

Radish control in wheat

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The aim of this replicated trial was to control the population of wild radish in wheat, reducing its competitive effect and subsequent plant numbers prior to flowering. Once at flowering the control of seed set using a phenoxy herbicide will be most successful.

Summary: The trial determined that Tigrex, Paragon, Glean, Affinity + MCPA500, Eclipse + MCPA LVE, and Jaguar + MCPA LVE provide good early post emergent control of radish in wheat. To ensure that no radish sets seed it is still important to follow up with a phenoxy herbicide later in the season. In this trial Jaguar + MCPA LVE had the highest wheat yield.

Background

Wild radish (*Raphanus raphanistrum*) is one of the most competitive and persistent broad-leaved weeds of cropping systems in southern Australia. Despite 45 years of chemical control, wild radish continues to be one of the most common weeds of crops and is spreading into the Mallee. With as few as 10 plants per square metre wheat yield can be reduced by 20%. Research by the CRC for Weed Management Systems has shown how one wild radish plant per square metre is enough to replenish the seed-bank and incur ongoing economic losses.

The spread and dominance of wild radish as a weed of cereals is largely due to contamination of grain by pod segments. Intensified rotations with canola and pulses, make it more difficult to control radish with a lack of post-emergent herbicides. To control radish it is essential to reduce seed set during the cereal phase of a rotation when more herbicide options are available.

Methods

The trial site was located approximately 25km south of Charlton on a red duplex soil. Radish is a problem weed on the property and is kept in check by an intensive herbicide program. The trial site was sown with Silverstar wheat at 90kg/ha, with Mallee Mix 1 at 80 kg/ha and Urea at 80 kg/ha (as a single pass operation) on July 3, 2001. Prior to sowing the site was sprayed with RoundUpXtra at 2 L/ha.

Herbicide treatments were applied at the 4 leaf stage of wheat, at this time the wild radish was between 8 and 25cm in diameter. Treatments were fully replicated:

Treatment rate/ha	Active ingredient	Herbicide Group	Cost \$/ha
Diuron 0.4L + MCPA500 0.3L	diuron + MCPA amine	C + I	
Tigrex 0.75L	diflufenican + MCPA ester	F + I	
Paragon 0.37L	picolinofen + MCPA ester	F + I	
Hussar 150g + 0.25% wetter	iodosulfuron-methyl-sodium	B	
Diuron 1L PSPE then Glean 25g + 1% oil	diuron + chlorsulfuron	C + B	
Affinity 60g + MCPA500 0.5L	carfentrazone-ethyl + MCPA amine	G + I	
Eclipse 7g + MCPA LVE 0.5L + 1% oil	metosulam + MCPA ester	B + I	
Jaguar 0.3L + MCPA LVE 0.3L	diflufenican + bromoxynil + MCPA ester	F + C + I	

At wheat head emergence the site was sprayed with 2,4 D Amine at 1.5L/ha to ensure that there was no wild radish seed set from escapes of earlier herbicide treatments . The control plots were mown because the radish population was too high and had caused significant damage to the wheat crop.

Results

There was a significant difference in the effect of the herbicides on control of wild radish. Diuron + MCPA and Hussar had a significantly lower damage score rating compared to the other treatments. There were also significant differences between the herbicide impact on the wheat crop, however the ratings were all less than 3.0 which indicates that no long term damage was expected. The Jaguar + LVE treatment had a significantly higher yield than the other treatments. Yields at the site were low due to the dry season (XXXmm GSR).

Table 1. Effect of herbicide treatments on damage scores of radish and wheat, and wheat yield.

Treatment	Damage score radish#	Damage score wheat#	Yield t/ha
Diuron+MCPA500	5.4	1.4	1.5
Tigrex	8.4	2.8	1.3
Paragon	8.4	2.3	1.3
Hussar	6.3	1.4	1.5
DiuronPSPE+Glean	8.6	1.2	1.3
Affinity+MCPA500	9.0	1.2	1.3
Eclipse+MCPA LVE	8.1	1.2	1.5
Jaguar+LVE	8.7	2.6	1.8
Significant difference	P<0.05 LSD=0.6	P<0.05 LSD=0.7	P<0.05 LSD=0.3

visual assessment of damage: 1 = no affect, 5 = damage expected to result in yield loss, 9 = dead

Interpretation

Diuron and MCPA500 is only a short term herbicide option for the suppression of wild radish. Hussar at 150g/ha was not effective enough, however the rate used was too low for effective control. Hussar at 200g/ha would have been more effective, but at high populations of radish even this rate would not offer control. The other herbicide options used in the trial were more effective and also provided some residual control. One of the most effective options, which also ended up yielding the highest, was Jaguar + LVE.

Commercial Practice

For effective radish control in wheat it is essential to:

1. control radish at the early growth stages to reduce the competitive effect on the wheat
2. control radish seed set with a phenoxy herbicide late in the season to control seed set

This can be achieved by utilising one of the many herbicide options available in wheat. The most effective in this trial were Tigrex, Paragon, Glean, Affinity + MCPA500, Eclipse + MCPA LVE, and Jaguar + MCPA LVE. The latter option also had the highest yield in this trial.

Regardless of the effectiveness of the early post emergent herbicides used, it is essential, in a situation with high radish pressure, to spray a phenoxy herbicide late in the season to ensure the radish does not set seed.