SEPTEMBER 2012

SUMMER FALLOW SPRAYING FACT SHEET

GRDC
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NORTHERN, SOUTHERN AND WESTERN REGIONS

IMPLICATIONS FOR NOZZLE SELECTION AND SPRAY QUALITY FROM RECENT TRIAL RESULTS

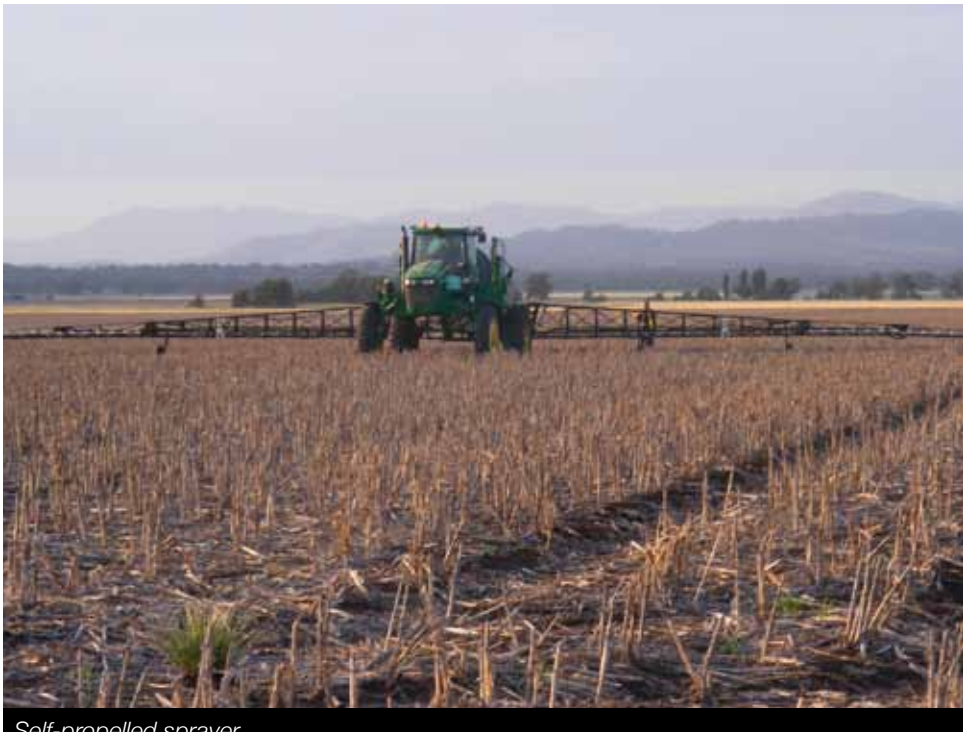
KEY POINTS

- Plan to control summer weeds as early as possible.
- Have the machine ready to go.
- Select an appropriate application volume for the product and situation.
- Choose the coarsest spray quality that will provide efficacy with the products selected.
- Monitor and record application details and weather parameters.

Plan to control summer weeds early and have the sprayer ready to go

If spraying to conserve soil moisture and retain nutrients over summer, early weed fallow control can increase the yield potential of future crops. Waiting for later germinations of summer weeds may not provide the same return on the dollars invested in control measures as a spray program that starts earlier.

Often the most important factor is getting the timing right in relation to weed susceptibility and using a robust rate of product. However, it is worth remembering that delayed control, which will result in reduced moisture and nitrogen in the soil, is better than no control at all.



Self-propelled sprayer

As part of the planning process, ensure that the sprayer is ready to go as soon as it is needed. This means that the sprayer and the mixing equipment are clean and decontaminated, the correct nozzles are available and calibrated, and the machine is functioning correctly.

Select an application volume to match the target weeds, stubble situation and the herbicides' mode of action

The majority of fully translocated herbicides require the use of a coarse spray quality or larger, particularly Group M, Group I and Group B herbicides. When using a coarse spray quality to apply fully translocated products to summer weeds, it is often best to keep water volumes at or above 50 litres per hectare in low stubble environments and at more than 60L/ha as stubble loads increase. Consider using higher application rates for poorly translocated products or when mixingproducts with a high loading of active ingredient.

Choose the coarsest spray quality that will provide efficacy

In situations where sensitive summer crops are grown and there is potential for off-target movement of product to cause damage or result in residues, consider a spray quality that is larger than coarse, such as extremely coarse, to further minimise risk.

Summer fallow trials over the last six years have shown that equivalent efficacy can be obtained for Group I and Group M products with extremely coarse droplets, provided that nozzles are operated appropriately (for example, sufficient pressure with the air induction types).

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What do recent trial results suggest about nozzle type and spray qualities when spraying summer weeds?

In February 2012, a series of three GRDC-funded trials was conducted at Mintaro and Clare, South Australia, by the Hart-Field Site Group Inc and the Mid North High Rainfall Zone Group respectively. The target species for this series of trials were heliotrope (*heliotropium europaeum*) and silver leaf nightshade (*solanum elaeagnifolium*).

Trial 1: Silver leaf nightshade (SLN) control at Clare, SA

Site and treatment details:

- Site location: Clare, mid-north of South Australia
- Spraying date: 1 February 2012
- Site condition: previously a long-term pasture with little residue remaining
- Target species: SLN at various stages from young 10 centimetre plants to mature 60 to 70cm plants at full flowering to early berry set stage; varying density; averaging approximately three plants per square metre
- Spraying conditions: temperature 18.5˚C to 22˚C; humidity 27 to 22 per cent; sunny; delta T 9.75
- Herbicide treatment: Roundup® Attack (570 grams per litre) 1.4L/ha + Amicide® Advance (700g/L) 800 millilitres + oil and non-ionic surfacant (0.5 per cent)
- Nozzle and water rate treatments: See Table 1; rainwater was used as the carrier, products were mixed according to label instructions

Assessment scores showed that the control of SLN progressed from 15 days after treatment (DAT) through to a maximum effect at day 32 DAT. The extremely coarse droplets at 90L/ha gave the highest control at both assessment timings.

At 15 DAT the average control for the 90L/ha water rate (74 per cent) produced significantly greater control compared to the average control for the 60L/ha water rate (64.5 per cent).

However, by 32 DAT the average final results for the 90L/ha water rate (82.4 per cent) were not statistically different to the 60L/ha rate (74.4 per cent).

Trials 2 & 3: Heliotrope control at Mintaro, SA

Site and treatment details:

- Site location: Mintaro, mid-north of South Australia
- Spraying date: 13 February 2012
- Site condition: a bean stubble, with all residue lying on the ground
- Target species: heliotrope, 10 to 20cm high, flowering to seed set, variable density
- Spraying conditions: temperature 29.3˚C to 32.8˚C, humidity 13 to 16 per cent, delta T of 14.5 to 15.5, wind speed average 7.7km/h, gusts to 16.5km/h, very warm afternoon
- Herbicide treatments:
  1. Roundup PowerMax® (540g/L) 1.2L/ha + Amicide® Advance (700g/L) 800ml + Garlon® 85ml/ha + ammonium sulphate 0.5 per cent + LI 700 0.2 per cent
     (Note: ammonium sulphate and LI700 are used at below label rates) OR
  2. Spray.Seed® 1L/ha
- Nozzle and water rate treatments: as per Table 2. Rainwater was used as the carrier, products mixed according to label instructions.

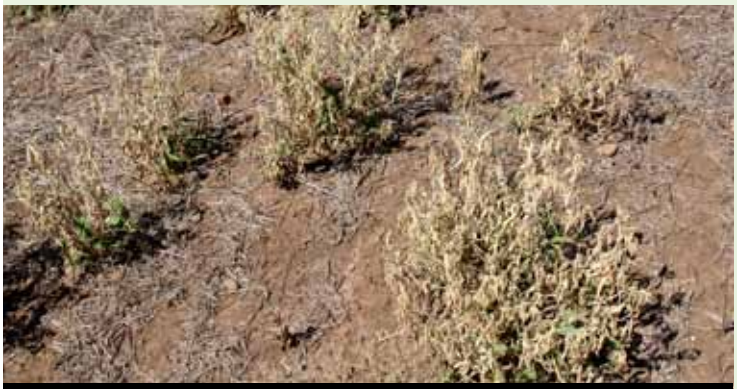
Summary of results for heliotrope trials

Spray.Seed® treatments

At 16 DAT all treatments had over 70 per cent control and by 24 DAT maximum control was 98 per cent. At the lower water volume the alternating extremely coarse treatment produced significantly lower control of heliotrope. Control was improved at the higher water rate to 92.3 per cent, which was not significantly different to the other treatments.

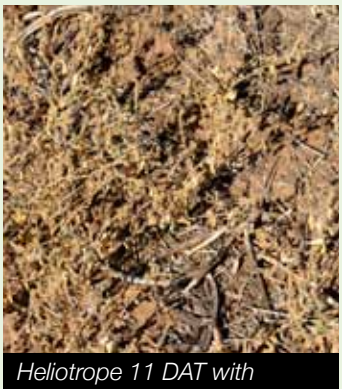
Glyphosate tank mix treatments

Assessment scores for the glyphosate mix at 16 DAT were almost all under 35 per cent control, but by the final assessment at 24 DAT, only two treatments were under 65 per cent. At 16 DAT the coarse air inducted (34.4 per cent) treatment had produced significantly greater control. However, eight days later there was no significant difference between the droplet size treatments. The coarse air inducted treatment was still the best. There was no significant difference between water rates.



Silver leaf nightshade 32 DAT with glyphosate tank mix.

Heliotrope 0 DAT.



Heliotrope 11 DAT with SpraySeed 1L/ha.

Table 1 Treatments, details and results for silver leaf nightshade trial conducted at Clare, SA, 1 February 2012. Least significant difference (LSD) for dessication at 32 days after treatment (DAT) was 13.3.

Water rate (L/ha)	Nozzle type and size	Pressure (bar)	Speed (km/h)	Spray quality	% dessication at 32 DAT (Note: Results with the same letter are not significantly different from one another.)
nil	Untreated control	nil	nil	nil	nil
60 L/ha	Turbo Teejet® TT11002-VP (forward)	3	17	Medium (M)	67.5 c
	Lechler IDK 12002	3	17	Coarse (C)	73.8 bc
	Turbo Teejet® Induction TTI11002-VP (all facing forwards)	3.5	17	Extremely coarse (XC)	76.2 bc
	Turbo TwinJet® TTJ60-11002VP	3	17	Coarse (C)	82.5 a
	Turbo Teejet® Induction TTI11002-VP (alternating forward and backward)	3.5	17	Extremely coarse (XC)	72.0 bc
nil	Untreated control	nil	nil	nil	nil
90 L/ha	Turbo Teejet® TT11003-VP (forward)	4	17	Medium (M)	83.2 ab
	TeeJet® AIXR110025VP	4	15	Coarse (C)	81.2 ab
	TurboTeejet® Induction TTI 11002-VP (all facing forward)	4	12	Extremely coarse (XC)	92.0 a
	Teejet® AITTJ60-11002VP	4	15	Coarse (C)	77.0 bc
	Turbo Teejet® Induction TT11002-VP (alternating forward and backward)	4	12	Extremely coarse (XC)	78.8 abc

Table 2 Treatments details for Heliotrope trials conducted at Mintaro, SA, February 2012.

Water rate (L/ha)	Nozzle type and size	Pressure (bar)	Speed (km/h)	Spray quality
Nil	Untreated control	nil	nil	nil
60L/ha	Turbo Teejet® TT11002-VP (forward)	4	18	Medium (M)
	TeeJet® AIXR11002VP	4	18	Coarse (C)
	Turbo TwinJet® TTJ60-11002VP	3	16	Coarse (C)
	TeeJet® AITTJ60-11002VP	4	18	Coarse (C)
	Turbo Teejet® Induction TTI11002-VP (alternating forward and backward)	4	18	Extremely coarse (XC)
Nil	Untreated control	nil	nil	nil
90L/ha	Turbo Teejet® TT110-025-VP (forward)	4	15	Medium (M)
	TeeJet® AIXR110025-VP	4	15	Coarse (C)
	Turbo TwinJet® TTJ60-110025VP	3	15	Coarse (C)
	Teejet® AITTJ60-11002VP	4	15	Coarse (C)
	Turbo Teejet® Induction TTI1102-VP (alternating forward and backward)	5	14	Extremely coarse (XC)

Table 3 Results for the heliotrope trails at Mintaro, SA, February 2012.

Water rate (L/ha)	Nozzle type and size	Spray quality	Spray.Seed® % dessication		Glyphosate mix % stunting	
			16 DAT	24 DAT	16 DAT	24 DAT
			(Note: Results with the same letter are not significantly different from one another.)			
60 L/ha	Untreated control		0.0	0.0	0.0	0.0
	Turbo Teejet® TT11002-VP (forward)	Medium (M)	87.5	92.5a	27.5	72.5ab
	TeeJet® AIXR11002VP	Coarse (C)	88.8	98.0a	30.0	78.8a
	Turbo TwinJet® TTJ60-11002VP	Coarse (C)	88.8	94.0a	30.0	68.8ab
	TeeJet® AITTJ60-11002VP	Coarse (C)	92.5	93.8a	27.5	70.0ab
	Turbo Teejet® Induction TTI11002-VP (alternating forward and backward)	Extremely coarse (XC)	72.5	82.5b	25.0	63.8b
90 L/ha	Untreated control		0.0	0.0	0.0	0.0
	Turbo Teejet® TT110-025-VP (forward)	Medium (M)	92.0	94.5a	23.8	63.8b
	TeeJet® AIXR110025-VP	Coarse (C)	89.5	95.5a	25.0	68.8ab
	Turbo TwinJet® TTJ60-110025VP	Coarse (C)	85.0	95.5a	38.8	72.5ab
	Teejet® AITTJ60-11002VP	Coarse (C)	94.8	96.8a	18.8	61.2b
	Turbo Teejet® Induction TTI1102-VP (alternating forward and backward)	Extremely coarse (XC)	86.0	92.3a	21.2	66.2b
		LSD (0.05)	8.6	5.9	8.3	11.5

Implications for summer spraying

For summer spraying, coarse spray qualities and larger generally perform as well as, or often better than, medium spray qualities. In situations where excellent drift control is required, the use of extremely coarse spray qualities can provide equivalent efficacy for many treatments. However, in this trial and some previous trials a reduction in efficacy is occasionally observed on some targets, and with some tank mixes.

A TTI nozzle that produces an extremely coarse spray quality has resulted in reduced efficacy in situations such as where tank mixes have included triclopyr products, where oil-based adjuvants have been used, where larger than an 02 orifice has been used and where the nozzle pressure was below 4 bar.

Other important factors to consider for summer spraying include:

- correct mixing order and suitable spray water quality;
- monitoring and recording meteorological parameters during the application;
- avoiding surface temperature inversion conditions; and
- recording the application details and the results of the spray job.

FREQUENTLY ASKED QUESTIONS

When should I consider using an extremely coarse spray quality?

Extremely coarse spray qualities reduce drift potential by reducing the amount of airborne droplets by up to 80 per cent of those produced by a standard coarse spray quality. Larger droplets also increase the time that the chemical stays in solution before the water fully evaporates, so they are useful in harsher spraying conditions.

Larger droplets are better suited to fully translocated and soil applied products. However, at higher application volumes they can also be used on larger targets for some products with minimal translocation. Always consult the label and/or manufacturers' recommendations for recommended spray quality.

Do twin nozzles improve control of summer weeds?

Twin nozzles that produce a coarse spray quality generally perform very well in trials where the speed is not more than 21km/h. In situations where larger weeds are present they can improve control. However, in most situations, factors such as timing, rate of product, water volume, the sprayer's forward speed and boom height will have a greater impact on control than the nozzle design.

USEFUL RESOURCES:

Nozzle selection for boom, band and shielded spraying Back Pocket Guide

GRDC Fact Sheets: spray mixing requirements, spray water quality, weather monitoring equipment, surface temperature inversions and spraying
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MORE INFORMATION

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