

1.0 COVER PAGE



REGIONAL WEED MANAGEMENT PLAN

1.1 Plan Title: *Riverina Silverleaf Nightshade Management Plan* **No. 704**

1.2 Plan Proponents / Applicant Contact Details

Regional Weeds Advisory Committee: Eastern and Western Riverina Noxious Weeds Advisory Groups

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Signature: Eastern Group Representative: Date:

Signature: Western Group Representative: Date:

1.3 Name of Plant(s) **WONS - No**

Botanical name: *Solanum elaeagnifolium* Common name: Silverleaf nightshade

1.4 Plan Period

Starting date: 01/07/04 Completion date: 30/06/2009

1.5 Area of Operation:

Region 5, extending from Tumut in the east to Wentworth/S.A border in the west and Carrathool in the north to the Murray River in the south. The Local Control Authorities and Rural Land Protection Boards this region encompasses are all representatives of the Eastern and Western Riverina Noxious Weeds Advisory Groups (**E/WRNWAG**).

1.6 Aim:

To contain and control Silverleaf nightshade infestations preventing further spread across the Riverina.

1.7 Objectives:

- a. Minimise spread by controlling new infestations before seed set.
- b. Prevent further spread of all rare & isolated infestations.
- c. Contain and prevent the spread of marginal infestations.
- d. Contain core infestations and limit the spread into un-infested areas.
- e. All land managers given the opportunity to attain identification skills and an understanding of Integrated Weed Management principles and practices to minimise further infestations of Silverleaf nightshade across the Riverina.
- f. Support biological control programs in heavily infested areas.

2.0 STAKEHOLDERS

2.1 Signatories

The following Local Control Authority (**LCA**) and Rural Land Protection Board (**RLPB**) members of the Eastern & Western Riverina Noxious Weeds Advisory Groups (**E/WRNWAG**): Albury City, Balranald Shire, Bland Shire, Carrathool Shire, Central Murray County Council, Coolamon Shire, Cootamundra Shire, Corowa Shire, Culcairn Shire, Griffith City, Gundagai Shire, Hay Shire, Holbrook Shire, Hume Shire, Jerilderie Shire, Junee Shire, Leeton Shire, Lockhart Shire, Murrumbidgee Shire, Narrandera Shire, Temora Shire, Tumbarumba Shire, Tumut Shire, Urana Shire, Wagga Wagga City, Wakool Shire, Wentworth Shire, Balranald RLPB, Gundagai RLPB, Hay RLPB, Hillston RLPB, Hume RLPB, Murray RLPB, Narrandera RLPB, Riverina RLPB, Wagga Wagga RLPB and Wentworth RLPB.

2.2 Other Stakeholders

The Noxious Weeds Advisory Committee (**NWAC**), NSW Agriculture (**NSW Ag**), Department of Infrastructure Planning and Natural Resources (**DIPNR**), Murrumbidgee and Murray Regional Landcare (**L**), Murrumbidgee / Murray / Lower Murray Darling / & Lachlan Catchment Management Boards (**CMB**), Rail Infrastructure Corporation (**RIC**), NSW National Parks & Wildlife Service (**NP&WS**), State Forests of NSW (**SF**), Roads & Traffic Authority (**RTA**) and the Ungarie Silver-Leaf Nightshade Group.

3.0 BACKGROUND AND GENERAL FACTS

3.1 Reason for Plan and description of the problem.

Silverleaf nightshade (*Solanum elaeagnifolium*) is a deep-rooted perennial weed from the tomato family. Being first introduced into New South Wales from North America in 1901, it wasn't considered important until 1960 when it's spread into agricultural areas caused concern. Silverleaf nightshade (SLN) is one of the most widespread and damaging weeds of the NSW wheat-belt, infesting in excess of 140,000ha of land.

Silverleaf nightshade is a weed of regional significance because it seriously reduces crop and pasture production. Its vast root system (up to 2m in depth – and reported up to as much as 5m) enables it to compete with summer crops and pastures, removing water and nutrients from a large volume of soil over summer leaving it depleted for following winter crops. It is also said to exude plant inhibitors, interfere with harvesting and may be toxic to stock. The occurrence of this weed on farming land will result in productivity losses through competition. Additionally, it is very difficult to kill thus resulting in extensive control costs.

There is no doubt that a planned regional response is necessary to ensure all stakeholders remain proactive in reducing the spread of this persistent weed. Once established, Silverleaf nightshade is extremely difficult to manage.

Within the Riverina there are significant dense infestations both on roadside and private property. At present these core infestations are mostly restricted to Leeton and Griffith shires. Within these shires, managing current infestations are beyond the resources of many. Therefore land managers efforts are directed to preventing further spread in to clean areas.

The Ungarie Silverleaf nightshade group formed in 1996, comprising local farmers, district Agronomist and Noxious Weeds Officer. The main issues they have attempted to address are inadequate control methods, lack of research funding and awareness. Locally they have held field days, are carrying out trial work, formed a technical contact network, lobbied for funding, and initiated an awareness campaign. Their efforts helped instigate the formation of the National Silverleaf Nightshade Management Committee, consisting of representatives of research institutions from NSW, Vic, SA and also CRC. Included on this committee are two landholders, one of who is a member of the Ungarie group. This committee is investigating funding avenues, biological control and enhancement of herbicide translocation. They are also carrying out trial work and an education and publicity campaign.

Null hypothesis

Without this plan and a consistent and coordinated approach, Silverleaf nightshade has the potential to spread into all Riverina Shires and cause considerable impact to biodiversity and agricultural production – decreasing land values. Should continuing action by land managers be withdrawn, SLN will spread potentially creating larger more damaging dense infestations throughout the Riverina. With this in mind concern exists amongst primary producers, who, in many instances are aware of the problems it can cause and wish to minimise its effects on horticultural, viticultural, grazing and cropping activities before it has the chance to spread further, possibly alienating large tracts of land.

3.3 Distribution of Infestation

Refer to Appendix 1. for distribution of Silverleaf nightshade in the Riverina.

3.4 Weed Biology/ Ecology

Silverleaf nightshade is an erect, herbaceous / shrub-like, multi-stemmed, summer growing, perennial to 1 m tall with an extensive underground root system. Its seeds germinate in autumn with much root growth in the first few months. New shoots emerge from lateral roots each spring.

It tends to most often occur in regions with an annual average rainfall between 250 to 600 mm, which are considered as being warm temperate zones. It appears to grow on most soil types and may prefer lighter soils. It may be found colonising roadsides, stockyards, channel banks, orchards, cropping or grazing land, vineyards and stockyards.

3.5 Method and Rate of Spread

Spread is via root segments and seed. Cultivation is a major cause of spread. New shoots can develop from root pieces as small as 1cm in length. Contaminated machinery, water, birds and livestock are reported as being vectors for the dispersal of seed. Seeds have been reported as remaining viable following digestion by stock, and can take many days to pass through the animal, thus stock movement following ingestion may be another vector for the spread of seed.

3.6 Roles and Responsibilities of Land Managers

All land managers listed below are critical in the success or failure of this plan. If Silverleaf nightshade were to be left untouched due to the lack of awareness of its potential distribution, the Riverina could end up with severe infestations that could cost the community enormously.

Roads and Traffic Authority, State Forests, Department of land and Water Conservation, Rail Services Australia, Rural Lands Protection Boards, Local Control Authorities and Landholders/managers.

4.0 LEGISLATIVE AND REGULATORY SITUATION

4.1 Current Declaration

<u>Council</u>	<u>Current Declaration</u>	
Bland	W3	
Carrathool	W3	
Central Murray County	W3	
Coolamon	W3	
Cootamundra	W2	
Corowa	W3	
Culcairn	W3	
Griffith		W3
Hay	W2	
Holbrook	W2	
Hume	W2	
Jerilderie	W3	
Junee	W3	
Leeton	W3	
Lockhart	W3	
Murrumbidgee		W3
Narrandera	W3	
Temora	W2	
Tumut	W2	
Urana	W3	
Wagga	W3	
Wakool	W3	

4.2 Declaration Changes

None required

5.0 CONSIDERATIONS AND OPPORTUNITIES

5.1 Opportunities to be exploited

The main opportunity to be exploited under this plan is the opportunity to adopt a coordinated approach to the management of Silverleaf nightshade utilising the expertise and knowledge of stakeholders. As the plan progresses, opportunities may arise to obtain funding for preservation / enhancement works on remnants or vegetation restoration works, on private lands, through cooperation with Landcare. Extension activities will require cooperation between plan stakeholders. Eastern and Western Riverina Noxious Weeds Advisory Groups have a strong link to the National Silverleaf nightshade management committee through the Ungarie Silverleaf nightshade group situated within Bland shire. The Ungarie group regularly updates ERNWAG and WRNWAG on where research is at through Bland shire's weeds officer. Contact and support will continue for both of these committees/groups.

5.4 Species Management

For specific details on control techniques refer to Kirrily Condon's pamphlet "Be aware, Be active – Silverleaf nightshade" (NSW Ag).

- Silverleaf nightshade is very difficult to kill, so it is important to keep it out of clean areas by treating isolated plants and small patches as soon as they appear.
- Keep stock off fruiting plants as this can lead to increased seed dispersal.
- Stock leaving infested properties should be quarantined for at least 6 to 7 days.
- Vehicles and machinery should be thoroughly cleaned upon leaving infested paddocks.
- Spray during early flowering and before berry-set
- Use herbicides and competitive pastures for better control.

5.6 Extension and Education

Extension and education activities are key components of weed management plans and as such they should ensure client ownership of the problem and participation in the development and implementation of solutions. If people are unable to identify Silverleaf nightshade, are unaware of the potential problems it can cause, and lack an understanding of management options, then they are unlikely to act. Extension activities will address these issues and be delivered through field days, workshops, media releases, personal contact during inspections and through the provision of printed material to the general public. The Ungarie SLN group has organised a number of forums in their area and will continue to do so to update everyone on new developments from the national committee.

5.7 Links to other Strategies

- * The National Weeds Strategy (Australia).
- * The New South Wales Weeds Strategy.
- * The NWAC Strategy – Noxious Weed Control Extension.
- * Regional Total Catchment Management Plans.
- * Murray and Murrumbidgee Catchment Blueprints.

5.8 Barriers and Contingencies

The following are barriers that exist that may result in reduced performance during the plan period. Possible solutions, contingencies are also given.

POTENTIAL BARRIERS / CONSTRAINTS	POSSIBLE SOLUTION, CONTINGENCIES
Lack of awareness of problems this species can cause and land manager attitudes.	Incorporate issue into extension program.
Lack of control options, especially in areas where chemicals are unable to be used.	Investigate IWM options and incorporate issue into extension program. Keep updated on Bio-control and other options being researched.
Lack of recognition that contaminated livestock and machinery may act as vectors in spread	Incorporate issue into extension program.
Inadequate information in regard to size / density and location of infestations.	Stakeholders produce maps clearly and accurately showing infestation levels.

6.0 PERFORMANCE INDICATORS AND ACTIONS

OBJECTIVE	ACTION	PERFORMANCE INDICATOR	BY WHOM
a. Limit spread by controlling new infestations before seed set.	1 Inspect for Silverleaf nightshade as part of routine property inspection program.	1 Property inspection program implemented.	1 LCAs
	2 Control new infestations prior to seed set and before the root systems fully develop.	2 Infestations controlled before onset of berries.	2 LCAs, RLPBs, landholders
	3 New infestations located and mapped.	3 Map developed and regularly being updated	3 LCAs and RLPBs
	4 Recommend new isolated infestations marked (star picket) so they can be easily located and avoided.	4 Sites staked and monitored for reinfestation.	4 Landholders, RLPBs, LCAs
	5 Field staff and landholders encouraged to report new infestations.	5 Map updated as infestations are located.	5 Landholders, RLPBs, LCAs
b. Prevent further spread of all rare and isolated infestations.	1 All infested properties / roadsides are to be inspected annually.	1 100% of infested properties / roadsides inspected.	1 LCAs
	2 Develop control measures (plan) based on IWM principles for infested properties.	2 All affected properties over 2ha have plans in place by the end of the plan period.	2 LCAs with Land managers
	3 Treat existing infestations on LCA/RLPB land annually in early flower before the onset of berries.	3 Infestations treated and are reducing	3 LCAs, RLPBs

<p>c. Contain and prevent the spread of marginal infestations.</p>	<ol style="list-style-type: none"> 1 All infested areas are to be inspected annually. 2 Develop control measures (plan) based on IWM principles for infested properties 3 Treat existing infestations on LCA/RLPB land annually in early flower before the onset of berries. 	<ol style="list-style-type: none"> 1 100% of infested areas inspected. 2 All affected properties over 2ha have plans in place by the end of the plan period. 3 Infestations treated and are reducing. 	<ol style="list-style-type: none"> 1 LCAs 2 LCAs with Land managers 3 LCAs, RLPBs
<p>d. Contain core infestations and limit the spread into un-infested areas.</p>	<ol style="list-style-type: none"> 1 All infested areas are to be inspected annually. 2 LCAs in conjunction with land managers develop control measures (plan). 3 Treat core infestations annually in early flower before the onset of berries. 	<ol style="list-style-type: none"> 1 100% of infested areas inspected. 2 Control measures developed and all land managers with core infestations have a property plan. 3 Infestations contained – prevented from seeding. 	<ol style="list-style-type: none"> 1 LCAs 2 LCAs, Land managers. 3 LCAs, Land managers.
<p>e. All land managers in affected areas given the chance to gain identification and appropriate management / control skills so as to effect desired reductions in Silverleaf nightshade infestations by the end of the plan period.</p>	<ol style="list-style-type: none"> 1 Run extension program targeted at relevant land managers, industries and the general public; based on outlining the problems this weed can cause; its recognition and; identified IWM options. 	<ol style="list-style-type: none"> 1 - Four specific workshops / field days run within the region over the plan period. - 3 regional field days / year - Four media releases run over the plan period. - Personal contact made with each Land manager during inspections where possible. 	<ol style="list-style-type: none"> 1 LCAs, RLPBs, ERNWAG, WRNWAG
<p>f. Support biological control programs in heavily infested areas (If</p>	<ol style="list-style-type: none"> 1 Establish bio-control sites in core areas. 	<ol style="list-style-type: none"> 1 Bio-control released in core areas as it is developed. 	<ol style="list-style-type: none"> 1 LCAs, RLPBs, E / WRNWAG

and when a bio-control agent becomes available).	2 Maintain a working relationship with the National SLN management committee to monitor development of bio – agents.	2 Participation and support at field days.	2 ERNWAG / WRNWAG, Ungarie SLN Group.
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7.0 MONITOR AND REVIEW PROCESS

Plan participants meet each autumn (eg mid March) to review previous years activities, check are on track to meet this plans overall aim / objectives / performance indicators. All stakeholders' local plans / worksheets to be presented at this meeting to ensure they are achieving performance indicators outlined in these plans. Should they not be met, without an appropriate explanation, group pressure may be applied to encourage them to be met in future years. Go over planned activities for upcoming season, arrange resource sharing and familiarise each other as to what activities are to be conducted (especially adjoining LCAs). Where appropriate renew plan commitment and discuss Regional Group Project Funding Application for this weed so that it can be developed in time for the May 1st deadline.

8.0 BENEFITS

This plan aims to protect and thus benefit the following regional endeavours / assets:

- ◆ Primary industries such as agriculture (e.g. grazing winter and summer cropping), horticulture and viticulture. As Silverleaf nightshade infestations reduce in size through the use of appropriate IWM practices, agricultural, horticultural and viticulture land should become more productive as a result of reduced weed competition. Additionally, potential stock health issues associated with this weed should decline resulting in enhanced animal production. Minimising the spread of Silverleaf nightshade should also protect these industries in other parts of the region, state and country, currently unaffected by infestations, from the negative effects of this weed.
- ◆ The general environment and recreational areas where infestations may reduce biodiversity, inhibit regeneration of native vegetation and result in increased maintenance costs for roadsides, parks and gardens. Additionally, infestation in these areas could influence tourism, e.g. visitors may prefer to experience a more pristine environment free of weeds.
- ◆ The local economy through flow on effects of reduced control costs and enhanced productivity of industries previously affected by Silverleaf nightshade.

It also aims to improve networks between stakeholders within the Riverina. Benefits will accrue as a result of this plan bringing together people with a common interest in the management of Silverleaf nightshade.

Cost savings through preventing this weed from spreading further, although difficult to quantify, will be significant.

9.0 RESOURCES

References and Further Readings

Agfact: P7.6.10 Silverleaf nightshade

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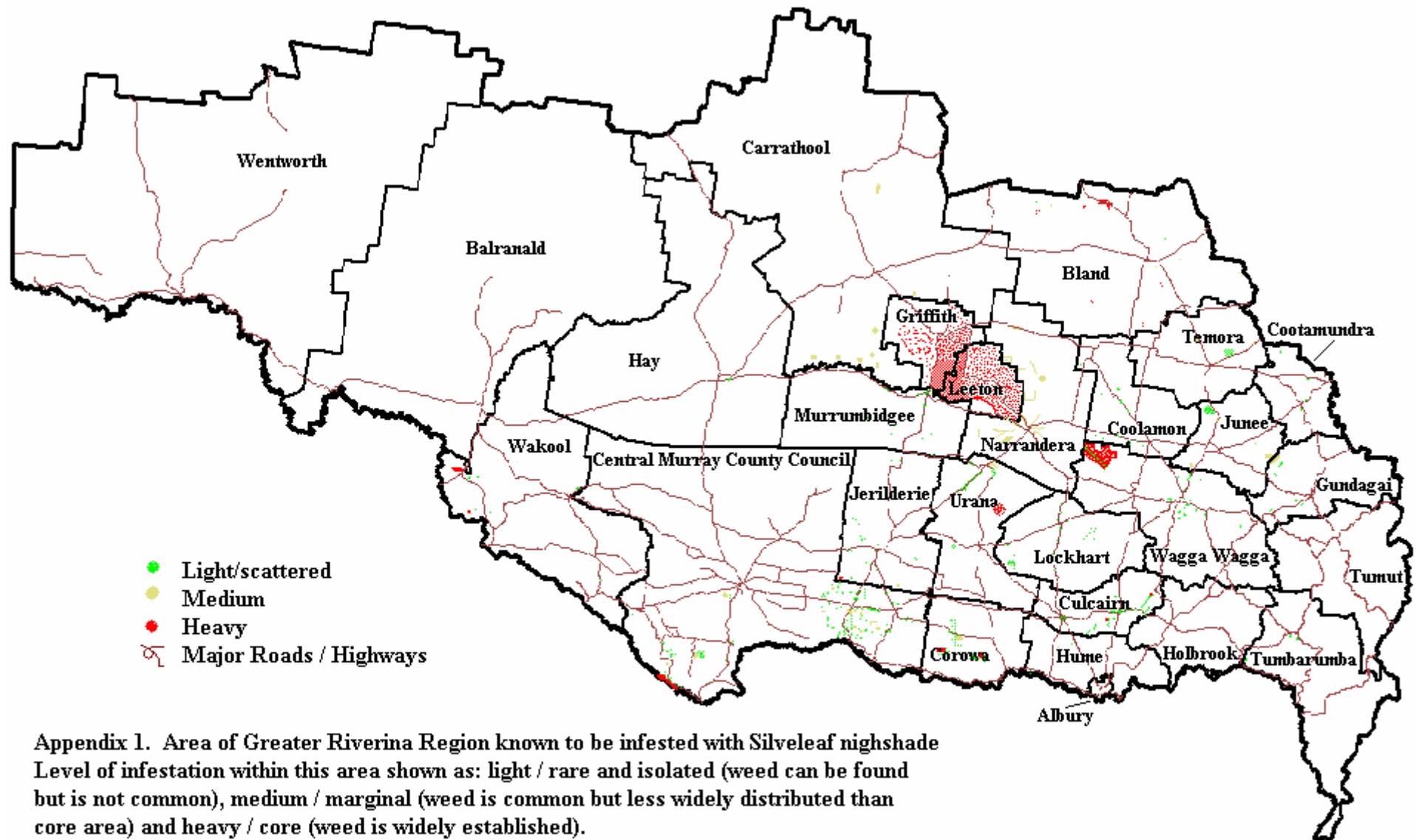
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DISCLAIMER

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Appendix 1. Area of Greater Riverina Region known to be infested with Silveleaf nightshade. Level of infestation within this area shown as: light / rare and isolated (weed can be found but is not common), medium / marginal (weed is common but less widely distributed than core area) and heavy / core (weed is widely established).

Note: Base map derived from data provided by and copyright of Land and Property Information New South Wales. Road data is copyright of the Australian Land Information Group (AUSLIG). This general image determined by the regions, LCA Weeds Officers (WO) and RLPB Rangers (R). Generally, weed distribution remains similar on LCA and RLPB managed lands.