

GOA Trial Site Report

Is potential clethodim damage in canola greater in tank mixes?

Trial code: GOCD00318.

Year: Winter 2018.

Location: 'Spicers Run', Spicers Creek.

Trial co-operators: Sam and Joe Mason.

Keywords

GOCD00318, clethodim, damage, canola, ryegrass, herbicide, tank mixes, Clearfield, triazine, Wellington

Key findings

- There was no effect on yield any of the treatments compared to the untreated plots.
- No treatments had significant numbers of effected flowers, although a very small number of plants were observed with club or stuck flowers.
- Oil % was not affected by any of the clethodim treatments.

Background

Increasing levels of Group 1 (previously Group A), 'fop' herbicides resistance and the drop in retail pricing of clethodim herbicide¹ has driven an increase in use and of rates applied of these products in canola. There has been increased reports of clethodim damage recently, possibly related to these higher rates and use frequency. It is well known that in some cases clethodim can cause crop damage, but conditions that favour this or the actual yield effects, have not been well studied.

Trial research by Grain Orana Alliance (GOA) from 2013 investigated triggers might cause clethodim damage to canola focused on application rates and timings. The research found that damage was only evident when clethodim was applied at timings and rates outside of label recommendations. However, when clethodim crop damage was observed, yield impacts, if any, were often low.

In contrast, research conducted by the Hart Group in South Australia, found significant yield effects from clethodim damage when applied outside label recommendations. This research also observed some varietal differences in the crops clethodim tolerance. Experiments on several varieties by GOA in 2015 did not find major differences in clethodim susceptibility.

As GOA has been unable to replicate clethodim damage in the field in commercial crops, they are now aiming to trial if tank mix partners may influence the occurrence and severity of clethodim crop damage. Clethodim is often applied with several other products:

- water conditioners, such as sulfate of ammonia (SOA)
- other herbicides and insecticides
- oils, wetters or fertilisers.

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

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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

To investigate the effects of clethodim in various tank mixes on canola and if these mixes contribute to crop damage the GOA region.

Methods

The trial was conducted with:

- small plots
- using a randomised complete block design
- three replicates
- Two variety types: Clearfield® (CL) or triazine tolerant (TT) variety, see **Error! Reference source not found..**

Table 1. Trial site details

Establishment date	Autumn, 2018		
Crop and variety	TT: 44T02 CL: 44Y90	Targeted plant populations	45 plants/m ²
Sowing date	31/5/2017	Harvest date	20/11/2018
Seedling equipment	Knife point, press wheel	Row spacing	27.5 cm
Crop nutrition (kg/ha)	100 MAP	Soil type	Sandy clay loam
Previous crop	Pasture	Pre sowing stubble management	Cultivated

- Treatments: 16 clethodim tank mixes (8 Clearfield® and 6 Triazine tolerant) and an unsprayed plot of each variety/technology at a water rate of 100 L/ha (Table 2).
- Treatments applied: where the bud was clearly visible and elongating.
- The trial was located on the upper slope of a hill and a mild frost was experienced on the morning prior to application (Figure 1).
- The trial had a low weed population after establishment and received an early post-emergent application of Verdict™ and Lontrel™ Advance to remove weed prior to the clethodim treatment.

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Table 2. Treatment list

Product/timing [^]	Rate (mL/ha)	Variety
Nil (Clearfield®)	0	44Y90
Clethodim	500	44Y90
Clethodim + SOA	500 + 800	44Y90
Clethodim + Lontrel Advance™	500 + 150	44Y90
Clethodim + Lontrel Advance™ + SOA	500 + 150 + 800	44Y90
Clethodim + Intervix®	500 + 500	44Y90
Clethodim + Intervix® + SOA	500 + 500 + 800	44Y90
Clethodim + Intervix® + Lontrel Advance™	500 + 500 + 150	44Y90
Clethodim + Intervix® + Lontrel Advance™ + SOA	500 + 500 + 150 + 800	44Y90
Clethodim	500	44T02
Clethodim + atrazine	500 + 1100	44T02
Clethodim + atrazine +SOA	500 + 1100 + 800	44T02
Clethodim + atrazine + Lontrel Advance™	500 + 1100 + 150	44T02
Clethodim + atrazine + Lontrel Advance™ + SOA	500 + 1100 + 150 + 800	44T02
Clethodim + Lontrel Advance™	500 + 150	44T02
Clethodim + Lontrel Advance™ + SOA	500 + 150	44T02
Clethodim + SOA	500 + 800	44T02
Nil (triazine tolerant)	0	44T02

[^] Uptake oil with all clethodim treatments at 0.5%

Table 2. Application data

Date Applied	14/8/2018	Temperature (°C)	14	Wind direction	SSW	Comments
Start time	10:00	Wind (km/ha)	8-10k	Humidity (%)	54.8	
Finish time	11.30	Δt	7.4	Pressure (bar)	3	
Water rate	100L/ha	Equipment	Hand boom			

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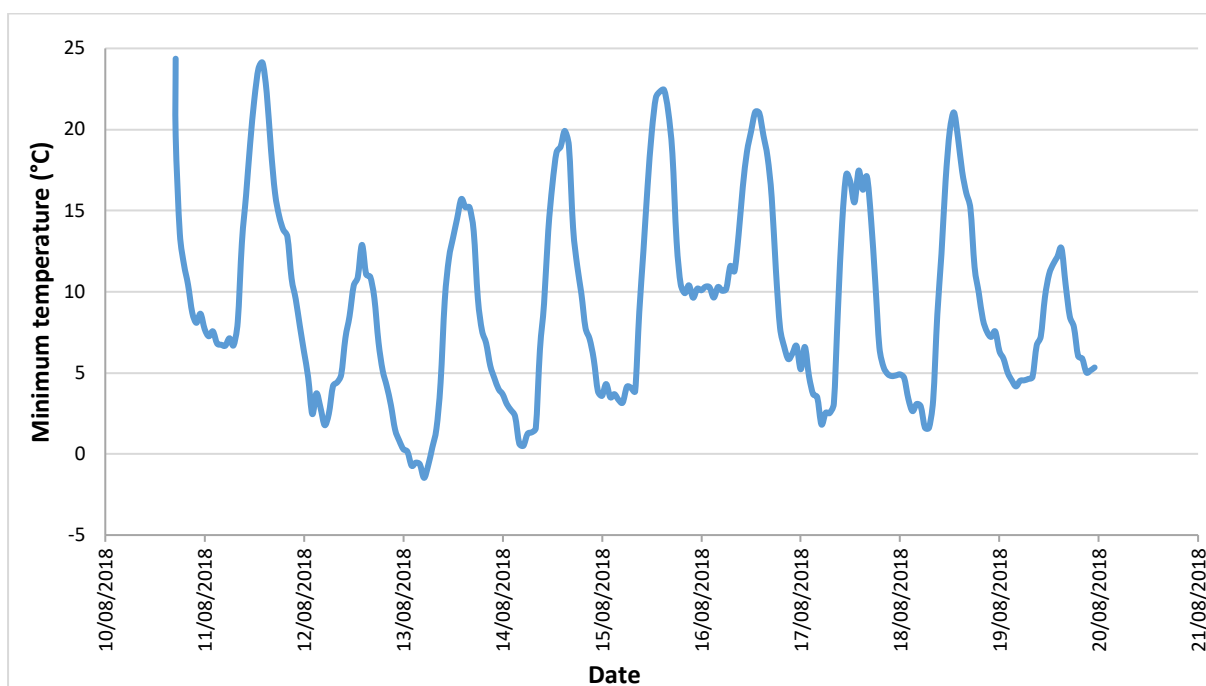


Figure 1. Hourly minimum temperatures.

Results

- Results are listed in Annex 1. The trial was assessed for flower abnormality 62 days after application (DAA) of the clethodim treatments at peak flowering.
- No plots were scored as having a significant number of effected flowers, although a very small number of plants were observed with club or stuck flowers.

Yield

There was no statistically significant impact on yields of any of the treatments when compared to the untreated plots. There was a varietal difference in yield, with CL 44Y90 outperforming TT 44T02 by close to 22%.

Oil

Significant arietal differences were detected in oil content, CL 44Y90 had ~0.5% higher oil content than TT 44T02. Within varieties there was no significant treatment effect.

Discussion

In this trial, the application of several common clethodim tank mixes on canola did not result in any significant flower damage, yield reductions or oil penalty. It is noted that in 2018, a very dry season, there were very few (reported) incidences of clethodim damage on commercial farms.

Conclusion

At this site, tank mixes did not exacerbate flower or yield damage in canola.

Acknowledgements

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Annex 1. Treatment list and results

Note all treatments (except the untreated control) were tank mixed with clethodim and Uptake, rates are listed below.

Variety	Herbicide treatment	Oil (%)		Yield (t/ha)	
44T02	Clethodim	41.4	cdef	1.82	cd
44T02	Clethodim + Atrazine	41.3	efg	1.64	d
44T02	Clethodim + Atrazine + Lontrel Advance™	40.8	g	1.74	d
44T02	Clethodim + Atrazine + Lontrel Advance™ + SOA	41.4	defg	1.83	cd
44T02	Clethodim + Atrazine + SOA	41.4	cdef	1.86	cd
44T02	Clethodim + Lontrel Advance™	41.4	cdef	1.82	cd
44T02	Clethodim + Lontrel Advance™ + SOA	41.0	fg	1.84	cd
44T02	Clethodim + SOA	41.0	fg	1.74	d
44T02	Nil (TT)	41.1	fg	1.67	d
44Y90	Clethodim	41.7	abcde	2.26	a
44Y90	Clethodim + Intervix®	41.6	abcde	2.07	abc
44Y90	Clethodim + Intervix® + Lontrel Advance™	42.0	ab	2.30	a
44Y90	Clethodim + Intervix® + Lontrel Advance™ + SOA	41.3	efg	2.04	abc
44Y90	Clethodim + Intervix® + SOA	42.1	a	2.17	ab
44Y90	Clethodim + Lontrel Advance™	41.9	abcd	2.28	a
44Y90	Clethodim + Lontrel Advance™ + SOA	41.5	bcdef	2.21	ab
44Y90	Clethodim + SOA	41.6	abcde	2.13	ab
44Y90	Nil (CL)	41.8	abc	2.00	bc

Product	Rate (g or ml/ha)
Atrazine	1100
Intervix	500
Clethodim	500
Lontrel Advance	150
Uptake oil	0.50%
SOA	800