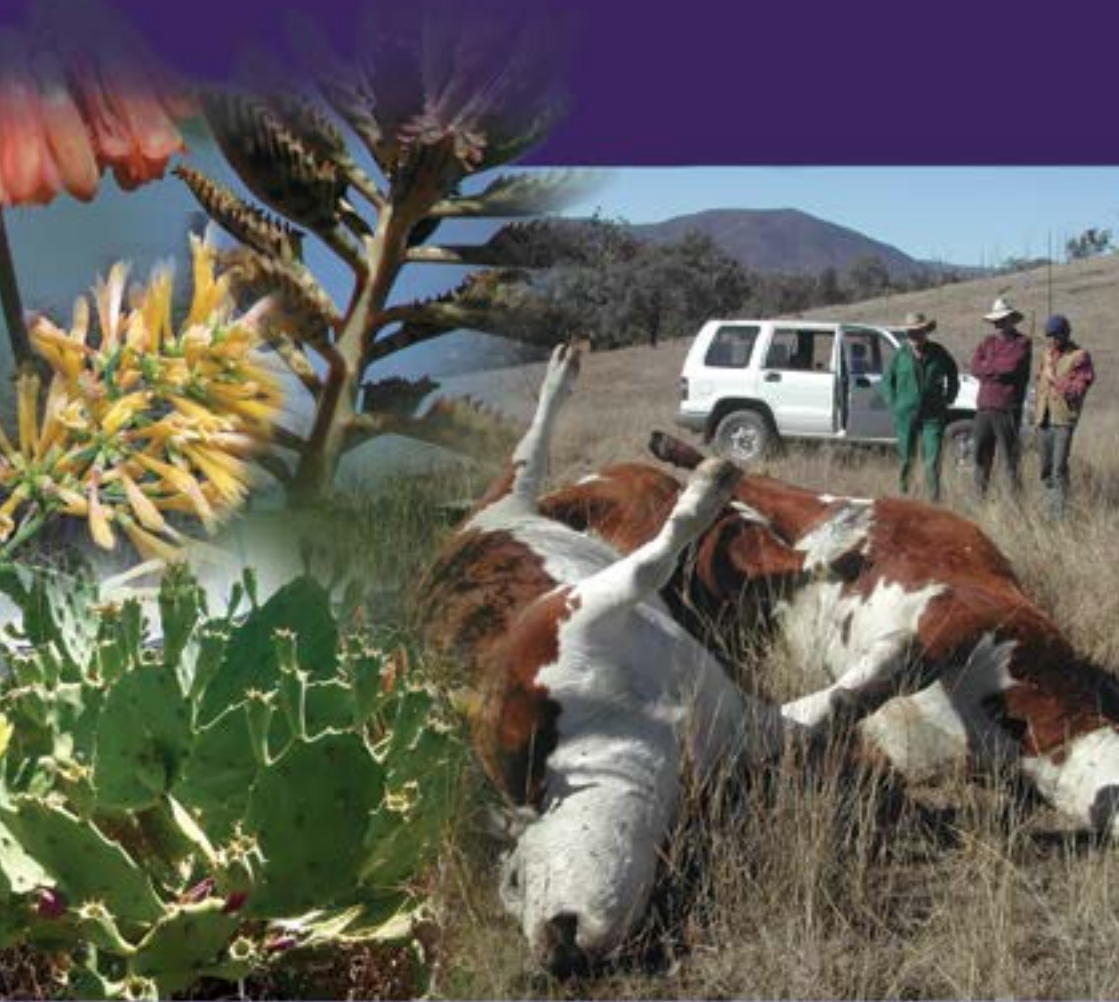


NORTHERN TABLELANDS & NORTH WEST LOCAL  
LAND SERVICES REGIONAL WEED COMMITTEES

# **WEED MANAGEMENT GUIDE**

## **FOR THE NORTH WEST & NORTHERN TABLELANDS**



Local Land  
Services

I N V A S I V E   W E E D   A L E R T

# TROPICAL SODA APPLE MUST BE ERADICATED



Leaf Spines



Immature Fruit



Mature Fruit



Seeds

## IF YOU HAVE:

- > **Seen this plant growing on your property**
- > **Suspect you may have this plant on your property**
- > **Purchased or transported livestock from infested areas**

**PLEASE CONTACT YOUR LOCAL COUNCIL'S BIOSECURITY OFFICER  
OR THE NSW DPI FOR ASSISTANCE.**

*This plant is regulated under a Biosecurity Control Order under the NSW Biosecurity Act 2015.  
This plant must be destroyed and stock must not be transported or sold without quarantine.  
Failure to comply can incur an on the spot penalty notice of \$2,000 or a fine up to \$440,000.  
Council's Invasive Weeds Team are ready to assist in identification and control.*





# Local Land Services

This booklet has been updated through collaboration with the Northern Tablelands and North West Local Land Services Regional Weed Committees (previously the Northern Inland Weeds Advisory Committee).

The Regional Weed Committees promote a regional approach to the management of high priority and other species of concern by bringing together all local and state government organisations and other bodies involved in land management throughout the Northern Tablelands and North West Local Land Services regions of NSW.

The combined region covers 13 Local control Authorities (Councils and County Councils). Other relevant agencies within the area are also represented - eg NSW Department of Primary Industries, Office of Environment & Heritage, National Parks and Wildlife Service, Department of Industry - Lands, other Managers of Crown Lands and Reserves, Aboriginal Land Managers, NSW Farmers together with community groups, volunteers and individuals.

This edition includes the new legislation changes of the Biosecurity Act 2015 which has repealed the Noxious Weeds Act 1993. The Biosecurity Act 2015 streamlines and modernises the way weeds are managed in NSW.

The Northern Tablelands and North West Local Land Services Regional Weed Committees acknowledges with thanks the significant financial support from the Northern Tablelands Local Land Services and the North West Local Land Services towards production costs of this Weed Management Guide for the Northern Tablelands and North West LLS regions.

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# Come clean - go clean!

Holidays are great for fun, fishing and relaxation - but nobody likes to be tangled in weeds!

Invasive aquatic weeds like Alligator weed can spread quickly and spoil our local waterways and ecosystems.

Help us keep the good fishing and fun spots clean for next time:



## **1. Check your gear**

This includes watercraft, trailers, equipment including inside boats, live wells, bilge, yabby and shrimp traps, and bait containers before leaving home and before leaving any water bodies.

## **2. Learn to recognise water weeds and be observant of new or unusual plants**

## **3. Report suspected infestations to the**

**NSW Weeds Hotline on 1800 680 244**

or contact your local council weeds officer,

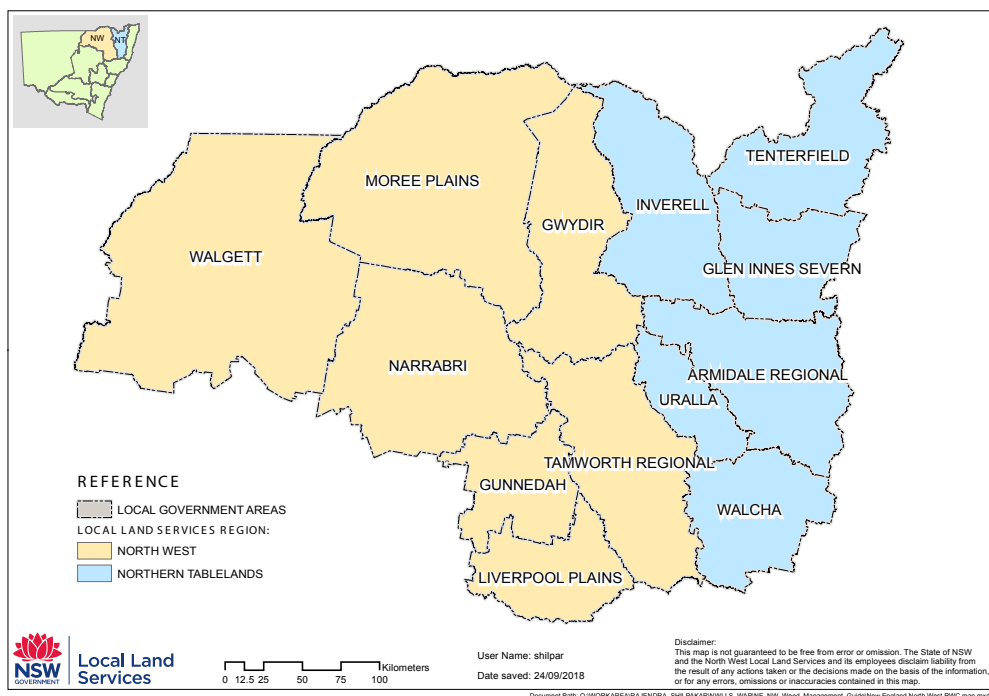
Local Land Services or NSW Department of Primary Industries.



NEW SOUTH WALES  
**No Space for  
Weeeeds**

# WEED MANAGEMENT GUIDE FOR THE NORTH WEST & NORTHERN TABLELANDS

Weeds pose a serious threat to human and animal health, to primary production and to our natural environment. Weeds reduce farm productivity, displace native species and contribute to on-going land degradation and reduced land values. This booklet seeks to provide general advice and guidance to land managers to assist them in their endeavors to control noxious and other undesirable weeds on their lands.



weed officers, DPI, previous CMA and National Parks staff.

Cover design: Simply Print Anything, Images: individual plants, unless otherwise indicate: North West Weeds / Les Tanner.



Refer to the DPI's weedwise website (<http://weeds.dpi.nsw.gov.au>) for detailed information on weed characteristics and control, or download the weedwise app.

# THE IMPORTANCE OF PRIORITY WEED CONTROL

Weeds pose a serious threat to human and animal health, to primary production and to our natural environment. Weeds reduce farm productivity, displace native species and contribute to on-going land degradation and reduced land values. This booklet seeks to provide general advice and guidance to land managers to assist them in their endeavors to control noxious and other undesirable weeds on their lands.

**The Northern Tablelands and North West Regional Weed Committees** have produced this Weed Management Guide with financial support from the Northern Tablelands and North West and Local Land Services.

## Section 1

Introduction

## Section 2

Council, NSW DPI , Local Land Services, & Landcare contacts

Useful weeds websites

## Section 3

The Biosecurity Act 2015

Summary of Management Categories & the groups of species to which they apply

Summary table of required measures required to demonstrate compliance with the General Biosecurity Duty on Regional Priority Weeds

Related Acts -

NSW DPI's NSW Weedwise App

## Section 4

Priority weeds information (Northern Tablelands and North West region)

## Section 5

Other weed species of concern

## Section 6

Accredited weed spraying contractors available within the NT and NW regions

**DISCLAIMER:** The information contained in this publication is based on knowledge and understanding at the time of writing. However, because of advances in knowledge, users are reminded of the need to ensure that information upon which they rely is up to date and to check currency of the information with the local Council Biosecurity officer or the user's independent adviser.

### ALWAYS READ THE LABEL

Herbicides recommendations throughout this publication are provided as a general guide only to enable land managers to obtain further information on herbicides known or believed to be registered for the particular weed. It is a legal and essential requirement that users of agricultural or veterinary chemical products must always read the label and any permit, before using the product, and must strictly comply with the directions on the label and conditions of any permit. Users are not absolved from compliance with the directions on the label or the conditions of the permit by reason of any statement made or not made in this publication. Compliance with label directions includes adherence to stock withholding periods. Users are reminded they have a general duty of care in relation to notifying neighbours of intended spray applications.



# COUNCIL AND OTHER CONTACTS - as at October 2018

## **Castlereagh Macquarie County Council**

77 Fox Street, Walgett NSW 2832

PO Box 664, Walgett NSW 2832

Telephone: 02 6828 1399

Email: [enquiries@cmcc.nsw.gov.au](mailto:enquiries@cmcc.nsw.gov.au)

Website: [www.cmcc.nsw.gov.au](http://www.cmcc.nsw.gov.au)

Biosecurity Officer Walgett: 0428 462 060

## **Gunnedah Shire Council**

63 Elgin St (PO Box 63)

Gunnedah NSW 2380

Telephone: (02) 6740 2100 Fax : (02) 6740 2219

Email: [council@infogunnedah.com.au](mailto:council@infogunnedah.com.au)

Web: [www.gunnedah.nsw.gov.au](http://www.gunnedah.nsw.gov.au)

Biosecurity Officer: (02) 6740 2225

Mob. 0427 254 188

Email: [council@infogunnedah.com.au](mailto:council@infogunnedah.com.au)

## **Gwydir Shire Council**

Maitland St (Locked Bag 5)

Bingara NSW 2404

Telephone: (02) 6724 2000 Fax: (02) 6724 1771

Email: [mail@gwydir.nsw.gov.au](mailto:mail@gwydir.nsw.gov.au)

Website: [www.gwydirshire.com](http://www.gwydirshire.com)

Biosecurity Officer

Telephone 0428 305 364

## **Inverell Shire Council**

144 Otho St (PO Box 138)

Inverell NSW 2360

Telephone: (02) 6728 8288

Fax: (02) 6728 8277

Email: [council@inverell.nsw.gov.au](mailto:council@inverell.nsw.gov.au)

Website: [www.inverell.nsw.gov.au](http://www.inverell.nsw.gov.au)

Biosecurity Officer: 0427 241 806

[council@inverell.nsw.gov.au](mailto:council@inverell.nsw.gov.au)

## **Liverpool Plains Shire Council**

60 Station St (PO Box 152)

Quirindi NSW 2343

Telephone: (02) 6746 1755

Fax: (02) 6746 3255

Email: [lpssc@lpssc.nsw.gov.au](mailto:lpssc@lpssc.nsw.gov.au)

Website: [www.lpssc.nsw.gov.au](http://www.lpssc.nsw.gov.au)

Biosecurity Officer: (02) 6746 2859

Mob. 0428 961 982 / Mob: 0427961980

## **Moree Plains Shire Council**

21 Auburn St

Moree NSW 2400

Telephone: (02) 6757 3222 Fax: (02) 6752 3934

Email: [council@mpsc.nsw.gov.au](mailto:council@mpsc.nsw.gov.au)

Website: [www.mpsc.nsw.gov.au](http://www.mpsc.nsw.gov.au)

Biosecurity Officer: (02) 6757 3259

Mobile: 0427 044521

## **Narrabri Shire Council**

46-48 Maitland St (PO Box 261)

Narrabri NSW 2390

Telephone: (02) 6799 6866 Fax: (02) 6799 6888

Website: [www.narrabri.nsw.gov.au](http://www.narrabri.nsw.gov.au)

Email: [council@narrabri.nsw.gov.au](mailto:council@narrabri.nsw.gov.au)

Biosecurity Officer:

PH: (02) 6799 6702 or 0427 294771

## **New England Weeds Authority**

2/129 Rusden St (PO Box 881)

Armidale NSW 2350

Telephone: (02) 6770 3602 Fax:

Email: [newa@newa.nsw.gov.au](mailto:newa@newa.nsw.gov.au)

Website: [www.newa.nsw.gov.au](http://www.newa.nsw.gov.au)

Biosecurity Officers: 0428 211 314

## **Tamworth Regional Council**

Ray Walsh House

437 Peel St (PO Box 555)

Tamworth NSW 2340

Ph: (02) 6767 5555 Fax: (02) 6767 5499

Website: [www.tamworth.nsw.gov.au](http://www.tamworth.nsw.gov.au)

Email: [trc@tamworth.nsw.gov.au](mailto:trc@tamworth.nsw.gov.au)

Biosecurity Officer: 0429 821 579

## **Tenterfield Shire Council**

247 Rouse St (PO Box 214)

Tenterfield NSW 2372

Telephone: (02) 6736 6000

Fax: (02) 6736 6005

Email: [council@tenterfield.nsw.gov.au](mailto:council@tenterfield.nsw.gov.au)

Website: [www.tenterfield.nsw.gov.au](http://www.tenterfield.nsw.gov.au)

Biosecurity Officer

Telephone: (02) 6736 1744 / 0402 210 102

# COUNCIL AND OTHER CONTACTS (continued)

## LOCAL LAND SERVICES

### Northern Tablelands Local Land Services

15 Vivian Street

PO Box 411

Inverell NSW 2360

Website: [www.northerntablelands.lls.nsw.gov.au](http://www.northerntablelands.lls.nsw.gov.au)

Telephone: (02) 6720 8300

Email: [admin.northerntablelands@lls.nsw.gov.au](mailto:admin.northerntablelands@lls.nsw.gov.au)

### North West Local Land Services

Tamworth Agricultural Institute

4 Marsden Park Road Calala

PO Box 500 Tamworth NSW 2340

Telephone: (02) 6764 5900

Email: [admin.northwest@lls.nsw.gov.au](mailto:admin.northwest@lls.nsw.gov.au)

Website: [northwest.lls.nsw.gov.au](http://northwest.lls.nsw.gov.au)

### NSW DPI

Invasive Species Officer

INSW Department of Primary Industries

Block K TAFE New England

Allingham Street Armidale

PO Box 1138 Armidale NSW 2350

Telephone: (02) 6770 3134 / 0427 311 824 :

Email: [weeds@dpi.nsw.gov.au](mailto:weeds@dpi.nsw.gov.au)

Website:

<https://www.dpi.nsw.gov.au/biosecurity/weeds>

### NSW Landcare

PO Box 362 St Peters NSW 2044

Telephone: 0458 168 225

Email: [administration@landcare.nsw.gov.au](mailto:administration@landcare.nsw.gov.au)

Website: <http://landcare.nsw.gov.au>

Regional Landcare Facilitator -

Phone: 02 6770 2008 or 0419 329 762

Email: [tablelands@nenwlandcare.org.au](mailto:tablelands@nenwlandcare.org.au)

Website: <https://www.nenwlandcare.org.au/>

## USEFUL WEEDS WEBSITES

### NSW DPI

Download the NSW Invasive Species Plan 2018 - 2021

<https://www.dpi.nsw.gov.au/biosecurity/vertebrate-pests/legislation/state-strategies/nsw-invasive-species-plan-2018-2021>

Download the NSW DPI's Weedwise App

<https://www.dpi.nsw.gov.au/biosecurity/weeds/nsw-weedwise-app>

Download the Northern Tablelands Regional Strategic Weed Management Plan

[https://northerntablelands.lls.nsw.gov.au/\\_data/assets/pdf\\_file/0007/722869/NT-RegionalWeedMgmtPlan-WEB-June17.pdf](https://northerntablelands.lls.nsw.gov.au/_data/assets/pdf_file/0007/722869/NT-RegionalWeedMgmtPlan-WEB-June17.pdf)

Download the North West Regional Strategic Weed Management Plan

[https://northwest.lls.nsw.gov.au/\\_data/assets/pdf\\_file/0010/722917/North-West-Regional-Weed-Mgmt-Plan-web-version.pdf](https://northwest.lls.nsw.gov.au/_data/assets/pdf_file/0010/722917/North-West-Regional-Weed-Mgmt-Plan-web-version.pdf)

Specific Best Practice Management Plans for individual Priority weeds in your area can be found on your local government / county council area website.



# THE BIOSECURITY ACT 2015

The *Biosecurity Act 2015* has repealed the Noxious Weeds Act 1993, which has provided regulatory controls and powers to manage noxious weeds in NSW. The Biosecurity Act 2015 streamlines and modernises the way weeds are managed in NSW as it:

- embeds the principle of shared responsibility for weed biosecurity risks across government, community and industry
- applies equally to all land in the state regardless of whether it is publicly or privately owned
- is premised on the concept of risk so that weed management investment and response is appropriate to the risk

In keeping with its premise that biosecurity is a shared community responsibility, the Act introduces the legally enforceable concept of a General Biosecurity Duty.

## GENERAL BIOSECURITY DUTY

The General Biosecurity Duty (GBD) means that any person dealing with plant matter must take measures to prevent, minimise or eliminate the biosecurity risk (as far as is reasonably practicable).

A GBD applies to all weed species regardless of whether they are listed in this booklet or not.

Any person dealing with plant matter must take measures to prevent, minimise or eliminate the biosecurity risk (as far as is reasonably practicable). 'Dealing' has a broad definition in the Act and the GBD applies equally to a carrier of plant matter and to any person who knows or ought to know of the biosecurity risks associated with the activity. In general if you deal with or carry plant matter as part of a commercial, professional, volunteer or recreational activity or lifestyle, you would be considered to know or ought to know the risks. Plant matter includes plants, parts of plants and seeds. Biosecurity is everyone's responsibility and further explanation of the GBD is available from the Local Land Services website and local offices, Local Government and NSW DPI.

www.granularproducts.com

## Granular Products

Profitable Pastures Through Australian Innovation

**BENEFITS OF GRANULES**

- Manage weeds in hard to access areas
- Low volume applications reduces costs
- Ability to reach weeds under canopies and foliage
- Activated by rain
- No drift or off-target damage

Contact Hamish Graham 0447 041 337 for more info today.

The advertisement features a central diagram with five icons connected to the title 'BENEFITS OF GRANULES'. The icons represent: a mountain for 'Manage weeds in hard to access areas', a person with a backpack for 'Low volume applications reduces costs', a tree for 'Ability to reach weeds under canopies and foliage', a rain cloud for 'Activated by rain', and a sun for 'No drift or off-target damage'. The background is a light orange grid, and the bottom shows a green grass field.

## **Aerial Agricultural Services**



- Spraying
- Granular Herbicide
- Fertiliser / Seed Spreading
- Feral Animal Control

Mudgee, Armidale and Tumut

# **02 6372 7622**

**[ag@commercialhelicopters.com](mailto:ag@commercialhelicopters.com)**



## REGIONAL PRIORITY WEEDS - Northern Tablelands and North West NSW

A number of invasive plants have been identified as of particular concern in the Northern Tablelands and North West regions. The biosecurity impacts of these weeds varies across the regions, so an objective and repeatable risk assessment was conducted. The management categories used in the assessment are summarised below and are listed for each weed on the following page.

### Summary of Management Categories and the groups of species to which they apply.

| Category         | Objective   | Weeds in this category   |
|------------------|---|--|
| Prevention       | To prevent the weed species arriving and establishing in the region.  | These species are high risk (highly invasive and high threat) and have a high likelihood of arriving in the region due to potential distribution and/or an existing high risk pathway. These species are not known to be present in the region.  |
| Eradication      | To permanently remove the species and its propagules from the region.<br>OR to destroy infestations to reduce the extent of a weed in the region or a part of it with the aim of local eradication (extirpation). | These species have a very high weed risk and very high feasibility of coordinated control. These species are present in the region to a limited extent only and the risk of re-invasion is either minimal or can be easily managed.              |
| Containment      | To prevent the ongoing spread of the species in all or part of the region.  | The species have a limited distribution. Regional containment strategies aim to prevent spread of the weed from an invaded part of the region (core infestation), and/or exclude the weed from an uninvaded part of the region (Exclusion Zone). |
| Asset Protection | To prevent the spread of the species to key sites/assets of high economic, environmental and/or social value or to reduce impact on these values if spread has already occurred.                                  | These weed species are widespread and unlikely to be eradicated or contained within the wider regional context. Effort is now focussed on reducing threats to protect priority high value assets.  |

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 Weeeeds**

## Regional Priority Weeds

A number of invasive plants have been identified as of particular concern in the Northern Tablelands and North West regions. The biosecurity impacts of these weeds varies across the regions, so an objective and repeatable risk assessment was conducted. The management categories used in the assessment are summarised below and are listed for each weed on the following page.

## Summary - Regional Priority Weeds

This table summarises the regionally prioritised weeds and outcomes to demonstrate compliance with the General Biosecurity Duty.

| Common Name                | Scientific Name   | Northern Tablelands<br>LLS Region* | North West<br>LLS Region** |
|----------------------------|---|------------------------------------|----------------------------|
| African Boxthorn           | <i>Lycium ferocissimum</i>                                    | -                                  | ASSET PROTECTION           |
| African feather grass      | <i>Cenchrus macrourus</i> (syn. <i>Pennisetum macrourum</i> ) | -                                  | EMERGING                   |
| African Lovegrass          | <i>Eragrostis curvula</i>                                     | SPECIES OF CONCERN                 | -                          |
| African Olive              | <i>Olea europaea</i> subsp. <i>Cuspidate</i>                  | -                                  | ASSET PROTECTION           |
| Aleman grass               | <i>Echinochloa polystachya</i>                                | -                                  | PREVENTION                 |
| Alligator Weed             | <i>Alternanthera philoxeroides</i>                            | PREVENTION                         | CONTAINMENT (EX)           |
| Anchored water hyacinth    | <i>Eichhornia azurea</i>                                      | PREVENTION                         | PREVENTION                 |
| Annual ragweed             | <i>Ambrosia artemisiifolia</i>                                | ASSET PROTECTION                   | -                          |
| Arrowhead                  | <i>Sagittaria calycina</i> subsp. <i>Salycina</i>             | -                                  | PREVENTION                 |
| Athel Pine                 | <i>Tamarix aphylla</i>  | ASSET PROTECTION                   | ASSET PROTECTION           |
| Bahia Grass                | <i>Paspalum notatum</i>                                       | SPECIES OF CONCERN                 | -                          |
| Bellyache bush             | <i>Jatropha gossypifolia</i>                                  | ASSET PROTECTION                   | PREVENTION                 |
| Bitou bush                 | <i>Chrysanthemoides monilifera</i> subsp. <i>Rotunda</i>      | CONTAINMENT                        | CONTAINMENT                |
| Black Knapweed             | <i>Centaurea xmoncktonii</i>                                  | PREVENTION                         | PREVENTION                 |
| Black locust, False acacia | <i>Robinia pseudoacacia</i>                                   | -                                  | EMERGING                   |
| Black willow               | <i>Salix nigra</i>  | -                                  | ASSET PROTECTION           |
| Blackberry                 | <i>Rubus fruticosus</i> spp. agg                              | ASSET PROTECTION                   | ASSET PROTECTION           |
| Blue hounds tongue         | <i>Cynoglossum creticum</i>                                   | -                                  | PREVENTION                 |

# REGIONAL PRIORITY WEEDS - Northern Tablelands and North West NSW

| Common Name                                | Scientific Name  | Northern Tablelands<br>LLS Region* | North West<br>LLS Region** |
|--|--|------------------------------------|----------------------------|
| Blue periwinkle                            | Vinca major  | -                                  | EMERGING                   |
| Boneseed                                   | Chrysanthemoides monilifera subsp. Monilifera                                    | ERADICATION                        | ERADICATION                |
| Box elder                                  | Acer negundo   | -                                  | EMERGING                   |
| Bridal creeper                             | B Asparagus asparagoides (syn. Myrsiphyllum asparagoides, Asparagus medeoloides) | -                                  | EMERGING                   |
| Bridal veil creeper                        | Asparagus declinatus   | PREVENTION                         | PREVENTION                 |
| Broomrape                                  | Orobanche spp.   | PREVENTION                         | PREVENTION                 |
| Browntop Bent                              | Agrostis capillaris  | -                                  | PREVENTION                 |
| Cabomba                                    | Cabomba (all Species except C. furcata)  | -                                  | PREVENTION                 |
| Camel Thorn                                | Alhagi maurorum  | -                                  | PREVENTION                 |
| Canary Island date palm                    | Phoenix canariensis (non planted)  | -                                  | EMERGING                   |
| Cape tulip                                 | Moraea miniata and M flaccida  | -                                  | PREVENTION                 |
| Castor Oil                                 | Ricinus communis   | -                                  | EMERGING                   |
| Cat's claw creeper                         | B Dolichandra unguis-cati (syn. Macfadyena unguis-cati)                          | SPECIES OF CONCERN                 | EMERGING                   |
| Chilean Needle Grass                       | Nassella neesiana  | ASSET PROTECTION                   | CONTAINMENT (EX)           |
| Chinese violet                             | Asystasia gangetica ssp. micrantha   | -                                  | PREVENTION                 |
| Cocksfoot                                  | Dactylis glomerata   | SPECIES OF CONCERN                 | -                          |
| Coolatai Grass                             | Hyparrhenia hirta  | -                                  | -                          |
| Coral cactus/Boxing glove cactus           | B Cylindropuntia fulgida var. mamillata  | -                                  | EMERGING                   |
| Cotoneaster                                | Cotoneaster spp  | SPECIES OF CONCERN                 | -                          |
| East Indian hygrophilia                    | Hygrophilia polysperma   | -                                  | PREVENTION                 |
| Elephant grass                             | Pennisetum purpureum   | -                                  | EMERGING                   |
| Espartillo                                 | Amelichloa brachychaeta and A. caudata   | -                                  | EMERGING                   |
| Eurasian water milfoil                     | Myriophyllum spicatum  | -                                  | PREVENTION                 |
| Feral Fruit and Nut trees various species. |  | -                                  | EMERGING                   |

# REGIONAL PRIORITY WEEDS - Northern Tablelands and North West NSW

| Common Name                | Scientific Name                                     | Northern Tablelands LLS Region* | North West LLS Region** |
|----------------------------|---|---------------------------------|-------------------------|
| Firethorns                 | Pyracantha spp                                      | SPECIES OF CONCERN              | -                       |
| Fireweed                   | Senecio madagascariensis                            | SPECIES OF CONCERN              | EMERGING                |
| Frogbit/Spongeplant        | Limnobium spp. (all species)                        | PREVENTION                      | PREVENTION              |
| Galenia                    | Galenia pubescens                                   | -                               | EMERGING                |
| Gamba grass                | Andropogon gayanus                                  | PREVENTION                      | PREVENTION              |
| Giant Parramatta grass     | Sporobolus fertilis                                 | -                               | EMERGING                |
| Giant rat's tail grass     | Sporobolus natalensis and S. pyramidalis            | -                               | EMERGING                |
| Gorse                      | Ulex europaeus                                      | ERADICATION                     | PREVENTION              |
| Green Cestrum              | Cestrum parqui                                      | ASSET PROTECTION                | CONTAINMENT             |
| Green Panic                | Panicum maximum var trichoglume                     | SPECIES OF CONCERN              | -                       |
| Harrisia cactus            | Harrisia martinii and H. tortuosa                   | ASSET PROTECTION                | CONTAINMENT             |
| Hawkweed                   | Hieracium spp.                                      | PREVENTION                      | PREVENTION              |
| Hawthorn                   | Crataegus monogyna, Cotoneaster spp.Pyracantha spp. | SPECIES OF CONCERN              | EMERGING                |
| Hawthorn                   | Crataegus monogyna                                  | SPECIES OF CONCERN              | EMERGING                |
| Honey locust               | Gleditsia triacanthos                               | CONTAINMENT                     | CONTAINMENT             |
| Horsetail                  | Equisetum spp.                                      | -                               | PREVENTION              |
| Hudson pear                | Cylindropuntia pallida & tunicata Spp               | ASSET PROTECTION                | ERADICATION             |
| Hydrocotyl/Water pennywort | Hydrocotyle ranunculoides                           | PREVENTION                      | PREVENTION              |
| Hygrophila                 | Hygrophila costata                                  | -                               | PREVENTION              |
| Hymenachne                 | Hymenachne amplexicaulis and hybrids                | -                               | PREVENTION              |
| Japanese honeysuckle       | Lonicera japonica                                   | -                               | EMERGING                |
| Karoo acacia               | Vachellia karroo (syn. Acacia karroo                | PREVENTION                      | PREVENTION              |
| Kidneyleaf mud plantain    | Heteranthera reniformis                             | -                               | PREVENTION              |
| Kochia                     | Bassia scoparia (excl subsp. trichophylla)          | PREVENTION                      | PREVENTION              |



# REGIONAL PRIORITY WEEDS - Northern Tablelands and North West NSW

| Common Name   | Scientific Name                             | Northern Tablelands LLS Region* | North West LLS Region** |
|---|---|---------------------------------|-------------------------|
| Koster's curse                                      | Clidemia hirta                              | PREVENTION                      | PREVENTION              |
| Lagarosiphon  | Lagarosiphon major                          | PREVENTION                      | PREVENTION              |
| Lanatana  | Lantana camara                              | ASSET PROTECTION                | -                       |
| Leafy elodea, Dense waterweed, Egeria               | Egeria densa                                | -                               | PREVENTION              |
| Long-leaf willow primrose, Long-leaf water primrose | Ludwigia longifolia                         | -                               | PREVENTION              |
| Mesquite  | Prosopis spp                                | ASSET PROTECTION                | CONTAINMENT             |
| Mexican feather grass                               | Nassella tenuissima (syn. Stipa tenuissima) | PREVENTION                      | PREVENTION              |
| Mexican water lily                                  | Nymphaea mexicana                           | CONTAINMENT                     | PREVENTION              |
| Miconia   | Miconia spp. (all species)                  | PREVENTION                      | PREVENTION              |
| Mikania vine  | Mikania micrantha                           | PREVENTION                      | PREVENTION              |
| Mimosa  | Mimosa pigra                                | PREVENTION                      | PREVENTION              |
| Montpellier/Cape broom                              | Genista monspessulana                       | CONTAINMENT                     | CONTAINMENT             |
| Mother of millions                                  | Bryophyllum delagoense                      | SPECIES OF CONCERN              | ASSET PROTECTION        |
| Nodding thistle                                     | Carduus nutans subsp. nutans                | CONTAINMENT                     | EMERGING                |
| Oleander  | Nerium oleander (in riparian zones only)    | -                               | EMERGING                |
| Onion weed  | Asphodelus fistulosus                       | -                               | EMERGING                |
| Osage orange  | Maclura pomifera (non planted)              | -                               | EMERGING                |
| Ox-eye Daisy  | Leucanthemum vulgare                        | SPECIES OF CONCERN              | -                       |
| Parkinsonia   | Parkinsonia aculeata                        | ERADICATION                     | ERADICATION             |
| Parthenium weed                                     | Parthenium hysterophorus                    | PREVENTION                      | PREVENTION              |
| Paspalum  | Paspalum dilitatum                          | SPECIES OF CONCERN              | -                       |
| Peruvian primrose                                   | ludwigia peruviana                          | -                               | PREVENTION              |
| Phalaris Phalaris aquatica                          | Phalaris aquatica                           | SPECIES OF CONCERN              | -                       |
| Pond apple  | Annona glabra                               | PREVENTION                      | PREVENTION              |

# REGIONAL PRIORITY WEEDS - Northern Tablelands and North West NSW

| Common Name                    | Scientific Name  | Northern Tablelands LLS Region* | North West LLS Region** |
|--------------------------------|--|---------------------------------|-------------------------|
| Prickly acacia                 | Vachellia nilotica (syn. Acacia nilotica)                                  | PREVENTION                      | PREVENTION              |
| Privet                         | Sp. Ligustrum lucidum/Ligustrum vulgare/Ligustrum sinense                  | ASSET PROTECTION                | -                       |
| Rhus tree                      | Toxicodendron succedaneum (syn. Toxicodendron succedanea, Rhus succedanea) | -                               | PREVENTION              |
| Rope pear                      | Cylindropuntia imbicata  | -                               | ASSET PROTECTION        |
| Rubber vine                    | Cryptostegia grandiflora   | PREVENTION                      | PREVENTION              |
| Sabi Grass                     | Urochloa mosambiciensis  | SPECIES OF CONCERN              | -                       |
| Sagittaria                     | Sagittaria platyphylla   | ASSET PROTECTION                | ERADICATION             |
| Salvinia                       | Salvinia molesta   | ASSET PROTECTION                | ERADICATION             |
| Scotch/English broom           | Cytisus scoparius subsp. scoparius   | CONTAINMENT                     | CONTAINMENT             |
| Senegal tea plant              | gymnocoronis spilanthoides   | -                               | PREVENTION              |
| Serrated Tussock               | Nassella Trichtotoma   | CONTAINMENT                     | CONTAINMENT             |
| Siam weed                      | Chromolaena odorata  | PREVENTION                      | PREVENTION              |
| Silverleaf nightshade          | Solanum elaeagnifolium   | ASSET PROTECTION                | ASSET PROTECTION        |
| South African Pigeon Grass     | Setaria sphacelata   | -                               | EMERGING                |
| Spotted knapweed               | Centaurea stoebe subsp. australis  | PREVENTION                      | PREVENTION              |
| St John's wort                 | Hypericum perforatum   | ASSET PROTECTION                | CONTAINMENT             |
| Sweet Briar                    | Rosa rubiginosa  | ASSET PROTECTION                | ASSET PROTECTION        |
| Sweet Vernal Grass             | Anthoxanum odoratum  | SPECIES OF CONCERN              | -                       |
| Tall Coolatai, Thatch grass    | Hyparrhenia rufa   | -                               | EMERGING                |
| Tiger pear                     | Opuntia aurantiaca   | -                               | ASSET PROTECTION        |
| Toothed spurge, David's spurge | Euphorbia davidii  | -                               | EMERGING                |

# REGIONAL PRIORITY WEEDS - Northern Tablelands and North West NSW

| Common Name         | Scientific Name                           | Northern Tablelands LLS Region* | North West LLS Region** |
|---------------------|---|---------------------------------|-------------------------|
| Tree of Heaven      | Ailanthus altissima                       | SPECIES OF CONCERN              | -                       |
| Tree pear           | B Opuntia tomentosa                       | -                               | EMERGING                |
| Tropical Soda Apple | Solanum viarum                            | ERADICATION                     | ERADICATION             |
| Turnip weed         | Rapistrum rugosum                         | SPECIES OF CONCERN              | -                       |
| Vetch               | Vicia spp                                 | SPECIES OF CONCERN              | -                       |
| Water caltrop       | Trapa spp. (all species)                  | PREVENTION                      | PREVENTION              |
| Water Hyacinth      | Eichhornia crassipes                      | PREVENTION                      | CONTAINMENT             |
| Water Lettuce       | Pistia stratiotes                         | ERADICATION                     | ERADICATION             |
| Water soldier       | Stratiotes aloides                        | PREVENTION                      | PREVENTION              |
| Whiskey grass       | Andropogon virginicus                     | SPECIES OF CONCERN              | EMERGING                |
| Witchweed           | Striga spp. (except native S. parviflora) | PREVENTION                      | PREVENTION              |
| Yellow bells        | Tecoma stans                              | ASSET PROTECTION                | PREVENTION              |
| Yellow burrhead     | Limnocharis flava                         | PREVENTION                      | PREVENTION              |

\*Local Control Authority areas of New England Weeds Authority, Inverell, Glen Innes and Tenterfield

\*\* Local Control Authority areas of Tamworth, Gunnedah, Liverpool Plains, Walgett, Narrabri, Bingara and Moree



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## The Pesticides Act 1999 - what it means for weed controllers

THE PESTICIDES ACT 1999 Controls the use of pesticides (herbicides, insecticides and baits) in NSW. The Act aims to reduce the risks associated with the use of pesticides to human health, the environment, property, industry and trade. It also aims to promote collaborative and integrated policies for the use of pesticides.

The Environmental Protection Agency (EPA) enforces the proper use of all pesticides in NSW, after the point of sale. This includes pesticide use in agriculture, on public lands and on domestic and commercial premises.

### What does the act say?

The Act says that if you use pesticides it is your responsibility to use them strictly according to the label direction and to take all reasonable actions to prevent off-target impacts. The aims of these rules are to protect your health, other people's health and property, the environment and trade.

### Who does the act apply to?

everyone who uses a pesticide and everyone involved in the decision making about using a pesticide. For example, it applies to land occupiers, farmers, aerial operators, ground rig operators, pesticide users in council or government agencies, pest controllers and domestic users.

### How can you make sure you are doing the right thing?

the control of priority weeds is a very important job and needs to be done with care. If you use pesticides you need to remember some important things:

- only use registered pesticides and make sure that the product you choose is specifically registered for your target weed
- only use the pesticide as directed on the label (unless you have a permit from the Australian Pesticides and Veterinary Medicines Authority (APVMA) to allow specific off-label use)
- check for people, houses, crops and livestock downwind of the application site and make sure they will not be exposed to the pesticide
- if you are the farmer or manager and you have asked someone else to apply a pesticide, provide that person with the information about nearby houses, sensitive areas or items that must not be harmed
- spray in suitable weather conditions so that spray does not drift outside the target area. Don't spray in high winds or when there is no wind. A light steady wind blowing away from houses and other sensitive areas is best. Don't spray just before rain
- use the right equipment and make sure it is well maintained, calibrated and operated, provide adequate instruction and training to all employees or family members who use pesticides on the farm, property or public land
- do not store pesticides in containers which do not bear an approved label

# What record keeping, training and notification is required?

## Record keeping:

Record keeping requirements apply to you if you use pesticides as part of your business or job such as a farmer or Biosecurity officer. They do not apply to household pesticide users.

### Records need to be kept on:

- do not store pesticides in containers which do not bear an approved label
- the full name of the crop or situation of use
- the rate of application and the quantity applied
- the equipment used to apply the pesticide (e.g. boom sprayer, power spray unit)
- the detailed location of the spraying
- the date and time of spraying, including start and finish times
- names and contact details of the person who applied the pesticide (or in some circumstances their employer or supervisor) and
- relevant weather conditions specifically wind speed and direction and anything else required by the label (eg temperature, humidity)

Records need to be made as soon as possible after the application and no longer than 24 hours after the pesticide has been applied.

Records need to be kept for 3 years. Spraying of weeds in pastures or on fallow crop land using hand held and hand powered spray equipment does not require a record. Spot spraying weeds within tree crops using hand held and hand powered equipment does not require a record, providing the application is no closer than 20 metres to a property boundary. An example form and guidance information about keeping records is available from the NSW EPA. Refer [www.epa.nsw.gov.au](http://www.epa.nsw.gov.au)

## Training:

All commercial pesticide users, including weed controllers, farmers, council and government agencies, are required to have certain qualifications before they can use pesticides. In most cases the training involves a two-day course, based on national chemical user competency standards. A shorter refresher course is required every five years. Information on trainers is available on ChemCert website at <http://www.chemcert.com.au/>

## Notification:

All public authorities (local councils, county councils, NSW Government agencies) are required to give notice of their outdoor pesticide use in public places in accordance with a publicly available pesticide use notification plan. If you are an employee or contractor working for a public authority you should ask what notice should be provided before you use a pesticide in a public place. In other situations, notification of neighbours by weed controllers is generally voluntary (but good practice), unless required by the product label or permit.

## Need more information?

Information about the Pesticides Act 1999 and the record keeping regulation is available from <https://www.epa.nsw.gov.au/your-environment/pesticides>



## **Workcover NSW**

Under the Work Health and Safety Act 2011, WorkCover NSW seeks to protect workers in the workplace. Regulations under the WHS Act control hazardous substances including most (though not all) pesticides. The Work Health and Safety Regulation 2011 is the most recent and important of these. It covers identification of hazardous substances in the workplace and the assessment and control of risks associated with their use.

## **The Biodiversity Conservation Act 2016 and Local Land Services Amendment Act 2016**

The Native Vegetation Act 2003 and the Native Vegetation Regulation 2013 were repealed on 25 August 2017.

The Biodiversity Conservation Act 2016 and Local Land Services Amendment Act 2016 take advantage of the best available science and data to ensure a balanced approach to land management and biodiversity conservation in NSW.

### **The integrated package of reforms features:**

- New arrangements that allow land owners to improve productivity while responding to environmental risks
- New ways to assess and manage the biodiversity impacts of development
- A new State Environmental Planning Policy for impacts on native vegetation in urban areas
- Significant investment in conserving high value vegetation on private land
- A risk-based system for regulating human and business interactions with native plants and animals
- Streamlined approvals and dedicated resources to help reduce the regulatory burden

The Office of Environment and Heritage (OEH) has regulatory responsibility for the compliance and enforcement of land management (native vegetation) activities under Part 5A of the Local Land Services Act 2013 (LLS Act).

OEH detects potential unlawful native vegetation clearing through public reporting to the Environment Line, through its own investigations and audits, and from remote surveillance including aerial surveys and satellite imagery.

OEH takes a risk based approach to identified compliance issues, and will help people to comply in relation to low risk matters, but will take firm but fair enforcement action in relation to more serious matters such as those that involve intentional unlawful clearing that causes significant harm to the environment.

**Contact your Local Land Services Office for further information.**

# Need to know what a weed is or how to control it?

## Get the NSW DPI's free weeds app

The NSW DPI's "NSW WeedWise" is provided as a free smartphone app through the app stores.



Like the web version, the smartphone app provides key information to help users reduce the impact of over 300 weeds in New South Wales.

Users, ranging from home gardeners and residents to farmers, land managers and weeds professionals, can search or browse weed names (common or scientific); recognise a weed by its physical description and image gallery; and find out about its impacts, where it occurs, how it spreads and its preferred habitat.

Control options are described for each weed and the herbicides registered for control by the Australian Pesticide and Veterinary Medicines Authority are listed, including application rates and techniques, and any minor-use permits that must be complied with. General, state or regional biosecurity duties under the *Biosecurity Act 2015* are displayed for each weed.

## Features include:

Users experience different functions within the app depending on whether they are landholders, residents or weeds professionals.

Landholders and residents can enter the contact details of their local council weeds officer, and then directly report sightings of state priority weeds via email or SMS.

Weeds professionals can share information about a weed with clients via email or SMS, including a weed's profile, biosecurity duties, control advice and herbicide options.

NSW WeedWise incorporates the content contained in the NSW Weed Control Handbook, a free, publication from NSW Department of Primary Industries.



**Alligator weed** (*Alternanthera philoxeroides*) is an aggressive invader of Australia's waterways, wetlands and floodplains. A native of South America, it can grow in water and on land.

## THE PROBLEM

Alligator weed is one of the greatest threats to waterways, wetlands, floodplains and irrigation systems in Australia. As a weed that can grow both on land and in water and can tolerate a range of control methods - herbicides in particular - alligator weed has serious impacts worldwide.



## IDENTIFICATION

The stems are hollow, leaves spear-shaped in opposite pairs along the stems. They are generally dark, waxy, glossy and sessile (there is no obvious stalk attaching them to the stem). These features generally distinguish alligator weed from other similar plants. It is a perennial, stoloniferous herb producing masses of creeping and layering and upright stems. It has the ability to grow in aquatic, semi-aquatic and terrestrial habitats in tropical, subtropical and temperate regions (Julien & Stanley 1999).



## BIOSECURITY DUTY

**Regional Recommended Measure.**

**North West:** Containment

**Northern Tablelands:** Containment

**Prohibition on dealings**

## CONTROL ALTERNATIVES

Chemical options registered for alligator weed include *Brushoff*® for terrestrial areas and *Roundup Biactive*® for the aquatic form. However, because this is a very serious, and notifiable, noxious weed, local Council will assist with treatment. Ring your local weeds officer.

*Images courtesy Josh Biddle.*

## HOW TO IDENTIFY ALLIGATOR WEED

Alligator Weed can take many forms. It can grow as a mat of stems on the water surface - either free floating or rooted in the bank. It can also grow on land in an upright stand, creeping amongst other vegetation, or along the ground.



Smartweed *Polygonum persicaria* is often confused with Alligator Weed (Note pink flower)

## WANTED DEAD OR ALIVE

# ALLIGATOR WEED



**Alligator Weed has serious impacts:**

1. Blocks irrigation channels and water storage facilities.
2. Invades horticulture, pastures, turf, and cropping systems.
3. Depletes oxygen levels and restricts light, affecting fish and other aquatic life.

### HOW TO IDENTIFY ALLIGATOR WEED:



Glossy spear-shaped leaves arranged in opposite pairs along the stems.



Hollow stems.



Papery white bell-shaped flowers on short stalks.



On land plants can have nodding stems and extensive underground root systems.

**Cabomba** (*Cabomba caroliniana*) is a submerged aquatic weed that invades bodies of fresh water such as lakes, dams, slow flowing rivers and billabongs.

## THE PROBLEM

Cabomba was introduced to most countries, including Australia, through the aquarium industry, as a popular ornamental, habitat and ‘oxygenator’ plant for fish tanks and aquariums. It was easily propagated and cultivated for trade. The trade and sale of cabomba is now banned in all States and Territories in Australia.

## IDENTIFICATION

Cabomba is strictly aquatic and completely submerged except for its flowers and occasional floating leaves. The roots attach to the bottom of the water body and stems can be up to 10 m long, but usually range up to 5 m.

### Key identification features

The submerged leaves and stems have a thin gelatinous coating. Leaves are arranged in opposite pairs along the stems and are finely dissected giving the characteristic feathery, fan-shaped appearance.

Single flowers approximately 2 cm in diameter are raised 1-4 cm above the water surface on stalks. They can be milk-white, pale yellow or purplish (usually white petals with yellow centres), and appear to have 6 petals (3 of these are sepals). Flowers emerge from the water during the day and recede into the water overnight. The raised flowers are often the first visible sign of an infestation



## BIOSECURITY DUTIES

**Northern Tablelands:** General Biosecurity Duty

**North West:** Prevention.

## OPTIMUM TIME TO TREAT

Regular monitoring of uninfested areas and water bodies close to known infestations will help in the early detection and possible eradication of small, new infestations.

## CONTROL ALTERNATIVES

Early detection is critical as once established cabomba is extremely difficult to control. Control methods focus on drawdown, shading, manual removal and mechanical removal. All of these methods are costly and labour intensive and only effective over small areas. In larger infestations it is only viable or practical to reduce cabomba in strategic locations such as swimming areas or to prevent spread by containment



## PROHIBITED MATTER: If you see this plant call your local Weeds Biosecurity Officer

**Frogbit** (*Limnobium laevigatum*) is a floating freshwater plant from Central and South America. It has been kept and traded for use in fish ponds, aquariums and water features. It can rapidly invade and smother waterways and is a serious biosecurity threat to NSW.



The first known occurrences of frogbit in NSW have been found in a natural waterway in a bushland reserve, and in fish ponds on private property at Green Point, near Forster. It has also been found advertised for sale by online sellers around Sydney. These occurrences are subject to an immediate eradication response.

### THE PROBLEM

Plants can form into large mats of runners and adult plants can develop very quickly. Juvenile plants have a great capacity for distribution in that they are small and can be easily and quickly carried along by water currents

Frogbit spreads when plants move in water, but a common cause of spread is the dumping of illegal aquarium or pond plants in waterways.



### IDENTIFICATION

Plants float on the water surface, and have smooth, rounded, fleshy green leaves up to 4 cm across, with sponge-like sections on their undersides.

### BIOSECURITY DUTY

State Priority Weed Objective - PREVENTION (whole of state):

Frogbit poses a significant biosecurity risk and prevention of the biosecurity risk and prevention of the biosecurity risk posted by this weed is a reasonably practical objective.

### PROHIBITED MATTER

A person who deals with prohibited matter or a carrier of prohibited matter is guilty of an offence. A person who becomes aware of or suspects the presence of prohibited matter must immediately notify the Department of Primary Industries. All species of *Limnobium* are Prohibited Matter.

### CONTROL ALTERNATIVES

Contact your local council Biosecurity officer if you suspect you have found Frogbit.

*Photos courtesy Terry Inkson*



**Hymenachne** (*Hymenachne amplexicaulis*) is a semi-aquatic perennial grass that has become a major weed of northern Australia invading freshwater wetlands, flood plains and stream banks.

## THE PROBLEM

Hymenachne forms dense infestations and thrives in nutrient-rich water. It displaces native plants, reduces biodiversity and threatens native fish populations and wetland habitats.

If left undetected, hymenachne has the potential to spread further in northern NSW and become a major weed of wetlands and waterways.



## IDENTIFICATION

Hymenachne is a perennial grass that prefers swampy or seasonally flooded areas, growing in water up to 2 m deep.

Key identification features

- Stems are up to 2.5 m tall, contain white pith and are hairless. On land, erect stems can stand up to 1.5 m tall, rising from stems that run along the ground. New plants are produced from horizontal stems that form roots at their lower nodes.
- Leaf blades are 20-35 cm long and 2-3 cm wide, bright green, with light-coloured veins and hairy edges. A key characteristic is that the base of the leaf blade is slightly heart-shaped and clasped around the stem.
- Each flower-head is spike-like and cylindrical, about 8 mm wide and up to 40 cm long.

## BIOSECURITY DUTIES

**All of NSW:** General Biosecurity Duty

**Prohibition on deadlings:** Must not be imported into the States or sold

## CONTROL ALTERNATIVES

Hymenachne is difficult to control and is capable of spreading from plant fragments, requiring strict hygiene procedures during its removal. If you suspect you have found hymenachne, immediately contact a local council weeds officer who will assist with identification, removal and eradication.





Sagittaria (*Sagittaria graminea*) is a native of South America was originally introduced into Australia as an ornamental.

## THE PROBLEM

Sagittaria can form dense mats, covering water areas and in some cases blocking water flows in irrigation channels and the like. Ducks are believed to spread the seeds into new waterways. Shade tolerant, competes vigorously with native waterplants.

## IDENTIFICATION

White flowers in groups of three, always below leaf height, appearing around January each year through to early autumn.

The plant takes root in the mud, reproduces from seed, rhizomes

and tubers and grows to a height of around 50 centimetres above the water.

## BIOSECURITY DUTIES

**North West:** Prevention

**Northern Tablelands:** Asset protection

**Prohibition on dealings**

## OPTIMUM TIME TO TREAT

November - March when plants are actively growing.

## CONTROL ALTERNATIVES

**Non-chemical:** Careful removal of entire plants and seed bank may be appropriate for isolated areas, with follow-up. **Chemical:** *Roundup Biactive®*. Refer to label directions.



**Salvinia** (*Salvinia molesta*) is a free-floating aquatic fern with slender stems, floating leaves, and a root-like structure.

## THE PROBLEM

Ecologically - salvinia disrupts aquatic ecosystems, seriously affecting native animals and plant life; decreasing the quality of water by causing odours through accumulation of organic matter and stagnation of streams. Recreational - degrades the aesthetic value of waterways; reduces or prevents the use of waterways for recreation and transport.



## IDENTIFICATION

The leaves of this weed float on the water surface are paired and round-to-oval in shape, with dense, waxy hairs on the upper surface. The shape and size of leaves vary with age and the degree of crowding. Stems are submerged, green, branched and covered with fine hairs. The Roots are thought to be a modified leaf, forming into trailing, hairy strands up to 25cm long.



## BIOSECURITY DUTIES

**North West:** Eradication

**Northern Tablelands:** Asset Protection

**Prohibition on Dealing:** Must not be imported into the state or sold

## CONTROL ALTERNATIVES:

**Non-chemical:** Mechanical removal is an option for small infestations (an old tennis racquet is great). Care needs to be taken to remove all plants to prevent rapid re-growth. **Chemical:** controlling salvinia with herbicides depends on having good access to the weed in well-defined waterways. Salvinia is a high-priority weed - report any findings to Council who will assist with a control program.



**Senegal tea** (*Gymnocoronis spilanthoides*) is native to tropical and subtropical America (from Mexico to Argentina). It is an invasive aquatic weed in New Zealand, India and China. It was introduced to Australia from India for the aquarium trade in the 1970s, and was first recorded as naturalised in the Manning River near Taree in 1980. Infestations have also occurred at Dapto, Byron Bay and Gloucester and these have since been controlled.

## THE PROBLEM

Senegal is a hardy plant with a rapid growth rate, growing on the banks of watercourses and in shallow water.

Senegal tea can form dense erect stands, or extend mats of stems from the banks across the water surface. This impedes flow, ecosystem function, navigation, and recreational activities. Senegal tea is one of 28 weeds on the Australian Government's National Environmental Alert List. These weeds are in the early stages of establishment and could seriously threaten biodiversity if not managed.



## IDENTIFICATION

Senegal tea is a perennial plant that can grow in dense stands or as clumped bushes up to 1 m high.

## LEAVES AND STEMS

Stems are ribbed, pale green and erect, becoming prostrate as they lengthen and age. They are hollow between the nodes and buoyant, able to form tangled floating mats. Stems branch at nodes and are 1 - 1.5 m long and 5 - 10 mm in diameter, increasing to 1 - 2 cm with age. Fine, fibrous roots form at stem nodes.

The tapered leaves are dark green, 5 - 20 cm long, 2.5 - 5 cm wide, grow on short stalks and have serrated, slightly wavy margins. They occur in opposite pairs along the stems.

## FLOWERS AND SEEDS

White, pom-pom-like flowers 1.5 - 2 cm in diameter occur in groups at the ends of stems. Flowering starts in late spring or early summer and continues until temperatures fall. Flowers have a strong fragrance. Seeds are yellow-brown, 5 mm in diameter, and ribbed.

## BIOSECURITY DUTY

**All of NSW:** General Biosecurity Duty

**North West:** The plant should be eradicated from the land and the land kept free of the plant.

## CONTROL ALTERNATIVES

Control should not be attempted by individuals as Senegal tea can spread very easily from plant fragments. If you suspect you have Senegal tea seek advice from your local council Biosecurity officer. This plant can be eradicated if detected early in its establishment.



**Water hyacinth** - (*Eichhornia crassipes*) - is considered by many as the world's worst aquatic weed. It infests rivers, dams, lakes and irrigation channels on every continent except Antarctica. It devastates aquatic environments and costs billions of dollars every year in control costs and economic losses. Water hyacinth is a native of the Amazon basin in South America and was brought to Australia in the 1890s as an ornamental plant for ponds and aquaria.



## THE PROBLEM

Water hyacinth forms dense, impenetrable mats. It blocks rivers, irrigation channels, destroys natural wetlands, reduces water quality, restricts access for stock and recreational users. Second photo shows water hyacinth in the Gingham Channel west of Moree, NSW.

## IDENTIFICATION

Water hyacinth is a free-floating perennial waterweed that forms large, dense rafts on the water surface. Each plant consists of several broad, leathery leaves, spongy inflated petioles (leaf stalks), a crown and a mass of slender, hairy roots. Water hyacinths show considerable variation in both leaf and flower form. Leaves are smooth, hairless and glossy. They are generally a rich green colour or can be tinged with rusty-yellow on their edges. Flowers are 4 to 7cm across, funnel-shaped, light bluish-purple or dark blue with a yellow centre and six distinct petals. The upper petal is darker purple with a yellow mark in the centre.

## BIOSECURITY DUTY

**North West:** Containment. An exclusion zone is established for all lands in the region, except the established core infestation area comprising lands within Moree Plains Shire Council.

**Northern Tablelands:** Prevention

**Prohibition on Dealing:** Must not be imported into the state or sold



## CONTROL ALTERNATIVES

Water hyacinth is difficult to control in all freshwater aquatic environments. It is essential that any new infestations be controlled as soon as possible using a range of control techniques. If allowed to become established, the seed bank rapidly expands, increasing costs and the duration of the program. **Non-chemical:** manual removal suitable for small infestations. **Chemical:**

diquat, amitrole, 2,4-D acid, *Roundup Biactive*® are all registered for treatment of water hyacinth. Refer to label directions.

**Mexican water lily** (*Nymphaea Mexicana*). Water lilies are aquatic perennial plants. Several species have escaped cultivation.

## THE PROBLEM

A native of Mexico and South Eastern USA, Mexican waterlily has been extensively used as an aquatic ornamental. It is a common invader of still or slow moving water bodies, particularly where nutrients are high. It spreads vegetatively from stolons into water up to 2 metres deep.

Mexican waterlily can choke waterways, degrade water quality, out-compete native plant species and make aquatic habitats unsuitable for some fauna species.



## IDENTIFICATION

Mexican waterlily is an attached aquatic perennial, with emergent leaves and flowers. Leaves are waxy, elliptical and become erect when crowded. Flowers are yellow; opening during the day and closing at night. Underwater rhizomes produce white horizontal stems (stolons) that produce new plants at the nodes. New plants forming at the nodes can easily detach and establish elsewhere.

## BIOSECURITY DUTY

Regional Recommended Measure - North West and Northern Tablelands. Land managers should mitigate the risk of new weeds being introduced to their land. The plant should be eradicated from the land and the land kept free of the plant. The plant should not be bought, sold, grown, carried or released into the environment. Notify local control authority if found.

## CONTROL ALTERNATIVES

Mexican waterlily is difficult to eradicate. Manual removal (either mechanical or by hand) will only be successful where all parts of the plant (especially the extensive underwater structures) are removed. The plant should be disposed of at an appropriate waste management facility.

Chemical options registered for Mexican water lily include Watrol®, Reglone®, and Glyphosate (only products registered for aquatic use).





**Water lettuce** (*Pistia stratiotes*) is a free floating aquatic plant native to Asia, Africa and equatorial America. It is believed to have been introduced as an ornamental aquarium plant.

## THE PROBLEM

Rivers, wetlands, lakes, reservoirs and slow moving streams are most at risk from this weed, especially in the warmer parts of the State. Once established, water lettuce has the potential to quickly spread and form a dense mat that can cover an entire body of water. These large dense floating mats can have negative impacts on native aquatic plants and animals. They can also interfere with irrigation, boating and water sport activities. Thick mats of water lettuce are also known to harbour disease-causing mosquitoes.

## IDENTIFICATION

As the name suggests, the entire plant resembles a floating, open head of lettuce. This aquatic perennial is spongy and consists of a floating rosette of pale green, fan-shaped leaves covered with hairs. It has a tuft of unbranched, fibrous roots up to 80cm long.

## BIOSECURITY DUTY

**All of NSW:** The plant should be eradicated from the land and the land kept free of the plant. Land managers should mitigate the risk of new weeds being introduced to their land. The plant should not be brought, sold, grown, carried or released into the environment.

**Prohibited on dealing:** Must not be imported into the State or sold

## OPTIMUM TIME TO TREAT

Plants can be retrieved from the water at any time of the year. Chemical treatment not usually suitable during winter period.

## CONTROL ALTERNATIVES

**Non-chemical:** physical removal is slow but effective. Plants removed from the water will dry out and die. **Chemical:** herbicides include diquat, 2,4-D acid, *Roundup Biactive*®. Refer to label directions.



Since its introduction into Australia many years ago, **African boxthorn** (*Lycium ferocissimum*) has been widely planted as a garden and hedge plant.

## THE PROBLEM

African boxthorn is a very thorny bush, restricting movement of humans and most animals. Birds spread the plant's many seeds, usually depositing them under trees. As the plants grow in size they take over the shaded area, denying access to livestock, and creating the perfect harbour for rabbits, foxes, feral cats and pigs (see photo, below).



## IDENTIFICATION

African boxthorn plants average around 3m in height. Every limb is covered with sharp spines up to about 75mm long. The berries are green when young and succulent, round 5 to 10 mm in diameter, contains 35 to 70 seeds and are orange - red when ripe.

## BIOSECURITY DUTY

**North West:** Asset Protection

**Northern Tableland:** Asset Protection

**Prohibition on Dealing:** Must not be imported into the State or sold

## OPTIMUM TIME TO TREAT

Chemical treatment must only be carried out when plants are actively growing. July - September is usually the optimum period - provided the plants are NOT moisture-stressed.



## CONTROL ALTERNATIVES

**Non-chemical:** Mechanical removal can be effective as long as the work is followed up to control new growth. You might want to burn the dead bushes later, so stack them away from desirable trees. **Chemical:** herbicide options include complete foliar spray with *Roundup 360®* (NOT 450 or higher), *Tordon 75-D®* or *Grazon®*, basal bark/cut stump treatment with *Access®*, *Garlon®* or cut stump treatment with *Vigilant®*. Refer to label directions. In the case of foliar spray, the whole plant must be covered, and if the mix is too strong, it will burn the top off before the chemical gets into the roots!

## Blackberry (*Rubus fruticosus* L.agg.)

Introduced to Australia around the time of European settlement as a source of edible fruit and as a hedging plant, blackberry quickly adapted to the cool temperate areas of Australia.



## THE PROBLEM

Blackberry can severely restrict access in agricultural, conservation and recreational areas. Sheep become entangled in the long canes when foraging for pasture and often die as a result. The spread of blackberry is facilitated by the large numbers of seed produced, their attractiveness to dispersal agents and the ease of distribution. Blackberry is listed as a *Weed of National Significance* (WoNS).

## IDENTIFICATION

An erect shrub to 2m high growing singularly or in dense thickets with stems covered in curved prickles. Leaves are usually dark green on the upper side and lighter underneath with prickles on leaf stalks and the undersides of veins. Flowers are white.



## BIOSECURITY REQUIREMENTS

**Northwest:** Asset Protection: An exclusion zone is established for all lands in the region, except the core infestation area comprising the Gwydir Shire Council, Liverpool Plains Shire Council and Tamworth Regional Council.

**Northern Tablelands:** Asset Protection

**Prohibition on dealings:** Must not be imported into the state or sold.

## OPTIMUM TIME TO TREAT

Treatment with herbicides should only be carried out post-flowering when plants are actively

growing with good soil moisture and before the onset of winter conditions.

## CONTROL ALTERNATIVES

**Non-chemical:** Physical removal of the crowns and root systems by mattocking; cultivation may be used in suitable situations. However, these practices are limited in application and effectiveness.

**Chemical:** herbicides include complete foliar spray with *Grazon*®, *Brushoff*® or *Roundup 360*®. *Roundup Biactive*® can be used on plants within waterways. Refer to label directions. Follow-up treatments are usually required.



**Bridal creeper** (*Asparagus asparagoides*) is a perennial native of South Africa, first recorded as naturalised in Victoria in 1886. Introduced as an ornamental and often used in bridal bouquets, it escaped and now infests native vegetation in all southern Australian States.

## THE PROBLEM

Bridal creeper is capable of colonising undisturbed ecosystems. It forms massive tuber mats in the soil that prevent native plant regeneration. Birds and foxes eat the berry fruit that form in the spring, the only feed source available at this time of the year and indiscriminately scatter the seeds.

## IDENTIFICATION

Bridal creeper is a climber that forms dense thickets of foliage that blanket the ground and surrounding vegetation. Its dainty white flowers emerge in late winter followed by numerous bright red berries in spring.

## BIOSECURITY DUTY

**All of NSW:** General Biosecurity Duty

**Prohibition on dealings** Must not be imported into the State or sold.

## OPTIMUM TIME TO TREAT

Treatment with herbicides should be carried out from mid June to late August. Mechanical control must involve the removal of all underground parts of the plant.

## CONTROL ALTERNATIVES

**Non-chemical:** Remove and burn all tubers.

**Chemical:** herbicides registered for bridal creeper include *Roundup 360®* and/or *Brushoff®*. Refer to label directions. Follow-up treatment may be required on regrowth.

*Bridal creeper images - top: courtesy Victoria Dept of Primary Industries (Weeds Section) website; patch: Greg Steenbeeke.*



**Cats Claw Creeper** (*Dolichandra unguis-cati*) (previously *Macfadyena unguis-cati*) is a woody climber with stems extending over 20 m. The leaves have two leaflets, with a three-clawed tendril (the cat's claw) growing between them. The vine produces long, flat, narrow pods 15 to 45 cm long which contain numerous winged seeds 2 to 4 cm long including the wing. Swollen underground tubers grow along the roots. Flowers are large, bright yellow, bell-shaped and produced in spring.



## THE PROBLEM

Cat's claw creeper is native to tropical America and a garden escape in NSW. Cat's claw creeper is an aggressive climber which completely smothers shrubs and trees.

## IDENTIFICATION

Cat's claw creeper is a perennial woody vine with numerous stems, generally up to 15 cm thick. The leaves are opposite and compound, with a 1-2 cm long stalk (petiole). Each leaf has a pair of lance-shaped leaflets 2-7 cm long x 1-3 cm wide.

The plant's name (cat's claw) refers to a modification to the third leaflet, forming a three-pronged tendril with stiff tips that form hooks. Tendrils are 10-35 mm long and aid in climbing.

## BIOSECURITY DUTY

**All of NSW:** General Biosecurity Duty.

**Prohibition on dealings.** Must not be imported into the State or sold

## OPTIMUM TIME TO TREAT

Autumn-winter when plants are young and actively growing.

**Non-chemical:** Individual plants can be manually removed, but care must be taken to remove all the root material, as plants will regrow from root fragments. Fruit should be collected and disposed of appropriately (deep burial or burnt).

**Chemical:** Spot spray with Glyphosate or Fluroxypyr.



**Fireweed** (*Senecio madagascariensis*) is a highly invasive and opportunistic weed native to south-eastern Africa. It quickly colonises overgrazed pastures and disturbed areas.

## THE PROBLEM

Fireweed is a serious pasture weed of coastal NSW, and it continues to spread inland. It will grow on most soil types. It is a prolific seeder and if not controlled before it flowers can rapidly take over heavily grazed and neglected pastures, competing strongly with existing pasture plants. It is known to be poisonous to livestock, causing liver damage. All parts of the plant at all stages of growth are toxic. Hay, silage or grain contaminated with fireweed plants or their seeds can also be toxic. Cattle, sheep and horses are susceptible.



## IDENTIFICATION

Fireweed is a daisy plant that grows from 10 to 60cm high. The most common form is a low, heavily branched, annual or short-lived perennial plant. Leaves are generally bright green in colour, fleshy and narrow, 2-7cm long, alternately arranged on the stem, and have serrated, entire or lobed margins. Broader leaves usually clasp around the stem. Flowers are small, yellow and daisy like, and each flower will usually have 13 petals and 21 bracts forming the 'cup' under the flower.

## BIOSECURITY DUTY

**All of NSW:** General Biosecurity Duty.

**Prohibition on dealings.** Must not be imported into the State or sold

## OPTIMUM TIME TO TREAT

Autumn-winter when plants are young and actively growing.

## CONTROL ALTERNATIVES

**Non-chemical:** Pasture improvement and proper grazing management will assist with control. **Chemical:** herbicides registered for fireweed include bromoxynil 200 g/L (eg Bromicide® or equivalent), MCPA 250 g/L plus diflufenican 25 g/L (eg Nugrex® or equivalent). Refer to label directions. *Images courtesy Chris Clausen*





A native of central and western Europe, **gorse** (*Ulex europaeus* L.) was listed as being grown in the Colony of NSW in 1803. It was widely promoted as a “long-lived hedge plant with potential to be used for a browse shrub”.



## THE PROBLEM

Gorse infestations increase in size and density and provide ideal harbour for rabbits and foxes. The plant's spiny nature restricts human and animal movement and access to pasture species for grazing, with a resulting loss of carrying capacity. Gorse burns readily and dense patches are a considerable fire hazard. Burning can be a trigger for massive germination of gorse seedlings. Gorse has the potential to be a major pest; for example, it has become a big problem in New Zealand where more money is now spent on control of this weed than on all other weeds combined.

## IDENTIFICATION

An erect, much-branched shrub up to 4m high, commonly 1-3m diameter, reproducing by seed with stems and branchlets terminating in sharp spines. Flowers are bright yellow, pea-like, fragrant and generally occur in spring and autumn.

## BIOSECURITY DUTY

**North West:** Prevention.

**Northern Tablelands:** Eradication

**Prohibition on dealings.** Must not be imported into the State or sold.

## OPTIMUM TIME TO TREAT

Treatment with herbicides as a complete overall foliar spray is best carried out in spring and summer when plants are actively growing with good soil moisture.

## CONTROL ALTERNATIVES

**Non-chemical:** Physical removal of the whole plant including as many roots as possible is an effective method of control. However, cutting the plants off without treatment encourages strong regrowth. **Chemical:** herbicides registered for gorse include Grazon® and Brushoff®. Refer to label directions. Re-treatment required on regrowth.

Chilean needle grass (*Nassella neesiana*) is a native of South America. It builds up a large and persistent seed bank in the soil, thanks to its abundant panicle, basal and stem seeds.



## THE PROBLEM

Chilean needle grass is a highly invasive weed and has serious impact on agricultural and native ecosystems as well as riparian vegetation. The panicle seed readily attaches to stock, particularly sheep, and can cause injury by burrowing into the skin and sometimes muscle. Its presence in wool reduces quality and can be a major cause of downgrading. Rehabilitation of infested land is very difficult. The potential for spread and its likely economic and environmental impacts have led to the declaration of Chilean needle grass as a *Weed of National Significance* (WoNS).

## IDENTIFICATION



Chilean needle grass is a perennial tussock-forming grass up to 1.5m when in seed. It is very similar in appearance to native spear grasses (*Austrostipa* spp.), tall fescue and wallaby grasses (*Austrodanthonia* spp.). The distinguishing feature found only on Chilean needle grass is the crown-like 'corona', a raised crown

of hairs at the junction of the seed body and the awn (image closeup, courtesy Enid Mayfield). Seed heads emerge spring to late summer and, when mature, have a distinctive purplish colour.

## BIOSECURITY DUTY

**North West:** Containment.

**Northern Tablelands:** Asset Protection

**Prohibition on dealings.** Must not be imported into the State or sold.

## OPTIMUM TIME TO TREAT

Chemical treatment must be carried out from autumn to flowering, ensuring plants do not mature and produce seed.

## CONTROL ALTERNATIVES

Prevent movement of livestock and machinery from infested areas during seeding. For best results, combine herbicide application with physical removal, crop rotation, pasture sowing and grazing management (short duration, high intensity) (CRC 2003). Mowing, slashing, cultivation, mulching and fire can also be implemented to assist in an integrated control program. **Chemical:** apply *Taskforce®* no later than 8-10 weeks before flowering is anticipated. Applications of *Roundup 360®* in the NIWAC region are more effective in autumn months compared to spring applications (Storrie 2003). Refer to label directions.



**Gamba Grass** (*Andropogon gayanus*) is a tall tropical grass. It forms dense patches that out-compete native species. It is a Weed of National Significance.

## THE PROBLEM

Gamba grass is highly invasive in the tropical savannas of northern Australia and poses a significant threat to substantial areas of Australia's tropical savannas. Currently, gamba grass only occupies an estimated 2.1 per cent of its potential range. Hence, efforts to reduce its spread could generate significant benefits.



## IDENTIFICATION

Gamba grass can be distinguished from native grasses on the basis of its growth habit - tall, dense and erect tussocks. Plants may be up to 4.5 metres tall including the flowering stems which may extend 2.2 metres above the height of leaf foliage. The leaves have a distinctive white midrib and are covered with soft hairs (noticeable when holding rain water and dew). Late curing (remaining green) into the dry season also distinguishes it from native grasses.

## FLOWERS AND SEEDS

Gamba grass flowers mostly in April although it may continue through to August if conditions are suitable. Seeds are generally formed from May to June and most seeds have been dropped by the end of August. Germination of seeds occurs whenever sufficient soil moisture is available, from early wet season storms in October through the typical commencement of the wet season in December. Plants that have been burnt or slashed earlier in the year can also flower and form seed from October to December.

Reproduction is from seeds. Flowering and viable seed production starts when the plant is two years old. Mature plants can produce between 15 000 and 244 000 seeds annually. This results in soil seed banks of 600 to 3500 seeds per square metre. However, seed longevity is short, with rapid decline in seed viability in the dry season and very low seed survival after 12 months.



**Giant Parramatta grass** (*Sporobolus fertilis*) is a robust, tufted, well-rooted perennial tussock related to other weedy sporobolus grasses including giant rat's tail grass, American rat's tail grass and Parramatta grass.

## THE PROBLEM

Giant Parramatta grass can dramatically decrease producers' economic viability and lower land values. Summer growing unpalatable tough grass. Widespread and locally common in coastal areas of NSW and Queensland **and moving from coastal areas to inland parts of the NIWAC region**. When established will exclude native plants. Recovers rapidly from fire. Major weed of disturbed and pastoral land.



## IDENTIFICATION

Tufted perennial with seedhead to 1.6 m high. Leaf blades to 50 cm long. Distinguished by leaf blades to 1.5-5 mm wide; seedhead 25-50 cm long with branches oppressed to the axis and overlapping. Dispersal is by seed, water, wind and machinery. At maturity seeds become sticky and may attach to hair or fur. (Not to be confused with purple pidgeon grass - *Setaria incrassata* - which has a long, bristly seed-head and is commonly found on the NW slopes and plains). As it is similar to many native *Sporobolus* species, ensure identification before undertaking control.

## BIOSECURITY DUTY

**All of NSW:** General Biosecurity Duty

**Prohibition on dealings** Must not be imported into the State or sold



## OPTIMUM TIME TO TREAT

Treatment with herbicides as a complete overall foliar spray is best carried out in spring and summer when plants are actively growing with good soil moisture.

## CONTROL ALTERNATIVES

Every effort should be made to prevent giant Parramatta grass from becoming established in new areas. Treatment - either manual removal (small areas only) or herbicide application - is advisable before plants have a chance to produce seed. Regular follow-up is essential to prevent further establishment. **Chemical:** Roundup 360®, Taskforce® or 2,2-DPA 740 g/kg. Refer to label directions.

*Images courtesy Chris Clausen.*

**Mexican feather grass** (*Nassella tenuissima*) is a new and potentially serious weed for NSW. It is closely related to serrated tussock, widely regarded as the worst pasture weed in Australia. During the past five years plants have been sold in nurseries in Victoria and New South Wales and have been found growing as ornamental plants in private and public gardens.



## THE PROBLEM

Mexican feather grass could spread through eastern Australia and has the potential to cause major economic and environmental damage. Mexican feather grass should not be cultivated, propagated or sold. Existing plants in gardens and nurseries should be destroyed, suspect plants should immediately be reported to the nearest local Council or DPI office.



## IDENTIFICATION

A densely tufted perennial tussock grass in the spear grass group, growing to about 70cm high, very similar to serrated tussock and indistinguishable from it except by flowers and flowering heads.

## BIOSECURITY DUTY

**All of State:** General Biosecurity Duty

## CONTROL ALTERNATIVES

Your local Council will assist with an eradication program.

*Images courtesy Alan Maguire.*



A native of South America, **serrated tussock** (*Nassella trichotoma*) was first recorded in NSW at Yass in 1935. It is considered by many to be this State's worst weed. It accounts for a greater reduction in carrying capacity of grazing land than any other weed in Australia. It is of major significance to natural systems as well.



## THE PROBLEM

It produces vast quantities of viable seeds, which are easily distributed long distances. It is of low palatability and low digestibility to grazing animals. The preferential grazing of other pasture plants allows serrated tussock to reproduce freely and suppress competition.

## IDENTIFICATION

A densely tussocky perennial grass up to 50cm high. Leaves are fine, tightly rolled, light green in colour except in winter when they are bleached and more of a straw green. This is the time when plants are most easily detected.

## BIOSECURITY DUTY

**North West:** Containment: An exclusion zone is established for all the lands in the region, except the core infestation area comprising all Local Government Areas lands East of the Newell Highway.

**Northern Tablelands:** Asset Protection

**Prohibition on dealing** Must not be imported into the State or sold.



## OPTIMUM TIME TO TREAT

Treatment with herbicides should be carried out when the plants are actively growing and early enough to prevent flowering and the formation of seed. A lead time of four months is required with *Taskforce*®. Mechanical control, which is effective, consists of removing the whole plant from the soil.

## CONTROL ALTERNATIVES

**Non-chemical:** Physical removal of the plant, complete with the root system by mattocking and cultivation is an effective method of control if done prior to seeding. **Chemical:** herbicides registered for serrated tussock include *Taskforce*® and *Roundup 360*®. Refer to label directions. A lead time of four months is required with *Taskforce*®. Follow-up treatment required on regrowth and new plants.



Green cestrum (*Cestrum parqui*) is a native of Chile and Peru, and very toxic to animals! Like many of our noxious weeds, green cestrum was introduced into Australia as a garden plant. It's an easy plant to grow, and the attractive, yellow flowers guaranteed widespread plantings in gardens everywhere. Birds spread the seed into rural areas.



## THE PROBLEM

Green cestrum can be toxic to animals including sheep, horses, pigs, poultry but **ESPECIALLY CATTLE!** It is a mysterious plant. Animals can graze in amongst it for months without any problems, but a change of weather conditions (notably, a fall of rain after a long dry) can trigger a change in the plant making it desirable to stock. The other main danger period for animals is when plants have been broken off, chemically treated or drought affected. As the plant material dries out, it can become more attractive to animals. Any part of the plant can be toxic. Stressed stock and/or new to a paddock are also at risk.

## IDENTIFICATION

Green cestrum leaves are dark green, smooth and shiny. The distinctive flowers are yellow and trumpet-shaped. Cestrum grows to a height of around 3 to 4 metres. Two other important ID points: (1) stems/branches are very brittle - they snap off easily and (2) crush a leaf between your fingers. The smell is not very pleasant! Wash your hands afterwards!



## BIOSECURITY DUTY

**North West:** Containment: An exclusion zone is established for all the lands in the region, except the core infestation area comprising the Gunnedah Shire Council, Narrabri Shire Council and Tamworth Regional Council.

**Northern Tablelands:** Asset Protection

## OPTIMUM TIME TO TREAT

When plant is actively growing.

## CONTROL ALTERNATIVES

**Non-chemical:** Manual control is an option for small patches. Physical removal of all plant material is effective but difficult because the roots are hard to extract. **Chemical:** herbicides registered for treatment of green cestrum include *Grazon Extra*®, *Access*®, *Tordon 75-D*®, *Garlon*®, *Amitrole T*®. Neat glyphosate (scrape stem treatment) is suitable for single plants in sensitive areas eg in a backyard garden. Refer to label directions. **Caution:** Never leave removed/treated plant material where it can be eaten by stock. Drying plant material is at its most dangerous!

**Honey locust** (*Gleditsia triacanthos*) was introduced into Australia from America in the late 1800s as a fodder and ornamental tree. Unfortunately, the trees grow too well, and are now a serious problem particularly in riparian zones.

## THE PROBLEM

Honey locust is an invasive tree. It thrives in riparian areas, forming dense monocultures, restricting access to water, and creating safe harbour for certain feral animals. The plant is armed with strong spines capable of causing serious injury to humans and animals. The seeds are efficiently spread by animals and, more importantly, floodwaters. The seed pods become small boats as they float downstream for kilometres.



## IDENTIFICATION

Honey locust grows to height of 15m or more. The trunk and branches are covered in strong, tri-pointed spines (as recognised in its botanical name). It produces massive numbers of seed pods, each containing many viable seeds.

## BIOSECURITY DUTY

**North West:** Containment: An exclusion zone is established for all the lands in the region, except the core infestation area comprising the Gunnedah Shire Council, Narrabri Shire Council and Tamworth Regional Council.

**Northern Tablelands:** Containment



## OPTIMUM TIME TO TREAT

Spring-summer when plants are actively growing. [Qld DPI has done a lot of work on this plant and suggests honey locust trees can be successfully controlled with basal bark treatment with *Starane*® in both actively-growing and dormant stages.]

## CONTROL ALTERNATIVES

**Non-Chemical:** manual removal may be appropriate for small plants but unless roots are removed there will be regrowth. **Chemical:** herbicides include basal bark/cut stump application of *Access*®/diesel or

*Starane*®/diesel, cut stump/stem injection with *Vigilant*®, folia spray with *Starane*® with various rates according to plant size. Refer to label directions.

**Lantana** (*Lantana camara*) was introduced to Australia from tropical South America in the 1840s as a garden ornamental. It now infests more than four million hectares along the east coast from Victoria to northern Queensland with isolated infestations reported in the Northern Territory and Western Australia.



## THE PROBLEM

Lantana is listed as a *Weed of National Significance* (WoNS) due to its impact on primary industries, conservation and biodiversity. It competes with and displaces pasture and native species; is toxic to livestock; changes soil and nutrient status; restricts access; increases the intensity of wildfires and dramatically reduces biodiversity.

## IDENTIFICATION

Sprawling perennial shrub that grows in dense thickets or clumps, generally 2 - 4m high but able to climb to 15m. The long arching weak woody stems are square in cross section with short backwardly hooked prickles. Flower colour is dependant on variety with pink, red, orange, white and pink-edged red the most common. Fruit is berry-like, green at first then ripening to black.



## BIOSECURITY DUTY

All of NSW: General Biosecurity Duty

## OPTIMUM TIME TO TREAT

The optimum time to control lantana is when it is actively growing. This usually occurs from December through to April, dependant on seasonal conditions.

## CONTROL ALTERNATIVES

Lantana control should be undertaken in stages using integrated control methods. Once the initial control work is completed it is essential that regular follow-up work is undertaken for a number of years to prevent regrowth. Treated areas should be revegetated as soon as possible. **Non-chemical:** slashing, pulling, grubbing, ploughing and burning; **Biological:** a range of insects and a rust has been released - research is continuing; **Chemical:** a number of herbicides are registered for control of lantana, including *Grazon Extra*®, *Starane Advanced*, *Brushoff*®, and *Roundup 360*®. Refer to label directions. Application methods include foliar spraying, basal bark spraying, cut stump and splatter gun. Seek local advice on the best option for your situation.

**Madeira Vine** (*Anredera cordifolia*), is a climber with wide, fleshy, ovate leaves that are 2 to 15 cm long, with flower spikes up to 30 cm long. These spikes resemble a lamb's tail, hence the alternate common name lamb's tail. The vine produces thousands of tubers both underground and aerially along the stems. Small light-brown or green aerial potato-like tubers fall to the ground as vines age and sprout



## THE PROBLEM

Madeira vine is a succulent climbing vine that invades tropical and subtropical native forests and riparian (riverside) vegetation, killing native trees and understorey plants.

## IDENTIFICATION

Fleshy, sometimes woody, climber with stems extending for 20 m or more. Leaves usually fleshy, ovate, to about 6 cm long. Single seed per fruit.

### Key identification features

Madeira vine has fleshy, waxy green, heart-shaped leaves which are usually 4-5 cm in length, but can range between 1-15 cm in length and 0.8-11 cm in width. It has slender, twining and hairless stems up to 30 m long. These are initially herbaceous and green/pinkish/red in colour but become brown, exfoliated and woody with age, reaching 2-3 cm in diameter.

Madeira vine produces a large number of 5 mm to 25 cm aerial tubers which are small, light brown or green and 'warty' in appearance. The vine also produces 'potato-like' subterranean tubers which can grow up to 20 cm in diameter and at depths of up to 1 m.

The inflorescence (flower cluster) is fragrant, greenish-white to creamwhite and resembles a 'lamb's tail', with numerous small flowers along a drooping, central stem that is 6-65 cm long.

## BIOSECURITY DUTY

**North West:** Asset Protection

**Northern Tablelands:** Asset Protection

**Prohibition on dealing**

## OPTIMUM TIME TO TREAT

Best results are achieved during the warmer months.

## CONTROL TERNATIVES

Herbicides can be effective if they are carefully chosen and selectively applied.

The main application techniques are scrape and paint and foliar spray—stem injection, cut stump and basal barking are less commonly used.

Physical removal of Madeira vine is difficult because of the extent of underground tubers and ease of fragmentation of the vine and root system.





**Mesquite** (*Prosopis* spp.), a very drought tolerant plant, usually grows as a multi stemmed shrub with drooping branches, although tree forms can occur. It was widely planted in western parts of Queensland and New South Wales around mine sites for soil stabilisation and dust control during the 1900s.



## THE PROBLEM

Mesquite, an introduced plant, is an aggressive invader with the potential to significantly reduce stock carrying capacity by reducing available feed and restricting stock and personal movements.

## IDENTIFICATION

The thorny shrub can grow to 10m but are usually 3-5m high. The foliage is usually dark green but can be a bluish-green. The flowers, which are greenish-yellow, grow in clusters, are “lamb's tail” in shape and 5-12cm long. The seed pods are 5-20cm long ripening to a straw colour, straight to slightly curved and somewhat flat. The leaves are fern-like, consisting of many small leaflets. Mesquite is often confused with mimosa bush (*Vachellia farnesiana*) which is common in parts of north-western NSW.



## BIOSECURITY DUTY

**North West:** Asset Protection An exclusion zone is established for all the lands in the region, except the core infestation area comprising lands within the Walgett Shire Council.

**Northern Tablelands:** Asset Protection  
Prohibition on dealings

## OPTIMUM TIME TO TREAT

**Chemical:** treatment should be carried out when the plants are actively growing and soil moisture is good.

## CONTROL ALTERNATIVES

**Mechanical:** mechanical removal is effective providing the root system is cut below the bud zone (20-30cm). Mesquite will not sprout from lower roots. **Chemical:** herbicide options include folia spray with *Grazon Extra*®, basal bark/cut stump with *Access*® or *Garlon*®, cut stump or injection with *Vigilant*®. Refer to label directions.

*Mesquite photos courtesy Queensland Government, Dept of Natural Resources and Mines.*

**Mother-of-millions** (*Bryophyllum* spp.) is a plant from Madagascar. Its beautiful flowers have made it a popular garden plant in eastern Australia. Unfortunately, mother-of-millions is highly toxic to stock!



## THE PROBLEM

The plant's ability to reproduce in such large numbers and to withstand droughts explains why it has escaped from numerous gardens and rubbish tips to become a serious problem in many rural areas. Mother-of-millions, particularly at flowering, can be **VERY POISONOUS**. It continues to claim the lives of cattle throughout the north west.

## IDENTIFICATION

Mother-of-millions is a hardy, drought-resistant succulent. The plants grow upright (to 1m) thin "stems", each containing numerous small "branches" or leaves. There are also hybrid versions which have similar flowers but serrated branches. Each leaf produces many plantlets. The plant flowers in the winter.



## BIOSECURITY DUTY

**North West:** Asset Protection

**Northern Tablelands:** General  
Biosecurity Duty

**Prohibition on dealings** Must not be  
imported into the State or sold

## OPTIMUM TIME TO TREAT

Winter, when the plants are in flower  
and easier to find.

## CONTROL ALTERNATIVES

**Non-Chemical:** plants can be removed  
and burnt or stored in black plastic bags  
until completely destroyed. Encourage  
strong pasture competition. **Chemical:**  
herbicides include 2,4-D amine,

*Starane*®, *Grazon Extra*®, *Brushoff*®. Refer to label directions. Permit information available from  
<http://apvma.gov.au>

**Nodding thistle** (*Carduus nutans*) arrived in Australia as a contaminant in pasture seed from New Zealand. It was first recorded near Bathurst NSW in 1950. It has now become one of the most important weeds of improved pastures of elevated tablelands areas in southern Australia. It prefers higher altitude fertile soils with an annual rainfall of 500 to 900mm.



## THE PROBLEM

Nodding thistle readily invades fertile annual species pastures with elevated levels of soil nitrogen and phosphorus. It colonises bare ground following drought or when pastures are in a seasonal decline often in autumn and winter months. Heavily infested areas prevent access to grazing animals because of their density and thorny nature. Each plant produces about 7000 seeds which can germinate shortly after their formation.

## IDENTIFICATION

An erect annual to biennial herb commonly 80-120cm high reproducing by seed. Flowers are deep mauve to purple, formed in large solitary drooping heads on bare ended branches which are surrounded by purplish bracts terminating in sharp spines. Leaf margins and stems are profusely armed with spines.

## BIOSECURITY DUTY

**North West:** General Biosecurity Duty.

**Northern Tablelands:** Containment

**Prohibition on dealings** Must not be imported into the State or sold



## OPTIMUM TIME TO TREAT

Treatment with herbicides should be carried out at the rosette stage when it is actively growing and before the plant has elongated.

## CONTROL ALTERNATIVES

**Non-chemical:** physical removal of the plant, complete with the root system by mattocking and cultivation is an effective method of control. Ideally, flower heads should be removed and bagged for disposal.

**Chemical:** herbicides registered for nodding

thistle control include MCPA for early rosettes and tank mixes of MCPA plus *Lontrel*® for larger rosettes. Refer to label directions. Follow up treatment will be required.

**Parkinsonia** (*Parkinsonia aculeata*), also called Jerusalem thorn, is a native of the tropical Americas. It was introduced into Australia in the late 1800s as a shade tree and an ornamental. It now mainly occurs along watercourses where it can be spread rapidly by water.



## THE PROBLEM

Parkinsonia is an invasive, thorny shrub/small tree with potential to invade more than 75% of mainland Australia. It will have serious consequence for grazing industries and the environment, including restricting access of stock to water.

## IDENTIFICATION

Parkinsonia is a spreading, many branched shrub or small tree. It can grow to 10 metres high but usually grows from 2 to 8 metres. It has slender zig-zag branches which are pale to dark green with very sharp spines 7-12mm long growing from the leaf nodes. The long, distinctive, flattened leaf stalks have tiny oblong leaflets along each side. The flowers have five petals, mainly yellow including one with an orange spot. The straw coloured pods are up to 10cm long, straight and constricted between the seeds.



## BIOSECURITY DUTY

**North West:** Eradication.

**Northern Tablelands:** Eradication

**Prohibition on dealings**

## OPTIMUM TIME TO TREAT

**Chemical:** treatment should be carried out when the plants are actively growing and soil moisture is good.

## CONTROL ALTERNATIVES

**Non-chemical:** mechanical removal is most effective when the root system is cut below the bud zone (20-30cm). Best results are often obtained when the plants are stressed. **Chemical:** includes basal bark spray with *Access*® and diesel, cut stump or injection with *Vigilant*®, or gas gun application with hexazinone (e.g. *Velpar*® or similar in other brands). Refer to label directions.



## PROHIBITED MATTER: If you see this plant call your local Weeds Biosecurity Officer

**Parthenium weed** (*Parthenium hysterophorus*) is regarded as one of New South Wales' most serious weed threats. It is native to the Caribbean region and is thought to have been introduced to Australia on machinery from USA during World War II and as a contaminant of imported pasture seed during the 1950s. Parthenium weed is a *Weed of National Significance* (WoNS).



### THE PROBLEM

Parthenium weed seed is transported from infested areas in hay, grain, harvesting machinery, livestock transport vehicles, harvesting support and tourist vehicles. New plants are difficult to detect until in flower, and there is only a small window of opportunity to eradicate the plant before it seeds. Once established, it creates a seed bank in the soil that can last more than 15 years. Parthenium weed contains powerful allergens that cause a range of human health problems, including asthma and severe contact dermatitis in sensitised individuals. It taints meat and milk in exposed grazing animals.

### IDENTIFICATION

Parthenium weed is a very nondescript and difficult plant to spot until it comes into flower. The main features are (1) randomly grouped white, 5-lobed flower heads, each 4-6mm in diameter and (2) the stems contain vertical grooves in light and dark shades of green. It's an annual plant with a deep taproot and an erect main stem, growing to an average height of around 80cm. Because of the white flowers, the plant is sometimes mistaken for bishop's weed or hemlock (and vice-versa).



### BIOSECURITY DUTY

**All of NSW:** Prohibition on dealing. Prohibited matter



*Images courtesy of Josh Biddle*

### CONTROL ALTERNATIVES:

Anyone who suspects they have found parthenium weed **SHOULD NOT** attempt to control it themselves. If it is parthenium weed, Council and DPI staff will carry out the control work. Initial control cost of notified parthenium weed infestations is covered by a contingency fund allocated by the Minister for Agriculture. Location of parthenium weed outbreaks on private property is kept strictly confidential.

**Common pest pear** or “prickly pear” (*Opuntia stricta*) was originally imported from the Americas during the early 1800s. It was subsequently promoted and grown as a source of stock fodder during periods of drought.



## THE PROBLEM

Common pest pear is an invasive plant. It spreads quickly if not controlled and can completely take over a paddock. The plant is “armed” with two sets of thorns: the 25mm ones are very sharp, but they aren’t as significant as the clusters of small, golden thorns across the leaves. These tiny thorns attach to the tongues and mouths of animals tempted to eat the plant, as cattle (in particular) often do when feed is scarce. These tiny thorns are also very irritating for humans (especially shearers!).

## IDENTIFICATION

Common pest pear is a flat-leaved cactus plant, usually around 60cm high but up to 1m. Flowers are yellow, the prolific fruit purple when ripe. Birds, foxes and pigs eat the fruit and spread seed over large areas. New plants grow from seed or from pieces of the plant. The two main growing periods for the plant are in February and October each year.

## BIOSECURITY DUTY

**All of State:** General Biosecurity Duty.

**Prohibition on dealings:** Must not be imported into the State or sold



## OPTIMUM TIME TO TREAT

Can be treated anytime during the year, although best time is when plants are actively growing (Sep to Feb)

## CONTROL ALTERNATIVES

**Non-chemical:** manual removal, burn/bury. Repeated ploughing-cultivation takes care of prickly pear, but plants need to be broken up and disturbed a number of times before they give up. **Biological** control is a good control option for large areas of pear, especially in the dry and warmer areas of the State. There are two control agents for common pest pear - cactoblastis (*bottom*) and the tiny cochineal insects (*top - both pics include a fingernail for scale*). Biocontrol can be very effective with some assistance. **Chemical:** registered herbicides include folia spray with *Access®*, *Garlon®* or *Grazon®*. Refer to label directions.





**Harrisia cactus** (*Harrisia martinii*) is a native of the Americas, brought into Australia for its appeal as a garden plant. Harrisia developed into a serious pest problem in parts of central Queensland, and is now prevalent in the Boggabilla-Yetman areas of New South Wales.



## THE PROBLEM

Harrisia cactus can form thick infestations, blocking out grazing access and reducing stock-carrying capacity. Harrisia cactus is spread by seed. A single plant can produce >50 fruit per year. Each fruit contains about 800 seeds encased in a sweet, sugary substance attractive to birds, emus, pigs, goannas and ants.



## IDENTIFICATION

Harrisia cactus is a low-growing, jointed, cactus plant. Its runners spread out in all directions (like the tentacles of an octopus), often taking root again as they touch the ground. The large fruit is bright red when ripe, and splits open to reveal its sweet contents to birds, animals and ants.

## BIOSECURITY DUTY

**North West: Containment** An exclusion zone is established for all the lands in the region, except the core infestation area comprising lands within the Gwydir Shire Council and Moree Plains Shire Council

**Northern Tablelands: Asset Protection**

**Prohibition on dealings** Must not be imported into the State or sold

## OPTIMUM TIME TO TREAT:

When plants actively growing. Any time of year except mid-winter.

## CONTROL ALTERNATIVES

**Non-chemical:** ploughing is probably the only means of eradication.

Biological control using a mealybug

(*Hypogeococcus festerianus*) is of limited use in thick infestations only. **Chemical:** includes *Brushoff*®, *Grazon*® (PER10544) *Access*®/diesel, *Lantana 600*®. Refer to label directions.

Refer <http://apvma.gov.au> for permit details.



**Hudson pear** (*Cylindropuntia rosea*) was first recorded in Australia in the Lightning Ridge area during the late 1960s. Believed to have spread from a cactus nursery at nearby Grawin, it is now scattered over more than 100 square kilometres of land in that part of the state. A major chemical treatment program is on-going.



## THE PROBLEM

Hudson pear spreads easily by segments. The segments have particularly vicious spines capable of penetrating footwear and even vehicle tyres.

These spines are capable of causing serious injury to humans, livestock and working animals such as horses and dogs. Hudson pear also poses a threat to native fauna and has caused deaths of native animals such as koalas.

## IDENTIFICATION

Hudson pear is a branched cactus which grows to 1.5 m high and to 3 m wide, with a cylindrical trunk and rope-like segments. To those familiar with rope pear (*Opuntia imbricata*), Hudson pear is a larger and much thornier version.

## BIOSECURITY DUTY

**North West:** Eradication Whole Region excluding core infestation within Walgett Shire.

**Northern Tablelands:** General Biosecurity Duty.

### Prohibition on dealings

Must not be imported into the State or sold

## OPTIMUM TIME TO TREAT

Whenever a plant is found.

## CONTROL ALTERNATIVES

**Non-chemical:** Small plants can be dug out and burnt/buried. **Biological:**

No biological control agents are available for this plant. **Chemical:**

herbicides include Garlon®/diesel, Access®/diesel, Grazon®. Refer to label directions and <http://apvma.gov.au>



A native of Mexico and the United States, **rope pear** - *Cylindropuntia imbricata* - (also known as devil's rope) has been widely distributed in New South Wales as a garden plant. An easy plant to grow, and one that requires very little moisture, rope pear survives well in the dry areas of the State.

## THE PROBLEM

Rope pear is a very thorny cactus which can cause injury to humans and to animals. Segments are mainly spread by floodwaters, and in some cases by being rolled along bare ground by strong winds. It can eventually become thick enough to impede animal and human access and to reduce stock-carrying capacity.



## IDENTIFICATION

This cactus is referred to as “rope pear” because of its rope-like appearance. The plant grows upright to a height of 2-3m. It is made up of strong, woody segments - the outer segments (and fruit pods) break off easily to form new plants. The plant has 2-3cm thorns, each one enclosed in a yellowy, papery sheath. The plant produces attractive, purple flowers.

## BIOSECURITY DUTY

**North West:** Asset Protection

**Northern Tablelands:** Asset Protection

**Prohibition on dealings** Must not be imported into the State or sold



## OPTIMUM TIME TO TREAT

Can be treated anytime during the year, although best time is when plants are putting on new leaf (February and October).

## CONTROL ALTERNATIVES

**Non-chemical:** with care, plants can be manually removed and then buried/burnt. **Biological** control (left) involves use of rope pear cochineal insects (different species to tiger pear and common pear cochineal) assisted by cutting & stacking of plant material. **Chemical:** Garlon®/diesel, Access®/diesel. Refer to label directions.

**Tiger pear** (*Opuntia aurantiaca*) is a native of South America. It's believed to have been introduced into Australia as a garden plant during the very early 1800s.

## THE PROBLEM

Tiger pear is easily spread. Segments detach from parent plants and attach to passing animals, humans, car tyres etc. Tiger pear will cause painful injury to animals or humans who come into contact with the plant. Dogs, for example, use their teeth to try and remove segments from their paws, and often end up with thorns stuck in their gums, roof of the mouth, even right through their tongues!



Floodwaters carry tiger pear segments over long distances. Animals then carry the segments back into the hills. Some NSW river systems such as the Turon, Peel, Namoi, Gwydir and Horton valleys have become infested in this way and, in most cases the origin was traced to a local house garden!



## IDENTIFICATION

Tiger pear is a low-growing cactus plant made up of many joined segments, each covered in sharp, 25mm spines. Each spine contains tiny “one-way” barbs - the thorns enter easily but are very difficult to remove!

## BIOSECURITY DUTY

**North West:** Asset Protection

**Northern Tablelands:** General Biosecurity Duty.

**Prohibition on dealings** Must not be imported into the State or sold

## OPTIMUM TIME TO TREAT

Can be treated anytime during the year, although best time is when plants are putting on new leaf (October - February).

## CONTROL ALTERNATIVES

**Ploughing**, where possible (and where it complies with the *Native Veg Act 2003*), is probably the only way to totally eradicate an area of tiger pear. It cannot survive on lands under constant cultivation. **Burning:** tiger pear can be destroyed by fire. Tops of plants are easily killed, butts require extra heat. **Biological:** a practical and cost-effective control option for large and/or inaccessible areas of pear, especially in the warmer areas of NSW/QLD. Cactoblastis sometimes attacks tiger pear, but **cochineal** (photo shows infected segment) is more effective in the long term. **Chemical:** herbicides include *Access®*, *Garlon®*, *Grazon Extra®*. Refer to label directions and <http://apvma.gov.au> for permit details





**Velvety tree pear** (*Opuntia tomentosa*) spreads by seeds - very slowly. These large plants can produce huge quantities of fruit, but fortunately the germination rate is not high.

## THE PROBLEM

The size of the plants, and the way they will continue to spread and take over.

## IDENTIFICATION

Plants grow to a height of 5m. They are thorny, but not as nasty as most of the other prickly pear species. In fact, cattle will eat the leaves during drought periods when other food is scarce.

## BIOSECURITY DUTY

**All State:** General Biosecurity Duty.

**Prohibition on dealings** Must not be imported into the State or sold.

## OPTIMUM TIME TO TREAT

Can be treated anytime during the year, although best time is when plants are putting on new leaf (February and October).

## CONTROL ALTERNATIVES

**Non-chemical:** Small plants can be dug out

and burnt/buried. **Biological:** Cochineal (*Dactylopius opuntiae*) insects can be very effective, but they often need to be manually transferred into new areas. Cutting and stacking parts of the plant around the base will help insects to become established. When insects are present on the main plant, the biocontrol program can be further assisted by cutting some plants down (about 300mm above ground level). Ideally, try to land these plants on rocks/logs to minimise their contact with



the soil and their ability to take root. Those parts of the plant that break away when the plant hits the ground should be stacked back on top of the main plant. Cutting the tree pear down does three things: (1) it severs the plant's food supply, (2) reduces the plants resistance to the effects of the tiny cochineal insects, and (3) provides a sheltered environment (the underside of the leaves) for the cochineal insects to flourish in. **Chemical:** herbicides include Garlon®/diesel, Access®/diesel, Grazon Extra®, Amitrole T® (Qld only). Refer to label directions, and <http://apvma.gov.au> for permit details.



**Privet** (*Ligustrum* spp.) originally from China and widely cultivated in Europe was introduced to Australia by early settlers as a hedging plant, for shade and for windbreaks. Privet was readily transported as seed, established easily and was hardy, the very qualities that made it a potential weed.



### THE PROBLEM

The presence of flowering privet is often associated with discomfort endured by people suffering with asthma and other bronchial conditions. The fruit is harvested by birds and the seed distributed into municipal, riverine and bushland areas. This increases its density, encourages an influx of aggressive bird species such as Currawongs and causes further loss of biodiversity.

### IDENTIFICATION

Plants range from small shrubs to trees up to 10m high. Masses of white flowers are produced in mid-summer followed by the formation of large numbers of round, black fruit containing up to 3 seeds. Two of the three varieties declared noxious are common in the region: narrow-leaf and broad-leaf privet (the photos on this page show broad-leaf species *L. lucidum*).

### BIOSECURITY DUTY

**North West:** General Biosecurity Duty.

**Northern Tablelands:** Asset Protection

**Prohibition on dealings** Must not be imported into the State or sold.

### OPTIMUM TIME TO TREAT



Treatment with herbicides should be carried out when the plant is actively growing and, ideally, well before flowering. If mechanical control is chosen, the crown and roots must be removed and exposed to air and sunlight to assist drying out.

### CONTROL ALTERNATIVES

**Non-chemical:** Physical removal of the plant including root system is an effective method of control. **Chemical:** herbicides registered for privet include *Roundup 360®*, *Brushoff®*, *Garlon®*, *Access®*, *Vigilant®*. Refer to label directions. Regrowth will require follow-up treatment.



**Rhus tree**, (*Toxicodendron succedaneum*) sometimes also referred to as wax tree, is a native of China, Japan and neighbouring areas. It is a small, deciduous tree up to 8m tall. It grows vigorously in its early years and later, if not pruned, forms a spreading crown on a single erect trunk. Rhus tree, is a dangerous, allergy-causing tree.



## THE PROBLEM

Rhus can cause HUMANS painful allergic reactions. Between 12 hours and 7 days after contact, rhus causes severe dermatitis beginning with a rash, redness, itching and blisters where the skin has touched the plant. The rash is often accompanied by localised swelling of the face, arms and legs. These symptoms usually last 7 to 10 days. Chronic sufferers may have more extreme symptoms over a longer period of time. Some cases have required hospitalisation. The allergic reaction is caused by a phenolic oily resin named toxicodendrol which has a complex active principle—urushiol.

## IDENTIFICATION

The compound leaves are 20-35cm long and are divided into 9 to 15 (mostly 11) leaflets arranged in pairs. The leaflets are 4-10cm long and 2-3cm wide. They are bright green above and often greyish beneath because of a waxy bloom on the surface. In autumn they change to a brilliant scarlet and crimson before they fall. The small creamy-white flowers occur among the new leaves in spring and early summer. The fruit when ripe is pale brown and papery in appearance and hangs on the tree through autumn and winter.



## BIOSECURITY DUTY

**All State:** General Biosecurity Duty.

**Prohibition on dealings** Must not be imported into the State or sold.

## CONTROL ALTERNATIVES

**Non-chemical options:** Rhus should be removed with extreme caution. Wear gloves and work carefully. Dig up as much of the main root system as possible to discourage suckering. Do not burn any part of the plant. Dispose of all rhus debris properly by taking it to the local garbage tip (consult with controller so rhus material is not mulched with other green waste). Be careful not to drop leaves and branches along the way. Rhus branches should not be mulched or chipped for garden use, as the toxic resin remains active for many months, even after weathering. **Chemical:** herbicides registered for control of rhus include *Roundup 360®* (stem injection/cut stump), *Vigilant®* (cut stump). Refer to label directions.

*Images - top: courtesy www.arc.govt.nz; bottom: Greg Steenbeeke.*

**Scotch broom** (*Cytisus scoparius*) is a native legume shrub of western and central Europe. First introduced to Australia in the 1800's as an ornamental plant, it has become a major woody weed of temperate areas of Eastern Australia with major infestations centred on the Barrington Tops region of NSW.



## THE PROBLEM

Scotch broom readily forms dense impenetrable thickets which displaces native vegetation and are an ideal harbour for feral animals such as pigs, rabbits and foxes. It burns readily and is a major fire hazard were dense thickets have been allowed to form. Broom is a prolific producer of seeds with up to 20,000 seeds per square metre having been recorded in the soil under established infestations. Scotch broom is also hard-seeded with only some seeds germinating at any time. This makes established infestations difficult to control as treated sites are readily re-infested.

## IDENTIFICATION

Scotch broom is a shrub up to 4m tall which produces yellow pea-like flowers which mature into 2-7cm long pods with hairy margins containing up to 22 seeds. The main stems of the plant are five-sided which support numerous straight, erect and prominently ridged branchlets. Flowering occurs from October to December.

## BIOSECURITY DUTY

**North West:** Containment An exclusion zone is established for all the lands in the region, except the core infestation area comprising all Local Government Areas lands East of the Newell Highway.

**Northern Tablelands:** Containment

**Prohibition on dealings**



## OPTIMUM TIME TO TREAT

Foliar spraying of infestations with herbicides is best carried out during spring and early summer.

## CONTROL ALTERNATIVES

**Non-chemical:** single bushes can be pulled out and burnt before seeding although this may be impractical over large areas. Control can be obtained through cultivation or heavy grazing with sheep or goats. Dense patches have been controlled by bulldozing and repeated disc cultivations over a number of years. **Chemical:** folia application *Grazon Extra*®, *Garlon*®, or *Glyphosate 360*® or cut stump/injection with *Vigilant*®. Refer to label directions.

*Images courtesy John Hosking.*



**Silverleaf nightshade** (*Solanum elaeagnifolium*) is a serious problem in cultivation paddocks. Once established, it is almost impossible to eradicate. The roots penetrate to a depth of >2m making chemical control unreliable. Ploughing breaks up the root system and creates new plants.

## THE PROBLEM

Apart from its impact on farming, all parts of the plant, particularly the green or ripe fruit, can be toxic to animals. Symptoms include bloating, trembling, loose faeces, nasal discharge, salivation and breathing difficulties. Cattle are more susceptible than sheep. Goats or horses don't seem to be affected.

## IDENTIFICATION

Silverleaf nightshade grows to a height of around 80cm. Flowers are purple (sometimes white) with yellow stamens. The plant is usually (but not always) armed with small, sharp prickles. The round fruit (berries) change in colour as they mature, from green stripes to mottled yellow and orange. Each fruit contains about 60 seeds and is spread by floodwaters, machinery, animals and birds. Sheep can carry the seed in their digestive tract for periods of 7 days or more without affecting the germination capability of the seed. Silverleaf nightshade has three common "look-alikes": native quena, Narrawa burr and apple of Sodom.

## BIOSECURITY DUTY

**North West:** General Biosecurity Duty.

**Northern Tablelands:** Asset Protection

**Prohibition on dealings** Must not be imported into the State or sold

## OPTIMUM TIME TO TREAT

September - February if plants are not moisture stressed. Don't let the plants seed.

## CONTROL ALTERNATIVES

**Non-Chemical:** the use of strong competitive crops or pastures will give some control; quarantine the infestation prior to seeding (sheep carry the seed).

Ploughing is ineffective as it causes more spread from root pieces! **Chemical:** options include folia spray with *Tordon 75-D®*, *Roundup 360®* or *Starane®*. Refer to label directions.



Arguably one of our most serious noxious weeds, St John's wort (*Hypericum perforatum*) threatens all grazing properties in northern New South Wales. One plant of St John's wort can produce 30,000 seeds. The (sticky) seeds are spread by animals. The seeds can remain viable in the ground for more than twenty years. It is so important, therefore, that all infestations are regularly monitored to locate any flowering plants. These plants need to be treated before seed set. Every plant untreated has the potential to produce hundreds of new plants!



## THE PROBLEM

Over-exposure to St John's wort can cause various animal health problems, including photosensitisation. Photo (right) show effects of St John's wort on a horse that had been grazing in a paddock of wort for only five days. Humans can also be affected by excessive contact with St John's wort.



## IDENTIFICATION

Apart from the distinctive flowers (top right), a positive way to identify St John's wort is by examination of the leaves. Hold a leaf up to the light and you should see what look like tiny pin holes through every leaf. These are the *hypericum* oil glands (photo, far right).

## BIOSECURITY DUTY

**North West:** Containment An exclusion zone is established for all the lands in the region, except the core infestation area comprising the Gunnedah Shire Council; Gwydir Shire Council; Liverpool Plains Shire Council and Tamworth Regional Council

**Northern Tablelands:** Asset Protection

**Prohibition on dealings** Must not be imported into the State or sold.

## OPTIMUM TIME TO TREAT

From first flowering (usually around September), right through until around March. Plants are hard to see unless they are in flower.



## CONTROL ALTERNATIVES

**Non-chemical:** Perennial pastures and grazing management will offer some control - converting an infested area to a well-worked cultivation paddock is probably the only effective way to eradicate St John's wort. **Chemical:** herbicides for St John's wort include *Grazon Extra*®, *Starane*®, *Roundup 360*® (suitable for single plants or small infestations only), 2,4-D ester, *Brushoff*® + very light rate of *Roundup 360*®. Refer to label directions. If plants have seeded, follow-up treatment will be required for many years.



**Sweet briar** (*Rosa rubiginosa*) was introduced to Australia as a garden plant around the time of first European settlement. Sweet briar quickly adapted to the cool temperate areas of Australia receiving more than 600mm annual rainfall. A Tasmanian article on practical gardening in 1838 noted that sweet briar was a suitable rootstock for ornamental roses and that it could be found in all parts of the Tasmanian bush. By the early 1900's it had spread to large areas of Victoria and New South Wales.



## THE PROBLEM

The prickly nature of sweet briar can severely restrict access for human activities and deters grazing animals from feeding close to plants. It competes with pastures for soil nutrients and moisture. Birds eat the fruit and distribute the seeds indiscriminately, leading to increased plant density and loss of stock grazing capacity.

## IDENTIFICATION

An erect shrub to 3m high, reproducing from perennial roots and seeds. The arching stems are woody when mature and bear numerous backward curving flat prickles varying in length up to 1.5cm. Flowers, pink or white. Fruit, ovoid, orange to red 2cm long with short spines at stalk end.



## BIOSECURITY DUTY

**North West:** Asset Protection

**Northern Tablelands:** Asset Protection

**Prohibition on dealings** Must not be imported into the State or sold

## OPTIMUM TIME TO TREAT

Treatment with herbicides should be carried out from the onset of flowering when plants are actively growing with good soil moisture and before leaves are shed.

## CONTROL ALTERNATIVES

**Non-chemical:** Physical removal of the plant, complete with the root system by mattocking and cultivation is an effective method of control. **Chemical:** herbicides registered for sweet briar include *Grazon Extra*®, *Brushoff*®. Refer to label directions. Regrowth will require follow-up treatment.



**Tree of heaven** (*Ailanthus altissima*) is a widespread environmental weed. Mainly spreading by root suckers, it is a fast-growing deciduous tree reaching heights of up to 20m.

## THE PROBLEM

Tree of heaven will continue to spread through extension of the plant's vast and active root system. Roots will often undermine fences and out-buildings as the plants continue to spread. Trees pushed out with bulldozers or other machinery will grow back from the roots - ten fold! The bark of tree of heaven is reported to be toxic to some animals, including horses. Contact with tree of heaven bark and leaves may cause dermatitis in some people.



## IDENTIFICATION

It has smooth grey bark, large compound leaves up to 1m long with leaflets in opposite pairs. Crushed leaves have an unpleasant smell. Originally a garden plant, dumped or otherwise scattered plant material will soon take root.

## BIOSECURITY DUTY

**All of NSW:** General Biosecurity Duty

### Prohibition on dealings

Must not be imported into the State or sold

## OPTIMUM TIME TO TREAT

During summer and early autumn when periods of active growth and good moisture reserves are present.



## CONTROL ALTERNATIVES

**Non-Chemical:** manual removal of small plants including complete root system. Do not plough, bulldoze or cut without poisoning, as suckering will be massive. **Chemical:** options include basal bark or cut stump using Garlon® or Access® mixed in diesel, cut stump or inject with Vigilant®, folia spray with Tordon® 75 or Brushoff®. Refer to label directions. Plants will often sucker from the roots so follow-up will be required.

**Tropical Soda Apple** (*Solanum viarum*), is an aggressive, prickly, perennial shrub 1-2 m high. It invades open to semi-shaded areas including pastures, forests, riparian zones, roadsides, recreational areas, horticulture and cropping areas.



## THE PROBLEM

Tropical soda apple reduces biodiversity by displacing native plants and disrupting ecological processes. Its foliage is unpalatable to livestock, thus reducing carrying capacities. Prickles on this plant restrict grazing by native animals and livestock and thickets can create a physical barrier for animals preventing access to shade and water. The plant is a host for many diseases and pests of cultivated crops, and it contains solasodine which is poisonous to humans.

## IDENTIFICATION

Tropical soda apple is an upright, branching, perennial shrub growing to 2 m in height. It has broad-based, straight, cream-coloured prickles to 12 mm long scattered on most plant parts.

### Key identification features

Leaves are mostly 10-20 cm long and 6-15 cm wide. The upper and lower leaf surfaces are densely covered in short hairs; mid-veins and primary lateral-veins are cream-coloured on both sides of the leaves. Flowers are white, with 5 petals 2-4 mm long. They occur in clusters of 3-6 off a short stem. Mature fruit are yellow and golf ball-size (2-3 cm in diameter). When immature they are pale green with dark green veins, like immature water melons. In the USA plants produce an average of 45 000 seeds.

## BIOSECURITY DUTY

**All of State:** Eradication

**Prohibition on dealings** Must not be imported into the State or sold.

## OPTIMUM TIME TO TREAT

Autumn-winter when plants are young and actively growing.



## CONTROL ALTERNATIVES

**Non-chemical:** Individual plants can be manually removed, but care must be taken to remove all the root material, as plants will regrow from root fragments. Fruit should be collected and disposed of appropriately (deep burial or burnt).

**Chemical:** Spot spray with Glyphosate or Fluroxypyr.

# WHISKEY GRASS

## THE PROBLEM:

Whiskey Grass (*Andropogon virginicus*) is of low nutritional value to stock and may create a fire hazard. It becomes highly invasive once soil has been disturbed, commonly on roadsides and powerlines where surface has been slashed.



## IDENTIFICATION:

An erect, tufted, warm season perennial grass growing up to 1.2m tall. Plants are light green, often with purplish-tinged stems and leaves when young, becoming reddish brown then straw coloured with maturity. The seedhead is long and narrow with leaf-like structures. Two hairy branches are attached to the base of each small seed, giving the seedhead a fluffy appearance.

## BIOSECURITY DUTY

**North West:** Emerging

**Northern Tablelands:** Species of Concern

Prohibition on dealings

## CONTROL:

**Mechanical:** Regular close slashing from late summer. Fertiliser application if other species are still responsive will cause a decline in numbers. Especially when combined with an increased stocking rate.

**Chemical:** There appears to be no registered herbicide for use on Whiskey grass.



*Photos courtesy of Josh Biddle*

Yellow bells (*Tecoma stans*) Yellow bells is a shrub or small tree originally introduced as an ornamental plant. It is a highly competitive weed of bushland and disturbed areas from Sydney north to north-western Western Australia.

Yellow bells prefers sunny conditions in sub-tropical and tropical climates, which are free of heavy frosts, have 700-1800 mm annual rainfall. It prefers well-drained soils with a light texture.

It grows in riparian areas, edges of rainforest and eucalypt forest, open woodlands, grasslands, waste areas, sand dunes, agricultural land and other disturbed areas. It is also salt tolerant and is capable of becoming established in mangrove habitats.



## THE PROBLEM

Yellow bells invades riparian areas, edges of rainforest and eucalypt forest, open woodlands, grasslands, waste areas, sand dunes, agricultural land and other disturbed areas.

It can form dense stands which strongly compete with other species and reduces habitat for native animals.

Although palatable to stock, it reduces feed quality, restricts access for stock and machinery and competes with orchard plantings. It has the potential to be a serious weed of much of tropical and subtropical Australia.



## IDENTIFICATION

Yellow bells is a large shrub or much-branched small tree 3-8 m tall, rarely to 10 m tall. Bark is initially green and smooth, but becomes light brown to pale grey and grooved with age. Leaves are pinnate with 3-13 leaflets. Leaflets are hairless and up 2.5-10 cm long, with serrated edges. Flowers are borne in several-flowered clusters at or near the stem tips. Petals are bright yellow, tubular and 3-5 cm long, with reddish lines in the throat. Fruit are 10-30 cm long, linear, bean-like pods. Pods are initially green then ripen to brown. Seeds are paper, winged and to about 2.2 cm long.

## BIOSECURITY DUTY

Regional Recommended Measure - North West and Northern Tablelands Land managers should mitigate the risk of new weeds being introduced to their land. The plant should be eradicated from the land and the land kept free of the plant. The plant should not be bought, sold, grown, carried or released into the environment. North West: Notify local control authority if found.

## CONTROL ALTERNATIVES

The main methods of control are excluding plants from uninfested areas, physical removal of all plant parts, and herbicide application. Which method is appropriate depends on:

- size and density of the infestation
- accessibility
- time and resources available
- habitat infested.

Continued follow-up and re-treatment is essential for all control methods.

Chemical options include (Roundup®)- PERMIT 9907 Expires 31/03/2020, Vigilant II ®)and Access™



## BLUE HELIOTROPE

(*Heliotropium amplexicaule*) is a native plant of South America.

### THE PROBLEM

The plant re-generates from rootstock and seeds: it is easily spread through soil disturbances (especially cultivation), slashing, water and animal movements. It displaces most other desirable plants. Blue heliotrope is poisonous to livestock. While most animals try to avoid the unpalatable plant, it can still be consumed with other feed. Heliotrope causes liver damage and reduced productivity. Horses, pigs, cattle, sheep and goats can all be affected (in that order of susceptibility). Cases have also emerged where cattle have died after changing from a heliotrope-contaminated diet to a high protein diet (eg feed lot).



### IDENTIFICATION

Blue heliotrope flowers are purple or lilac, with a yellow centre. One positive identification feature is the characteristic bend in that part of the plant holding the flowers - as indicated in the photo, right. The shape can be likened to that of a “sea-horse”. The plant lies dormant throughout winter, emerging in the spring as a dense, low-growing plant covered in “attractive” flowers. At this stage of growth, blue heliotrope emits an unpleasant odour, offensive to most people but especially hay fever sufferers.

### BIOSECURITY DUTY

**All of NSW:** General Biosecurity Duty.

**Prohibition on dealings.** Must not be imported into the State or sold.

### OPTIMUM TIME TO TREAT

November - February

### CONTROL ALTERNATIVES

**Non-chemical:** Dig out single plants. Improve pastures with vigorous perennial species.

Ploughing is not advised because (a) the plant grows from root pieces and (b) dormant seeds will germinate. **Biological** Releases continue to be made of a blue heliotrope beetle. A long-term project, and looking very promising for large and/or inaccessible infestations. **Chemical:** includes Roundup 360®, Brushoff®, Grazon®, Starane® and Dicamba®. Refer to label directions.





**NOOGOORA BURR** (*Xanthium* spp.) was introduced into Australia from America and the Caribbean.

## THE PROBLEM

Noogoora burr grows in cultivation, pastures, waterways and around stock watering dams. The burrs contaminate animal wool or hair fleeces, as well as summer grain crops, resulting in significant financial loss from vegetable fault and reduced yield.

## IDENTIFICATION

The plant grows to 2m high, producing green, inconspicuous flowers which develop into green burrs, turning brown when ripe. The hard, ripe burrs are an elongated egg shape 10 to 20mm long and 4 to 8mm wide. The burr is densely covered with hooked spines (similar principle to Velcro®) and with large, horn-like projections at the tip. Each burr produces two seeds. The harder of the two seeds may remain dormant for several years before favorable conditions stimulate germination.



## BIOSECURITY DUTY

All of NSW: General Biosecurity Duty.

## OPTIMUM TIME TO TREAT

Prior to seed development.

## CONTROL ALTERNATIVES

**Non-chemical:** (a) Prior to seed set, chip or plough to kill the plant and the root system (b) If left until after seed set, cut, stack and burn the plants. Take care seeds do not fall and further increase seed bank burden for future germinations. Do

not plough or slash because seeds will be dislodged. **Chemical:** for best results spray when plants are young and actively growing, and certainly prior to flowering and seed set. Older plants require higher herbicide rates and control will cost more. After seed set, when the fruit is still green or yellow, a salvage spray operation will help to reduce viable seed numbers but results will be variable. Better to spray prior to seed set. Chemicals registered for Noogoora burr include 2,4-D amine, *Dicamba*®, *Brushoff*®, *Starane*®, *Tordon*® 75-D. Refer to label directions.



**COOLATAI GRASS** (*Hyparrhenia hirta*) has taken over large areas of north west NSW and is still spreading. It continues to cause serious ecological damage within national parks and other natural areas, where it displaces desirable plant species. Coolatai grass is generally regarded as a weed because of its low digestibility and stock generally avoid Coolatai grass in favour of other grasses. However, the hardy nature of Coolatai grass has made it the only feed available in many lighter-soil areas during extreme drought conditions. Stock will survive on it, with assistance from feed supplements.

## THE PROBLEM

Coolatai grass can take over new areas very quickly! It has an amazing capacity to spread. During its seeding phase, the plant produces thousands of tiny, sticky seeds which adhere readily to animals, farm machinery and motor vehicles.

## IDENTIFICATION

Coolatai grass has a distinctive seed head, as shown in photo, right. The plant forms dense tussocks.

## BIOSECURITY DUTY

All of NSW: General Biosecurity Duty.



## OPTIMUM TIME TO TREAT

Treatment with herbicides as a complete overall foliar spray is best carried out in spring and summer when plants are actively growing with good soil moisture.

## CONTROL ALTERNATIVES

Every effort should be made to prevent Coolatai grass from becoming established in new areas. Treatment - either manual removal (small areas only) or herbicide application - is advisable before plants have a chance to produce seed. Regular follow-up is essential

to prevent further establishment. **Chemical:** permits have been issued for the use of *Roundup 360®* and/or *Taskforce®* for treatment of Coolatai grass. For permit details refer to <http://apvma.gov.au>

**GOLDEN DODDER** (*Cuscuta campestris*) or dodder, is a parasitic summer-growing species. It attaches itself by suckers to a range of mainly broadleaf and leguminous host plants.



## THE PROBLEM

Dodder threatens the viability of lucerne, vegetable and certain broadleaf crops and pastures. Yields are reduced; contaminated produce is unmarketable (and illegal to sell).

## IDENTIFICATION

Dodder stems are long, thin and leafless, almost threadlike, usually orange to yellow in color and easily identified because of its contrast on a green background.

Germinating October - April, it must attach to host plants within 2-6 days or it will die (although seedlings may sometimes survive longer in the soil in wet conditions). Flowering usually occurs October - May. The golden, usually small, bell-shaped flowers are found in clusters of four along the stems, and are distributed in contaminated hay, grain, horticulture and pasture seeds, through livestock and birds (especially water fowl) and along waterways. Seeds ingested by livestock are passed and germinate quickly in dung pats.

## BIOSECURITY DUTY

All of NSW: General Biosecurity Duty

## OPTIMUM TIME TO TREAT

Treat anytime dodder is found.

## CONTROL ALTERNATIVES

Quarantine areas with seed, so animals do not disperse them. **Non-**

**chemical:** Subject to compliance with local bushfire restrictions ALL DODDER WITH VIABLE SEED SHOULD BE BURNT

with a long, hot fire. Be aware that seeds may detach during site preparation for burning and during the process; if seeds fall into soil cracks they may not be heat affected. To burn dodder, spray with a flammable substance such as diesel, kerosene. Or carefully spread old hay over the plant. Only if there is no threat of seed fall, clip/cut and carefully bag to relocate to another area for burning. **Chemical:** includes *Brushoff*® mixed at very low rate (1g/100L water). NB. Dodder seeds remain viable for at least 10 years - continued inspections will be necessary to locate and treat new plants.



**ESPARTILLO** (*Amelichloa brachychaeta*), a perennial grass “sleeper weed” of temperate grasslands, was introduced from South America and first identified in NSW in the 1950’s. The contamination source is unknown. It is also now present in Victoria and Tasmania.

## THE PROBLEM

Espartillo will invade native pastures. Untouched tussocks grow to 1m high and wide. New seedlings appear during winter, following autumn germination. The centre of the plants dies, leaving the mulch full of viable seed. Seeds are transportable by a wide range of methods. Seed banks are usually heavily populated with seed awns as well as cleistogene seeds. They remain viable for more than ten years.

## IDENTIFICATION

The coarse leaf blades are tightly whorled and unpalatable, ending in a stiff, spike-like tip which is sharp when touched with the open hand. Espartillo has been locally called “standby grass”, because hungry livestock will walk up to it, not eat, just “stand by”

## BIOSECURITY DUTY

All of NSW: General Biosecurity Duty.

## CONTROL ALTERNATIVES

**Non-chemical:** 1. Physically remove the whole tussock plus the soil containing cleistogenes. Carefully dispose of the material by burning in a well contained and protected area. Continue to monitor this site for many years. (2) Annual cropping with long fallow weed control may kill new seed germinations and may progressively reduce the seed bank. (3) Establishing lucerne or permanent pasture may encourage re-infestations of Espartillo from a remaining seed bank, allowing early detection and treatment. **Chemical:** as of Oct 2014 no herbicides are specifically registered for Espartillo control. However, spot spraying with certain non-selective knock-down herbicides used on similar grasses will provide some control (recommended prior to flowering in an effort to decrease the volume of seed produced). Glyphosate 360® boom spraying application may give limited control. Pre-emergent herbicides (used to establish lucerne) may give a degree of control in the first season. More information: Peter Scott, Chief Weeds Officer, Liverpool Plains Shire Council, Quirindi.





**HEMLOCK** (*Conium maculatum*) originated in Europe, western Asia and North Africa. It was most likely introduced into Australia as a garden plant for its attractive white flowers. Hemlock prefers moist, neglected situations. It is most common in riparian areas and sometimes moves into pastures and areas of cultivation.



## THE PROBLEM

Hemlock contains five toxic alkaloids which vary in concentration due to climatic conditions. The fruit, vegetative parts and roots are all poisonous to humans and stock. In Victoria a child died from hemlock poisoning in 1994. Handling the plant can cause dermatitis in some people. Cattle, pigs, horses and poultry are more susceptible to hemlock poisoning than sheep and goats. The plant is rarely grazed when green and is more likely to be consumed in hay, chaff or silage. Symptoms of hemlock poisoning in stock include dullness, loss of muscular power, stumbling and falling, nausea, dilation of pupils and complete paralysis. Symptoms may show as quickly as 12 minutes after the plant is eaten and death may occur in 2 to 3 hours.

## IDENTIFICATION

Hemlock can be mistaken in appearance for a larger version of “bishop’s weed” or “wild carrot”, with its white flowers and similar leaf. But, for the layperson, the main feature that identifies hemlock is the stem. The pale green stems are hollow (except at the nodes) with purple patches particularly toward the base of the plant. The plant has a long, white taproot. Hemlock reproduces from seeds which usually germinate in autumn. Seeds can be spread by animals, machinery, water, agricultural produce including hay and silage, gravel, soil extraction and to a limited extent by wind.



## BIOSECURITY DUTY

All of NSW: General Biosecurity Duty

**OPTIMUM TIME TO TREAT** - When plants are young and actively growing.



## CONTROL ALTERNATIVES

**Non-chemical:** Physical removal hand pulling (use rubber gloves), hoeing, slashing prior to seeding; sound pasture management. **Chemical:** options include 2,4-D ester 800 g/L (May to Sep only), *Dicamba*® and MCPA 340g/L + *Dicamba*® 80g/L. Refer to label directions. Keep stock away from treated plants!



**LIPPIA** (*Phyla canescens*) infests 5,300,000 hectares of the Murray-Darling Basin at an annual cost of \$1.8 billion to the environment, and conservatively costs grazing industries \$38 million per annum in lost production. Lippia is generally considered an invasive weed of floodplains. However, if seasonal conditions are suitable, lippia can adapt to almost any area. A weed of this magnitude cannot be overlooked in the Australian agricultural and environmental landscapes. It should never be grown as a lawn turf.



## THE PROBLEM

The primary threat from lippia lies in its direct impact on groundcover in floodplain communities. The spread of lippia has significantly impacted on and continues to threaten biodiversity throughout the Murray-Darling Basin.

## IDENTIFICATION

Lippia is a prostrate perennial broadleaf herb and has many branched stems, sometimes up to 1m in length. The plant has the ability to grow roots tapering downwards from nodes along the stems and, when well established, lippia can form a dense mat of groundcover. Tubular flowers occur in clusters forming a round head when mature, 1-1.5mm in diameter. Flowers white, cream, pinkish or lilac.

## BIOSECURITY DUTY

All of NSW: General Biosecurity Duty

## OPTIMUM TIME TO TREAT

Herbicides should be used as part of an overall management plan that includes vigorous pastures and good grazing management. Apply when lippia is actively growing, preferably early flowering with good soil moisture.



## CONTROL ALTERNATIVES

**Non-chemical:** a strong competitive pasture is vital for long-term lippia control and simply de-stocking or reducing the stocking rate on lippia infested country may not be enough for long-term control in some instances. Pasture may need to be rejuvenated or re-established. **Chemical:** Only use *Roundup Biactive®* or equivalent formulations within 20m of a waterway. Agricrop *Lantana 600®* (dichlorprop) is the only herbicide registered for lippia control in pasture and non-crop areas. Permits are in place for the use of 2,4-D amine for lippia control in these areas in both NSW and Qld. Extreme care should be taken when using 2,4-D near cotton. Refer to label directions.

## PATERSON'S CURSE

(*Echium plantagineum*) is a winter annual herb, germinating following summer and autumn rains. Plants grow vegetatively as a rosette during autumn and winter. Flowering stems are produced in early spring, and seed in late spring to early summer.

### THE PROBLEM

It reduces pasture productivity and is toxic to livestock. Paterson's curse contains **pyrrolizidine alkaloids**. These alkaloids cause liver damage. The natural environment is degraded by compromising habitat values. This occurs through crowding out and suppressing native vegetation.



### IDENTIFICATION

Paterson's curse is an erect herb commonly 60cm high, but it can grow up to 150cm. Rosettes have green to light-green hairy, egg-shaped leaves that may grow to 30cm long. The rosettes are stalked and have distinct, branched veins. Seeds are dark-brown to grey and have a roughened seed coat. Flowers are mostly purple, but white, blue and pink flowering plants are sometimes found. Flowers generally appear from July to November. The plant has a stout taproot with numerous lateral roots.



### BIOSECURITY DUTY

All of NSW: General Biosecurity Duty.

### OPTIMUM TIME TO TREAT

Winter months.

### CONTROL ALTERNATIVES

Paterson's curse spreads only through the movement of seeds, therefore methods which prevent seed moving to uninfested areas should be employed. **Non-chemical:** integrated weed management of Paterson's curse includes the use of competitive crops and pastures, grazing management, hand weeding, biological control,

slashing. **Chemical:** options include 2,4-D amine, *Roundup 360®*, *Brushoff®*, *Grazon Extra®*, MCPA and *Dicamba®*. Refer to label directions.



**MIMOSA** (*Mimosa Pigra*) is a branched, spiny, perennial shrub growing to 6 m in height. It forms dense thickets that replace native vegetation in northern Australia's ecologically and economically valuable wetlands. It tolerates flooding, and can grow along roadsides, watercourses and seasonally inundated wetlands, and on a wide variety of soil types. It has the ability to invade ecologically sensitive areas and threatens indigenous cultural activities, and pastoral and tourism industries. Once mimosa becomes established, it dominates vegetation and is very difficult to control.

## IDENTIFICATION:

Mimosa has large thorns (5-10 mm long) on the stem and smaller thorns on the branches between the leaves. The greenish stems on young plants become woody with age. Mimosa has a branching taproot which can reach a depth of 1-2 m. Leaves are green and fern-like. They are

made up of many fine leaflets that occur in pairs along the branches. The leaflets fold together at night or when they are touched. Made up of 100 individual round (1-2 cm diameter) pink mauve flowers. Olive green seed pods 6-8 cm long covered in fine hairs. Each flower head produces 10-20 pods. Mature pods turn brown and break into segments. There is one oblong shaped seed, 4-6 mm long per segment.

## BIOSECURITY DUTY:

All of NSW: General Biosecurity duty  
Prohibited Matter

## CONTROL:

You must report this plant if you see it anywhere in NSW. Help will then be provided to remove and destroy it. This serious weed could spread if control efforts do not follow all protocols. Not reporting it is a breach of your legal biosecurity duty.



## CHEMICAL:

Options registered for us on Mimosa include Roundup®, Starane™ Advanced, Starane™ and metsulfuron methyl.

## THISTLES

All thistles are members of the Asteraceae family. These images show some of the more common species in inland NSW. Problem thistles have all been introduced into Australia and generally serve no useful purpose.

### THE PROBLEM

Thistles prefer to colonise bare ground. Under suitable conditions most thistles form thick infestations. They monopolise water and nutrients, reducing yield. They can contaminate grain and wool products along with causing physical damage to humans, livestock and dogs.

### IDENTIFICATION

The main challenge when identifying thistles is not deciding what is a thistle but rather which particular thistle. All thistles have spines on their stems, leaves, flowers or all three. They can be as low growing as stemless thistles which never grow much above 100mm through to black thistles which can reach 180cm or more.

### BIOSECURITY DUTY

#### Nodding Thistle:

Northern Tablelands: Land managers should mitigate the risk of new weeds being introduced to their land. Land managers should mitigate spread from their land. The plant should not be bought, sold, grown, carried or released into the environment. Notify local control authority if found.

Other included thistles:

All of NSW: general Biosecurity Duty



St Barnaby's thistle (*Centaurea solstitialis*)



Variegated thistle (*Silybum marianum*)



Star thistle (*Centaurea calcitrapa*)



# OTHER WEED SPECIES OF CONCERN

There are other local thistles with a General Biosecurity which cause significant economic and environmental harm:

- Black/spear thistle (*Cirsium vulgare*)
- Scotch thistle (*Cirsium vulgare*)
- Variegated thistle (*Silybum marianum*)
- Stemless thistle (*Onopordum acaulon*)
- St Barnaby's thistle (*Centaurea solstitialis*)
- Star thistle (*Centaurea calcitrapa*)
- Slender thistle (*Carduus pycnocephalus*)

## OPTIMUM TIME TO TREAT

Plants need to be actively growing for effective chemical treatment. Thistles are better treated when they are still young as they require far lower chemical rates. This lowers the risk of off-target damage to pasture or crops.

## CONTROL ALTERNATIVES

**Non-chemical:** Mechanical removal via chipping or slashing can be effective but time-consuming. Both are best carried out before plants produce viable seeds. **Chemical:** options include MCPA, Lontrel®, 2,4-D ester, Roundup 360®, Dicamba®. Refer to label directions. Treatment should be tailored to the particular conditions with regard to timing, rates and method of application.



Saffron thistle (*Carthamus lanatus*)



Scotch thistle (*Cirsium vulgare*)



Milk thistle (*Sonchus oleraceus*)



Nodding thistles (*Carduus nutans*)



## OTHER WEED SPECIES OF CONCERN

The age-old definition of a weed is simply “a plant growing in the wrong place”. There are many common plants which we refer to as weeds. Some are more of a nuisance than others. But, a lot of these plants have a right to exist; indeed, many are natives.

The following collection of images is included in this booklet to assist land managers with identification of plants commonly found within the Northern Tablelands and North West Local Land Services regions. Identification is always the first step - once we have a name we can glean more information about the plant from local weeds officers, agronomists, contract weed sprayers, libraries and the internet.

It's also hoped this section of the booklet will create a greater interest in the fascinating world of plants, and inspire all land managers to take more notice of the many wonderful (or otherwise) plants growing on their properties.



**AFRICAN LOVEGRASS** - (*Eragrostis curvula*) (left) and Coolatai grass - (*Hyparrhenia hirta*) (right) - two of our more troublesome grasses in the north west.



**ANNUAL RAGWEED** - (*Ambrosia artemisiifolia*) - causes hay fever and other allergenic problems for some  
**APPLE** - (*Malus pumila*) - grows wild in some areas - harbour for fruit tree pests (image Greg Steenbeeke)

## OTHER WEED SPECIES OF CONCERN

### HAWKWEEDS

(Hieracium species) have the potential to be serious weeds in the temperate areas of south-eastern Australia, including the Australian Alps and Tasmanian grasslands. Prompt treatment of known populations of hawkweeds has limited their spread so far. Hawkweeds are highly invasive plants forming dense stands of up to 3800 plants per square metre. This is a major threat to biodiversity in conservation areas and native grasslands.



**AZOLLA** - *Azolla filiculoides* - free-floating water fern, green to deep-red coloured, multiplies rapidly to form carpets in still or slow-moving waters especially when water nutrient levels are high - other common names include red azolla, Pacific azolla, duckweed



## OTHER WEED SPECIES OF CONCERN



**BAHIA GRASS** (*Paspalum notatum*)

perennial that can form dense monocultures Photo: Brisbane City Council.



**BALLOON VINE** - (*Cardiospermum grandiflorum*) - serious invader of riparian areas

## OTHER WEED SPECIES OF CONCERN



**GOLDEN DODDER** (*Cuscuta campestris*) is a parasitic summer-growing species. It attaches itself by suckers to a mainly broadleaf and leguminous host plant.



**BLUE HOUNDS TONGUE** (*Cynoglossum creticum*)  
Photo: Weedwise - José Darnaude



**ASPARAGUS FERN** (*Asparagus aethiopicus*) is a native of South Africa and was introduced to Australia as an ornamental plant. Asparagus fern is commonly spread by dumped garden waste that contains seeds and rhizomes and by birds that eat the colourful berries and deposit the seeds in their droppings. The seeds germinate readily and start new infestations. This weed is invasive and poses a significant threat to the bushland environment.



## OTHER WEED SPECIES OF CONCERN



**CAUSTIC CREEPER** - (*Chamaesyce drummondii*) - if feed scarce, this plant can cause poisoning to sheep and sometimes cattle and horses - interesting herbal history (PWNSW) (image Greg Steenbeeke)



**CHINESE VIOLET** (*Asystasia gangetica* subsp. *Micrantha*) Photo: Weedwise - Graham Pritchard



Common olive, African olive - (*Olea europaea*) - spread by birds, this plant is proving to be very invasive in some areas of the NIWAC region and a threat to native landscapes (main image Greg Steenbeeke, fruit image John Hosking)





## OTHER WEED SPECIES OF CONCERN



**COREOPSIS** - (*Coreopsis lanceolata*) - garden escape - attractive but prolific flowering plant found throughout the tablelands (image Greg Steenbeeke)



**COTYLEDON** - (*Cotyledon orbicularis*) - one of the “mother-of-millions” look-alikes



**FALSE CAPER** - (*Euphorbia terracina*) - not common but has been suspected of poisoning stock in western areas of NSW (PWNSW)

## OTHER WEED SPECIES OF CONCERN



**COTONEASTER** - (*Cotoneaster glaucophyllus*) - a popular garden plant but now invading rural areas on the outskirts of towns and villages (image John Hosking)



**FIRETHORN** - (*Pyracantha* spp.) - a garden plant but moving into rural areas - birds spread the abundant seed - a declared noxious weed in some Shires (main image Greg Steenbeeke)



**HAWTHORN** (*Crataegus monogyna*) Hawthorn is a spiny shrub, used for hedging. It has been dispersed by birds throughout south-east Australia.



## OTHER WEED SPECIES OF CONCERN



**FIELD BINDWEED** - (*Convolvulus arvensis*) - serious problem in cultivation paddocks (image Greg Steenbeeke)



**SWAMP FOXTAIL GRASS** - (*Pennisetum alopecuroides*) - generally not favoured by stock (image Greg Steenbeeke)



**FLEABANE** - (*Conyza* sp.) - common in pastures, out-competes useful plants, sap can cause skin irritation - very difficult plant to eliminate (image Greg Steenbeeke)



**GREEN PANIC** (*Panicum maximum* var. *trichoglume*)  
Photo: NSW DPI

## OTHER WEED SPECIES OF CONCERN



**GIANT REED** - (*Arundo donax*) - an increasing problem in riparian zones where it dominates river banks and eventually impedes water flow - declared noxious weed in some NSW Shires



**INKWEED** - (*Phytolacca octandra*) - infests cultivation areas in coastal districts and suspected of poisoning stock - common in higher parts of NW slopes - photo taken Copeton Dam foreshores



## OTHER WEED SPECIES OF CONCERN



**JERUSALEM CHERRY** - (*Solanum pseudocapsicum*)  
- the leaves and green fruits are poisonous - bright red fruits look like mini-tomatoes.



**LANTANA** (*Lantana camara*) All types and parts of lantana are considered poisonous to stock. Red-flowered lantana is most dangerous. Stock poisoning



**MORNING GLORY** - (*Ipomoea purpurea*) (right) and (*Ipomoea indica*) (left) - both garden escapees, rapidly-growing vines that envelop natural bushland areas (images Greg Steenbeeke)





## OTHER WEED SPECIES OF CONCERN



**NARRAWA BURR** - (*Solanum cinereum*) - native plant, similar to but larger than silverleaf nightshade (*Solanum elaeagnifolium*) - suspected of poisoning sheep and horses particularly from the fresh fruits (PWNSW) (image Greg Steenbeeke)



**SALSIFY, OYSTERPLANT, JERUSALEM STAR** - (*Tragopogon porrifolius*) - favours sheltered and/or damp areas - used as a vegetable (similar to turnip) in some parts of the world (PWNSW)



**OSAGE ORANGE, BOW-WOOD** - (*Maclura pomifera*) - fruit spread by floodwaters - thorny trees inhibit access in riparian areas - attractive timber excellent for wood-turning etc (image Greg Steenbeeke)

## OTHER WEED SPECIES OF CONCERN



**POISON RICE-FLOWER** - (*Pimelea neo-anglica*) - bark peels off like twine - plant not readily grazed but can be poisonous to hungry sheep and cattle on the move (PWNSW)



**PEPPER-LEAF SENNA, SMOOTH SENNA** - (*Senna barclayana*) - a native plant, produces masses of seed, also attracts ants to its sweet sap/flowers - apparently linked to poultry, cattle and sheep poisonings (PWNSW)



**ROCK/MULGA FERN** - (*Cheilanthes sieberi*) - native - can cause stock deaths (image Greg Steenbeeke)



**SPINY BURRGRASS** - (*Cenchrus incertus*) - sharp and clingy burr, ability to spread rapidly and tendency to develop into dense infestations - problem for animals including working dogs



## OTHER WEED SPECIES OF CONCERN



**SWAN PLANT, NARROW LEAF COTTON BUSH** - (*Gomphocarpus fruticosus*) - an increasing problem (image Greg Steenbeeke)



**TREE TOBACCO** - (*Nicotiana glauca*) - flowers similar to and sometimes mistaken for green cestrum in flower - favours riparian areas and other disturbed sites (image Greg Steenbeeke)



**THORNAPPLE** - (*Datura stramonium*) - introduced to Australia in early 1800s - up to 30,000 seeds per plant - all parts of the plant, particularly seeds, are toxic to livestock and humans. Rank smell and bitter taste usually deter stock from grazing plants (ref. [www.weeds.org.au](http://www.weeds.org.au)).

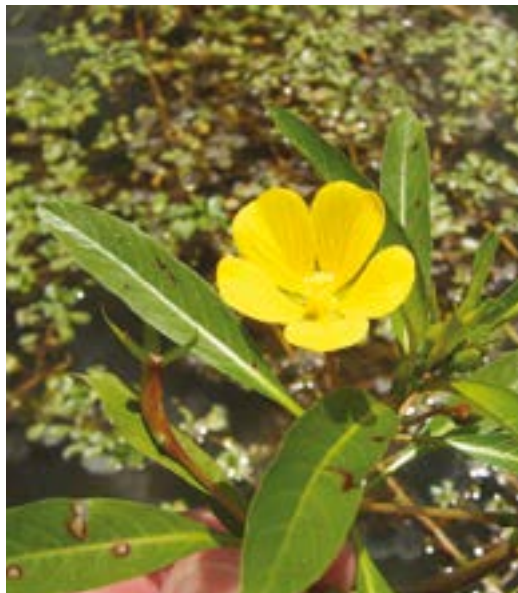


**TWIGGY MULLEIN** - (*Verbascum virgatum*) - considered a weed in pastures because it impedes growth of palatable plants. Seeds can be injurious to fowls (PWNSW)

## OTHER WEED SPECIES OF CONCERN



**VEINED VERBENA** - (*Verbena rigida*) - this coarse-leaved plant establishes itself in thick patches, choking out all competition



**WATER PRIMROSE** - (*Ludwigia peploides*) subsp. *montevidensis* - native plant commonly found in dams and waterways



**WILD CARROT** - (*Dauca carota*) - similar flowers to Bishop's weed or Queen Anne's lace (*Ammi majus*) - both common throughout the region



## OTHER WEED SPECIES OF CONCERN



**YORKSHIRE FOG** - *Holcus lanatus* - large, tussocky perennial, common in higher altitudes of the NIWAC region - can invade native pastures and displace native spp. in woodlands (image Greg Steenbeeke)



**PATERSONS CURSE** (*Echium plantagineum*)



Rhus tree (*Toxicodendron succedaneum*)

# Keep Our State Parthenium FREE

*Parthenium hysterophorus*



**PARTHENIUM WEED** is a dangerous weed, which can have a devastating effect on all parts of the community. Parthenium has caused serious problems in Central Queensland and is now being found in some parts of NSW. This is a weed we do not want. We need to keep it out of New South Wales.

Parthenium weed (*Parthenium hysterophorus*) is an annual herb with a taproot. The plant usually grows to a height of 1 - 1.5 metres. The

leaves are pale green, deeply lobed, covered with fine hairs and are alternately branched. Little creamy white flowers containing 5 black seeds each occur on the tips of the numerous stems. The main identification features of the weed are (1) the stems appear to be striped due to grooves on ridges and (2) the flowers have five distinct lobes.

Parthenium weed mainly grows in spring and summer. Parthenium can germinate, grow to maturity and set seed in only 28 days if stressed. The weed is also allelopathic, which means it can chemically inhibit pasture growth. In grazing country Parthenium dominates pastures, decreases carrying capacity and land values. The weed also affects crop yields and threatens exports by contamination of grain.

Parthenium weed can cause serious health problems for humans. In some cases people have been forced to move from Parthenium infested areas. Repeated contact with the weed and pollen can cause allergic reactions. These reactions include: severe contact dermatitis; respiratory problems such as hay fever or asthma; increased allergic reaction to other plant species (e.g. sunflower).



For further information call the NSW DPI Biosecurity Helpline on 1800 680 244

Parthenium weed is toxic to animals. It can cause dermatitis, eye irritation, loss of condition and even death. Parthenium weed seed is spread by water, machinery, vehicles, stock, humans, feral animals, contaminated feed and seeds.

Parthenium can be controlled with herbicides, cultivation, competitive pastures and biological control. If you find suspected Parthenium weed DO NOT touch the plant and DO NOT remove it. Mark the area and ask your Biosecurity Officer to come out and identify the plant. Parthenium weed is a Control Class 1 declared noxious weed, so if a plant is found it MUST be reported to your local council Weeds Officer or NSW Department of Industry and Investment.



Simple prevention measures include:

BE AWARE of Parthenium weed

BE AWARE when purchasing stock, feed and crop or pasture seed.

BE AWARE of the origin machinery vehicles and stock.

BE AWARE of pasture composition

BE AWARE of procedures for cleaning vehicles.





## Looking for an accredited weed sprayer to do that job on your property?

This is a list of accredited contract sprayers available in northwest New South Wales as at the time of printing. They have paid to advertise here.

Please note that these businesses are listed in good faith as a service to the contractors and local landholders but the Regional Weed Committees or any of the authors/contributors) cannot make any recommendations as to suitability nor does it accept any responsibility for work performed or not performed or other functions provided or not provided by these contract sprayers.

### Delander Row Weeding & Spot Spraying Contractor

27 Delander Crescent, Moree NSW 2400

Les Wilson 02 6751 5031 or 0427 657 055

5 x Quad Bikes 100 to 300 Litre tanks plus water, 4,000 L transport trailer

Refer to ad opposite

### Spot Spraying -Woody & Priority Weeds

**Tom Groth** 0408 621 938

3 x 4WD units equipped with twin-reel Quik sprays with 200m hose

3 Quad Bikes with 100L spray units. Email: tomgroth@hotmail.com.au

"Lindon" 391 Black Creek Road, Narrabri NSW 2390

### Contract Weed Spraying - Spraying of all Priority Weeds

**Steve Potts** 0424 021 277

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### Invasive Weed Species Management Services

**Steve Geddes** 0427 961 984 0427 961 984

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Email: isms\_sgeddeshotmail.com Website: www.ismanagement.com.au

### Northern New England Southern Queensland Spot Spraying

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[tomgroth@hotmail.com](mailto:tomgroth@hotmail.com)

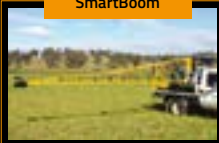
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\*Always use product according to label instructions. Any subsequent weed management strategies should involve an integrated weed management (IWM) approach to minimise development of glyphosate resistance.

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