

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

Trail Code: GOCD00115-1
Season/Year: Winter 2015
Location: “Inglewood” 10 km NNE of Gilgandra, NSW
Collaborators: The Kilby Family

Background

Increasing levels of Group A fop resistance and the drop in retail pricing of clethodim¹ 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

- 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.
- 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.

¹ 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 by hand boom applying 100L/ha of herbicide and rain water through AIXR015 nozzles @ 3 bar.

Pre-emergent applications offered very good control of weeds but to the trial was also sprayed with Lontrel Advance™ @150mls/ha and Verdict™ @100mls/ha (with Uptake™) on the 12/06/2015 to ensure no weed pressure in the trial area- any surviving plants were hand pulled when found.

Table 1. Trial site details

| | | | |
|---------------------------|--------------------|-------------------------------|------------------|
| Trial Establishment Date | Autumn 2015 | | |
| Crop and Variety | Canola - 44Y84CL | Seeding rate | 2 kg/ha |
| 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 MAP + 100 Urea | Soil type | Sandy Clay Loam |
| Previous Crop (and yield) | Wheat | Pre Sowing Stubble Management | Burnt pre-sowing |

Table 2. Details of herbicide treatments

| Timing | Date | Days After Seeding | Crop Stage | Comments |
|-----------|-----------|--------------------|-----------------------|--|
| Frosty | 2/6/2015 | 35 | 5-6 leaf | Two light frosts followed the application |
| Early | 12/6/2015 | 45 | 6-7 leaf | No frost for a week either side of application |
| Late | 1/7/2015 | 64 | Early Elongation | Application followed by 5 frosty nights |
| Very Late | 3/8/2015 | 97 | Early Flowering (10%) | Light frost (-0.8) the night before application. |

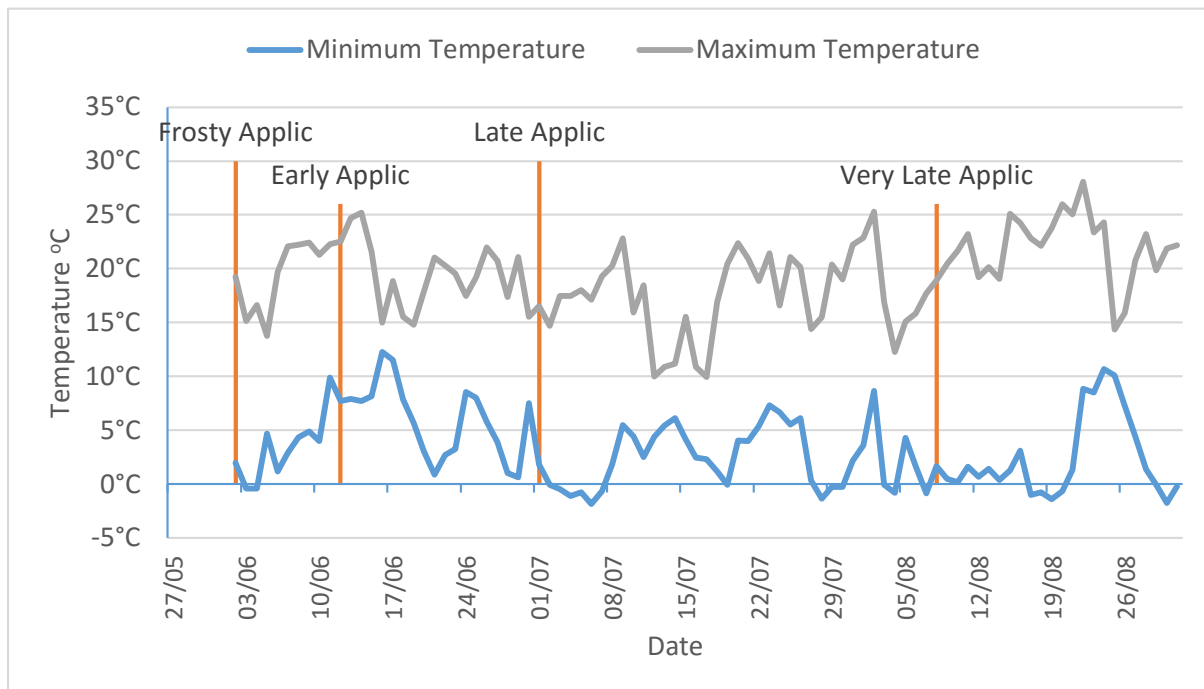


Figure 1. Daily maximum and minimum temperature measured at canopy height and clethodim application timing at the Gilgandra trial site 2015.

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

Results

There was no measurable effect on crop biomass by preceding herbicide treatments when assessed using by NVDI at both 45 and 97 days after sowing.

Flower damage was assessed on the 3rd September (full flower) where no abnormal flowers were observed in any of the treatments.

Yields were assessed using a plot harvester, and are outlined in Figure 2 below. At this site no treatment resulted in a yield significantly different to the untreated control (Nil). Only one treatment 0.25 L/ha of clethodim applied early, reduced oil% by 1% compared to the Nil treatment. The use of factor did not result in any impacts to yield or oil% in this trial.

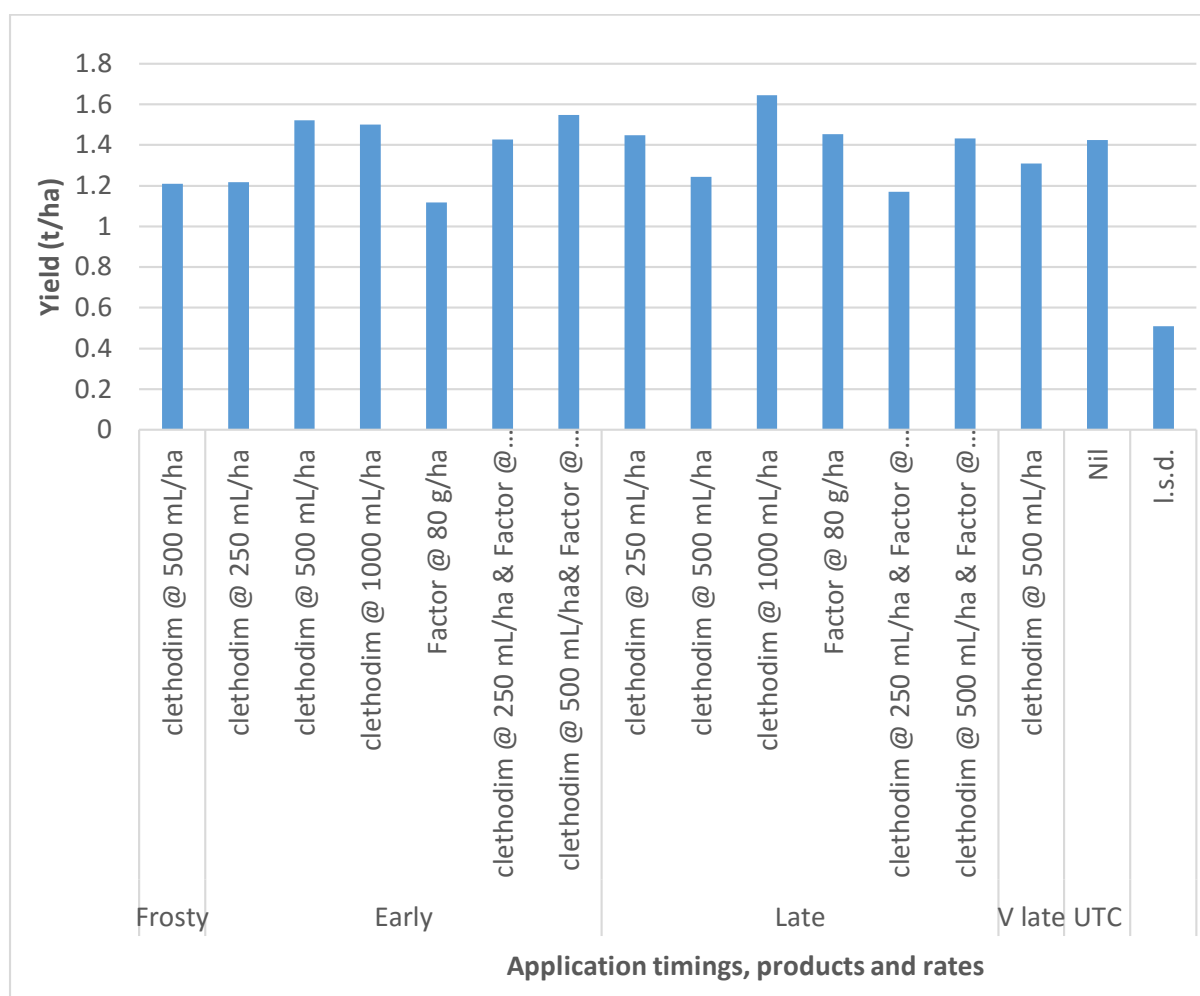


Figure 2. Yield response in canola to different application timings and rates of clethodim and/or Factor

Discussion

As mentioned above no damage to the crop was evident by either biomass reduction or flower damage. Statistically there was no significant difference between the yield from all the treatments however as can be seen in Figure 1 yields were extremely variable.

Exceptionally good growing conditions combined with the tall plant type of the variety 44Y84 meant harvesting was difficult. Many plots were in excess of 1.8 m tall and did not feed into the plot header well and significant but variable harvest losses may have occurred which is likely to be a large cause of the yield variability. Hence readers should exercise caution in considering the yield results in this trial.

At this trials site the 'Frosty' treatments were applied on the 2nd June with minimum temperatures of -0.4°C, and -0.4°C recorded at canopy height for the following two nights. The 'Late Application' was also followed by 5 frosty nights where the temperatures ranged from -0.1 to -1.9, and although these temperatures are not extreme this period was the most "frosty" period experienced at this site within the potential window of application yet no damage was observed.

Conclusion

Variability in harvested yield from this site mean that readers should exercise caution in considering the outcomes of this trial. Readers should only consider the outcomes from this trial along with other trial data placing the greatest emphasis on that information.

In this trial clethodim did not result in any evidence of crop damage and subsequent yields tended to support that evidence also showing no impacts.

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

Despite the lack of yield response in this trial questions still remain over whether there are varietal sensitivities to clethodim and whether the damage is exacerbated by specific tank mixes. This trial only tested on one variety (whose relative tolerance is unknown) and with 2 tank mixes. Other more sensitive varieties may behave very differently as may be the damage under different tank mixes. These aspects are being investigated by GOA in ongoing trials.

The 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

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