Spray resistant radish early for best efficacy and yield

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Key messages

- Know your resistance status and your best mode of action for success.
- Spray early for best efficacy, spray coverage on weeds and preservation of yield.

Aims

Demonstrate that early application of herbicides on a dense stacked resistant radish population is optimum in controlling weeds and preserving grain yield.

Method

This trial was at Paul Messina's farm (JERICHO) at South Yuna. This site was an application by timing trial on a very high density population. Plots were 25m x 2m x 3 reps. A large scale herbicide resistance screen was also conducted at the property. The JERICHO trial was a 2 time of application trial, with treatments applied at either 2 leaf (Z12) or 5 leaf (Z15) of the crop, on a high density radish site of approximately 80 radish plants /$m^{2.}$

Weeds were cotyledon to 2 leaf at Z12, or 4-6 leaf and up to 20cm at Z15.

Table 1 Herbicide treatments applied at 2 or 5 leaf stage of the crop.

Trt	Herbicide	Rate		Herbicide/ Adjuvant	Rate		Adjuvant	Rate	Growth Stage
1	NIL								
2	Jaguar®	750	ml/ha						Z12
3	Velocity®	500	ml/ha	Hasten®	1	%			Z12
4	Jaguar®	800	ml/ha	MCPA LVE 570	440	ml/ha			Z15
5	Velocity®	670	ml/ha	MCPA LVE 570	440	ml/ha	Hasten®	1%	Z15
6	Logran®	10	g/ha	MCPA LVE 570	440	ml/ha	Hasten®	1%	Z15
7	Aptitude®	200	ml/ha	MCPA Amine 500	500	ml/ha			Z15

These spray treatments were applied with an AGROTOP AIRMIX 110 01 nozzle at 2 bar at 98L/Ha at 4km/hr.

Resistance Profile of the trial site population: Jericho

In Field Resistance screen Landmark R and D / Robert Alderman & Grant Thompson – weeds 2-4 leaf.

- 81% survival to 30g Logran (B)
- 43% survival to 2L Atrazine (C)
- 57% survival to 200ml Brodal® (F) 40% survival to 400ml Brodal®
- 15% survival to 800ml 2,4-D Ester (I), 12% survival to 1600ml 2,4-D Ester.
- 62% survival to 500ml Intervix® (B)
- 8% survival with 500ml Velocity® (H & C)

Results

Table 2 shows that there is a significant yield improvement of between 22-36% by spraying radish at this site. More importantly, there is an improvement in efficacy when wild radish is sprayed early before shading occurs. Even when MCPA (grp I), a systemic herbicide, is added to Jaguar at the later 5 leaf spray timing, radish control declined compared to the early Jaguar spray at 2 leaf.

Velocity achieved the highest level of control (100%) at 2 leaf, but when MCPA was added and sprayed at 5 leaf, still achieved 100% control and did not suffer a reduction in efficacy like the Jaguar + MCPA treatment. The Velocity based treatments (trt 3 & 5) were also 10-13% higher yielding than the Jaguar based treatments (trt 2 & 4). The data clearly shows that herbicide choice and time of application are both important factors in achieving the best weed kill and highest grain yield.

Table 2 Efficacy 76DAA (%) and Crop Yield (t/ha) of treatments at 2 different times of application at the JERICHO site

At East Yuna.

Trt	TREATMENTS								Efficacy 76DAA %	Yield as % of untreated	Yield kg/ha
1	NIL								0	100%	1400
2	Jaguar	750	ml/ha					Z12	96	**126%**	1768
3	Velocity + Hasten	500	ml/ha	1	%			Z12	**100**	**136%**	1911
4	Jaguar + MCPA LVE 570	800	ml/ha	440	ml/ha			Z15	67	**123%**	1722
5	Velocity + MCPA LVE 570 + Hasten	670	ml/ha	440	ml/ha	Hasten	1%	Z15	**100**	**136%**	1905
6	Logran + MCPA LVE 570 + Hasten	10	g/ha	440	ml/ha	Hasten	1%	Z15	43	**122%**	1701
7	Aptitude + MCPA Amine 500	200	ml/ha	500	ml/ha			Z15	48	**127%**	1774
								LSD 0.01	120	20.00	280.42
								LSD 0.05	85	14.00	200.01
								CV	74	0.00	6.46

*Radish pod contamination of the nil sample was significant. Yield of wheat grain had to be estimated based on proportion of radish pod to wheat grain.

Conclusion

The trial work conducted shows the importance of spraying at the earliest possible timing when a population is known to be resistant to several modes of action. Given the poor activity from Brodal SC (Group F) in the resistance screen, the early spray of 750ml of Jaguar (F & C) still gave very acceptable results on cotyledon to 2 leaf radish. The data also shows that herbicide mixes containing Velocity (Group H & C) are highly effective and reliable when used on large and small weeds. The trial also shows that there are significant improvements in efficacy and grain yield by implementing an early spray strategy when radish density is high. This season had a significant dry spell for most of June, which may have increased the grain yield losses from poor weed control. Yield gains of up to 500kg/ha were achieved at this site from spraying early compared to no spraying at all.

Treatments 3 and 5 were the highest yielding treatments. Both contained Velocity and achieved 100% control of radish and a very fast burn-down of weeds.

The data also clearly shows that knowledge of the herbicide resistance status is important. Treatment 6 (Group I and B) and Treatment 7 (Groups I, C, G) clearly underperformed and is not unexpected given the in-field resistance screen results mentioned earlier.

This data may also help to decide, when using a 2 spray strategy on resistant radish, whether Jaguar or Velocity should be used at the first early 2 leaf timing. In this case, both 750ml Jaguar and 500ml Velocity work well early achieving 96% and 100% radish control respectively, at Z12. At the later timing, the 800ml Jaguar + 440ml MCPA treatment fell away to achieve only 67% control whereas the 670ml Velocity + 440ml MCPA treatment still achieved 100% control (NSD). This would suggest that, in a similar scenario, where group I and F tolerance is present, that Jaguar would be more reliable when applied at 2 leaf and the Velocity based mixtures should be applied at 5 leaf to ensure the best efficacy from both sprays.

Key Words

Wild Radish, Herbicides, Multiple Herbicide Group Resistance

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