

Faba beans – why are we windrowing them?

The aim of this replicated trial was to determine the optimum time of windrowing for faba beans and compare this practice to direct heading.

Summary

The practice of windrowing beans has become increasingly popular in the past two seasons for harvest management and perceived grain quality benefits. These benefits were not realised in this trial.

The time of windrowing had a significant effect on harvestable yield in this trial. Direct heading (2.2 t/ha) yielded significantly higher than the early- (1.7 t/ha) and mid-windrowing (1.8 t/ha) treatments. Late windrowing (2.0t/ha) yielded the same as direct heading (LSD 5% = 0.3). Time of windrowing also impacted on grain quality. 100-grain weights were lowest for the early windrowing treatment (68 g) and highest for direct heading (76 g) and late windrowing (77 g) (Table 1). It appears also that less seed discolouration occurred the longer the plant stood.

These results are consistent with work conducted by Dr. Trevor Bretag (NRE – VIDA) this season at Quantong that proved windrowing to be detrimental to grain quality.

Windrowing beans is not something you can do to delay harvest. Yield penalties and grain quality issues can result from windrowing beans.

Background

The practice of windrowing bean crops in the Wimmera has grown in popularity over the last two seasons as it allows more harvest management flexibility. It was considered that windrowing was not detrimental to yield and grain quality.

This trial set out to address these issues and determine the optimum time of windrowing for beans.

Methods

This trial was conducted using a fully replicated randomised block design.

The trial was established in a commercial Aquadulce bean crop located at Rupanyup on the property of Andrew and Rodney Weidemann. All weed and disease control was conducted with normal applications of registered products.

All plots were harvested for yield and samples were collected for assessing grain weight and discolouration.

The treatments were:

Timing	Date	Description
Control	31/12/01	Direct-head crop at maturity
Early windrow	26/11/01	Seeds in middle pods have distinct black line on hylum (no black line visible on seed in top pods)
Mid windrow	08/12/01	Seed in top pods have distinct black line on hylum (seed in bottom and middle pods fully formed)
Late windrow	29/12/01	Seed in top pods have complete black hylum (bottom and middles pods are now very ripe and can shatter)

All plots were 6.5m wide (width of windrower) and 50m long.

Results

The time of windrowing had a significant effect on harvestable yield in this trial. Direct heading (2.2 t/ha) yielded significantly higher than the early- (1.7 t/ha) and mid-windrowing (1.8 t/ha) treatments. The late windrowing treatment yielded 2.0 t/ha. (LSD 5% = 0.3).

Time of windrowing also impacted on grain quality. 100-grain weights were lowest for the early windrowing treatment (68 g) and highest for direct heading (76 g) and late windrowing (77 g) (Table 2). It appears also that less seed discolouration occurred the longer the plant stood.

Figure 1: Harvested yields for Aquadulce beans windrowed at three times versus direct heading. LSD 5% = 0.3.

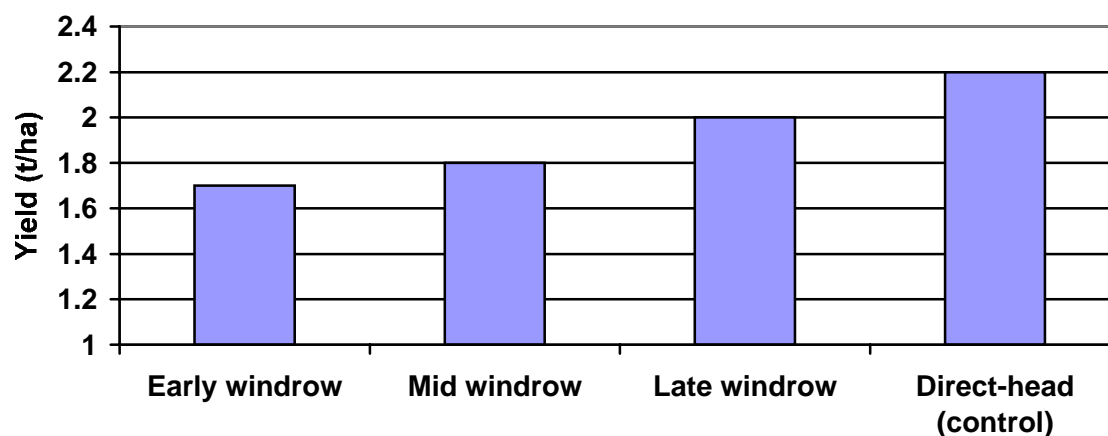


Table 1: Grain quality for windrowed versus direct headed Aquadulce beans.

Treatment	100 gwt (g)	Discolouration of seed (%)				
		0	1-5	6-25	26-50	>50
Early windrow	68	41	49	9	1	0
Mid windrow	73	41	45	12	2	0
Late windrow	77	51	41	7	1	0
Direct head	76	52	37	10	1	0

Interpretation

In this trial the direct heading (2.2 t/ha) was significantly higher yielding than the early- or mid-windrowing treatments (1.7 and 1.8 t/ha respectively). It was previously thought that the optimum time of windrowing was at the mid-windrowing time (when seed in top pods have a distinct black line on hylum and seed in bottom and middle pods is fully formed) however this was not the case. To minimize yield and quality losses windrowing has to take place when the seed in top pods have a complete black hylum (bottom and middles pods are very ripe and can shatter)

Windrowing before seed in top pods have completely black hylum's and bottom and middles pods are ripe was also detrimental to grain quality. The main effect was on grain size – average grain weight for early- and mid-windrowing 71 g and the average for late windrowing and direct heading was 77g.

These results are consistent with work conducted by Dr. Trevor Bretag (NRE – VIDA) this season at Quantong that proved windrowing to be detrimental to grain quality. Dr. Bretag's work found grain discolouration was highest in windrows compared to direct heading. Within the windrow itself discolouration was greatest on top of the windrow (exposed to rainfall) and the bottom of the windrow (subjected to moisture from being in contact with the soil). These results suggest that if windrowing is conducted for a management reason (eg stopping ryegrass seed set) then the harvest should not be delayed once grain moisture drops below 13%.

Commercial Practice

The practice of windrowing beans has become increasingly popular in the past two seasons for harvest management and grain quality benefits. These perceived benefits were not realised in this trial.

Windrowing beans is not something you can do to delay harvest. Yield penalties and grain quality issues can result from windrowing beans too early!

Acknowledgments

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