



CENTRE FOR
INVASIVE SPECIES SOLUTIONS

USING OUR SMARTS TO GET RID OF WEEDS FACT SHEET

Weeds have major economic, environmental and social impacts in Australia, causing damage to natural landscapes, agricultural lands, waterways and coastal areas. They are among the most serious threats to Australia's natural environment and primary production industries.

The Centre for Invasive Species Solutions strives to address the impact of invasive plants and animals across Australia. We do this through innovative research, by developing new tools, products and practices, and by working with the community. The Centre is working with CSIRO, the NSW Department of Primary Industries and the South Australian, Queensland and Victorian Governments. Australians will only overcome the impact of weeds by working together.

We have aligned our portfolio of weed projects with the research, development and extension priorities of the Environment and Invasives Committee of the cross-jurisdictional National Biosecurity Committee.



Banner and this image. Rubber Vine (*Cryptostegia grandiflora*).
Images by Andrew Mitchell (CISS)

A long-term commitment

The Centre has developed a 10-year National Investment Plan for Weeds Research, Development and Engagement that complements the *Australian Weeds Strategy, 2017–2027* produced by the former Invasive Plants and Animals Committee of the National Biosecurity Committee (chaired by the Secretary of Agriculture, Water and the Environment).

“Weeds cost Australian agriculture nearly \$5 billion a year and have major impacts on biodiversity.”

Ross McLeod, 2018.

What we are doing

We are investing in a significant portfolio of weed projects that focus on collaborative research, development and engagement.

These projects encompass the prevention of new weed incursions, the identification of weeds, the digital delivery of best practice management tools and information, on-farm trials and rigorous experimental trials of new solutions.



Bitou Bush (*Chrysanthemoides monilifera* subsp. *rotundata*). Image by Andrew Mitchell (CISS)

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Our projects

We are working on weed projects that will:

- deliver progressive improvements to the **WeedScan app** that uses artificial intelligence to rapidly identify priority weeds based on digital images taken on a mobile device.
- Provide access for communities to a **digital platform showcasing best practice management and local experience**.
- Update the control sections of **Weeds of National Significance operating manuals**.
- Provide continuously updated weed management information on the **WeedsAustralia digital platform**.
- Roll out a **surveillance system that monitors illegal plant trade on e-commerce web sites** to stop the introduction and distribution of plant species with known weed characteristics across Australia.

Digital tools to identify weeds and provide solutions

We know that people across Australia need help in identifying weeds and the knowledge to deal with them.

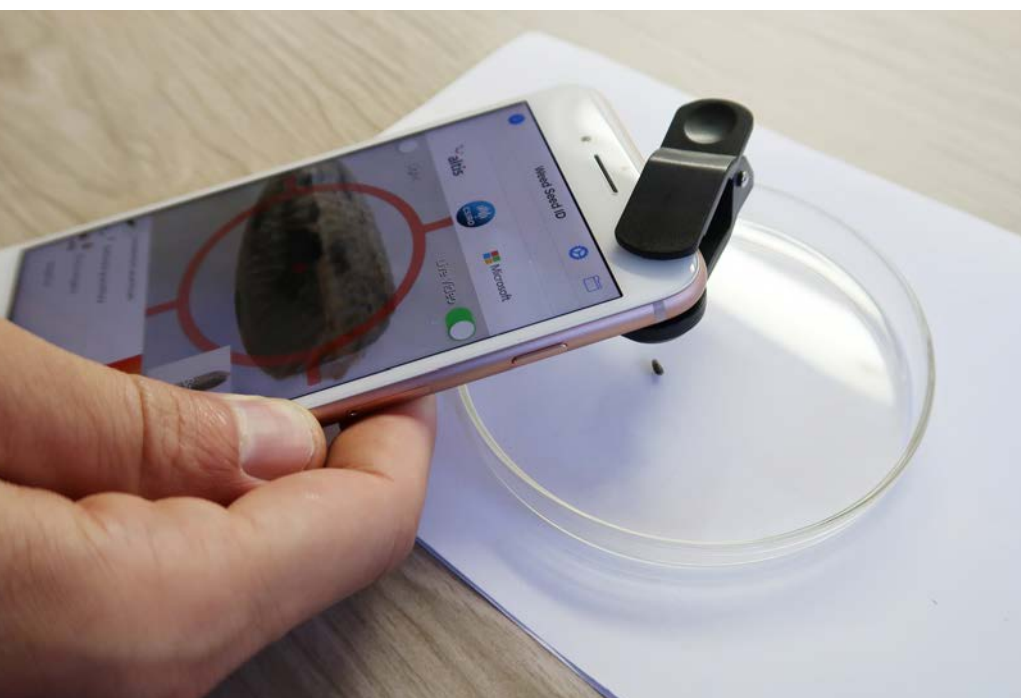
That's why we are working with CSIRO, the NSW Department of Primary Industries and the South Australian, Queensland and Victorian Governments. on Australia's first real-time, artificial intelligence based automated system to identify priority weeds and point you to solutions — the **WeedScan app and online platform**.

WeedScan will provide community groups, farmers, graziers and governments with:

- Rapid weed identification that does not require expert knowledge.
- Easy access to best practice management information.
- A management system that can be used at an individual property level as well as connect to the activities being undertaken at local and regional scales.

For more information,
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Andrew Mitchell,
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Centre for Invasive Species Solutions



Top image: English broom
(*Cytisus scoparius*).

Middle image: Lantana
(*Lantana camara*).

Images by Richie Southerton
(CSIRO) Bottom image:

Common evening primrose
(*Oenothera stricta*). Image
by Andrew Mitchell (CISS)

Dr Alexander Schmidt-Lebuhn (CSIRO) demonstrating an app prototype for weed seed identification through machine learning. The identification function of WeedsScan will have the same functionality, only for mature weed plants.

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Ramping up biosecurity surveillance online

We need innovative solutions to manage the biosecurity risk and prevent new weed incursions from the trade of high-risk invasive species and declared pests via e-commerce platforms.

E-commerce platforms can provide a significant pathway for the introduction of weeds and pest animals into new areas, which creates major biosecurity risks to human health, food security, agricultural health and biodiversity loss around the world.

We are addressing this risk by:

- Working with the University of Adelaide to develop a new **surveillance system that monitors illegal plant trade on e-commerce web sites.**



\$5
Prickly pear cactus
Rockingham, WA

of illegal plants sold online in Australia.



Arum Lilies \$5 each

Prickly pear cactus (*Opuntia* spp.) and Arum Lily (*Zantedeschia aethiopica*). Images by Jacob Maher, University of Adelaide

- Creating baseline data on the quantity and diversity
- Developing minimum standards to guide web scraping of sites engaged in illicit trade (including the dark web).

- Providing a user-friendly interface for Australian Government and state and territory government officials to handle and analyse the surveillance data.

For more information,
contact: Phill Casey,
University of Adelaide,
phill.cassey@adelaide.edu.au

Finding solutions to weeds and driving the adoption of best practices

The Centre is working with the NSW Department of Primary Industries to establish large-scale experimental sites — known as 'proof sites' — to develop best management practices for controlling a particularly difficult class of weeds across Australia under the National Invasive Grasses RD&E Program.

Proof sites will be surrounded by smaller sites on working properties or National Parks — known as 'adaptation sites' — where farmers, graziers and land managers can trial emerging solutions in local conditions. These trials will run over a three-year period and adapt management approaches to local production systems, geography and geology.

A systems approach will be applied to these trials and be key to encouraging successful adoption and adaptation by:

- Raising the awareness, interest and attention of at least 4,000 graziers and land managers.
- Working with at least 2,000 of these in participatory research, development and engagement activities.
- Building the evidence to demonstrate productivity, natural resource and social benefits of invasive grass management on at least 40 properties, expanding to self-motivated trials and adoption on a further 1,000 properties.

For more information,
contact: Ali Bajwa, NSW
Department of Primary Industries,
ali.bajwa@dpi.nsw.gov.au



Frogbit (*Limnobium laevigatum*) and water hyacinth (*Eichhornia crassipes*). Images by Jacob Maher, University of Adelaide

Integrated Weed Management

The NSW Department of Primary Industries is working on an **Integrated Weed Management Project** as part of the Centre's 10-Year National *Investment Plan for Weeds Research, Development & Engagement 2020–2030*.

The project is being rolled out in two stages. The first addresses invasive grasses — specifically Chilean Needle Grass and Serrated Tussock. The second considers broader integrated weed management issues associated with a wider selection of weed species.

For more information, contact: Ali Bajwa, NSW Department of Primary Industries, ali.bajwa@dpi.nsw.gov.au

Easy access to weed information

The Centre is working with the Atlas of Living Australia to build a national **information portal called WeedsAustralia**.

A beta version of this digital platform was launched in April 2020. Since then the platform has been undergoing continuous improvements and its content updated to provide the latest information for land managers working to control weeds on their properties.

WeedsAustralia contains a lot of information on Weeds of National Significance. It has nearly 400 updated weed profiles and included new management information.

For more information, contact: Cath Walsh, Centre for Invasive Species Solutions catherine.walsh@invasives.com.au

Better manuals to manage Weeds of National Significance

The Centre is updating the control sections of **27 Weeds of National Significance manuals**.

This update will address the chemical, mechanical and biological control sections within these manuals and include additional new information as addendums.

The Centre will also be identifying gaps in our control methods for different weed species and using this knowledge to help identify new research areas. Such research will be focused on practical, appropriate solutions.

For more information, contact: Matt Sheehan and Shauna Potter, Wild Matters Pty, matt@wildmatters.com.au and shauna@wildmatters.com.au or Cath Walsh, Centre for Invasive Species Solutions catherine.walsh@invasives.com.au

CISS weed projects are supported by



THE UNIVERSITY
of ADELAIDE



Government
of South Australia



Australian Government



Top and bottom banner image: Blue Periwinkle (*Vinca Major L.*), Canberra. Bottom image: Dr Hanwen Wu with Feathertop Rhodes grass (*Chloris virgata*). Image supplied by Dr Hanwen Wu, NSW DPI



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