

Clethodim Damage in Canola- the Impact of Tank Mixing Other Herbicides or Additives- Dubbo 2016

Trial Code: GOCD00316-2
Season/Year: Winter 2016
Location: 'Larrys Plains' Geurie
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Keywords

GOCD00316, clethodim, damage, canola, ryegrass, herbicide, tank mixes, Dubbo

Take home message

Tank mixing other common herbicides or sulfate of ammonia (SOA) with clethodim when applied to canola did not appear to exacerbate flower or yield damage in canola

Background

Increasing levels of Group A – 'fop' resistance and the drop in retail pricing of clethodim herbicides¹ has driven an increase in both frequency of use and rates applied of these products in canola. At the same time there has been a marked increase in reports of clethodim damage, possibly related to higher rates and frequency. It is well known that clethodim can at times cause some level of crop damage but conditions that result in this expression or its actual impact on yield have not been adequately documented.

Trial research by GOA from 2013 investigated what might trigger damage to canola by studying application rates and timings of clethodim. In summary the research found that damage was generally only evident when clethodim was applied at timings and rates outside of label recommendations. However, even when obvious clethodim crop damage was observed, yield impacts, if any were often mild.

In contrast, research conducted by the Hart Group in South Australia, found significant yield impacts from clethodim damage when applied outside label recommendations. They also observed some varietal differences in crop tolerance to clethodim. Subsequent investigation of a number of varieties by GOA in 2015 did not find major differences in susceptibility to clethodim.

As GOA has been unable to replicate observed field level clethodim damage in commercial crops, investigation has moved on to assess the potential influence of tank mix partners may have on the occurrence and severity of canola crop damage. Clethodim is often applied with a number of other products; water conditioners such as sulfate of ammonia (SOA), other herbicides and insecticides, oils, wetters or fertilisers. GOA is investigating if some common tank mix options are contributing to observed commercial crop damage.

¹ Example trade names- Select®, Platinum®, Status®, Clethodim 240

DISCLAIMER

Following is a report on a scientific experiment. It may contain some herbicide treatments that are not registered for the situation, manner or rate at which they are used in this trial. This document or anything else resulting from, construed or taken from this or by GOA or its representatives should not be taken as a suggestion, recommendation or endorsement of any unregistered herbicide uses.

Aim

Investigate if the addition of additional herbicides or spray additives to clethodim and Uptake contributed to an increase in “clethodim damage” in canola.

Methods

Small plots, using a randomised complete block design with three replicates, was used for the trial.

A number of tank mix options were identified and applied to either a Clearfield or triazanine tolerant (TT) variety, see **Error! Reference source not found.**

Table 1. Trial site details

Trial Establishment Date	Autumn, 2016		
Crop and Variety	TT: ATR Gem CL: 44Y89	Targeted plant populations	45 plants/m ²
Sowing date	3/5/2016	Harvest Date	15/11/2016
Seedling equipment	Double Boot Tyne	Row Spacing	27.5 cm
Crop Nutrition (kg/ha)	150 Trifos + 200 Urea	Soil type	Sandy Clay Loam
Previous Crop	Lancer Wheat (4T/ha)	Pre-Sowing Stubble Management	Cultivated

Treatments consisted of 14 clethodim tank mixes (8 CL and 6 TT) as detailed in the table below.

Trial treatments were applied by hand boom calibrated to apply 100L/ha of spray mixture through AIXR015 nozzles at 3 Bar pressure. Rainwater was used as the spray carrier.

Treatment were applied when canola was 6 leaf. Buds were not visible and the crop was not yet elongating. This timing was towards the end of the ideal application windows in an effort to enhance any differences between treatments

The trial area had a low population of weeds after establishment and received an early post emergent application of Verdict™ and Lontrel™ Advance to remove any weed burden prior to treatment with clethodim.

Assessment was made at peak flowering for any level of flower abnormality and yields assessed by plot header.

Results were analysed by ANOVA and results compared by using LSD method with a 95% confidence interval. Any references to differences between treatments should be assumed to be statistically different unless otherwise stated.

Table 2. Treatment list

Product/timing	Rate (mL/ha), (g/ha) or % of spray volume	Variety
Nil (Y89)	nil	44Y89
Clethodim + Uptake™	500 + 0.5%	44Y89
Clethodim + SOA + Uptake™	500 + 800 + 0.5%	44Y89
Clethodim + Lontrel Advance™ + Uptake™	500 + 150 + 0.5%	44Y89
Clethodim + Lontrel Advance™ + SOA + Uptake™	500 + 150 + 800 + 0.5%	44Y89
Clethodim + Intervix® + Uptake™	500 + 500 + 0.5%	44Y89
Clethodim + Intervix® + SOA + Uptake™	500 + 500 + 800 + 0.5%	44Y89
Clethodim + Intervix® + Lontrel Advance™ + Uptake™	500 + 500 + 150 + 0.5%	44Y89
Clethodim + Intervix® + Lontrel Advance™ + SOA + Uptake™	500 + 500 + 150 + 800 + 0.5%	44Y89
Clethodim + atrazine + Uptake™	500 + 1100 + 0.5%	ATR Gem
Clethodim + atrazine + SOA Uptake™	500 + 1100 + 800 + 0.5%	ATR Gem
Clethodim + atrazine Lontrel Advance™ + Uptake™	500 + 1100 + 150 + 0.5%	ATR Gem
Clethodim + atrazine Lontrel Advance™ + SOA Uptake™	500 + 1100 + 150 + 800 + 0.5%	ATR Gem
Clethodim + Lontrel Advance™ + Uptake™	500 + 1500 + 0.5%	ATR Gem
Clethodim + Lontrel Advance™ + SOA Uptake™	500 + 150 + 800 + 0.5%	ATR Gem
Nil (ATR Gem)	Nil (ATR Gem)	ATR Gem

Results

Full results and statistical analysis are listed in Annex 1.

Only a small number of plots were observed with minor flower damage.

Yield: There was no impact of any of the applied treatments on yields when compared to untreated control. Nor were there any yield differences of the Clearfield variety when clethodim tank mixes were compared to application of clethodim only treatment.

Oil: There were no statistical differences in oil content.

Discussion

Application of a number of common clethodim tank mixes on canola did not result in any significant flower damage, yield reductions or oil effects over the use of clethodim and uptake alone.

It is noted that 2016 was quite mild growing conditions with good moisture. There were also fewer reported incidences of clethodim damage than normal on commercial farms which could indicate seasonal conditions were no conducive to damage.

As such it is from this trial alone unclear as to whether tank mixes with clethodim do increase damage and further work across a range of seasons may be warranted .

Conclusion

There was no indication from this trial that the addition of additional tank mix herbicides or SOA to clethodim when applying to canola results in anymore flower damage or result in yield damage in canola. However further work is required to confirm this is universal across varying seasons.

Acknowledgements

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Annex 1. Treatment list and results

Note all treatments with the exception of the untreated control were tank mixed with Clethodim and Uptake, rates are listed below

	Variety	Product and rate	Oil (%)	Groups	Yield (t/ha)	Groups
1	44Y89	Untreated Control	44.7	n.s.	2.8	abcd
2	44Y89	Clethodim and Uptake only	44.7	n.s.	2.7	abcd
3	44Y89	SOA	45.0	n.s.	2.6	abcdef
4	44Y89	Lontrel Advance™	44.9	n.s.	2.5	cdefg
5	44Y89	Lontrel Advance™ + SOA	44.8	n.s.	2.7	abcde
6	44Y89	Intervix	44.5	n.s.	2.8	abc
7	44Y89	Intervix + SOA	45.2	n.s.	2.9	a
8	44Y89	Intervix + Lontrel Advance™	44.9	n.s.	2.8	ab
9	44Y89	Intervix + Lontrel Advance™ + SOA	44.8	n.s.	2.5	bcdefg
10	ATR Gem	Atrazine	45.3	n.s.	2.2	g
11	ATR Gem	Atrazine + SOA	45.4	n.s.	2.4	efg
12	ATR Gem	Atrazine + Lontrel Advance™	44.7	n.s.	2.4	efg
13	ATR Gem	Atrazine + Lontrel Advance™ + SOA	45.2	n.s.	2.3	fg
14	ATR Gem	Lontrel Advance™	45.1	n.s.	2.3	g
15	ATR Gem	Lontrel Advance™ + SOA	45.1	n.s.	2.3	g
16	ATR Gem	Untreated Control	45.4	n.s.	2.5	defg
		LSD	1.1		0.3	

Product	Rate
Atrazine	1100g/ha
Intervix	500mL/ha
Clethodim	500mL/ha
Lontrel Advance™	150mL/ha
Uptake Oil	0.5% v:v
SOA	800g/ha