Silverleaf Nightshade Demonstration 2000/2004

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Aim: To demonstrate that herbicides could control and eradicate Silverleaf Nightshade, and foster the wider adoption of the effective treatment(s) by the wider farming community.

Trial Commenced: 24 November 2000
Spraying Stage: Early sucker and mid-berry

Spraying Method: 5m boom spray
Water Rate: 75L/ha
Pressure: **2** Bar

SLN Population: 1,000 to 1,500 stems/plot
Soil Type: Red clay loam

Plot Size: 10m **x** 50m **(5%** ha)
Sample Plot: **4m x** 50m

Background

Silverleaf Nightshade (SLN) is a problematic and entrenched noxious weed in many districts. SLN is a very robust weed. To date there is no product that can be applied to eradicate this weed in one season.

Many fanners have had a long interest in eradicating SLN but have had mixed results with SLN control for a variety of reasons.

Barney Milne, Weeds Research Officer, NSW Agriculture at Orange established many SLN control trials during the early 1990's, which identified 3 treatments as the most likely options that would progress towards eradicating SLN. These treatments are registered for farmer use. They are: (1) monthly 2, 4-D amine applications (treatment 2 in this demonstration); (2) 2, 4-D amine and Starane 200® strategy (treatment 3 in this demonstration); and (3) 2,4-D amine and Roundup CT® strategy (treatment 4 in this demonstration),

Control of this weed is a wearing battle of attrition that is expected to take some five to six years. Deviation from the prescribed management program in a single season may return the site back to "square one" status.

The two spray program is the most practical for most fanners as it is less of a burden on their time. The program established by Barney Milne was to kill the first stems/suckers within 4 weeks of emergence in spring. The plants will re-sucker in 2 to 4 weeks and this further depletes carbohydrate reserves in the rhizomes. It should also even up the onset of berry formation in late summer or early autumn.

Table 1. The annual silverleaf nightshade stem counts.

TREATMENTS	S LN stems/sample area			
	12.11.01	29.10.02	7.11.03	29.10.04
1. Control	616	331	79	13
2. 1.5L/ha 2,4-D amine + l.0L/ha CSO (monthly)	62	49	161	2
3. 1.5L/ha 2,4-D amine + l.0L/ha CSO (1st sucker) + 750ml/ha Starane 200 + l.0L/ha CSO (berry)	34	40	49	1
4. 1.5L/ha 2,4-D amine + l.0L/ha CSO (1st sucker) + 2.0L/ha Roundup CT +2.0L/ha CSO (berry)	78	82	55	1
5. 1.5L/ha 2,4-D amine + l.0L/ha CSO (1st sucker) + 1.0L/ha 2,4-D ester + l.0L/ha CSO (berry)	88	90	112	1
6. 1.5L/ha 2,4-D amine + l.0L/ha CSO (1st sucker) + 600ml/ha Tordon 75D (berry)	91	112	102	3
7. 1.5L/ha 2,4-D amine + l.0L/ha CSO (1st sucker) + 1.5L/ha Tordon 242 (berry)	45	98	60	3
8. 1.5L/ha 2,4-D amine + l.0L/ha CSO (1st sucker) + 4.0L/ha Atrazine 500 + 2.0L/ha CSO (berry)	75	81	80	4
9. 4.0L/ha Atrazine 500 + 2.0L/ha CSO (1st sucker) + 1.5L/ha 2,4-D amine + 1 .0L/ha CSO (berry)	41	107	30	2
Date of Early Berry Formation/Spray Date	5.3.02	25.3.03	13.4.03	

Note: CSO = Caltex Summer Oil
The dates at the top of the column are both the observation date and sucker spraying date.

Best advice suggests that SLN lays down new carbohydrate reserves when it starts to produce berries in late summer or early autumn and it is crucial to SLN persistence. Many perennial plants like lucerne and horehound have key seasonal windows in which to also recruit carbohydrates. It is crucial to time the second spraying with Starane 200® or Roundup CT® with the translocation of carbohydrates into the rhizomes, as it maximises bud death along a greater proportion of the rhizome and prevents viable seed set. Sucker death is slow. Slickers may take 6 to 10 weeks to wilt. The slower the wilting; the greater the translocation of herbicide down the rhizome.

A group of farmers at Gulgong are claiming that progress is being made by applying 2, 4-D amine 500® at four weekly intervals as new suckers appear. It is a highly labour intensive and expensive program but it mitigates the issue of a crucially timed application in early autumn.

Discussion

The treatments in this demonstration are not replicated. We are aiming to show the eradication of SLN from the plot. The plots are 10m wide and 50m long. It is not possible to count plants; we count suckers/stems in the sample area, which is 4m wide and 50m long in the centre of the plot.

The data in Table 1 shows progress is slow; we still have the burden in front of us. What the results do not show is the stems in the control area are tall and healthy in spite of the drought, their stems are usually 20cm to 40cm tall, while the stems in the treated areas are very short and spindly, some are 5 cm to 10cm tall.

Treatments 5 to 9 were included as carryovers from local trials in 1992/93. The two Tordon products were trialled because it was thought that they would kill SLN but the registered rates were very high and unaffordable for broadacre use. We wish to continue with observing

the two Tordon products as we thought they may have useful application opportunities in the cropping or fallowing phase.

To date, progress is satisfactory with the two Tordon's, although the Tordon 242® rate may have been more effective if increased to 2.0 litres per hectare. Using Tordon will remove clovers and medics from the pasture for the next 12 months. The plant back for pulse and oilseed crops is also 12 months. There is no current expectation of registering either Tordon product for SLN at these rates.

Treatment 5 is the local farmers' choice; some claim it is a successful option. Remember Roundup CT® was $12.00/litre in 1992 and Starane 300® was $34.00/litre. Its performance to date is satisfactory.

Some northern farmers indicated that SLN was sensitive to simazine and atrazine. The 1992 local trial confirmed that SLN sensitivity to the foliar application of atrazine. The atrazine treatment was equal in SLN control to that of Roundup CT® treatment in 1993. With the use of simazine in lupin and chickpea crops, and the future use of atrazine tolerant canola, it was hoped that we would have another tool/product to deal with this weed. For fanners outside the district that grow grain or forage sorghums, where atrazine is regularly applied, this is useful information.

SLN is very sensitive to foliar applications of atrazine but having observed late summer suckers emerging in treatment 9, this suggests that residual atrazine on the soil is not effective against the second initiation of suckers. The atrazine sits in the top 5mm of the soil surface and the sucker stems are not establishing surface roots to absorb the herbicide during the current three years of drought. Observations during a wet summer may prove interesting.

Conclusion

We are optimistic that the demonstration is making progress towards eradication; albeit slow. The drought has made progress difficult because I suspect we are not getting the same level of herbicide translocation into the rhizomes as we did in the early 1990's. We are prepared to push on with the demonstration for another two years with the expectation of eradication.

Postscript

Adjoining this demonstration we have planted a small area with four eucalypt species that (anecdotally) have an allelopathic effect on SLN. These eucalypts allegedly produce a toxin to which SLN is very sensitive. An officer with the South Australian Animal and Plant Control Board at Melrose has indicated where they planted these trees the SLN was completely eradicate and never recurred. A report on this project is due in 2008.