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Neem – Miracle tree or ecological menace?

Neem (*Azadirachta indica*) is a tree that has a long history of use by humans. It is said to have medicinal, cosmetic and insecticidal properties.



Neem flowers
Photo: Colin Wilson

Search for "neem" on the Internet and there will be no shortage of "hits" – "*Neem: a tree for solving global problems*". The species is native to eastern India and Burma but has been extensively planted in northern Australia as a shade tree. More recently, it has been promoted in Australia as a commercial plantation species, the purported product being insecticides.

A topic that has received less publicity is the species' weed potential.

Promoted as solving global problems, neem is creating problems of its own in northern Australia.

Now naturalised in Queensland, the Northern Territory and Western Australia, neem has shown itself especially invasive in northern Australian riparian areas. Infestations exist on the Gilbert River that flows into the Gulf of Carpentaria, the Victoria River in the Northern Territory, and the Ord River in the north of Western Australia. There are now many source populations of neem across the north of the continent.

Neem produces fleshy fruits. These are attractive to birds that thus provide a means of at least short-distance dispersal. Once neem trees are growing in riparian zones, there is every prospect that seeds will be spread downstream by other means.

Currently, it is legal to grow neem as an ornamental and permits have been issued for some plantations. It is important, however, to take immediate action to minimise the risk of further infestations establishing, and to at least contain the existing infestations. Because the extent of current infestations is unknown, it is unclear whether the invasion has already progressed beyond the point where eradication is still possible. It seems unlikely that neem plantations can be managed in such a way as to remove the risk of birds dispersing viable seeds into nearby natural habitat.



Neem (*Azadirachta indica*)
Photo: Colin Wilson

Moreover, any economic benefits from neem are likely to be far outweighed by the environmental costs that the species would impose.

There is a need for immediate policy measures and actions to remove the risk of further infestations developing, to document the scale of current infestations, and put in place strategies for containment or, where possible, eradication. [n Tony Grice](#)

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Neem leaves
Photo: Colin Wilson



Weeds CRC mark II, one year on...

The CRC for Australian Weed Management is working to reduce the risks posed by current and new weed incursions which affect the environment, agricultural and rural sectors across Australia. The Centre, referred to as the Weeds CRC, was established on 1 July 2001, replacing the CRC for Weed Management Systems, which operated from 1995 until 2001.

One year into its role the Weeds CRC has established sixty projects in three research programs, namely; Weed Incursion and Risk Management, Sustainable Cropping Systems, Landscape Management, and two education related programs; Community Empowerment, and Education.

For more information see the *overview* page on

 www.weeds.crc.org.au

CRC wins Environment Australia contract

The CRC was awarded a \$350 000 contract from Environment Australia (EA) in August 2002 entitled 'National Weed Extension/Communication Initiatives – Action to Tackle Australia's Weed Problems'.

The work will involve the production of best practice management guides for all 20 Weeds of National Significance and 28 Alert List species. The contract will also entail the production of weed distribution maps, protocols for data collection and communication suitable for community group involvement in research projects, a national training package, workshops, a newsletter and other products. A search for three new staff to work on the contract was held in September, and appointments were made in November. Under the arrangement with EA, products will continue to emerge from the work until the end of 2003.

Although the contract will draw extensively on the resources and expertise of the CRC, it will substantially reinforce the CRC's communication and extension effort and strongly support the goals of the CRC's Community Empowerment Program.

The CRC was also awarded a \$20 000 contract from Horticulture Australia in August to assist the nursery and garden industry map the networks of community-based weed groups around Australia, and assess their roles and needs. This work ties in well with activity already underway under the CRC's Communication Strategy, and working together the two tasks will enhance each other. Kath Laurie, who already has a close association with the Nursery and Garden Industry of SA, has been appointed part-time to undertake this work.

 Peter Martin

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Weedbuster Week 13 – 20 October 2002



Congratulations to Weedbusters across Australia!



Children from Ardtornish Primary School sing "weed" songs in Adelaide's Rundle Mall in Weedbuster Week

Photo: Peter Martin

Support for National Weedbuster Week 2002 was demonstrated by the considerable enthusiasm and creativity of the many volunteers who held events nationally, inspiring all Australians to be more weed aware and assist in "helping protect Australia's big backyard".

Over 320 Weedbuster events and activities took place, including a Brisbane City "Green

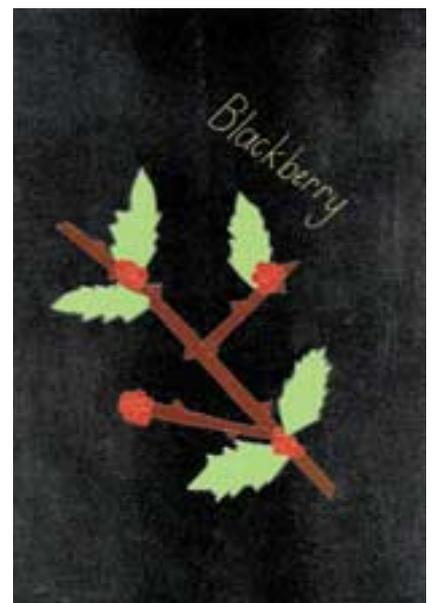
Day", demonstrations of biological control agent release onto pest plants in Adelaide, weed harvesting operations in the Burdekin, "Dyeing for Weeds" in Tasmania and a community car wash in Katherine. Community groups and school children were the most numerous participants, with many opting to showcase their activities, swap ideas (and trees for common garden thugs), whilst acknowledging the achievements of the many 'partners' who contributed to successful weed management efforts throughout their communities.

Weedbuster Week highlights included the announcement of the National Weedbuster Competition Winners and the presentation of the prestigious Victorian Weedbuster Awards at Parliament House, Melbourne.

 Helen Hoffmann (National Weedbuster Week Coordinator)

Take a peek at our new look web site

 www.weedbusters.info



Weedbuster Week 2002 artwork by Jessica Elliot-Petrillo of Ardtornish P.S.



Weeds conference

About 500 delegates attended the 13th Australian Weed Conference, held in September in Perth, which was declared "an outstanding success" by Professor John Lovett in the closing address. Approximately 85 per cent of participants were from Australia, with overseas delegates from every continent.

The theme of the conference, "Weeds threats now and forever?", was launched by keynote speaker Tim Low asking "Why are there so few weeds?" If sleeper weeds are those slowly naturalising, but not yet causing significant damage, what about the potential of foreign plants that are not yet showing signs of weediness? Are these plants that are unable to naturalise because they currently lack a pollinator, or animal vector to spread their seeds? Or could it be that they just haven't yet arrived in a favourable environment?

Other keynote speakers were Mark Lonsdale outlining the different weed strategies around Australia and David Pannell presenting the human factors involved in adoption of integrated weed management.

The conference consisted of three days of presentations, a choice of field trips and an optional Herbicide Resistance Symposium on the Friday.

Presentations covered every aspect of weed science, with many overseas visitors complimenting the breadth and quality of the conference.

There were numerous side meetings for the Weeds CRC, CAWSS and different interest groups who used the opportunity to meet face to face.

Proceedings are available for \$77 while stocks last from the publisher RG & FJ Richardson, Tel (03) 5286 1533.

■ Julie Cooper (Plant Protection Society of WA)

CAWSS medal for leadership – CRC winners all round

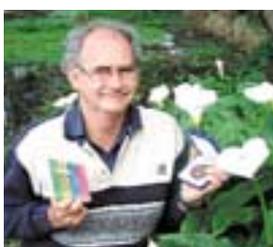
Weeds CRC scientists were winners all round at the recent awarding of the 2001 and 2002 Council of Australian Weed Science Societies (CAWSS) Medal for Leadership, presented during the Australian Weeds Conference.

This distinguished annual medal recognises contributions to science, technology and the practice of weed management through research, training, administration, extension and program implementation.

Three medals were awarded at the ceremony. Tim Woodburn received the 2001 medal, which had not yet been officially awarded, and there were two winners for the 2002 medal; Barbara Waterhouse and John Moore.

Tim was nominated by the Plant Protection Society of Western Australia (Inc.) for his capacity to initiate and direct research whilst being a valuable source of research advice for other projects. Tim is best known for his work on the biological control of nodding thistle, which has been highly successful. Prior to this, Tim worked on common heliotrope and from 1998, with his move to Perth, his research continued with the biological control of doublegee and bridal creeper. Tim has been a mentor to many, a great source of information and is widely recognised by his peers for his outstanding work.

John played an integral role in the identification of Kochia as a potential serious weed of Australian agriculture at a time when it was being actively promoted as a salt-land fodder. The net benefit of John's work in WA alone has been estimated at more than \$8 million per annum. John has also organised industry donations to enable local communities to undertake weed control and management long before such work was common. John has also carried out research on the ecology



John Moore with his latest publication and CAWSS medal
Photo: Jill Lisson



Barbara Waterhouse and friend in the field in Papua New Guinea
Photo: Barbara Waterhouse

and taxonomy of dock. A rare hybrid dock was named *Rumex x johannis-moorei* after him to acknowledge his expertise and knowledge of the topic.

Barbara has worked for the North Australian Quarantine Strategy (NAQS) in the Australian Quarantine and Inspection Service (AQIS) since 1990 and has made an outstanding contribution to Australian and international weed management. Her direct detection of new weeds in North Qld and her technical input into the eradication response have saved millions of dollars in future weed impacts. Much of Barbara's work has been done whilst travelling and living in often-difficult circumstances. Field work has included surveys in northern Australia and SE Asia to provide a record of the current flora and pest plants that threaten Australia. She has been a keen advocate of community education for the promotion of early detection and prevention.



CAWSS president Bruce Wilson presents Tim Woodburn with the 2001 CAWSS medal
Photo: Bruce Wilson

Congratulations to Tim, John and Barbara for their achievement.

For further information about CAWSS contact the Weed Society in your State or see the CAWSS website

 <http://avoca.vicnet.net.au/~weedss/>



Sustainable Cropping Systems – Project Profile

Engineering solutions to improve planting technologies for weed suppression and optimal crop yields and quality in conservation farming systems.

- Conservation farming leads to greater dependence on herbicides for weed control
- Stubble retention requires farmers to sow at wider row spacings than conventional sowing systems leading to poorly competitive crops
- A study to explore potential engineering solutions to enable sowing into stubble at conventional row spacing has already had some success

In conservation farming environments, the quantity and quality of crop stubble currently limits the ability of some machinery (in particular tined openers) to sow crops in narrow rows which allow the crop plants to compete favourably with weeds for resources such as light, moisture and nutrients. In addition, stubble on the soil surface and in the seed zone, and the amount of soil disturbance at sowing, can affect where and when weed species grow. It also affects the early health and vigour of the crop.

Two research questions are being addressed by this project: 'Are there engineering solutions to crop residue and soil disturbance problems associated with crop sowing in conservation farming systems?' and 'Can an understanding of the limitations of current sowing equipment lead to improvements in, and/or, innovations in machinery design?'

Aims

- To define the problems associated with current methods of sowing into crop residue and disturbed soil, and their affect on crop yield and weed patterns.
- To build attachments for existing sowing equipment to improve stubble management (one design is already being evaluated).
- To work with equipment manufacturers and farmers to get improvements in sowing machinery adopted by growers.

Further project information:

Gregor D., Lemerle D., Chan Y., Sutherland S. & Tullberg J. 2002, 'Crop establishment and weed management in the Australian grain-belt: the need for novel', *Proceedings of the Australian Conference on Engineering in Agriculture*.



Research at Wagga Wagga into current sowing equipment
Photo: Eric Koetz



Experimenting with row spacing and tillage depth
Photo: David Gregor

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Extending Weeds CRC results throughout South Australia

The Animal and Plant Control Commission (APCC) of South Australia is a new supporting participant in the Weeds CRC. The APCC is the State's noxious weed agency, and is now part of the Department of Water, Land and Biodiversity Conservation. Part of the APCC's contribution to the Weeds CRC is annual competitive grants provided to regional Animal and Plant Control Boards for community empowerment projects. The aim is for Boards to work with the Weeds CRC in demonstrating best practice weed management to rural landholders. There are 29 rural APC Boards employing approximately 75 authorised officers in SA. This provides a regional weeds network which the Weeds CRC can harness to ensure that research outcomes reach the wider community – the end result being better weed management in SA.

Eleven biocontrol grants and five best practice grants were approved for 2002 by a Weeds CRC/APCC committee. The biocontrol grants are focused on establishing, monitoring and redistributing agents in conjunction with landholders.

Weeds being targeted in 2002 are salvation Jane (with the crown weevil and flea beetle), horehound (with the plume moth), bridal creeper (with the bridal creeper leafhopper and rust), slender thistle (with the slender thistle rust) and gorse (with the gorse thrip and gorse seed beetle).

The best practice grants are for establishing field demonstration sites so that landholders can see the effective integration of various control techniques (e.g. herbicides, physical removal, biocontrol, fire, grazing and/or revegetation). Annual landholder field days will be held on site.

Community interest in the projects is strong – 100 landholders attended a horehound plume moth and bridal creeper rust redistribution day organised by David Clifford of the Murray Bridge Animal and Plant Control Board.

The day had an unexpected spinoff with many landholders subsequently calling David to say they already had the plume moth on their property!

Similar reports on the rapid spread of the plume moth have come from other parts of SA.

The projects are a component of the Community Biocontrol Networks task of the Weeds CRC, led by Raelene Kwong of Keith Turnbull Research Institute, Victoria. Ken Henry from the South Australian Research and Development Institute (SARDI) is assisting the salvation Jane and horehound biocontrol projects. Vicki Hawker and John Virtue are coordinating the projects within APCC. [n John Virtue](#)



Onlookers inspect crown weevil release cages at Robe in October
Photo: Vicki Hawker

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Ecology of bird-dispersed weeds

Plant functional groups and associated bird-dispersal syndromes



The problem

Bird-dispersed weeds represent a major challenge to weed managers. The dispersal process is complex and difficult to manage, often resulting in seeds being spread over long distances into isolated areas of native vegetation.



This project aims to gain a better understanding of how birds spread environmental weeds by:

1. Identifying the main bird species involved.
2. Determining feeding preferences and behaviour in different habitats and seasons.
3. Examining patterns of weed spread (whether dispersal is random or directed, scattered or clumped) and potential risks of spread.

This information will be used to investigate the concept of plant functional groups and associated dispersal syndromes.

What are plant functional groups?

Plant functional group refers to a group of plants that share the same traits or attributes that have functional significance. In terms of invasive weed species, plant functional groups may be defined by fruit traits such as fruit size and quality. The time of the year that the weeds produce fruits and how this differs from native fruit-bearing plant species may also play an important role in weed invasions.

What is a dispersal syndrome?

Dispersal syndrome refers to particular fruit types that are dispersed by certain groups of frugivorous birds, bats or other mammals. Successful dispersal may also depend on whether suitable dispersal agents (e.g. migratory flocking species) are nearby during the fruiting period.



Our plan

Initially a questionnaire will be sent to bird observers in southeast Queensland and surrounding areas (and later to other bird observer groups across Australia), to determine existing knowledge on bird-dispersed weed species.



Once the main dispersal agents have been identified, several sites in southeast Queensland will be chosen for more structured bird observations. Such observations will focus on bird species, feeding behaviour, fruit handling methods, frequency of sightings and bird movements in and out of weedy areas.

Bird characteristics will then be related to fruit traits such as colour, size, nutritional quality, fruit plant density and fruiting phenology, to determine whether any fruit functional groups and associated bird-dispersal syndromes can be identified.

Data obtained through structured bird observations and data on fruit characteristics will be supplemented with published information and used to compile a database on bird species and the fruits they consume.

Research methods may also include:

1. The use of radio tracking as a means to quantify potential dispersal distributions (utilising identified dispersal syndromes) in small vertebrate frugivorous birds.
2. Avian trials to monitor gut retention times, the effects of gut passage on seed viability and germination rates, and to provide a guide to estimate maximum potential dispersal distances.
3. Seed mapping and/or mapping of key weed species to determine whether dispersal is random or directed, scattered or clumped.

The information will be used for the development of integrated Weed Management strategies that target bird-dispersed weeds, and to identify which recent plant introductions are at risk of being dispersed by birds, potentially becoming invasive.



Interested in participating?

If you are interested in participating in the bird survey, or have any information relating to birds and introduced plants and invasive weeds, please contact:

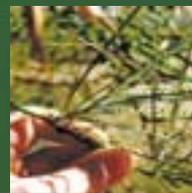


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Shenoyia photos courtesy of Richard Springer Photography

Dr Chris Stansbury, Dr Gabrielle Vivian-Smith and Dr Dana Panetta





Education – Project Profile

Developing the skills of weed managers

The Weeds CRC is actively involved in enhancing the training available to weed managers. It has a dedicated Education Program that has identified the importance of developing the skills of weed professionals with a national approach to Vocational Education and Training (VET). The VET task is led by NSW Agriculture's Regional Weeds Control Coordinator, Birgitte Verbeek. The Weeds CRC has also based an Education officer for the VET sector at the Wagga Wagga Agricultural Institute (WWAI). Annabel Bowcher will work closely with members of the VET sector to develop plain english weed management resources for the various organisations offering the Conservation and Land Management (CLM) training package. Resources will include workshop materials and regional case studies.

The Weeds CRC is supporting the Vocational Education and Training sector by:

- Developing weed management training resources
- Forming strong national links with training providers
- Encouraging weed professionals to enhance their weed management skills

Previous industry-based training in weed management has been informal, uncoordinated, and not recognised, documented or nationally accredited. The Australian National Training Authority (ANTA) has recently endorsed new national, weed management competency standards. These standards will enable weed managers to achieve nationally recognised qualifications under the (CLM) training package. This package targets areas ranging from ecotourism and recreation through to production-based industries. It includes specific training pathways for weed management professionals and other land managers.

Schools education update

In its education role, the Weeds CRC is aiming to increase awareness of weeds and weed management in the wider community through the development of educational materials for use in both primary and secondary schools. Increasing awareness by children of the risks associated with weed invasion and spread is a positive step to nurturing a better educated community.

As one of my first tasks as the Education Officer (Raising Awareness of Weeds in Schools) in the CRC, I am doing a stocktake of current resources and projects that are being used in schools across Australia.

I am aware that there are already a number of avenues through which weed awareness information is being delivered to primary and secondary students. Some examples include:

- Weed Warriors
- Weedbuster Week
- Weedbuster Activities, Information and Curriculum Links (Gould League)



Spiny burr field day
Photo: Toni Nugent

The national standards will set the benchmarks for performance and will guide the development of future training programs for the VET sector. All future weed management training resources and events for the VET sector will be delivered under the national training framework and will also enable apprenticeships and traineeships in weed management.



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Annabel Bowcher

At this stage, I am interested in finding out about any other resource materials or programs on weeds that you, or groups that you know of, may have produced for schools.

With this information we will then endeavour to develop and deliver additional and complementary resources for use in schools that best raise awareness of this environmental threat.

If you have any of these resources then I would really appreciate it if you could please send me a copy. Alternatively, if you have a contact name and number/email of someone that I could talk with about resources then I would be grateful for those details. [n](#) Ilka Klepper

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Student highlight – Dawn Hawthorn-Jackson

When Dawn began her undergraduate degree in Arts, majoring in Biology and Geography at Adelaide's Flinders University in 1991, she never imagined that in 2002 she'd be 2 1/2 years through a PhD with an eight year old son (Kiam) in tow. Her honours thesis, which she completed at the University of Adelaide, investigated the relationship between the weed horehound (*Marrubium vulgare*) and a biological control agent being introduced at the time, the horehound plume moth (*Wheeleria spilodactylus*).

With just one more year to complete her research into the 'Origins and spread of herbicide resistant annual ryegrass (*Lolium rigidum*) at the paddock and farm level', Dawn says the best parts have been the challenge of learning, the travel to conferences and workshops to meet fellow researchers, the work with farmers and most recently, obtaining pollen flow results.

The objective of Dawn's research is to investigate the significance of herbicide-resistant annual ryegrass populations on farms in southern Australia by examining:

- the spatial dynamics of this weed within and between paddocks on individual farms and between farms
- the presence of mutation point/s within and between populations
- the significance of gene flow via pollen dispersal in the absence of crops and within crops
- management strategies to contain and control this weed.

Dawn's preliminary results show that annual ryegrass pollen containing the gene for

herbicide resistance can spread up to ten metres from the resistant plants. This has implications for weed and farm management. While surveying farmers on their current management and future needs she has found that cultural and chemical methods of control have failed to significantly manage this weed to date. Furthermore, farmers are concerned about the spread of glyphosate-resistant ryegrass via pollen dispersal and the transfer of hay (containing glyphosate-resistant ryegrass) within and between States. A working party is being established to address these issues.

In the next year she will undertake further pollen analysis and wind tunnel experiments, information from which will be incorporated into a pollen flow model to test various management strategies. In the meantime she is looking forward to travelling to the USA to meet with fellow researchers and attend and present at the Weed Science Society of America Conference to be held in Florida in February 2003.

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Dawn Hawthorn-Jackson
Photo: Sally Vidler

CEO update

Welcome to the new Weed Watch for the new Weeds CRC! Weed Watch was established in the original southern Australian "CRC for Weed Management Systems" under the editorial and creative leadership of Sharon Corey of CSIRO Entomology. It's been on hold as we made the transition to the new national CRC for Australian Weed Management, but has been reborn with this issue under the able guidance of Sally Vidler at the CRC headquarters in Adelaide. Our aim for Weed Watch has always been to highlight some of the key breaking developments in the CRC with a greater regularity and different focus than our official annual report.

The CRC is a strongly environmentally focused consortium that provides research, information, and leadership across a wide range of areas from grain cropping to protection of natural ecosystems. Two recently won contracts demonstrate the CRC's role in public awareness and support for community groups. The CRC is also active in public debate, as illustrated by Tony Grice's remarks in this issue on neem. In June, former CRC postdoc Mary Rieger and colleagues published the world's largest ever study on pollen flow in canola, which placed the CRC directly at the forefront of the current controversy in Australia about GM crops and their potential for co-existence with non-GM crops.

Public recognition of the costs of weeds to the economy and environment has intensified over the last few years. A key objective of this CRC will be to ensure that weeds are rightfully seen as a threat comparable to other land management problems such as salinity. Solving Australia's weed problems is a massive job, and will require broad participation from all of us. Please don't hesitate to contact us with your ideas, suggestions and questions. **n Rick Roush** (CEO)

WWW

What's new on the web

Are you looking for up-to-date Weeds CRC information? The Weeds CRC has updated its website with user-friendly pages developed by the web team in Adelaide. The site, being in its first phase, already has an impressive list of publications and resources that are easy to locate. Many, including Weed Watch, are available in PDF format which can be downloaded free from the publications page. The **weed management** page, which looks at the 20 Weeds of National Significance and contains information on CRC related publications and external resources, is a great place to source information about

individual species. In stage two of the site's development this will be expanded further to include the 28 Alert List Species. You can use the site to find out more about the Weeds CRC and our partners, or to view information about individual research and education **projects**.

This is just the beginning for the Weeds CRC site. Over the next six years we will continue to develop the site into a source of technical and practical advice. Close links will be created to the excellent weed sites already available. Note the change of address, so update your bookmarks! **n Kelly Scott**



w www.weeds.crc.org.au



Have you seen this plant?

What's the problem? *Hypericum canariense* (Canary Island St John's wort) currently has a very limited distribution, but is highly invasive and has the potential to devastate natural areas, particularly coastal environs.

What's it look like? *H. canariense* is a shrub up to five metres tall with simple, opposite leaves 2 to 7cm long. The plant has attractive large yellow flowers with petals up to 15mm. These are followed by roundish brown seed capsules which are green when immature. Capsules rupture to release many small seeds, although some seed appears to be retained in the open capsules.

Where can I find more information?
Nature Conservancy <http://tncweeds.ucdavis.edu/alert/alrthype.html>
University of California Santa Cruz www.biology.ucsc.edu/people/parker/hypericum
What do I do if I think I've found it.

Contact the relevant person listed below to have the plant accurately identified. Do not attempt to pull plants out of the ground as they tend to break off at the base and may re-sprout.



Immature seed capsules
Photo: Michael Hansford



Mature ruptured seed capsules
Photo: Michael Hansford



H. canariense has been found in the Flinders region of Coastal Vic. and in Jerramungup



Flower
Photo: Michael Hansford

Contact

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Weed Watch Information

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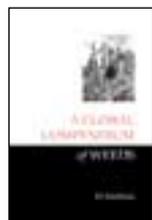


Established and supported under the Australian Government's Cooperative Research Centres Program.

bookshelf

A Global Compendium of Weeds by Rod Randall

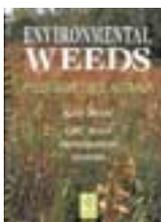
Predicting which plants will become weeds is difficult. In this compendium Rod Randall has compiled a list of almost 21,000 entries. A Global Compendium is specifically designed to give anyone interested in the weed potential of a plant a report on its status with, most importantly, further avenues for finding more information through the extensive reference listing.



\$165 from
RG & FJ Richardson
Tel (03) 5286 1533
richardson@weedinfo.com.au
Sample page [w](#)
www.weedinfo.com.au

Environmental Weeds: A field guide for SE Australia by Kate Blood

This comprehensive field guide details over 175 environmental weeds in south-eastern Australia. It provides detailed descriptions in easy-to-understand language supported by excellent photography. A guide suitable for a broad range of users, whether you're a weed officer, student, bushcarer, or bushwalker, you'll find this book easy to use.



\$35 from
CH Jerram & Associates
Tel (03) 9807 9795

Noticeboard

Submissions for the next edition of Weed Watch should be sent to the editor by **11th February 2003**. If you'd like to publicise a relevant event or important date, please contact the editor.