Direct heading versus windrowing

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Take home messages

- *Canola and juncea can successfully be direct-harvested without windrowing or using pre-harvest chemicals.*
- *Windrowing can help the crop ripen more evenly, allowing better management of the harvest window, especially if damaging weather is forecast.*
- *Although expensive, Reglone® and Desikote Max® may help to offset yield losses experienced with crop variability.*

Background

The majority of canola grown in Australia is windrowed, but an increasing number of growers are changing to direct heading in medium and low rainfall regions both to reduce costs and improve harvest management. In particular, direct harvesting removes the need for contractors and enables growers to adapt to seasonal conditions e.g. a heatwave ripening canola all at once. Advances in harvest machinery and improved varieties with faster maturing and less shatter-prone pods are allowing direct heading to become more of an option.

Whether canola is windrowed or direct headed will depend on the variety, seasonal conditions, soil type, size and variability of the crop and availability of a windrower. Those crops which are largely variable in maturity between the top and bottom pods ideally are windrowed to minimise shattering. Windrowing allows the seed to mature more evenly and quickly and the crop can be ready to harvest within 8-10 days (GRDC 2009). This can greatly reduce potential yield losses if hail or strong winds are forecast. Also becoming more widespread is the use of pre-harvest treatments like Pod Ceal® or Desikote Max and desiccation with Reglone to aid in direct heading.

Aim

To identify the yield penalty associated with direct heading oilseeds as compared with windrowing, and whether Desikote Max and Reglone negate any losses.

Method

This trial took the form of a replicated complete randomised block design, sown in the third week of April at a depth of 2cm with good sub-soil moisture. The trial was top-dressed with 90kg/ha urea on 7 June. Plots were windrowed using electric hedge cutters and manually placing the plants in a windrow along the centre of the plots. The windrowed treatments were harvested just prior to a large rainfall event. One week later, the direct head plots were harvested also just prior to a large rainfall event (Table 1).

Grain yield was measured using a plot harvester and grain quality analysed (oil content and moisture). Grain yields were corrected to 8% moisture.

Location: Culgoa

Replicates: 4

Sowing date: 23 April 2010

Seeding density: 40 plants/m²

Crop type/s: 44C79 canola and Sahara juncea

Seeding equipment: BCG parallelogram (knife point, press wheels on 30cm row spacing)

Fertiliser: 50kg/ha MAP at sowing

Treatment spray: 1.2L/ha Desikote Max and 1.5L/ha Reglone

Table 1. Treatment description

Variety	Treatment	Date of treatment application	Date of harvest
Canola	Windrow	2 Nov	12 Nov
Canola	Direct head + Desikote Max	11 Nov	21 Nov
Canola	Direct head + Reglone	11 Nov	21 Nov
Canola	Direct head + Desikote Max + Reglone	11 Nov	21 Nov
Canola	Direct head	-	21 Nov
Juncea	Windrow	5 Nov	12 Nov
Juncea	Direct head + Desikote Max	11 Nov	21 Nov
Juncea	Direct head + Reglone	11 Nov	21 Nov
Juncea	Direct head + Desikote Max + Reglone	11 Nov	21 Nov
Juncea	Direct head	-	21 Nov

Results

Pre-harvest shattering and lodging scores

Shattering and lodging scores were conducted one week after spraying Reglone and Desikote Max. This took the form of a visual observation using a scale from 1-10 (1 representing no lodging or shattering and 10 representing all plants severely lodged and all pods shattered). There was no difference in the pre-harvest shattering scores between the treatments. Juncea, however, was notably more lodged than canola, with an average score of 2.5 (some lodging) for juncea and an average of 1 (no lodging) for canola.

Grain yield and quality

Although there were no significant differences in yield between treatments, the canola yielded significantly more than juncea by almost 200kg/ha (Table 2).

Table 2. Grain yield of canola and juncea using various pre-harvest treatments and harvest techniques

Treatment	Yield (t/ha)		Oil %	
	Canola	Juncea	Canola	Juncea
Windrow	2.04	2.06	47%	49%
Direct head + Desikote Max	2.05	1.78	49%	52%
Direct head + Reglone	1.97	1.92	48%	51%
Direct head + Desikote Max + Reglone	2.16	1.69	49%	52%
Direct head	2.02	1.81	49%	54%
Sig. diff (interaction) LSD (P<0.05)	**NS**		**NS**	
CV%	**11.5**		**2.4**	

Quality was excellent, with all treatments producing above 47% oil. However there was no difference between treatments. Juncea had a significantly higher oil content than canola by more than 3% on average.

Interpretation

Given that there was no yield difference between pre-harvest chemicals and harvesting techniques this season, direct heading without chemical aid was the best option both economically and operationally. While windrowing is still a common practice, especially in high rainfall areas, the extra operation costs on average $25/ha (contract price). When uneven ripening is expected or damaging weather forecast, windrowing is still the safest pre-harvest option.

Pre-harvest aids such as Reglone and Desikote Max come at a greater cost per hectare than windrowing. Desikote Max can be sprayed from the beginning of maturity to form an elastic, semi-permeable membrane over the filling pods. It is argued that this membrane helps reduce pod shattering and aids in direct heading. At a cost of $34.20/ha, it is a slightly less expensive option than desiccating with Reglone, which costs $36.75/ha.

Extra to the direct chemical costs is the aerial application fee or purchase/hire of a self propelled sprayer, making desiccation quite an expensive operation. Nevertheless, it has the added benefit not only of promoting more even crop ripening, but it can also be used to control weeds like thistles that can pose harvesting difficulties as was seen this season.

Although this trial showed that there was no yield increase associated with windrowing, direct heading or, using Desikote Max or Reglone, it is vital for farmers to take into consideration many factors that could influence the final yield. These include the timing and availability of contractors, predicted severe weather conditions, extra operational costs, soil type variability and weed density. If these factors contribute to crop variability, then the cost of windrowing or spraying may be justified to offset losses.

Acknowledgments

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References

Grains Research and Development Corporation (2009) 'Canola best practice management guide for south-eastern Australia'