

Weed Management Society of South Australia Membership

The Weed Management Society of South Australia Inc. was formed on 15th October 1999, bringing together people actively involved in managing weeds and researchers with interests in protecting our agricultural and natural environment. The Society is a forum to share knowledge, debate issues and generate ideas, drawing on practical weed control experience and the latest research.

New members are always welcome, or simply come along as a visitor to public meetings.

The Society's newsletter *WeedWise* is distributed by mail to all financial members.

Weed Management Society of South Australia Inc. Membership Form

Please complete form, tick relevant boxes, fill in your contact details and send to the address below (Note: GST is not charged by the Society)

I want to become a member of the Weed Management Society of South Australia.

- I enclose a cheque for \$ _____ Annual Membership with Plant Protection Quaterly Subscription: \$90 standard, \$75 Concession/Student Annual Membership only: \$30 , \$15 Student; Free for community groups (payable to Weed Management Society of South Australia)
- I have made electronic payment of \$ _____ to the WMSSA Account - please ensure payment is clearly identified.
Account Name: Weed Management Society of SA
Institution: Peoples Choice Credit Union
BSB: 805-050
Number: 2378 7221

Name: Mr/Mrs/Miss/Ms/Dr _____
Address: _____

Telephone Work: _____ Mobile: _____
Facsimile Work: _____ Home: _____
Email: _____

Forward with payment to:
Secretary, WMSSA - c/- Henry Rutherford
PO Box 517 Torrens Park, SA 5062

Upcoming Events

18th Australian Rangelands Conference
"Innovation in the Rangelands"
12-16th April 2015, Alice Springs, Northern Territory
<http://arsconference.com.au/general-info/>

The 25th APWSS Conference
"Weed Science for Sustainable Agriculture, Environment and Biodiversity"
3-16th October 2015, Hyderabad, India.
<http://117.240.114.67/apwss/>

18th New South Wales Biennial Weeds Conference
"Weeds - The Future: Innovation & Adaptation"
12-15th October 2015, Cooma, New South Wales
http://nswweedsoc.org.au/conferences/2015_conference/

7th International Weed Science Congress
19-25th June 2016, Prague, Czech Republic
<http://www.iwsc2016.org/>

20th Australasian Weeds Conference
September 2016, Perth, Western Australia
<http://www.wswa.org.au/20awc>

WeedWise

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Newsletter of the Weed Management Society of SA



From the President, John Heap

Last century (1988-1990) I was President of the "Weed Science Society of South Australia (WSSSA)", which was later reformed as the current "Weed Management Society of South Australia (WMSSA)". Over the years many things have changed, particularly the emphasis. The WSSSA was driven by agricultural weeds and the fast-developing array of herbicides being released. Environmental weeds were part of WSSSA, but often on the periphery. Fast forward to 2014 and the situation is reversed! However, some things will never change. The success of the WMSSA still depends on the efforts of individual volunteers working as a team and the help and support of all members; the vibrancy of youth still drives innovation and progress from within the executive committee; volunteers are still under strain from personal and professional pressures and we must continually reassess and adapt to member needs.

Moving on to the present and future. Our AGM was held in October and as a result we have a new committee (see page 7). I would like to warmly welcome and thank newly elected members. Many are recidivists, several others have newly volunteered, but all answered the call graciously and for that I am very grateful! The AGM was a great night, with excellent talks given by Michael Ansong and Chris Brodie. It capped off a busy year that included a very successful SA Weeds Conference. The WMSSA would particularly like to offer our immense gratitude to outgoing committee members Susan Ivory (President) and Peter Watton (Treasurer). Both were shining examples of conscientious and hard-working individuals combined to make a successful committee, and hence society.

Earlier I alluded to constant adaptation to change. As President, I hope to drive a gentle and thoughtful evaluation of our focus, emphasis and future directions. I hope that our committee can make a start on this at our second meeting in February. I invite any member, or prospective member, to make suggestions to me on how we might improve, including your article ideas for our quarterly publication, *WeedWise*. As you can see from the wonderful (full colour!) publication in front of you, Sam Buxton Stewart (Ed), Heidi Hodge (assist. Ed) and the team have put together a varied and thought-provoking offering. As President, ultimately the buck stops with me about what is published and what is not. I am still grappling with that responsibility and feedback is invited! Our membership comprises a broad church from enthusiastic environmentalists to horticulturalists to commercial farmers. Most members probably have a little bit of everything in them. Not everyone will agree with everything that is published but I don't intend to vito anything based on my personal views, articles just need to be reasonable and respectful. In the end improvement comes from change, change comes from discussion, and discussion burns bright when fuelled by the flames of controversy!

Merry Christmas and happy holidays to all of our members. We will be back early next year, bright-eyed and bushy-tailed!

Best wishes John Heap (President of WMSSA)

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WEED ARTICLES NEEDED

Would you like to contribute an article, book review or some of your technical expertise battling a weed in your patch?
Is there an event you would like to publicise?

We welcome submissions for the next issue of *WeedWise* by 1st February 2015

Contact: Sam Buxton Stewart Email: wmssa01@hotmail.com

www.wmssa.org.au

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Feed or Weed?

new pastures are sowing problems for the future

Don Driscoll, Research Fellow in Ecology, Australian National University, Canberra & Jane Catford, Research Fellow in Plant Ecology, University of Melbourne, Victoria

Weeds cost Australian farmers around A\$4 billion every year - and they are likely to do a similar amount of damage to the environment. In a new global survey published in November in the Proceedings of the National Academy of Sciences, we show that new pasture plants, such as grasses, present a substantial weed risk. Despite the risk, new varieties of plants that are known to be invasive are still widely developed and sold in Australia, with little regulation from government. So, how can we tighten control to prevent the future spread of invasive plants?

Eragrostis curvula (african lovegrass) was used to “improve pasture” in Australia for almost 100 years, but now it is a declared weed in four Australian states and the ACT and actually proved to be of little value in pastures. Similarly, *Andropogon gayanus* (gamba grass) was widely promoted by the cattle industry and government in northern Australia, but is now listed as a Weed of National Significance. Introducing these

pasture species was a big mistake that Australians will continue to pay for indefinitely. We face increased fire risks, increased management and weed control costs, as well as ongoing loss of our natural heritage. Unfortunately though, we still haven't learned our lesson. Agribusinesses still develop and promote new varieties of species, which are known invasive weeds. In Australia, these species include *Dactylis glomerata* (cocks-foot), *Phalaris* sp., *Schedonorus arundinaceus* (tall fescue) and *Trifolium subterraneum* (sub-terranean clover). These species are all recognised weeds in Australia, and all promoted by agribusiness for pasture. They have already spread throughout much of Australia, but the environmental impact of new pasture varieties of the same species can be substantial, as emphasised in the “Weed Risk Set to Rise”, a Hot Topic published by the Ecological Society of Australia (www.ecolsoc.org.au/hot-topics).

New varieties can be created by cross-breeding different varieties or different species or by manipulating the symbiotic bacteria and fungi that live inside the plants. Engineering plants in any of these ways can lead



Photo credit: Sam Buxton Stewart

Figure 1: *Dactylis glomerata* (cocks-foot) seedhead.

to varieties with higher reproduction, higher growth rates, better resistance to disease and higher tolerance of environmental extremes. Unfortunately, these are the same characteristics associated with invasive species. New varieties of pasture plants are bred to grow great pasture, but at the same time, they are inadvertently bred to be super-weeds, perfectly-matched to their environment and planted widely across the landscape. Producing enormous amounts of pollen and seeds, these new pasture plants can spread quickly and over vast areas, making them very expensive to control if and when they become invasive. So it makes sense to nip the problem in the bud.

Australia has a world-leading biosecurity system, but new, supered-up plant varieties slip through the cracks. We assess weed risk before new species are imported and have a list of prohibited species of the world's worst weeds. However, exotic species that are already present in Australia are not assessed and are permitted ongoing entry, even if they are known to cause harm. New varieties of such species are not subject to any scrutiny, therefore are automatically given the green light for development and widespread release. In a nutshell, Australia already has an enormous weed burden that is destroying our natural heritage,

Limonium hyblaenum (statice)

coastal invasion (continued)

tions if found (e.g. South Gippsland Landcare Network 2012). While some control measures have begun in Victoria, much remains to be done both there and especially in New South Wales where Coastal Saltmarsh is listed as an Endangered Ecological Community (NSW threatened Species Conservation Act) as well as in South Australia and Western Australia. A ban on the sale of the species by nurseries should be implemented immediately. This species clearly needs to be taken into account in the on-going assessment process for threats to Subtropical and Temperate Coastal Saltmarsh and clearly should be removed from sale here as quickly as possible.

Edited from: Parsons, R F 2013, '*Limonium hyblaenum* (Plumbaginaceae), a cushion plant invading coastal southern Australia', *Cunninghamia: A journal of plant ecology for eastern Australia*, vol. 13, pp. 267–274

WMSSA Annual General Meeting

The Weed Management Society of South Australia Executive Committee held our AGM on Wednesday 29th October 2014. It was well attended with a number of positions were available for tenure. We are pleased to announce that all positions have been filled as follows:

- President & CAWS Delegate (proxy) - John Heap
- Immediate Past President - Vacant
- Vice-President - Leah Feuerherdt
- Treasurer & CAWS Delegate - Peter Tucker
- Ex-Officio Advisor to Treasurer - Peter Watton
- Newsletter Editor - Samantha Buxton Stewart
- Secretary - Henry Rutherford
- Publicity Officer - Deb Agnew
- Gen. Member & CAWS Delegate - Rachel Melland
- Gen. Member & Newsletter Assist.- Heidi Hodge
- Gen. Members - Simon Fensom, Terry Banks, David Blewitt & Nicole McGuinness.



Photo credit: Michaela Heinson, PIRSA

Figure 1: Out-going president, Susan Ivory with new president John Heap.

Congratulations to all new and continuing committee members. We look forward to another productive year with an abundance of new energy. Thankyou to all out-going committee members for their wonderful contributions, particularly Susan Ivory and Peter Watton for their tremendous service to WMSSA.

After formal AGM proceedings we were delighted to host two guest speakers. Michael Ansong, a PhD candidate from Griffith University in Queensland, presented his findings on unintentional weed seed dispersal (also highlighted in this edition of WeedWise). Chris Brodie, Weeds Botanist from the SA State Herbarium, gave a thought-provoking talk on the spatial distribution of weed types in SA, and their mode of arrival. Both speakers were well received and generated long discussion at the end of the meeting.



Photo credit: Michaela Heinson, PIRSA

Figure 2: Guest presenters Michael Ansong & Chris Brodie with new vice-president Leah Feuerherdt.

Feed or Weed?

new pastures sowing future problems (continued)

unregulated development and release of new varieties of pasture plants that are already environmental weeds will make this burden worse. A key problem is the widespread conflict within government. One section of government lists pasture plants as a threatening process and other parts effectively promote invasive pasture plants for use by the livestock industry. For example, *Cenchrus ciliaris* (buffel-grass) is causing widespread damage to Uluru Kata-Tjuta National Parks, but the Northern Territory Government

promotes it for pasture. The federal government still has sites listing the pros and cons of *Cenchrus ciliaris* (buffel-grass) as a pasture, while developing ways to prevent the introduction and spread of new varieties. We need a way of measuring the social, economic and environmental costs and benefits of these plants, which could help unite the different sections of government. Besides better accounting for the costs and benefits, there are four more steps governments can take:

- First, Australia needs to expand its list of prohibited and permitted species to include plant varieties. This would enable distinctions to be made between varieties of pasture species that are benign and those that are invasive.
- Second, government could expand its world-leading weed risk assessment protocols to apply them to new varieties that are proposed for either import or release after development within the country.
- Third, a new program is needed to monitor new varieties that are released and if they become invasive, to rapidly respond to eliminate the threat.
- And the fourth point stems from the question: who should pay for the costs of managing new pasture plants and for cleaning up the mess if any escape? We suggest that government needs to implement a polluter-pays scheme.



Photo credit: Don Driscoll

Figure 2: While the NT government supports ongoing use of buffel grass, the SA government is working towards outlawing the spread of new varieties.

The likely reason that agribusiness and government agricultural departments don't consider the weed risk of their products is that they are not held accountable for the environmental damage their products cause, or the cost of managing invasive pasture species. A polluter-pays system might include a combination of industry-wide levies such as the mining rehabilitation fund in WA, or environmental insurance, which is already available to polluting industries. Agribusiness could take up opportunities to integrate weed risk assessment into their development programs, with the aim of developing varieties with low weed risk. The former Future Farms Cooperative Research Centre pioneered this approach, proving that development for agriculture can work together with environmental responsibility. Agribusiness could also tap into environmentally-aware markets by developing a weed-free certification scheme for their products, and the same potential exists for certified farm products. Farmers could also contribute to improving stewardship of their land by refusing to buy new pasture varieties that have a high weed risk.

As our tropical savannas succumb to *Andropogon gayanus* (gamba grass) fires, as our arid woodlands vanish under *Cenchrus ciliaris* (buffel grass) wastelands, and as native species vanish from the few remaining woodlands degraded by introduced pasture plants, it seems like common sense to stop making these kinds of problems worse.

Edited from: Driscoll, D & Catford, J 2014, 'Feed or weed? New pastures are sowing problems for the future', *The Conversation*, <http://www.theconversation.com/feed-or-weed-new-pastures-are-sowing-problems-for-the-future-33733>
The full version of this paper can be downloaded from dondriscoll.wordpress.com.

An associated short video can be found at youtu.be/IMz1PXtmo1c

Limonium hyblaenum (statice)

coastal invasion

R.F. Parsons, Department of Botany, La Trobe University, Bundoora, Victoria

Limonium hyblaenum (statice) plants are herbaceous perennials to 25cm high. They have a shoot system usually made up of numerous small rosettes forming a dense cluster which can often become a cushion or extensive mat by production of new rosettes. In addition, new rosettes are often produced along rhizomes,



Photo credit: R.J. Bates

Figure 1: Cushion of *Limonium hyblaenum* rosettes from infestation in Robe, SA

especially at the edges of patches of plants. These rosettes become new plants if the rhizome breaks for any reason (Rodrigo et al. 2012).

The earliest record of a naturalized specimen of *Limonium hyblaenum* in Australia is from Port Adelaide in 1889 (Toelken 1987). From 1889 to 1959 there are nine collections from suburban Adelaide and one near Port Lincoln (specimens held at AD). Wider spread followed with specimens being found in Yorke Peninsula, Victor Harbour, the South East and Kangaroo Island. Spread continues in all of these regions. The western limit for the AD specimens is Baird Bay near Streaky Bay (Brodie no. 1981) but in 2012 it was seen well to the west at Fowlers Bay.

There have been no systematic surveys for *Limonium hyblaenum* in South Australia however, notes on herbarium specimens suggest serious problems at a minimum of three sites:

- a) Robe 2009 'forms a thick monoculture.... very, very common.' Brodie 796.
- b) Port Elliot 2006 'absolutely thick' and excluding native flora. Murfet 5147.
- c) Elliston 2010 'dense stands... found along road for many miles coming into town.' Brodie 1972.

All three stands involve rocky coastal sites.

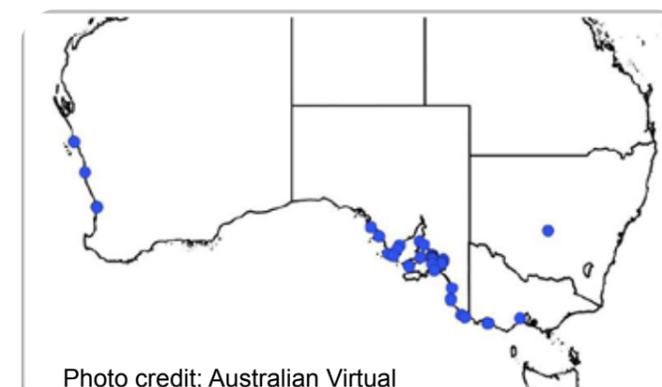


Photo credit: Australian Virtual Herbarium 2013

Figure 2: Distribution of *Limonium hyblaenum* in Australia.

Limonium hyblaenum is on sale at a few specialist nurseries in Australia and is grown for cut flowers and as an ornamental garden plant. In Marino, South Australia *Limonium hyblaenum* has spread from a garden planting, down a road verge and into a Conservation Park (specimen labels at AD; E.L. Robertson 242, 496). Another South Australian *Limonium hyblaenum* collection at AD (from Coffin Bay) is annotated 'Introduced with other *Limonium* spp. to help combat soil salinity.' (C.R.Alcock 6687; 1979. Alcock was a government weeds officer). Further data are badly needed to see if this practice still occurs in any area; deliberate introduction of salt-tolerant species for agriculture and salt-land remediation has led to other weed problems. Both in the salt spray zone of rocky coastlines and in saltmarshes, it is clearly a rapidly emerging weed, serious enough to be a major ecosystem transformer.

Successful elimination of two small populations by hand-pulling was described, as were effective herbicide treatments (Adair 2012). Another result was subsequent DSE public communications describing the species, urging vigilance in uninvaded areas, stressing the importance of early detection and giving instruc-

Watch Out For Free Riders

unintentional weed seed dispersal

Michael Ansong, PhD student, Environmental Futures Research Institute, Griffith University, Queensland

Weeds are a major threat to biodiversity globally and in Australia. Activities such as agriculture, forestry, and other types of horticulture can involve the deliberate introduction of new plants to a region. The majority of Australia's weeds, for instance, were deliberately introduced for cultivation as food, horticultural and/or ornamental plants with about 96% still in cultivation. Other mechanisms, however, can unintentionally introduce and disperse weeds. This includes when weed seeds (propagules) that become attached to clothing, vehicles, domesticated animals, in soil and animal fodder are unintentionally carried to new locations. The seed of a wide diversity of weeds, for instance, have been collected from clothing (211 species) and from vehicles (370 species), with over 150 species found to germinate from horse dung - many of which are not native to Australia, and some of which are important environmental weeds.

The risk of unintentional transportation of weed seeds is increasing. This is in part due to the increasing movement of people between habitats on local, national, regional, and transcontinental scales. For instance, there are more than 32.5 million crossings of Australia's international borders. The number of cars on the road and the size and extent of road networks is also increasing, including in Australia. There are over 800,000 km of road network in Australia and over 13 million passenger vehicles on the road. Even relatively remote and high conservation areas are at risk with around 100 million visits annually to national parks in Australia.



The amount of seed per vector varies. Estimates of seed on clothing were between 4 to 10 seeds per person. Average number of seeds per car was estimated to be between 2 to 4 seeds. When these numbers are combined with estimates of movement, the numbers add up. For example, 24,776 seeds from 70 taxa were collected from different types of clothing worn by visitors to Kosciuszko National Park, Australia; 2,686 seeds from visitors to the Antarctic; and 446 seeds from the footwear of passengers arriving by plane to New Zealand. Cars in Australia could also be moving approximately 26.6 to 53.2 million seeds, with between 2.6 to 5.3 million in South Australia.

Photo credit: Professor Catherine Pickering
Figure 1: Seeds of *Acaena* sp. attached to socks and hiking boots ready to be transported over large distances.

These types of unintentional human-mediated seed dispersal vectors favour some species over others. Most plants with seed found on clothing, vehicles or in horse dung have small light seeds with a hard seed coat and are either forbs or graminoids with a persistent seed bank. Some of these species are already part of a global weed flora that are easily spread by humans and well adapted to diverse environments that are starting to dominate many ecosystems, particularly when they leave their predators and pests behind.

What facilitates seed attachment on clothing and vehicles?

The number of seeds present, the arrangement of the seeds and the seed structure all affect their attachment to clothing and vehicles. Seed must, of course, be present at a site used by humans for attachment to occur, so weeds benefit from human disturbance - many weed seeds are more likely to attach to clothing and vehicles. The number of seeds available for attachment is also important. Plants with more seeds

Watch Out For Free Riders

unintentional weed seed dispersal

are more likely to succeed in attaching than those with fewer seeds, all else being equal. Seeds must be located on plants in such a way that they could come in contact with the clothing or vehicles. Seeds with attachment structures such as awns are also more likely to attach to clothing.

What people wear and where they go affects the number and types of seed that could unintentionally be dispersed. Shoes, socks, shoe laces and trousers vary in the number and types of seed that can attach, with uncovered socks and laces collecting more seeds than covered socks and laces. For the same type of clothing, the surface area of the item and the adhesive quality of the material are also important. More seeds can collect, for example, on sports socks than on hiking socks. Where people go is obviously important, with people walking through weedy areas such as road verges collecting more seed than those that walk through natural vegetation or on hardened paths.

Where seeds can attach to cars also varies. More seeds can be found on the underside of cars, followed by back mudguards, front mudguard and cabins, while fewer seed attach to engines, radiators, tyres and wheel rims. This can be because these areas are where mud collects on a car, how often they are cleaned, and if the seeds and mud are actually washed off during cleaning.

What can we do to reduce the risk of unintentionally dispersing weed seeds?

- Checking clothing for weed seed is important, including before entering areas of high conservation such as national parks. Also, wearing clothing such as gaiters, not using velcro fastenings and keeping pockets closed or zipped can reduce the chance of carrying weed seeds.
- Carefully disposing of seeds that become attached to clothing is important. Try not to remove seeds and then leave them in parks.
- Avoid walking through areas with weeds such as verges of roads and car parks - particularly in parks.
- Clean vehicles and other machinery regularly - particularly before and after driving on unpaved roads and/or in muddy conditions.



Photo credit: Dr Agustina Barros
Figure 2: Pathogen control stations in Springbrook National Park, Queensland, Australia.

These and other similar practices can be incorporated into minimum impact codes such as walking guides and educational materials for conservation areas. Examples could include visual material such as posters, notices or brochures at flight centres and visitor centres, park entry points and airports as well as internet based materials. They should be clear, specific and describe positive social norms because people are easily influenced by what seems to be other people's normal behaviour.

Further Reading

Ansong M. and Pickering C. (2014) Weed hygiene: what do we do with seeds we find on our clothing? In: 19th Australasian Weeds Conference-Science, Community and Food Security: the weed Challenge pp. 42-45. Tasmania Weed Society, Hobart
Pickering C. M. and Mount A. (2010) Do tourists disperse weed seed? A global review of unintentional human-mediated terrestrial seed dispersal on clothing, vehicles and horses. *Journal of Sustainable Tourism* 18, 239-256.
Pickering C. M., Mount A., Wichmann M. C. and Bullock J. M. (2011) Estimating human-mediated dispersal of seeds within an Australian protected area. *Biological Invasions* 13, 1869-1880.