

Glovebox Recording Sheets for Silverleaf Nightshade Demonstration Trials



Improving Strategies for Controlling Silverleaf Nightshade on Your Farm



Department of
Primary Industries



MLA Silverleaf Nightshade (SLN) Research & Extension Project

Silverleaf nightshade (*Solanum elaeagnifolium*) is an introduced weed that can dominate pastures and cropping areas. It reproduces from both seed and root fragments so can be difficult to control. Recent research work has shown the extent of the problem and best management practices. A systematic approach using a “Dual Action” control has been proposed to manage the weed over the growing season from spring to autumn. A summer control is required to prevent seed set and then a follow up spray in autumn will run root reserves down so the plant becomes less competitive to crops and pastures. Using this strategy over a number of years will bring this persistent weed under control.

This project aims to improve adoption of the research to farm communities across wide geographical areas by utilising the Landcare networks and farmer groups to build local knowledge and capacity. On farm demonstrations carried out by farmers will compare current research with the standard farmer practices. The information about different control practices used in each area will be analysed and used to refine the best management practice adapted for the local region.

Farmers are asked to set up test strips of treatments from the suggested list and monitor the impact of these treatments on the SLN population compared to their normal strategies.

What does the farmer need to do?

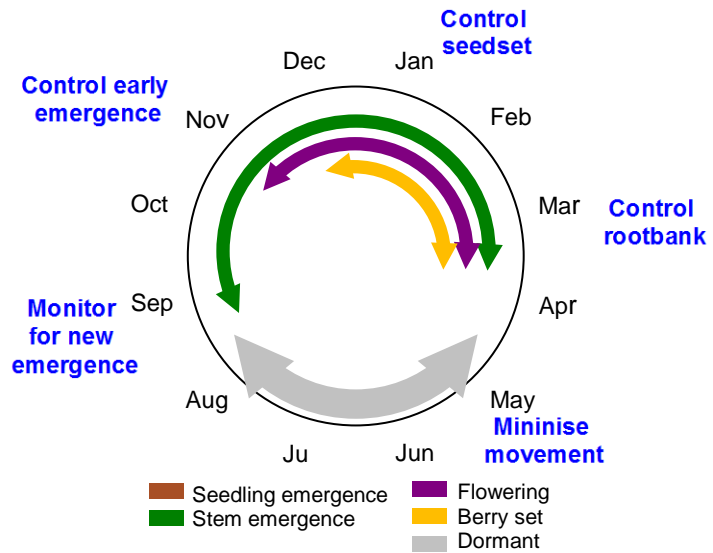
1. Select a paddock with SLN infested areas
2. Select 1 or 2 spray treatments (dual action) from the suggested list to apply as strips across the SLN infested area of the paddock
3. Your current practice on the rest of the paddock will be compared to these selected treatments
4. Leave an untreated strip of the paddock as a control treatment if possible
5. Peg or mark areas on the fence line so that you can keep track of the different treatments
6. Select 5 permanent patches within each treatment strip
7. Count stem numbers before treatments in early summer on the 5 selected permanent patches using a 0.5 m² polypipe ring (described in page 3) for each treatment strip
8. Record weed stem counts on the sheets provided
9. Apply treatments in summer to prevent seed set (1st action)
10. Do a follow up spray in autumn to affect root reserves (2st action)
11. Take digital photographs of each treatment before and after treatment if possible
12. Repeat steps 7, 8, 9, 10 and 11 for the 2nd and 3rd year
13. Provide access to the Landcare or farmer group members to show results over the 3 year project
14. To help understand the issues and context, please do the survey monkey online <https://www.surveymonkey.com/s/SLN2015>

A Best Management Practices (BMP) guide for silverleaf nightshade is available at http://www.csu.edu.au/_data/assets/pdf_file/0010/995878/SLN_BMPguide.pdf

For more information about what is needed to set up demonstration sites contact Phil Bowden, mobile 0427 201 946 or email philbow54@gmail.com
Dr Karen Herbert, mobile 0438 297 319 or kherbert@mli.org.au

Typical Silverleaf Nightshade Growth Cycle

A good strategy involves doing something **all year round**



Summary of Dual Action Approach

	Early action	Late action
Growth stage:	Prior/at flowering	Regrowth (Veg.)
Month:	Dec-Jan	Mar-Apr
	Grazing Slashing Burning or Knockdown herbicides	Picloram-based residue herbicides
	↓ •Seedbank •Stop provision of food •Exhaust the food reserve •Control seedlings	↓ •Rootbank



Paddock Records

To keep track of exactly what has been done we would like you to write the details on these record sheets.

Before spraying each year we would like a weed count done to see what difference each treatment is making.

Weed counts can be done by selecting 5 permanent infested patches along each treatment strip using a 0.5 m² polypipe circle for each treatment strip (details on page 7).

A 0.5m² ring can be made by cutting a 2.5 metre piece of 13mm polypipe and joining the ends.

On the record sheets on the following pages write down the application details at the time of treatment.

Participating grower's details:

- Property name: _____ Town name: _____
- Collaborator name: _____
- Contact details: Phone or Mobile _____
- Email: _____
- Farming enterprise (Please ✓): Cropping Livestock Mixed farming
- Farm size: _____ ha
- Total area affected by SLN: _____ ha; Please ✓: Large infestation (>1 ha, with stem density >1stem/m²); Scattered (<1 ha, with stem density <1stem/m²)
- Trial paddock name: _____
- Soil type (Please ✓): Clay Loam Sand Sandy loam
- Average annual rainfall: _____ mm
- Brief weed history (when and how the infestation occurred):
 - When was SLN first sighted:
 - How SLN came to the paddock?

- Past management of SLN:
 - Crop rotation in the past 3 years:

 - Non chemical options for SLN used in the past:

 - Herbicides used for SLN in the past:
 - Herbicide name and rate:

 - Timing of herbicide application (Please ✓): vegetative few flowers many flowers small green berries mature berries

- Estimated costs of current control methods:
 - Direct control cost (Herbicide, application, labour): _____ \$/ha/year
 - Crop yield: _____ (t/ha) in SLN paddock ; _____ (t/ha) in clean paddock
 - Pasture stocking rate: _____ (Head/ha) in SLN paddock ; _____ (Head/ha) in clean paddock

Suggested Treatments for 'Medium/Heavy' infestation (>1 ha, with stem density >1stem/m²)

Tick selected treatment	1st Action in Summer (December/January when 1 st SLN plant flowers in the paddock. The aim is to stop the seedset - seedbank)	Followed by	2nd Action in late Autumn (April/May prior to the frost. The aim is to kill the root - rootbank)
	Herbicide (rate/ha)		Herbicide (rate/ha)
✓	Grower's current practice (please specify)		
✓	Untreated control strip		
	Glyphosate 540 (2L)		-
	-		Glyphosate 540 (2L)
	Glyphosate 540 (2L)	➔	Glyphosate 540 (2L)
	Glyphosate 540 (2L)	➔	Garlon 600 (300ml)
	Glyphosate 540 (2L)	➔	Starane Advanced (300ml)
	Glyphosate 540 (2L)	➔	Tordon 75-D (2-4L)*
	Garlon 600 (300ml)	➔	Glyphosate 540 (2L)
	Garlon 600 (300ml)	➔	Tordon 75-D (2-4L)*
	Starane Advanced (300ml)	➔	Tordon 75-D (2-4L)*
	Glyphosate 540 (2L)+ 2,4-D amine (750ml)	➔	Tordon 75-D (2-4L)*
	Glyphosate 540 (2L)+ Starane Advanced (300ml)	➔	Tordon 75-D (2-4L)*
	Slashing (mowing) top growth	➔	Tordon 75-D (2-4L)*

*Treatments are effective for root control but care needs to be taken with some treatment selections such as picloram products that may affect following legume crops and pastures in the rotation.

The suggested treatments are for experimental purposes only. Not all the treatments are registered.

The suggested treatments are to decrease the population from 'Medium/Heavy' to 'Scattered' level within 2 years. Once this is achieved, eradication can follow.

Specify your current practice on SLN:

Suggested Treatments for 'Scattered' infestation (<1 ha, with stem density <1stem/m²)

Tick selected treatment	1st Action in Summer (December/January when 1 st SLN plant flowers in the paddock. The aim is to stop the seedset - seedbank)	Followed by	2nd Action in late Autumn (April/May prior to the frost. The aim is to kill the root - rootbank)
	Herbicide (rate/ha)		Herbicide (rate/ha)
✓	Grower's current practice (please specify)		
✓	Untreated control strip		
	Glyphosate 540 (2L)		-
	-		Glyphosate 540 (2L)
	Glyphosate 540 (2L)	→	Glyphosate 540 (2L)
	Glyphosate 540 (2L)	→	Tordon 75-D (2-4L)*
	Starane Advanced (300ml)	→	Tordon 75-D (2-4L)*
	Glyphosate 540 (2L)+ 2,4-D amine (750ml)	→	Tordon 75-D (2-4L)*
	Glyphosate 540 (2L)+ Starane Advanced (300ml)	→	Tordon 75-D (2-4L)*
✓	Tordon 75-D (2-4L)*	→	Tordon 75-D (2-4L)*

*The use of picloram products will speed up the eradication.

'Scattered' populations offer the best opportunity for eradication through manual spot spraying or with Weedseeker Technology.

If spot spraying scattered infestations, each treatment would need to be applied to 5 permanent patches and assess stem numbers in all the patches using the supplied sheets.

Specify your current practice on SLN:

Suggested Treatments for pastures

1. In the summer fallow period, apply glyphosate in December/January when 1st SLN plant flowers and then apply Tordon 75-D to the regrowth in April/May prior to frost.
2. Establish summer active grasses suitable for your region and maintain at least 1.5t/ha dry matter for maximum reduction in growth and seed production of the weed (see note below)
3. 1st Action: Grazing in summer (December/January when 1st plant flowers).
4. 2nd Action: with herbicides in Autumn (April/May).
5. Repeat steps 1 to 3 for 3 consecutive years.
6. Rotate to cereal cropping after 3 years of pasture phase.

Tick selected treatment	1st Action in Summer (December/January when 1 st SLN plant flowers in the paddock. The aim is to stop the seedset - seedbank)	Followed by	2nd Action in late Autumn (April/May prior to the frost. The aim is to kill the root - rootbank)
	Non-chemical options		Herbicide (rate/ha)
✓	Grower's current practice (please specify)		
✓	Untreated control strip		
	Grazing	→	Garlon 600 (300ml)
	Grazing	→	Starane Advanced (300ml)
	Grazing	→	Grazon Extra (2-4L)*
✓	Grazing	→	Tordon 75-D (2-4L)*
	Slashing (mowing)	→	Tordon 75-D (2-4L)*

Due to limited control options available, non-grass pastures such as lucerne or clover should be rotated out to cereal cropping for maximum SLN control.

Multiple years of effective pasture competition together with herbicides should dramatically reduce SLN population to 'Scattered' level. Following an effective pasture phase by rotating to a winter cropping phase offers opportunities for eradication.

Note about Pasture Species

For maximum competitiveness on SLN, a summer active grass species suited to your area, such as Rhodes grass (northern areas) or Tall fescue (southern areas) is recommended.

Chemicals used for SLN weed control may not be compatible with many legume species so addition of hard seeded legume species that will stay viable for several years may be used in the mix. These include subclover, serradella and biserrula.

For heavy infestations, boom spray can be used. For scattered infestations spot spraying is the best option.

Specify your current practice on SLN:

On-farm demonstration layout

(One pass of your spray boom for each treatment)

Grower's Current practice	Treated 1 BMP1	Treated 2 BMP2	Treated 3 BMP3	Untreated	Grower's Current practice
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Stem counts when boom spraying or spot spraying

- Select 5 infested patches along each treatment strip. These will be permanent patches for ongoing counts
- Pre-treatment stem count before the 1st Action in December/January: Count stem numbers in the 5 permanent patches using a 0.5 m² polypipe circle for each treatment strip
- If possible, GPS each point and mark the circle locations with pegs for future counts
- Record the counts in the supplied sheets
- Follow-up stem counts should be made in the same circle areas each year before the 1st Action in December/January

Results Record 2014

Stem Count from 5 permanent patches before 1st Action (0.5 m²)

T'ment	5 stem counts/treatment					Note
	1	2	3	4	5	
1 (Your current practice)						
2 (Untreated control)						
3 (BMP1)						
4 (BMP2)						
5 (BMP3)						
6 (BMP4)						

Land use for this year (Please ✓):

Crop type_____ Pasture type_____ Fallow

Treatment or application Details:

1st action:

Application date: _____

Weather conditions at spraying: T_____°C

Soil moisture (Please ✓): dry moist wet

Weed stage at spraying (Please ✓) : vegetative few flowers many flowers small green berries mature berries

2nd action:

Application date: _____

Weather conditions at spraying: T_____°C

Soil moisture (Please ✓): dry moist wet

Weed stage at spraying (Please ✓) : vegetative few flowers many flowers small green berries mature berries

Results Record 2015

Stem Count from 5 permanent patches before 1st Action (0.5 m²)

T'ment	5 stem counts/treatment					Note
	1	2	3	4	5	
1 (Your current practice)						
2 (Untreated control)						
3 (BMP1)						
4 (BMP2)						
5 (BMP3)						
6 (BMP4)						

Land use for this year (Please ✓): Crop type _____ Pasture type _____
Fallow

Treatment or application Details:

1st action:

Application date: _____

Weather conditions at spraying: T _____ °C

Soil moisture (Please ✓): dry moist wet

Weed stage at spraying (Please ✓) : vegetative few flowers many flowers small green berries mature berries

2nd action:

Application date: _____

Weather conditions at spraying: T _____ °C

Soil moisture (Please ✓): dry moist wet

Weed stage at spraying (Please ✓) : vegetative few flowers many flowers small green berries mature berries

Impact of different treatments on crop or pasture yield?

T'ment	Crop yield (t/ha)	Pasture stocking rate (No/ha)
1 (Your current practice)		
2 (Untreated control)		
3 (BMP1)		
4 (BMP2)		

Results Record 2016

Stem Count from 5 permanent patches before 1st Action (0.5 m²)

	5 stem counts/treatment					Note
T'ment	1	2	3	4	5	
1 (Your current practice)						
2 (Untreated control)						
3 (BMP1)						
4 (BMP2)						
5 (BMP3)						
6 (BMP4)						

Land use for this year (Please ✓): Crop type _____ Pasture type _____
Fallow

Treatment or application Details:

1st action:

Application date: _____

Weather conditions at spraying: T _____ °C

Soil moisture (Please ✓): dry moist wet

Weed stage at spraying (Please ✓) : vegetative few flowers many flowers small green berries mature berries

2nd action:

Application date: _____

Weather conditions at spraying: T _____ °C

Soil moisture (Please ✓): dry moist wet

Weed stage at spraying (Please ✓) : vegetative few flowers many flowers small green berries mature berries

Impact of different treatments on crop or pasture yield?

T'ment	Crop yield (t/ha)	Pasture stocking rate (No/ha)
1 (Your current practice)		
2 (Untreated control)		
3 (BMP1)		
4 (BMP2)		

Results Record 2017

Stem Count from 5 permanent patches before 1st Action (0.5 m²)

T'ment	5 stem counts/treatment					Note
	1	2	3	4	5	
1 (Your current practice)						
2 (Untreated control)						
3 (BMP1)						
4 (BMP2)						
5 (BMP3)						
6 (BMP4)						

Land use for this year (Please ✓): Crop type _____ Pasture type _____
Fallow

Treatment or application Details:

1st action:

Application date: _____

Weather conditions at spraying: T _____ °C

Soil moisture (Please ✓): dry moist wet

Weed stage at spraying (Please ✓) : vegetative few flowers many flowers small green berries mature berries

2nd action:

Application date: _____

Weather conditions at spraying: T _____ °C

Soil moisture (Please ✓): dry moist wet

Weed stage at spraying (Please ✓) : vegetative few flowers many flowers small green berries mature berries

Impact of different treatments on crop or pasture yield?

T'ment	Crop yield (t/ha)	Pasture stocking rate (No/ha)
1 (Your current practice)		
2 (Untreated control)		
3 (BMP1)		
4 (BMP2)		

Contact Details

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