

Newsletter of the Weed Society of Victoria Inc. Volume 29 issue 3 2018 eedsce

CAWS Medal for Leadership for Kate Blood

WSV committee member, Kate Blood, along with Joe Vitelli from Queensland, received the prestigious CAWS Medal for Leadership at the 21st Australasian Weeds Conference (AWC) recently in Sydney. No more than two medals are awarded at each biennial AWC through a rather onerous application process (for a description of eligibility, see http:// caws.org.au/caws medal.php).

Here are some excerpts from the nominators' application (it must be noted that the nomination came from the Weed Society of Western Australia - many thanks to Sandy Lloyd and Rod Randall, in particular):

'Kate Blood's childhood passion for weeds led her into the invasive plant world and a horticultural degree at The University of Melbourne's Burnley Campus. After graduating, she worked in Victoria's national parks and reserves for six years with the Department of Natural Resources and Environment. Kate then turned her focus to environmental weeds full-time with the CRC for Weed Management Systems. She is currently employed by Victoria's Department of Environment, Land, Water and Planning.

'Kate was completely fearless about breaking communication guidelines and rules where she thought (almost always correctly) that the rules were timid or dumb. This occasionally caused ructions but Kate was the easiest renegade to defend because of her logic and charm. But for me her greatest skill was in her TV and radio advocacy,



where she presented as this serene lady gardener in a classy hat and cane basket of flowers, pushing genocide to weeds. Her charms simply could not be denied. I never met a better environmental advocate. Subsequent advances in weed legislation and budgets owe a lot to Kate. She earned this award years ago.

'Kate is a skilled ecologist, first class communicator and a savvy public servant. It is extremely rare for one person to possess all of these skills, rarer yet to be able to successfully use them to such good effect in natural resource management.

'Kate has lead the Weeds in the Early Stages of invasion (WESI), formally NIPPA, project since 2011. WESI focuses on high risk invasive species at the early stage of invasion that threaten biodiversity. The WESI team have developed tools and training programs specifically for public land managers in Victoria, to support, enable and build their capabilities in identifying and managing weeds in the early stages of invasion.

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WSV Membership Rates 2018–19

Pay for 1, 3 or 5 yearsConcession*\$20Ordinary\$60Corporate\$140

* Students and Pensioners WSV is not registered to collect GST

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COVER PHOTO: Hypochaeris radicata (courtesy Rob Richardson)

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- Opportunities to network with others.

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'By investigating the barriers that prevent action on early invaders, WESI has created a process and tools to assist public land managers. The most significant resource developed by the WESI team under Kate's leadership was the 6-part decision making framework that guides public land managers through the process of dealing with invasive plants at the early stage of invasion.

^cFrom 2016 to 2017, Kate sat on the National Cactus Reference Group, which over-saw the development of the opuntioid cacti best practice management manual and associated resources. She played a critical role in testing and ground-truthing the decision support tools that were developed. Kate has an outstanding ability to critically view extension materials and management tools from the perspective of the target audience, allowing refinement of the language and visual guides to make it more accessible, effective and user friendly.

'In recent years through the WESI project, Kate has organised and delivered a series of weed identification training sessions across Victoria, and most recently, was involved with the delivery of information sessions and field trips for opuntioid cacti, promoting and putting to use the tools within the management manual. (*An article on recent opuntioid cacti workshops is published in this issue.*) Her knowledge, understanding of her audience, enthusiasm and delivery style makes for a charismatic and effective and accessible presenter, teacher and mentor.



Kate accepting her CAWS medal at the 21AWC

'Kate has been instrumental in ensuring that the conversation around early invaders continues, through her strong social media presence, using the handle @weedyk8 on Twitter, Facebook, Instagram and Yammer. Kate also co-founded I-SPEI (Invasive Species Prevention and Early Intervention) – pronounced 'I-spy' – an email-base network/discussion group, established in October 2012 to encourage national and international communication and knowledge sharing on invasive species prevention and early intervention.'

As in a quote from a peer recognition referee, "I cannot think of anyone more deserving of a CAWS medal" – thank you Kate for your contributions as "a leader and driver of change in weed management".



Weed Woman Weedyk8 on Twitter



The XV International Symposium on Biological Control of Weeds

by Raelene Kwong

Every four years, a diverse array of entomologists, plant pathologists, ecologists, geneticists and regulators come together from across the globe to attend the International Symposium on Biological Control of Weeds (ISBCW). The fifteenth symposium was held in Engelberg, Switzerland, from the 26–31 August 2018. Agriculture Victoria scientists, Raelene Kwong, Greg Lefoe and Jackie Steel, were amongst the 212 participants from 27 different countries delivering 81 oral presentations and 105 posters.

The comprehensive program covered 10 different scientific sessions over four days, ranging from weed target and agent selection, novel methods to determine efficacy and environmental safety, post release monitoring and evaluation, and restoration of habitats following biocontrol success.

A common theme throughout much of the symposium was the use of molecular tools to improve many different aspects of biocontrol research. For instance, Raelene Kwong demonstrated how an understanding of the population genetics of the aquatic weed, *Sagittaria platyphylla*, between the native USA and invaded Australian ranges had helped prioritise natural enemies that were 'pre-adapted' to Australian populations. In Jackie Steel's presentation, she showed how molecular tools could significantly improve the risk assessment of potential biocontrol agents by comparing results of field-based molecular studies with laboratory-based experiments undertaken under quarantine conditions.

Greg Lefoe presented two posters on his PhD research. The first poster titled, 'Risks and Decisions: is *Leptinotarsa texana* suitable for biological control of silverleaf nightshade in Australia?', outlined a range of novel methods used to assess the risks of this leaf-feeding beetle to Australian native and economically-important species and cultivars. His second poster titled, 'A tool to support learning about the success of biological control agent introduction', showed how models could be used to predict agent establishment under different contexts by understanding the key drivers underpinning establishment success.

In conjunction with the symposium, a series of workshops were held over three evenings which allowed for greater indepth discussion and formation of working groups to tackle specific issues related to biocontrol science, extension and regulation. On the first night of the symposium (Monday), Raelene participated in the Biological Control of Grasses workshop to discuss topics regarding the selection of agents, measurement of impacts and dealing with conflicts of interest with those who see grasses as valuable species (i.e. as fodder).

On Tuesday evening, Jackie and Raelene attended the Arts and Science of Native Range Explorations workshop during which the complexities, regulations and logistics of searching for, identifying and sourcing natural enemies of weeds from overseas was discussed.

Meanwhile, Greg attended a concurrent workshop on Taking Biological Control to Our Communities and highlighted the development of the Australian Biocontrol Hub (https:// biocollect.ala.org.au/biocontrolhub) as a model 'citizen science' tool for the collation of data on biocontrol agent releases and establishment for 28 Australian weed biocontrol programs.

The final workshop, held on Friday evening, discussed the Nagoya Protocol and its implications for classical weed biological control. The Nagoya Protocol, a supplementary agreement to the Convention on Biological Diversity (2010), essentially relates to the equitable sharing of benefits arising from the utilisation of genetic resources. However, the adoption of the Nagoya protocol in some South American countries has led to increased restrictions on the collection of potential biocontrol agents of weeds endemic to these areas.

For Victoria, these restrictions could impede the collection and importation of potential biocontrol agents for Chilean needle grass, serrated tussock and silverleaf nightshade. The workshop came up with a number of recommendations on how to navigate through the minefield of regulations, with the key strategy being to engage with an appropriate consultant specialised in assisting countries to become compliant with the Nagoya Protocol.

(The following are edited versions (for brevity) of Raelene Kwong, Jackie Steel and Greg Lefoe's symposium abstracts.)

Raelene presented 'Do host races exist in the *Sagittaria* fruit-feeding weevil?'. This research expands on previous comparisons of genetic diversity and population genetic structure between native and invasive populations of the aquatic monocot delta arrowhead, *Sagittaria platyphylla*, using molecular approaches, in order to more accurately match biocontrol agent to the target weed. DNA barcoding techniques were used to determine if natural enemy



Sagittaria fruit-feeding weevil, *Listronotus appendiculatus* (Photo: R. Kwong)

population genetics are associated with the different host genotypes. *Listronotus appendiculatus*, a fruit-feeding weevil, is under consideration for release into Australia and South Africa.

Jackie presented 'Application of DNA barcoding to compare the fundamental and ecological host ranges of a proposed biocontrol agents for *Sagittaria platyphylla*'. Larval and pupal stages of candidate biocontrol agents collected on or within plants provide a better indication that a particular plant species is a host for the insect, but these stages are more difficult to identify than the adults using morphological methods. DNA barcoding of larval and/or pupal samples, collected during natural enemy surveys within their native range, was used to determine the ecological host range of a crown-boring weevil, *Listronotus sordidus*. This information can be used to compare the evolutionary relationships between host species and natural enemies, and to inform host-specificity testing.



Nathan Harms (left) from the US Army Corps of Engineers (Mississippi) helping Jackie Steel (right) set up host specificity tests of the *Sagittaria* crown-boring weevil in the quarantine facilities at AgriBio, Bundoora



Greg Lefoe undertaking field studies on the silverleaf nightshade beetle, *Leptinotarsa texana*, in Texas

Greg presented 'Risks and decisions: is *Leptinotarsa texana* suitable for biological control of silverleaf nightshade in Australia?'. The leaf beetle, *Leptinotarsa texana*, was successfully introduced to South Africa from the USA to control silverleaf nightshade, *Solanum elaeagnifolium*. Quarantine laboratory experiments on 49 Australian native species and economically important plant species and cultivars, and field experiments with eggplant in the beetle's native range of Texas, USA, were conducted to determine whether the agent, *L. texana*, poses a negligible or very low risk to the environment and economy in Australia. Results indicated that *L. texana* is not suitable for introduction to Australia. Novel methods to assess and communicate the risk of introducing *L. texana* to other countries where silverleaf nightshade occurs have been proposed.

Greg also presented 'A tool to support learning about the success of biological control agent introduction'. Establishment success of biological control agent programs can be difficult to determine when first introduced and this may delay their beneficial impacts. Understanding the key drivers underpinning establishment success can be achieved through capturing existing data into a quantitative process



model, allowing managers to explore the likelihood of establishment in different contexts. Greg's case study uses a process model on the introduction of gorse soft shoot moth, *Agonopterix umbellana*, to assess its suitability as part of an adaptive management approach to biological control agent introduction.

Greg Lefoe monitoring gorse infestation in Tasmania (photo left: supplied by G. Lefoe)

2018 WEED BIOSECURITY ~ PROTECTING OUR FUTUR

CONFERENCE HANDBOOK

Greetings from the 21AWC

Bianca Gold, of DELWP's Weeds at the Early Stage of Invasion program, has sent an eye-catching cact-eye photo from the first day of the 21st Australasian Weeds Conference in Sydney.

From left to right are Angela Constantine (DEDJTR), CAWS delegate Sandy Lloyd of the Weeds Society of WA, and WSV Secretary Bec James (DELWP).



Opuntioid Cacti Workshops

by Kate Blood and Bianca Gold Weeds at the Early Stage of Invasion (WESI) Project

What is the difference between a cactus and a succulent? Is it the glochids or the jointed cladodes that distinguish Opuntioid cacti from other cacti, or both? Can't you just stab them all with a chemical applicator? Why won't the Cochineal biocontrol agent work on all of them? These are some of the tricky questions answered at a series of workshops held in Victoria in May 2018.

Opuntioid cacti are in a sub-family (Opuntioideae) of the Cactaceae (cacti) family. There are no cacti native to Australia. Australia has at least 27 introduced invasive Opuntioid cacti. Many of them occur in Victoria and a number are early invader weeds threatening biodiversity.

The Department of Environment, Land, Water and Planning (DELWP) has a project addressing early invader weeds called Weeds at the Early Stage of Invasion (WESI). The WESI project contracted Wild Matters (Matt Sheehan) to deliver three sessions in May 2018 to raise awareness about invasive cacti and assist biodiversity managers manage these expanding threats. The sessions were held at Bacchus Marsh (22 May), Ouyen (24 May) and Maffra (29 May 2018), attracting 69 participants including government agencies, community groups and individuals.

A key message from the sessions is that these cacti can grow and spread in much of Victoria and early intervention is the cheapest and easiest management approach if they are found in new areas. Safety is a very important consideration in their management.

The sessions included a presentation before lunch followed by a field trip to see cacti growing in local conditions. There was a big focus on the importance of correct identification. All cacti are not 'prickly pear'. Management options were described for different cacti and situations.

The sessions included copies of the valuable 'Managing Opuntioid cacti in Australia' manual and an identification guide. The successful sessions helped bring biodiversity managers together to share experiences and expand networks. Additional photos can be found on @weedyk8 on Facebook and Twitter.

'Managing Opuntioid Cacti in Australia – best practice control manual for *Austrocylindropuntia*, *Cylindropuntia* and *Opuntia* species' (authors: M.R. Sheehan and S. Potter) is



The fruit of the drooping tree pear (*Opuntia monacantha*) often form 'chains' (Photo: Kate Blood, DELWP)

available from the Western Australia Department of Primary Industries and Regional Development, at: www.agric.wa.gov. au/sites/gateway/files/Opuntioid%20cacti%20best%20 practice%20control%20manual.pdf



Participants at the Opuntioid Cacti Workshops were able to see and learn about these invasive plants close-up in the field (Photo: Kate Blood, DELWP)

CAWS report

June 2018 Ingrid Krockenberger

The 21 June meeting was reconvened on 28 June due to insufficient attendees to form a quorum. At the earlier meeting, President Rachel Melland reported on increased planning for weeds biosecurity and management via the Federal Department of Agriculture and Water Resources, the Centre for Invasive Species Solutions (CISS), Plant Health Australia (PHA) and the revitalised National Biosecurity Committee (NBC), amongst others. The new Environment and Invasives Committee (EIC) has replaced the Invasive Plants and Animals Committee, one of four sub-committees reporting to the NBC, to give greater focus on environmental biosecurity issues. The Weeds Working group is one of the key advisory groups for the EIC.

Rachel has been developing good working relationships with these entities on behalf of CAWS. She encourages weed societies to contribute planning input and experience, as might be requested by these national bodies. She also encourages weed societies to provide input on the development of the CAWS Strategic Plan 2019–2024. (The 2013–2018 plan can be found at: caws.org.au/policies.php).

Members (and the general public) can also contribute to formulating the National Biosecurity Statement via the 'Have Your Say' webpage: https://haveyoursay.agriculture.gov. au/national-biosecurity-statement. Submissions close on 31 October 2018. Rachel is on the working group developing the statement from the draft provided in the IGAB review*.

Rachel also reported on progress of the CISS Weeds Investment Plan to develop the national Research, Development and Extension program for weed management. (Although the public consultation process has ended, the consultation document can still be found at: https://invasives. com.au/weeds-rde-feedback/). The Weeds Digital Extension and National Weeds Portal Project is underway to enhance uptake and understanding of best practice weed control tools, techniques and management. This project integrates and expands on weeds.gov.au to develop (mainly digital) tailored information products and packages for CISS end-users, in collaboration with stakeholders. CISS is sponsoring one of the CAWS Interactive Sessions at the 21st Australian Weeds Conference (21AWC), titled 'Weeds Digital Extension Workshop'.

Rachel encourages participation in upcoming state, national and environmental biosecurity roundtables hosted by the Federal Departments of Agriculture and Water Resources, and Environment and Energy. (The remainder for 2018



are: Northern Territory: 27 September; Environmental Biosecurity (Brisbane); 9 October; Queensland: 11 October; and the National Biosecurity Forum (Canberra); 29 November. Contact: biosecurityroundtable@agriculture.gov. au).

The CAWS Communications and Advocacy sub-committee has been drafting a letter to federal and state/territory agriculture ministers in support of the Biosecurity Imports Levy initiative announced in the 2018/19 Federal Budget, and urging them to support revenue being directed to environmental biosecurity and other under-funded areas identified by the IGAB review*. (The Federal Agriculture Minister, David Littleproud, has since announced new funding for biosecurity, including the appointment of an ongoing Environmental Biosecurity Protection Officer and staff within the federal department. The letter will reflect this news. See 'In the Media' in this issue for more on the announcement.)

Rex Stanton and Stephen Johnson from NSW reported on progress in organising the 21AWC. There has been a high level of sponsorship secured to date, with \$120,000 so far. They estimate well over 250 delegates, having budgeted for 200 to break even, and so a healthy profit share for CAWS is anticipated.

Confidence in conference profit motivated the NSW organisers to nominate an international CAWS orator for the 21AWC, although only \$1500 had been allocated by CAWS to cover orator costs. (Professor Antonio DiTommaso, Cornell University, will present 'Climate Change and Weed Migration: What do we know and what next?'). The NSW organising committee argued that sufficient profit was expected to cover additional costs and, following concerned discussion, it was decided that \$4500 would be made available instead.

Work is continuing on the CAWS Constitution, to be ratified at the AGM in September, and in developing the CAWS Strategic Plan 2019–2024. CAWS is seeking nominations for President and Vice President for election at the AGM.

CAWS is also seeking nominations for the CAWS Medal to be awarded at the 21AWC in recognition of contribution to the science, technology and practice of weed management through research, teaching, administration, extension and implementation of programs. (Please see the cover article in this issue!) Rachel notes that, of the 40 CAWS Medals for Leadership in Weed Management presented since 1984, only three medals have been presented to women, namely Ms Barbara Waterhouse, Dr Rachel McFadyen and Dr Deirdre Lemerle. She states "let's get onto this folks, in all of our spheres of influence", with the CAWS medal being an excellent opportunity to express gender equity. (Note: Dr Cathy Foley has recently been appointed to the position of CSIRO Chief Scientist. See the CSIRO news release here: www.csiro. au/en/News/News-releases/2018/Physicist-appointed-as-CSIRO-Chief-Scientist). * 'Priorities for Australia's Biosecurity System: An independent review of the capacity of the national biosecurity system and its underpinning intergovernmental agreement', referred to as the IGAB (Intergovernmental Agreement on Biosecurity) Review.

Next meeting: 9 September 2018.

Ingrid Krockenberger and Rae Kwong are your CAWS delegates.

In The Media

Contribute to the National Weeds Website

The Centre for Invasive Species Solutions (CISS) has produced a survey to collect information for the development of the new National Weeds Website. CISS is seeking to make the most useful and efficient weed information resource possible, including using feedback from potential users of the website. Preliminary results from the survey will be presented at an interactive session at the 21st Australasian Weeds Conference in September.

Link to survey: www.surveymonkey.com/r/national-weedsportal

Centre for Invasive Species Solutions Weeds Investment Plan

Andreas Glanznig, CEO of Centre for Invasive Species Solutions (CISS), announced to CAWS that the draft 10year collaborative weeds RD&E (Research, Development and Extension) Investment Plan will be released at the 21st Australasian Weeds Conference, following an initial discussion paper circulated for public comment in March 2018, and a national workshop involving government, industry and community groups in May 2018. The public consultation process will continue to further develop the Investment Plan. If funded, the Investment Plan will commence in 2020 to coincide with the cessation of Agricultural White Paper investment in weed research and innovation. Andreas stated that the "proposed new national collaborative weeds RD&E portfolio will be the first major broadly scoped, long term initiative since the cessation of the Weeds CRC in 2008". Website: https://invasives.com.au/

Myrtle Rust Action Plan Released

As reported on the front page of the previous issue of Weedscene, the Plant Biosecurity CRC and the National Environmental Science Program were to release the 'Myrtle Rust in Australia: a draft national action plan' for public consultation. It is now available from the Australian Plant Biosecurity Science Foundation (APBSF) which has been established to follow the Plant Biosecurity Cooperative Research Centre (PBCRC). The previous issue of Weedscene also reported on the winding up of the PBCRC in an article on p. 6. See the draft Action Plan at: www.apbsf.org.au/ wp-content/uploads/2018/06/Draft-Myrtle-Rust-Action-Plan_May-2018.pdf

The PBCRC recommends that the plan be read in conjunction with 'Myrtle Rust Reviewed: The Impacts of the Invasive Plant Pathogen *Austropuccinia psidii* on the Australian environment' for valuable additional information. (Unfortunately, the link was broken at time of publication.) ABC NT Country Hour reported on the release of the plan and the threat of myrtle rust in Australia. Listen at: www. abc.net.au/radio/programs/nt-country-hour/myrtle-rust-draftaction-plan/9920200

New Funding for Biosecurity

The Federal Agriculture Minister, David Littleproud, has announced new funding for biosecurity, including the appointment of an ongoing staffed Environmental Biosecurity Protection Officer position within the federal department. An additional \$137.8 million biosecurity investment over five years has been allocated. This amounts to \$313 million in total biosecurity funding for the next 5 years. Media release: http://minister.agriculture.gov. au/littleproud/Pages/Media-Releases/coalition-beefs-upbiosecurity.aspx

Big Ideas on Biosecurity

ABC RN Big Ideas featured biosecurity in a 50 minute panel discussion. Of particular interest was mention of social programs which accompany biosecurity efforts to combat outbreaks in New Zealand (will have to follow *that* up). Community engagement is vital. There was much discussion on the loss of the Plant Biosecurity Cooperative Research Centre (CRC) and the crucial need for an enduring replacement to continue the work. Beginning at around the 36-minute mark, discussion moved from the limited timeframes associated with CRCs, to shared responsibility such as is embodied in the Intergovernmental Agreement on Biosecurity (IGAB) but also at the community level, to what comes next, with the Australian Plant Biosecurity Science Foundation (APBSF) filling the gap, for the



moment. Download audio at: www.abc.net. au/radionational/programs/bigideas/plantbiosecurity/9899722. See also the subsection 'Beyond the Plant Biosecurity Cooperative

Research Centre' in the p.6 article in Weedscene on 'Plant Biosecurity Cooperative Research Centre 2012–2018'.

Plant Biosecurity Science Foundation Project Call

The Australian Plant Biosecurity Science Foundation announced the first round of funding for "research, development, extension and capacity building activities that support its vision of Australian plant production systems, markets and environments are protected from invasive pests and diseases through an effective plant biosecurity system". Applications close on 15 October 2018. The funding proposal template can be found at: www.apbsf.org.au/?page_ id=502

Feral Cats – Declared Pest Animal in Victoria

The Victorian Minister for Energy, Environment & Climate Change, Lily D'Ambrosio, announced that feral cats have been declared an established pest animal. This applies to areas of Crown land managed by the Department of Environment, Land, Water and Planning, Parks Victoria, Phillip Island Nature Parks, and Victoria's four Alpine Resorts (but not on private land, meaning farmers and other private landholders will not be required to control feral cats). Restrictions have been placed on their control and a code of practice will be developed in consultation with animal welfare organisations.

Media release: https://www.premier.vic.gov.au/feral-catsdeclared-as-a-pest-animal-in-victoria/?utm_source=ALL+enews+subscribers&utm_campaign=59f267762c-EMAIL_CAMPAIGN_2018_07_27_06_37&utm_ medium=email&utm_term=0_dca65e59c7-59f267762c-93569213

Discussion Paper: Australia's failure to abate threats to biodiversity

The Invasive Species Council has released a discussion paper on changes required to abate threats to Australia's biodiversity. The paper questions the effectiveness in mitigating major threats through the current implementation of processes legislated under the *Environment Protection* & *Biodiversity Conservation Act 1999* (EPBC Act), i.e. listing key threatening processes (KTPs) and preparing and implementing threat abatement plans (TAPs). The federal Environment Minister is advised by the Threatened Species Scientific Committee but has prerogative on decisions regarding KTPs and TAPs. Access: https://invasives.org.au/ wp-content/uploads/2018/05/KTPs-and-TAPs-discussionpaper-23-May-2018.pdf

1st Issue of 'Gorse Talk'

The Victorian Gorse Taskforce has published the inaugural issue of its bi-annual newsletter, Gorse Talk.

Access: www.vicgorsetaskforce.com.au/wp-content/ uploads/2018/08/Gorse-Talk-Issue-1-July-2018-2.pdf

Weed Articles from NZPPS Conference

The New Zealand Plant Protection Society held its annual conference in August. Free access to full-text conference proceedings articles is available on their website. Articles pertaining to weeds are:

'Soil seed bank under variegated thistle does not explain thistle dominance.'

https://journal.nzpps.org/index.php/nzpp/article/view/181/86 'Suppression by three grass species of broom seedling emergence and survival.'

http://journal.nzpps.org/index.php/nzpp/article/view/142/94 'Impact of the biocontrol beetle, *Cassida rubiginosa*, on the secondary weed target, marsh thistle (*Cirsium palustre*).' http://journal.nzpps.org/index.php/nzpp/article/view/145/89 'Yellow bristle grass (*Setaria pumila*) germination biology.' http://journal.nzpps.org/index.php/nzpp/article/view/154/109

International Association for Open Knowledge and Open Data on Invasive Species

An online platform providing open access to data, research and debate on invasive species has recently been formed. An aim of INVASIVESNET is to facilitate global cooperation on research and management of invasive alien species. Their international council is made up of scientists from 5 continents and is inviting new members.

Anyone can join INVASIVESNET at: www.invasivesnet.org

NSW Brumby Decision Widely Criticised

Calls to reconsider a NSW government bill that will prohibit lethal culling of feral horses in Kosciuszko National Park have been coming from academic experts, environmentalists and other governments. Victoria's Andrews government has recently released the 'Feral Horse Strategic Action Plan' (see p. 9 in the previous issue of Weedscene) which contradicts the Berejiklian Coalition government's bill, now passed into legislation by the NSW Parliament. The Victorian policy aligns with the ACT government and also with the 2016 draft wild horse management plan the NSW government had been considering before its U-turn.

David Watson, an ecology professor at Charles Sturt University, resigned his membership on the NSW Threatened Species Scientific Committee in protest to the bill which grants 'heritage' status to feral horses in the Kosciuszko National Park. Labor's environment spokesperson, Penny Sharpe, stated that the professor's resignation is "a terrible blow for NSW" and that "Science is not a stakeholder group. The advice of our scientists is key to good policy and we ignore scientists at our peril". Indeed, David is reported to have said that science is increasingly being treated by governments as "one opinion" and elected officials are choosing "politically expedient" options instead. Article: www.smh.com.au/environment/conservation/



wilful-disregard-scientist-quits-nsw-panel-over-wildhorses-bill-20180607-p4zk19.html. A copy of David Watson's resignation letter can be found at: www.abc.net. au/news/2018-06-07/government-scientist-quits-overnsw-protection-of-feral-horses/9845142?smid=Page:%20 ABC%20Rural-Facebook_Organic&WT.tsrc=Facebook_ Organic&sf191260468=1

There are concerns that uncontrolled brumby populations will spill over into Victoria and the ACT. Furthermore, Professor Don Driscoll, an ecologist at Deakin University, said that without controls, populations would expand until they reached an area's carrying capacity. Beyond that, horses would starve to death, but not before great damage to the area. Brett McNamara, manager of ACT Parks conservation service, stated "Here in the ACT we have a zero-tolerance policy for horses in the Cotter Catchment". Article: www. abc.net.au/news/2018-06-10/brumbies-feral-horses-nsw-lawcould-hurt-environment/9850546

Victoria's Minister for Environment Lily D'Ambrosio described the NSW plan as a "recipe for disaster: on ABC RN Breakfast. Audio: www.abc.net.au/radionational/ programs/breakfast/nsw-brumby-management-plan-a-recipefor-disaster/9831046

NSW's Environment Minister, Gabrielle Upton, has reportedly received a letter from the International Union for Conservation of Nature (IUCN) director-general, Inger Andersen, concerned about the bill. The region is designated as an IUCN Category II National Park "which requires that areas will be managed in a natural state to protect largescale ecological processes". Article: www.smh.com.au/ environment/conservation/disturbing-world-conservationbody-blasts-nsw-wild-horse-plan-20180605-p4zjlg.html

Reaction to US Glyphosate Verdict

A Californian court ruled in August 2018 that glyphosate (the active ingredient in the herbicide, Roundup) caused a grounds-keeper to develop non-Hodgkin lymphoma due to regularly using Roundup and that the manufacturer knew of the product's potential health risks, and acted "with malice or oppression" by failing to warn users. Agribusiness giant, Monsanto, was ordered to pay US\$289m in the first lawsuit to go to trial against the manufacturer, among hundreds filed in state and federal US courts. The company intends to appeal against the decision.

As reported in earlier issues of Weedscene, in 2015 the World Health Organization's International Agency for Research on Cancer classified the herbicide as "probably" carcinogenic to humans. The European Union decided to renew the licence for glyphosate for only five more years, despite the European Commission's Committee for Risk Assessment conclusion that, on the basis of all the available science, glyphosate does not cause cancer and is not an endocrine disrupter.

In 2017, the New York Times published

an article on a federal court-ordered release of Monsanto documents. The unsealed documents suggest that Monsanto had ghost-written research which was later attributed to academics. It was also revealed that a senior official at the Environmental Protection Agency had worked to quash a government agency review of Roundup's main ingredient, glyphosate. The article also notes that the science is not yet settled.

The Guardian reports statements from a professor of cancer epidemiology at the University of Cambridge, who said "The epidemiological evidence that glycophosphates are associated with an increased risk of lymphoma is very weak ... From a purely scientific point of view I do not think that the judgement makes sense", and a professor of chemistry at the University of Melbourne said "if the exposure is low, there is very little risk ... I don't think there is a case for stopping using it at all." The National Farmers' Federation president stated that the US court finding set a "reckless precedent" that could harm agriculture and that "Through the use of glyphosate, farmers are able to practise minimum tillage – protecting soil structure and nutrients and ultimately increasing the storage of soil carbon".

Source: www.theguardian.com/environment/2018/aug/14/ australian-farmers-body-says-roundup-cancer-ruling-is-inblatant-ignorance-of-science

Carey Gillam, author of 'Whitewash: The Story of a Weed Killer, Cancer, and the Corruption of Science', was interviewed by Amy Goodman of Democracy Now! following the historic verdict. (A description of 'Whitewash' was published in Issue 2 2017 in New Publications.) Video and transcript are at: https://www.democracynow. org/2018/8/14/how_monsanto_plants_stories_suppresses_ science

ABC News published an article on alternative weed control used by Australian local councils, stating that efforts to limit use of Roundup predate the US court case, although a 2016 review by the Pesticides and Veterinary Medicines Authority "found no grounds to place it under formal reconsideration". Article: www.abc.net. au/news/2018-08-16/concerned-about-roundup-localcouncils-trying-alternatives/10122440?smid=Page:%20 ABC%20Rural-Facebook_Organic&WT.tsrc=Facebook_ Organic&sf195661282=1

Farmers have been vocal in condemning the US court finding, as reported in The West Australian: https://thewest. com.au/countryman/news/farmers-slam-reckless-glyphosatefindings-of-us-court-ng-b88923136z

The Weird and Wonderful World of Plants

Phylogeny of Flowering Plants Poster

Interested in a (free) phylogeny of flowering plants poster? Plant Gateway has published the open access article, 'The Phylogeny of Angiosperms Poster: a Visual Summary of APG IV Family Relationships and Floral Diversity', a fulltext article with a link to the 36MB pdf of the poster. Access: www.plantgateway.com/poster



Hibakujumoku – Amazing Survivors

Hibakujumoku is the Japanese term for a tree which survived the atomic bombing of Hiroshima on 6 August 1945. Adam Muyt recently posted a database document, published by the United Nations Institute of Training and Research (UNITAR), on the Tasmanian Weeds Facebook page. The document lists the individual trees which survived close to the hypocentre of the explosion, when the surroundings were obliterated by the blast. These individuals resprouted from burnt stumps or below-ground parts, and are revered and actively preserved in their special position in the Hiroshima memorial precinct.

Link: www.unitar.org/hiroshima/sites/unitar.org.hiroshima/ files/A-bombed%20trees%20worddoc%20as%20of%20 Dec.%202011_1.pdf

Plants within Plants

Independent media resource, The Conversation, published an article on *Pilostyles*, strange plant species which have abandoned the usual plant structures of roots, stems and leaves, in order to live cryptic lives within specific host plants, as endoparasites. They do not photosynthesise, utilising carbohydrates from their hosts. Therefore they are able to live in the dark, only to emerge on flowering. Their means of reproduction and dispersal is a mystery. There are three species native to Western Australia and an additional seven species are native to other parts of the world, parasitising very specific nitrogen-fixing hosts. Article: https://theconversation.com/the-mysteriouspilostyles-is-a-plant-within-a-plant-98767



Pilostyles hamiltonii, native to WA, only grows in plants in the genus *Daviesia* (Photo: K.R. Thiele, Florabase)

Speaking of Photosynthesis...

A new form of photosynthesis has shaken up the scientific community. Photosynthetically-Active Radiation (PAR) is so-named because it is the range of wavelength absorbed by pigments involved in the oxygen-producing form of photosynthesis utilised by plants, algae and specialised bacteria – wavelengths of 400–700 nm, the so-called visible spectrum, from red to violet.

A few years ago, a new photosynthetic pigment was discovered – Chlorophyll f (*Chl f*), isolated from cyanobacteria in stromatolites in Australia which used light beyond the PAR range, at 706 nm. It was thought to be an accessory pigment, with *Chl a* being the ultimate driver and 700 nm being the 'red limit' for photosynthetic activity. Recent research with cyanobacteria suggests that 727 nm may be the 'second red limit' for photosystem II functioning. This has implications for our understanding of the beginnings of life on Earth, possibly associated with deep-sea hydrothermal vents which emit geothermal radiation beyond the visible spectrum. And extra-terrestrial photosynthetic lifeforms, perhaps?

Access: www.botany.one/2018/08/new-form-of-photosynthesis-thats-above-par/