

Clethodim Damage – Canola Variety Tolerance Trial

Trial Code:	GOCD00215-1
Season/Year:	Winter 2015
Location:	“Inglewood” Gilgandra
Trial Co-operators:	The Kilby Family

Keywords

GOCD00215-1, clethodim, damage, canola, ryegrass, herbicide, Gilgandra

Take home message

In this trial there was no adverse impact from the use of clethodim in canola when applied **within label rates and timings regardless of variety.**

Applying clethodim later than the bud visible stage or rates in excess of the label recommendation resulted in reduced yields only in Victory 3002 canola indicating the variety might be slightly more sensitive to clethodim than the others tested.

Background

Increasing levels of Group A – ‘fop’ resistance and the drop in retail pricing of clethodim based herbicides¹ has driven an increase in both the frequency of use and the rates applied of these products in canola. At the same time there has been a marked increase in reports of clethodim damage. It has been long known that clethodim can at times cause some level of crop damage but the conditions that result in this expression or its actual impact on yield have not been entirely clear.

Trial work by GOA from 2013 investigated what might trigger such damage by looking at application rates and timings of clethodim and, in summary, found that damage was generally only evident when clethodim was applied at timings and rates outside of label recommendations. Even when obvious clethodim damage was observed in the crop, yield impacts, if any were often mild.

This is in contrast to research conducted by the Hart Group in South Australia, who found significant yield impacts from clethodim damage when applied outside label recommendations, in addition they also observed some varietal differences in crop tolerance to clethodim.

This led to the question, did some of the varieties used in GOA’s previous work have greater tolerance to clethodim than others, which may have lessened any potential observed responses?

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

Therefore, this trial was designed to look at a number of common varieties grown in the GOA region and test them for relative tolerance to clethodim. If varieties showed little difference in their response to clethodim, compared to the varieties used in GOA's previous trials testing rates and timings, growers could be more confident in the findings from that work.

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 the effect of application of clethodim at various rates and timings on a number of commonly grown canola varieties sown in the GOA region

Methods

The trial was conducted on small plots, using a randomised complete block design with three replicates.

Ten varieties were selected for the trial based on discussions with agronomists, farmers and seed suppliers and are listed in Table 2.

Table 1. Trial site details

Trial Establishment Date	Autumn, 2015		
Crop and Variety	Canola – Various	Targeted plant populations	35 plants/m ²
Sowing date	28/4/2015	Harvest Date	30/10/2015
Seedling equipment	Double Boot Tyne	Row Spacing	27.5 cm
Crop Nutrition (kg/ha)	100 MP + 100 Urea	Soil type	Clay Loam
Previous Crop (and yield)	Wheat	Pre Sowing Stubble Management	Burnt

Treatments consisted of two clethodim application timings of label (pre bud visible) and late (after the bud was visible). At the label timing two rates were applied, a full label rate (500 mL/ha) and double label rate (1 L/ha) while only a label rate was applied at the late timing. The treatments are summarised in Table 3.

Table 2. Varieties tested for susceptibility to Clethodim damage

Variety	Type	Suspected Susceptibility
ATR Gem	Triazine Tolerant	Some susceptibility ²
AV Garnet	Conventional	Some susceptibilityError! Bookmark not defined.
Hyola 474 CL	Clearfield	Some toleranceError! Bookmark not defined.
44Y84 CL	Clearfield	Some tolerance ³
Hyola 577	Clearfield	Unknown
Hyola 575	Clearfield	Unknown
Hyola 559	Triazine Tolerant	Unknown
Victory 3002	Conventional	Unknown
45Y86 CL	Clearfield	Unknown
Atomic TT	Triazine Tolerant	Unknown

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

Table 3. Herbicide Treatments

Timing	Rate mL/ha	Date of application	Comments
Label (early)	500	10/6/2015	Oldest plants in some varieties at 7-8 leaf stage, early bud initiation, large majority were younger
	1000	10/6/2015	
Late	500	1/7/2015	Crop clearly elongating and bud visible

Results

The trial was assessed for flower abnormality at peak flowering, minimal damage and inconsistent was observed (less than 2%) in only a small number of plots.

In this trial, yield reductions of 0.7 and 0.8 t/ha were observed in Victory 3002, otherwise there was no other statistically significant yield reductions within any other variety (Table 4).

Oil content was also measured with no statistically significant effect on oil content for any of the rates or timings except in AV Garnet at all timings and rates and Atomic TT when the double label rate was applied. In both varieties oil % increased.

²http://www.hartfieldsite.org.au/media/2013%20TRIAL%20RESULTS/17_Clethodim_tolerance_in_canola_2013HartTrialResultsBook.pdf

³ GOA trials 2013 and 2014

Table 4. Yields (t/ha) for the different varieties, timings and rates. Highlighted data (*) is statistically significantly different to the untreated control (UTC) for that variety.

Variety/Rate (L/ha)	UTC	Label timing		Late timing
		500	1000	500
44Y84 CL	2.1	2.8	2.5	2.0
45Y86 CL	3.1	3.1	3.0	3.1
Atomic TT	2.4	2.4	2.8	2.7
ATR Gem	2.7	3.1	2.7	2.9
AV Garnet	3.3	3.7	3.2	3.8
Hyola 474	2.6	2.5	2.9	3.1
Hyola 559	2.9	3.2	3.1	2.5
Hyola 575	3.0	3.1	2.9	2.9
Hyola 577	2.6	3.2	2.5	2.5
Victory 3002	3.6	3.4	2.9*	2.8*

Table 5. Oil Content (%) from the different varieties, timings and rates. Highlighted data (*) is significantly different to the UTC for that variety.

Variety/Rate (L/ha)	UTC	Label timing		Late timing
		500	1000	500
44Y84 CL	44.1	43.6	43.9	43.7
45Y86 CL	43.8	44.0	43.6	43.7
Atomic TT	42.7	43.4	44.6*	43.4
ATR Gem	43.1	43.4	43.4	43.6
AV Garnet	42.8	45.3*	44.6*	44.6*
Hyola 474	44.4	44.6	44.8	45.0
Hyola 559	45.0	45.4	45.2	46.2
Hyola 575	45.3	44.2	44.3	45.6
Hyola 577	44.6	43.9	44.8	45.8
Victory 3002	44.1	44.4	44.8	44.7

Discussion

It should be noted that the early application was applied later than intended due to seasonal conditions. Some of the quicker varieties had some plants at the 7-8 leaf stage and at bud initiation but the majority of those lot were younger as was the balance of the trial.

Exceptional growing conditions also lead to excessive heights of some varieties, particularly 44Y84, at maturity made harvesting difficult resulting in potential for some harvest losses in taller varieties. As varieties were compared to their own performance with and without clethodim (as opposed to comparing varieties) it is unlikely that losses influenced the outcomes. However, the reader should exercise some caution when interpreting these results.

As detailed above, no variety exhibited any greater level of crop damage, expressed as flower abnormality, under the range of timings and rates applied.

Furthermore, the application of clethodim at label rates and timings to the range of canola varieties did not show any significant impact on yield.

Excessive rates or delayed application also showed no impact on yield in the varieties tested, with the exception of Victory 3002, which showed yield penalties of up to 0.8/ha.

The application of clethodim has had some (positive) impact on oil percentage however, only in two varieties. The mechanism for this result is not yet clear.

Conclusion

The lack of evidence of observable damage, through visible flower abnormality or yield reduction would suggest there is little varietal response to clethodim applications, when applied as per the label recommendations, however, applications outside label recommendation could increase the risk of damage although from this work that would seem limited.

Despite this lack of response, growers should only apply clethodim within label recommendations to minimise the risk of crop damage.

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