

## The impact of rate and timing of clethodim applications on canola– Wellington 2015

**Trail Code:** GOCD00115-2  
**Season/Year:** Winter 2015  
**Location:** “West View” 20km NNE of Wellington NSW  
**Collaborators:** Mason Families

### Background

Increasing levels of Group A fop resistance and the drop in retail pricing of clethodim<sup>1</sup> based herbicides has driven increases in both the frequency of use and the rates applied of these products in canola. It has been long noted that clethodim can at times cause some level of crop damage but the conditions that invoke this expression are not very clear and neither are the actual impacts on yields.

Visual effects are most commonly observed at higher rates however, it is ambiguous as to whether the damage is simply related to higher rates or a combination of rate, timings (either late or during unfavourable weather conditions) or just some varieties are more sensitive than others.

The translation of these visible effects to yield is also unclear, some commentary suggests that the visual symptoms of flower distortion or pod abortion have little or no impact upon final yield as the canola crop compensates well. The other end of the commentary is that the impacts on flowering and pod formation are irreversibly detrimental and the effects upon yield substantial.

GOA has been running trials investigating these questions over the past two years and this report details the findings from further trials in 2015.

### 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

- 1 Identify possible contributors to the expression of clethodim damage in canola, such as the herbicide application rate & timing or other factors such as environmental conditions around application.
- 2 Quantify what, if any, is the level of yield impact is associated with the use of clethodim

### Methods

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

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<sup>1</sup> Example trade names- Select, Plantinum, Status, Clethodim 240

To investigate the possible causes of clethodim damage a range of clethodim rates (1/2, full and double the label rate) and a range of timings were tested. The timings tested were applications within label recommendations, delayed applications when the bud was visible and ones applied when poor growing conditions were forecast. The use of Factor, an alternate Group A, Dim herbicide was also tested both alone and in combinations with clethodim. All herbicide treatments were applied with Uptake Spraying oil at 0.5% of the spray volume.

Details of the timing of applications are contained in Table 2 below and the corresponding weather conditions are shown in Figure 1. All treatments were applied using a hand boom applying 100L/ha of herbicide and rain water through AIXR015 nozzles at 3 bar.

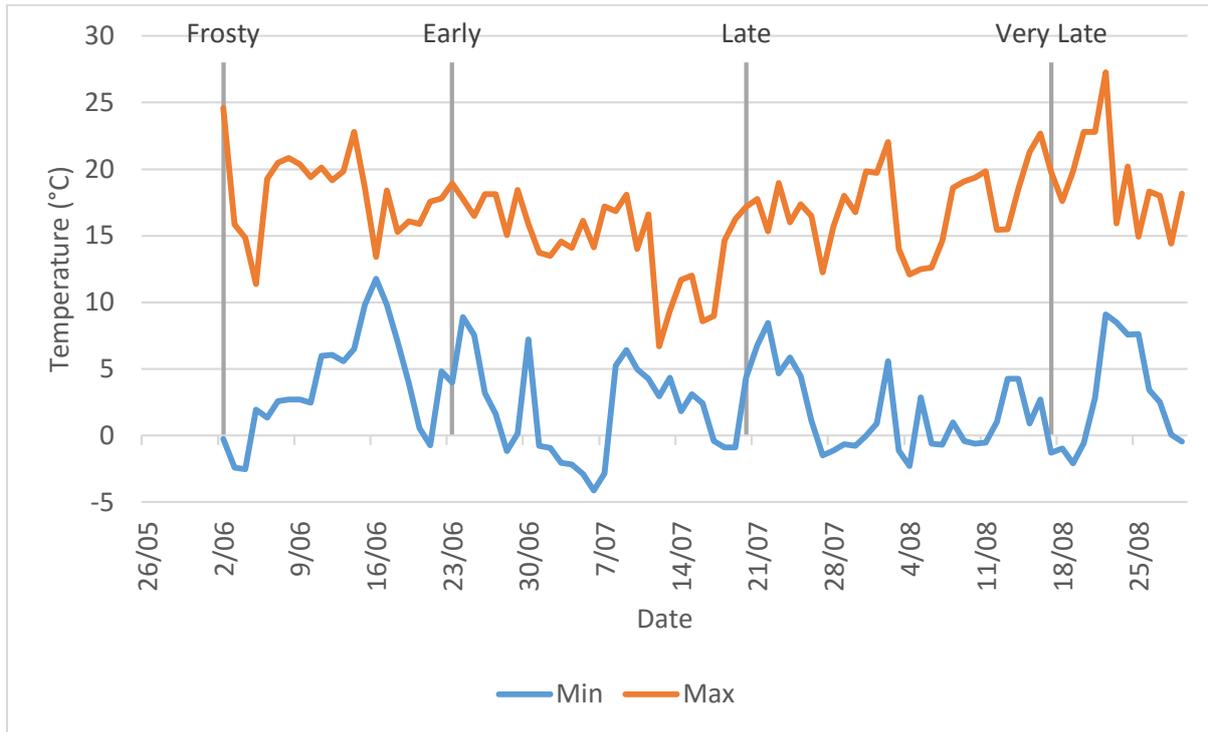
Weed burden present in the trial area was only low but the trial sprayed with Lontrel Advance™ @150 mL/ha and Verdict 520™ at 100 mL/ha (with Uptake™) on the 12/06/2015 to ensure no weed pressure in the trial area.

**Table 1.** Trial site details

Trial Establishment Date	Autumn 2015		
Crop and Variety	Canola - 44Y84CL	Seeding rate	2 kg/ha
Sowing date	29/04/2015	Harvest Date	11/11/2015
Seedling equipment	Double Boot Tyne	Row Spacing	27.5 cm
Crop Nutrition (kg/ha)	100 MAP, 100 Urea	Soil type	Sandy Clay Loam
Previous Crop	Wheat	Pre Sowing Stubble Management	Cultivated

**Table 2.** Details of herbicide treatments

Timing	Date	Days After Seeding	Crop Stage	Comments
Frosty	2/06/2015	35	3-4 leaf	Treatment was followed by 3 nights where temperature dropped to -0.2, -2.4 and -2.5°C
Early	23/06/2015	45	6-7 leaf	Mild frost 2 nights prior to application, and no frost for 4 nights post application
Late	20/07/2015	64	Bud visible	Two mild frosts prior to application and no frosts for the week after
Very Late	17/08/2015	97	Early Flowering	Frost on the morning of application and for the subsequent 3 days.



**Figure 1.** Daily maximum and minimum temperature measured at canopy height and clethodim application timings at the Wellington trial site 2015.

For the purpose of analysis and discussion unless otherwise stated, treatments and their effects will be compared to the nil treatment. Outcomes are statistically analysed using ANOVA at a 95% confidence interval with means compared by the LSD method.

## Results

**Flower damage:** was assessed at mid flowering with no treatment showing any level of damage or abnormality.

**Yields:** were assessed using a plot harvester and are outlined in

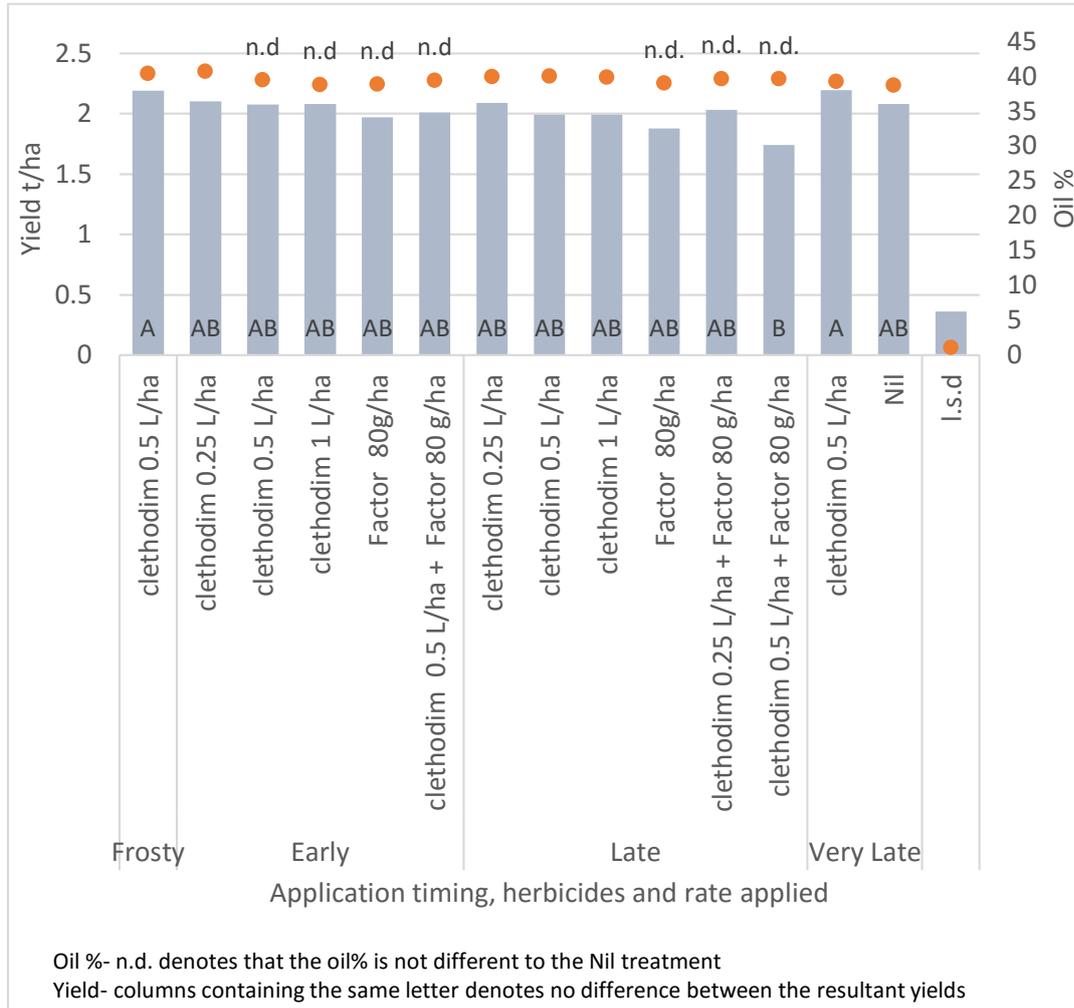


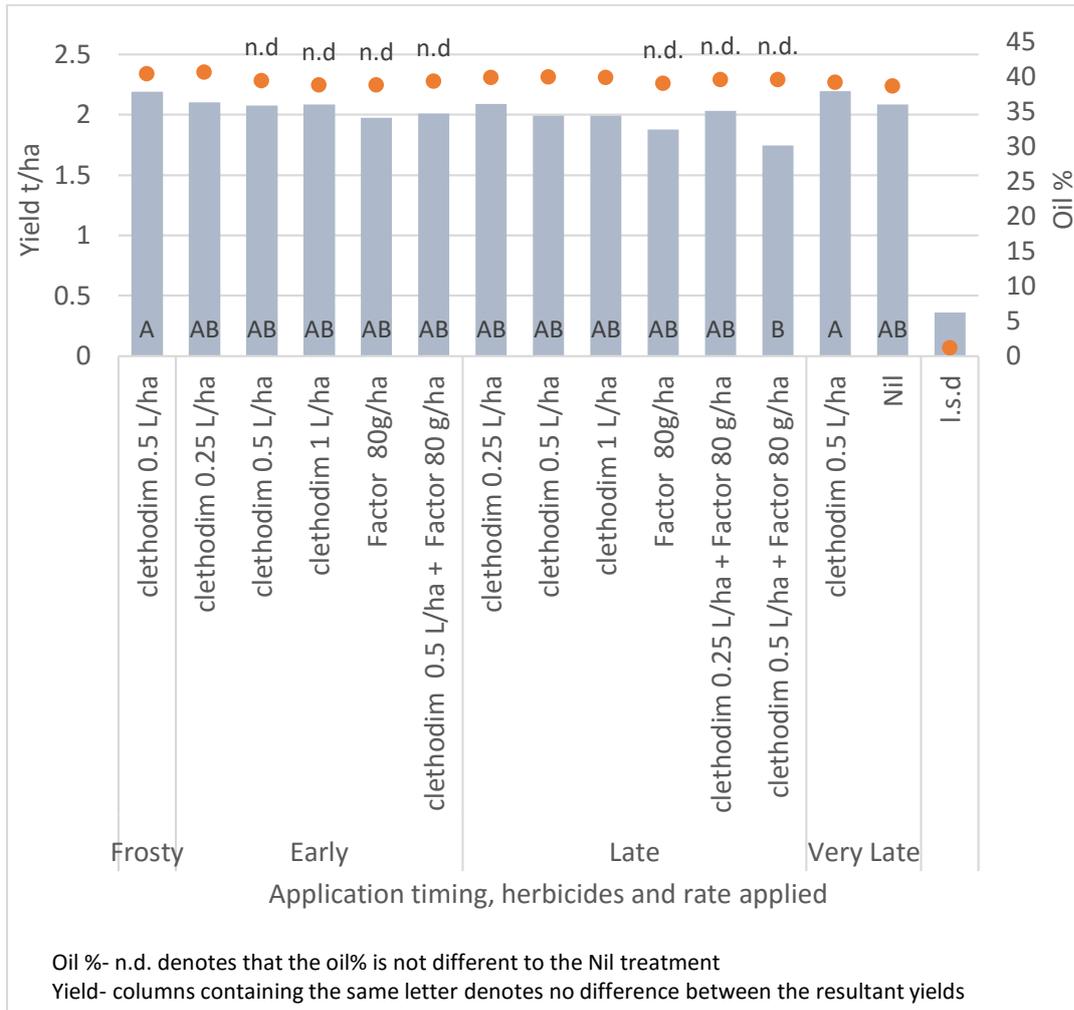
Figure 2 below. At this site no rate of clethodim at any of the timings tested resulted in a yield different to the Nil but there was some minor but inconsistent impact on oil %. The use of Factor alone or in a tank mix in this trial did not result in any significant impact on yields but there was some minor but inconsistent impact on oil %.

## Discussion

As mentioned above no damage to the crop was evident by either biomass reduction or flower damage and subsequently, no yield effect was observed.

At this trials site the 'Frosty' treatments were applied on the 2<sup>nd</sup> June prior to the "early" treatments. Minimum temperatures of -0.2, -2.4 and -2.5°C recorded at canopy height for the following three nights. Although these temperatures are not extreme they would represent a reasonably heavy frost, yet no damage was observed.

The application of Factor applied late either alone or in combination with 0.5 L/ha of clethodim resulted in the two lowest yielding treatments in the trial but as mentioned above neither were significantly different to the Nil treatment.



**Figure 2.** Yield and oil% response in canola to different application timings and rates of clethodim and/or Factor

## Conclusions

In this trial clethodim did not result in crop or yield impacts when herbicides were applied in label timings and at label rates. Even delaying application beyond label timings did not result any evidence of crop damage or yield impacts, however there was some limited impacts on oil%. These impacts were of a small magnitude and were somewhat inconsistent. This aspect may require some further investigations.

In this trial there was no clear evidence that clethodim damage is exacerbated by frosty conditions.

Despite the lack of any damage in this trial to excessive rates and delayed application timing growers should strive to apply clethodim within label recommendation as a number of other trials by GOA have demonstrated impacts from high rates and delayed application.

This trial also only tested on one canola variety (whose relative tolerance is unknown) and with two tank mixes. Other more sensitive varieties may behave very differently, as could be the damage inflicted under other different tank mixes. These aspects are being investigated by GOA in ongoing trials.

This trial is one of a series of trials investigating clethodim damage and should not be considered in isolation, nor any of the experimental timings or rates used in this trial as a suggestion, recommendation or otherwise to use such rates or timings.

## **Acknowledgements**

The research undertaken as part of this project is made possible by the significant contributions of growers through both trial cooperation and the support of the GRDC, the authors would like to thank them for their continued support. Special thanks goes out to the Mason family from Spicer's Creek who hosted this trial.