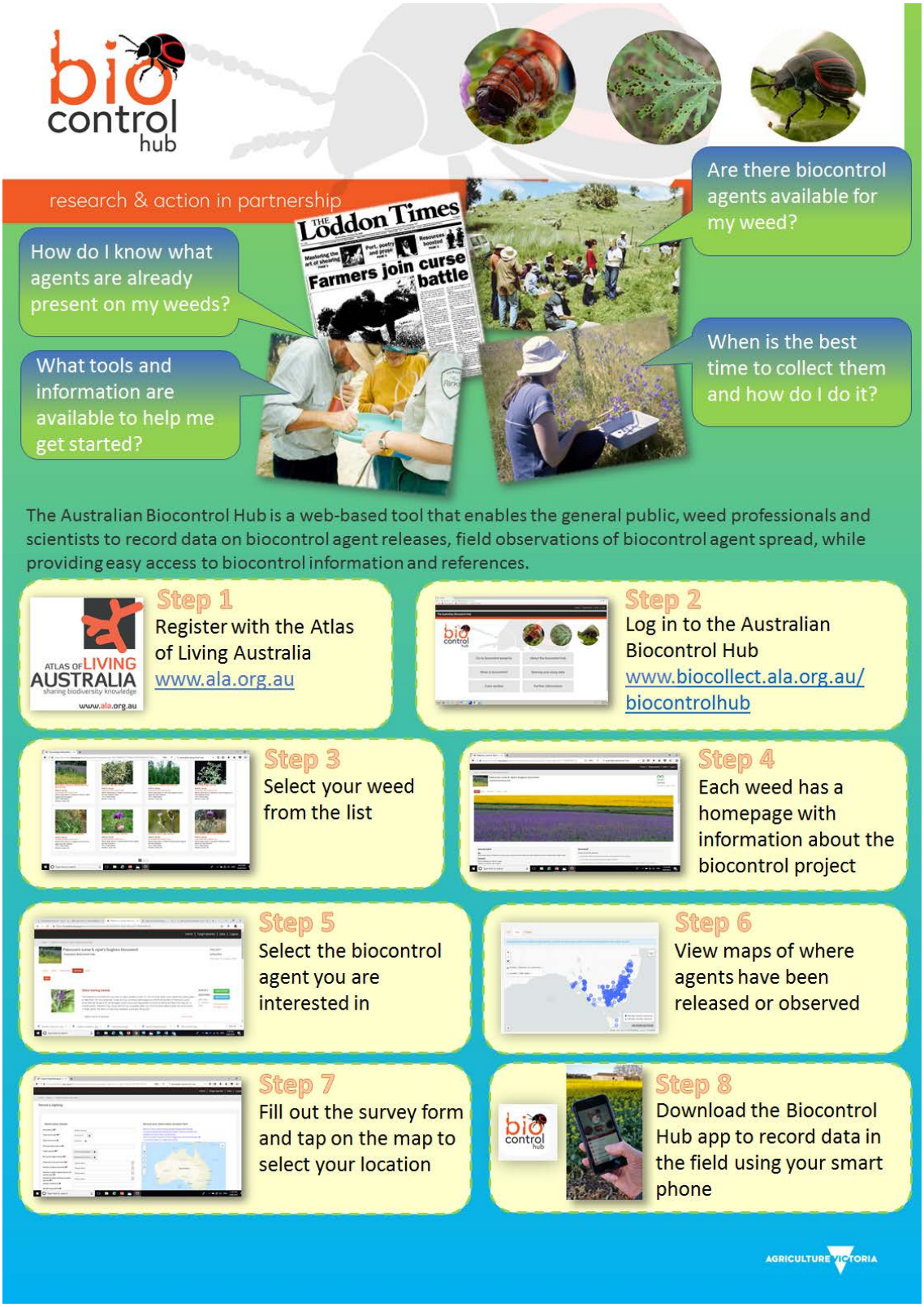
The Taskforce has a new process for you to receive weed biocontrol agents from any of our mass-rearing facilities in NSW. Please register your requests by clicking on the link below and filling in the form.
This weed biocontrol agent and site registration form will provide NSW DPI and the Taskforce with the ability to plan and prepare biocontrol agents for you in a timely manner. We further request information on your weed priorities so we can plan for the future while better servicing your current needs.
Weed biocontrol agent and release site registration form

The Weed Society of New South Wales Inc.

Promoting the awareness, understanding & control of weeds.
New members welcome.
The weed society provides an opportunity to network with others interested in weed management. Members recieve regular newsletters and discounted registration to seminars and conferences.
For more information: http://www.nswweedsoc.org.au/

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 include photos. https://biocollect.ala.org.au/biocontrolhub



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.

New Taskforce Priorities

Looking forward, new priorities for the Taskforce include the biocontrol of African lovegrass, African boxthorn, silverleaf nightshade, privet, 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	Who to contact
Alligator weed	*Alternanthera philoxeroides*	Flea beetle	*Agasicles hygrophila*	weed.biocontrol@dpi.nsw.gov.au
Cat's Claw Creeper	*Dolichandra unguis-cati*	Jewel Beetle Tingid bug	*Hylaeogena jureceki* *Carvalhotingis visenda*	weed.biocontrol@dpi.nsw.gov.au
Cylindropuntia spp.	A range of lineages are available for the biocontrol of *Cylindropuntia* spp.	Cochineal	*Dactylopius* spp. and their lineages	Mat Savage (msavage@cmcc.nsw.gov.au) or Jo Skewes (nwcactus@nsla.net.au) weed.biocontrol@dpi.nsw.gov.au
Madeira vine	*Anredera cordifolia*	Madeira beetle	*Plectonycha correntina*	weed.biocontrol@dpi.nsw.gov.au
Salvinia	*Salvinia molesta*	Salvinia weevil	*Cyrtobagous salviniae*	weed.biocontrol@dpi.nsw.gov.au
Wandering trad	*Tradescantia flumenensis*	Smut fungus	*Kordyana brasiliensis*	Ben.Gooden@csiro.au
Water hyacinth	*Eichhornia crassipes*	Water hyacinth weevils (temperate) (sub-tropical)	*Neochetina bruchi* *Neochetina eichhorniae*	weed.biocontrol@dpi.nsw.gov.au
Water lettuce	*Pistia strateoites*	Water lettuce weevil	*Neohydronomous affinis*	weed.biocontrol@dpi.nsw.gov.au

See the Weeds Extranet (https://extranet.dpi.nsw.gov.au/weeds) for information on other weed biocontrol agents and contact weed.biocontrol@dpi.nsw.gov.au for more information.

Don't forget to register your requests via the Weed biocontrol agent and release site registration form

NSW Biocontrol Taskforce 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.

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

For further information about the Taskforce please contact weed.biocontrol@dpi.nsw.gov.au

Wandering trad biological control

Fungal biocontrol of a creeping invasive plant for sustainable recovery of impacted native vegetation

Invasion by wandering trad

Wandering trad (*Tradescantia fluminensis*) is an herbaceous groundcover native to South America (**Figure 1**) that has become a significant environmental weed of cool temperate through to subtropical regions of Australia, with hotspots of invasion in moist forests of eastern NSW, south east Queensland and the Dandenong Ranges region of Victoria. Invasion is associated with significant reductions in native vegetation diversity and degraded rainforest ecosystems, especially in sensitive riparian areas.

Leaf smut fungus as a biological control agent

The recent release of a fungal pathogen from Brazil (the leaf-smut fungus *Kordyana brasiliensis*, **Figure 2**) as a biological control (biocontrol) agent for wandering trad in New Zealand presents a promising prospect for implementing a similar management solution in New South Wales. Given that wandering trad largely occupies sensitive environments, growing amongst indigenous vegetation along waterways, chemical control is often not viable due to the risk of off-target damage to native plants and contamination of the waterway. Manual removal is also made difficult due to the fragility of wandering trad stems, with fragments breaking off and remaining in the soil. This method is only effective if all material has been removed from the site. As such, biocontrol offers a more ecologically sensitive, sustainable means of controlling wandering trad control in areas where chemical and mechanical controls are not desirable.

Rigorous testing of the fungus has shown it is highly specific to wandering trad and poses no risks to native vegetation. Based on these results, it was approved for release in Australia by the relevant authorities. Our aim is that native vegetation will benefit from a reduction in the growth and competitive vigour of wandering trad in response to leaf attack by the fungal pathogen, thereby promoting native biodiversity.

Release of the leaf-smut fungus into the Australian environment

CSIRO has been involved in research on wandering trad biocontrol since 2014, with initial financial support from CSIRO and the Australian Government's National Environmental Science Programme administered by the Department of the Environment and Energy. CSIRO released the fungus into the environment at multiple locations throughout Victoria (focussed on the Dandenong Ranges) between May 2019 and September 2020, supported by the Commonwealth Department of Industry, Innovation and Science and the Community Weeds Alliance of the Dandenongs.

How to get involved

This current project aims to release the fungus throughout NSW in partnership with locally community stakeholders and is supported by funding from the NSW Government through its Environmental Trust between July 2020 and June 2023. If you would like further information about the fungal biocontrol program for wandering trad or to register your interest to receive fungal material for release in your local area, please contact Dr Ben Gooden (Ben.Gooden@csiro.au; +61262183896) or John Lester (John.Lester@csiro.au, +61 2 6246 4325). Further information can be found here: https://research.csiro.au/wandering-trad/

Figure 1: Wandering trad (*Tradescantia fluminensis*) flowers and dense infestation associated with a reduction in native vegetation diversity (B. Gooden; Kangaroo Valley, NSW).

Figure 2: Disease symptoms caused by the leaf-smut fungus *Kordyana brasiliensis* on leaves of wandering trad (*Tradescantia fluminensis*). These are characterised by diffuse chlorotic (i.e. yellowish) spots on the upper surface of leaves (**A**) and corresponding whitish lesions on the under surface of leaves where fungal spores are released (**B**). Lesions become necrotic as they mature, eventually causing complete necrosis and death of leaves. (B. Gooden; Kangaroo Valley, NSW).