Dual purpose canola – an emerging prospect

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Introduction

The prospect of grazing canola during the vegetative phase was first trialled by John Kirkegaard in 2004/05. It was demonstrated that crashed grazed canola was able to yield the same or slightly less than the control canola. These trials were based in Canberra and spring and winter cultivars were used. The data reported on here was conducted within the farming belt in the Wagga Wagga, NSW and Naracoorte, SA.

Methods

Three trials were conducted in the Wagga Wagga region in 2007. All trials were conducted in a similar manner with stock grazing all plots in common except for the ungrazed control. Grazing treatments varied in length of the grazing period and/or stocking rate. Other treatments included a range of commercially available cultivars, varied seeding rates and two different row spacings. The sites received approximately 200mm in crop rainfall (Apr-Oct) with only 37mm falling in Aug-Oct. Two sites had a further 100mm in irrigation. Frost also had an impact on yields and on one trial no yield was recorded.

The trial conducted in Naracoorte consisted of a wide range of cultivars (30) including commercially available spring types, spring cross winter types and imported winter types. There were three times of sowing but these results will only report on the 1st May sowing. These plots were mown instead of grazed to simplify the process. Naracoorte received 265 mm of rainfall (Apr-Oct) with 122mm arriving in Aug-Oct.

Results

Wagga Wagga

Yields were low in all trials due to the dry conditions in Wagga Wagga. Grazing decreased yield in all cultivars. Harvest Index averaged 12.5% across all plots.

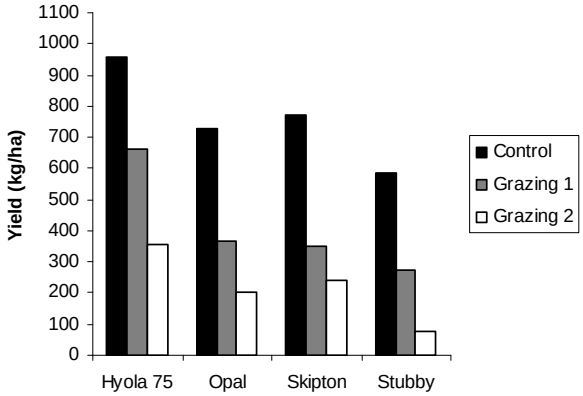

Figure 1 Yield of four varieties of canola in response to three grazing treatments at Wagga, 2007.

For the cultivar Hyola 75, treatment grazing 1 (18 days) decreased crop dry matter to 731kg/ha and delayed flowering by 11 days (Figure 2). Subsequently, there was a rapid

increase in regrowth when sheep were removed. The grazing level in this trial was harsh leading to low residual dry matter and would not be likely to be implemented on farm.

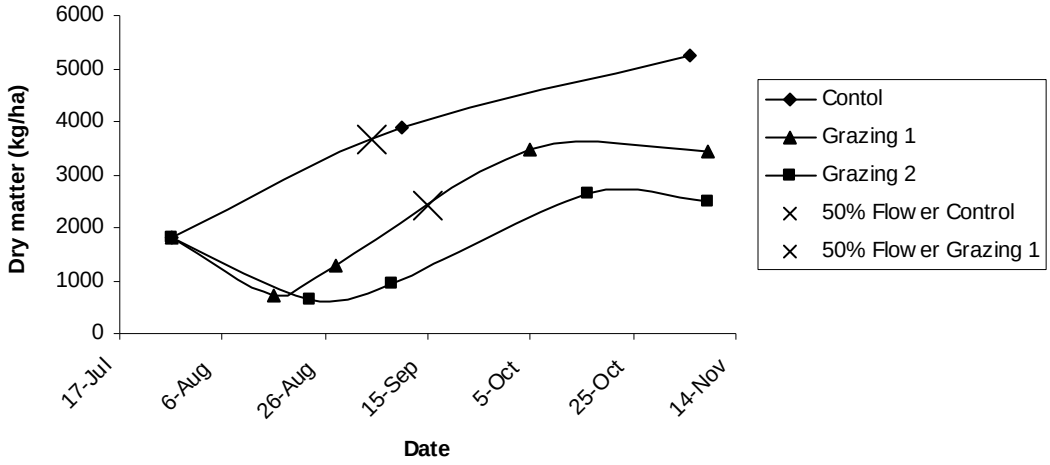

Figure 2 Dry matter for Hyola 75 over time in the Grazing x Cultivar experiment in Wagga, 2007.

Grazing delays flowering but the length of delay depends on the intensity of the grazing. Heavy grazing removed the growing point of the plant which led to re-shooting from buds at the base of the plant and flowering 10 - 17 days later than ungrazed controls. The lighter grazing tended to remove leaves only and the delay in flowering was only 4 days.

Dry matter can be increased for grazing by cultivar selection and plant density. There was considerable variation between the cultivars in early dry matter production (Figure 3). The choice of using a hybrid greatly increased dry matter available at grazing over conventional and TT cultivars. While, Skipton is classed as having exceptional vigour, it produced significantly less dry matter than Hyola 75. Increasing plant density will also produce higher biomass levels for grazing (Figure 4). The impact of these two strategies on regrowth is yet to be seen.

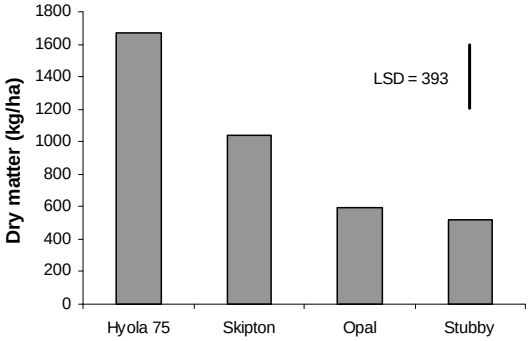

Figure 3. Crop dry matter at 79 days after sowing for four cultivars

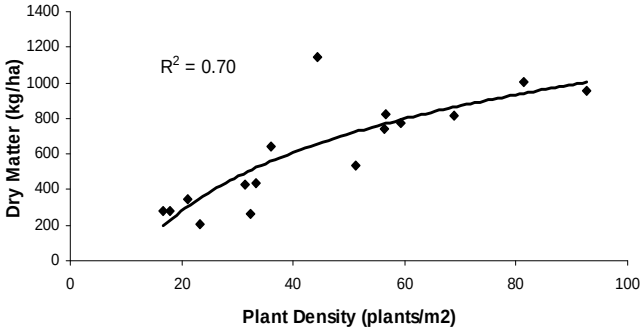

Figure 4. Effect of plant density of dry matter production at 77 days after sowing for the Canola variety Skipton.

Naracoorte

Results for the Naracoorte trial are still being processed. Cultivar types have been grouped together to demonstrate any trends that may occur. Large amounts of biomass were removed from the Naracoorte site (Figure 5). The type of canola cultivar strongly influences how much biomass is accumulated with long spring, hybrids and winter cultivars producing the most. At the time of mowing spring cultivars had already bolted and the main stem was removed compared to the winter cultivars that were still in the vegetative stage.

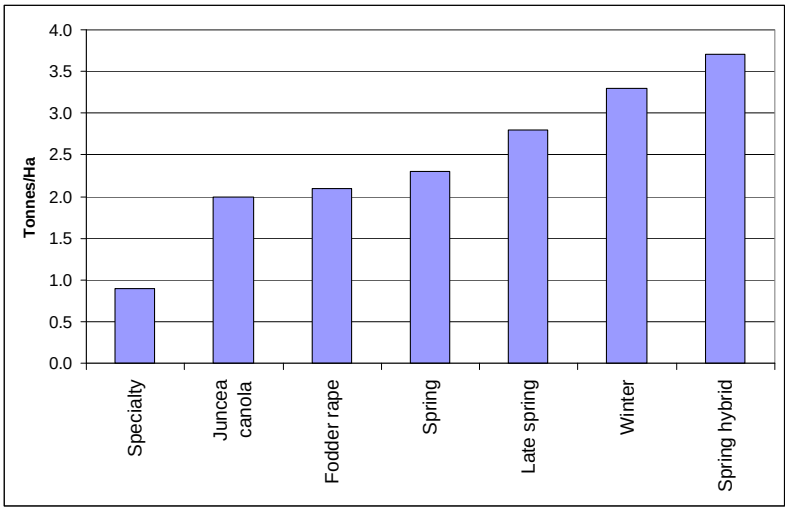

Figure 5. Biomass removed by mowing 81 days after sowing

Final yield comparisons between mown and unmown plots also depended on the type of cultivar (Figure 6). Winter cultivars yielded 3.5 T/ha whether they were mown or not. This is despite mown treatments having 3 T/ha of biomass removed during the vegetative stage. The spring cultivars suffered a yield penalty of 15-25% but still yielded up to 2.8 T/ha. These spring cultivars had the main stem removed during mowing and therefore had to regrow from lower buds and development was also delayed.

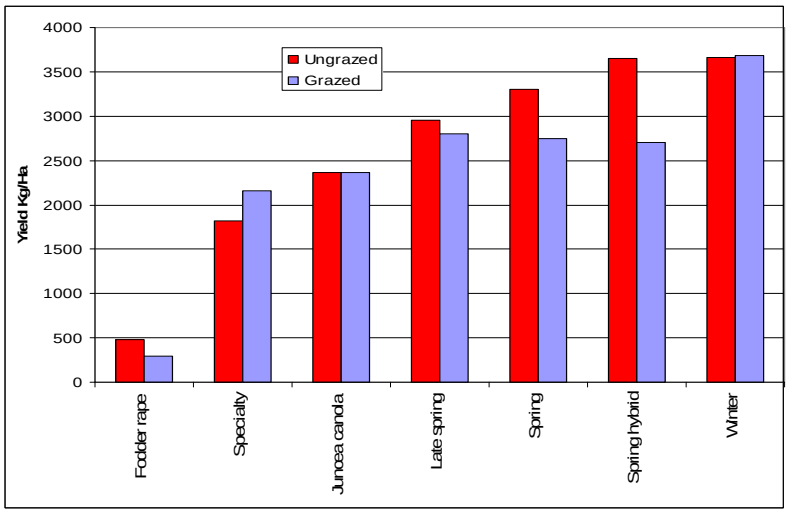

Figure 6. Final grain yield for a range of cultivars

Discussion

There is a clear difference between the results from Wagga Wagga as compared to Naracoorte. The importance of the Wagga Wagga results is questionable due to the unseasonable lack of rainfall from August on, which coincided with the recovery time for the grazed plots. The data does provide some indications that canola is able to rapidly increase dry matter after grazing leading to yield recovery. Considering the season and heavy grazing pressure the crop was still able to yield, in the case of Hyola 75, 69% of the control yield. This is in comparison to the Naracoorte results which showed no yield effect on the winter canola and a yield penalty of 15-25% for the spring cultivars. Managing the grazing will be an essential step for success when grazing canola. Removal of the growing point delays development by 10-14 days increasing the risk of finishing the crop in dry conditions. Although the crop can recover from harsh grazing and produce some yield, it is more vulnerable to the seasonal conditions. The ability to increase early dry matter production by selecting appropriate cultivars and/or increasing crop density should also be incorporated into management strategies for grazed canola. It may be assumed that increased vigour and higher plant densities would improve crop recovery and therefore yield but there is no data from this season to support this view.

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