

Windrowing canola – current industry practices & perceptions

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ABSTRACT

Windrowing canola is generally considered to be an integral management practice of canola production with the timing of the operation potentially having significant impacts on harvest losses and seed quality. A survey was conducted of industry participants including agronomists, consultants, growers and contractors located throughout canola growing areas within NSW. The aims of the survey were to determine current practices, technical skills, knowledge, understanding and attitudes to windrowing. Survey results reveal frequent inconsistent knowledge, understanding and skill levels in the approach to assessing crops for timing of windrowing. The economic costs of the consequences of poor windrowing timing were perceived to be high, but specifically unknown.

Key words: *Brassica juncea* – canola – windrowing – harvest – management – seed quality – oil – yield – shattering

INTRODUCTION

The introduction of canola to Australia was implemented based on overseas experiences and adapted to Australian growing conditions. The development and extension of recommended Best Management Practices included the determination of the optimum timing of windrowing. Windrowing canola is generally considered to be an integral management practice of canola production with the effect of the timing potentially having significant impacts on harvest losses and seed quality.

Many industry participants are questioning the need to windrow at all. Interest has been prompted by variety development and low yielding crops together with the promotion of limited trial information. Various trials have compared windrowing with direct heading practices and a number of commercial products promoted as adjuncts to windrowing or as alternatives to allow low risk direct heading.

MATERIALS AND METHODS

A structured survey was conducted in 2009 of industry participants including agronomists / consultants, growers and windrowing contractors in central western NSW. This survey was expanded in 2011 to encompass most of the canola growing areas within NSW, interviewing 119 industry participants. Interviewing people individually, mostly by phone, but also face-to-face allowed a broad range of information, both qualitative and quantitative to be gathered.

The aims of the survey were to establish current skills and practices used to determine the optimum timing of windrowing, levels of technical knowledge and understanding of canola growth and development, and attitudes regarding the role and risks associated with windrowing.

At this early stage, despite the data from 119 respondents, some categories recorded values less than 5, thereby affecting the reliability of some facets of statistical analysis. Simulations provided a more robust measure of the probability in a Chi-square test of independence.

RESULTS

The first question aimed to determine what practices and skills people used in their crop assessments to determine an optimal windrowing time.

What do you do when inspecting a crop to determine the optimum time to windrow, what parts of the plant do you examine?

Answers disclosed a range of approaches in the indicators that were used to trigger closer examination of the crop. These included various 'rules of thumb' that were based on calendar days relative to sowing dates, different stages of flowering and Melbourne Cup Day, and generalised changes in overall crop and pod colour.

Close crop inspection revealed a diversity of practices. For some there was a narrow focus as to the position within the plant, pods and seeds were inspected, for others it was more generalised, "look at the whole plant", "top to bottom". A small number were not really sure or specific - "somewhere in the canopy".

The term 'colour change' was interpreted differently by individuals, some strongly adamant as to what constituted 'colour change', others more casual. For example, seed may have to show "discolouration", "just a speck of colour", "any colour", "beyond the green", "bronze", "caramel", "brown smudge", "light brown", "brown", "black" and "jet black". Some specified it had to be black, others "not black!" or "not necessarily black". The firmness of the seed when rolled between their fingers was referred to by 15% of respondents, "not mush" and "as long as green seeds are firm."

Several questions were aimed at gaining an insight into people's level of knowledge and understanding of crop growth and development and general plant physiology.

What is your understanding of the process of oil formation in canola?

This question brought about a wide range of answers but most immediate responses revealed a similar position. Some examples included "Haven't a clue", "Nil.", "No idea", "Diddly squat", "Oh dear..... (*silence*)", "That's a good question", "God only knows!", "Pretty poor", "Zero", "Limited" and "Not as good as it should be".

There were some general references to influences like nutrition, especially nitrogen as well as environmental factors such as moisture and temperature conditions during reproductive development. Many responses related to the timing of when oil was formed – "laid down from the start", "laid down at the end", "oil during the last few days", "last couple of weeks", "happens within a 48 hour period, triggered by chlorophyll", "from bolting", "oil content is set at flowering", "happens in the end after yield".

Mention was also made to oil being the "reverse to protein", "mobilised from protein and soluble carbohydrates", "carbohydrate first".

A series of questions were asked to quantify the perceived outcomes from non-optimal windrowing timing. The question was designed to allow answers to be represented as oil and yield growth curves, revealing current understanding of crop physiology.

Optimum timing of windrowing – effects on oil and yield - the scenario was described where a crop was growing with no limiting factors (including moisture, temperature, nutrition, disease and weeds) and given optimum timing on a nominated day, oil levels were 42% and yield was 2.5 t/ha. Respondents were asked to specify what the oil and yield would be if windrowing occurred 3-4 days and 7-10 days earlier than the designated optimum day and 3-4 and 7-10 days later. It was reinforced to respondents that it was assumed that there were no adverse factors impacting on the crop like wind and shattering.

There was no significant difference between groups of people in their perceptions of change in either oil and yield with early or late windrowing timing (Table 1, 2).

Table 1. Expected changes in oil compared to optimum windrowing timing.

	3-4 days early			3-4 days late		
	Agronomist	Contractor	Grower	Agronomist	Contractor	Grower
Decrease	34	6	19	2	1	3
No change	5	2	7	17	3	8
Increase	1	1	2	19	5	18
	p = 0.4442; x-squared = 3.6406			p = 0.7013; x-squared = 2.4527		

Table 2. Expected changes in yield compared to optimum windrowing timing.

	7-10 days early			7-10 days late		
	Agronomist	Contractor	Grower	Agronomist	Contractor	Grower
Decrease	37	7	25	4	1	3
No change	2	1	2	16	1	3
Increase	0	0	0	20	7	21
	p = 0.4366; x-squared = 1.9026			p = 0.0746; x-squared = 8.3459		

Correlations with years of experience in the canola industry were also examined; there was no significant difference in responses to oil and yield related to optimal windrowing time. There was a trend that the expectation of an increase in yield with late harvest decreases with years of experience (Fig. 1).

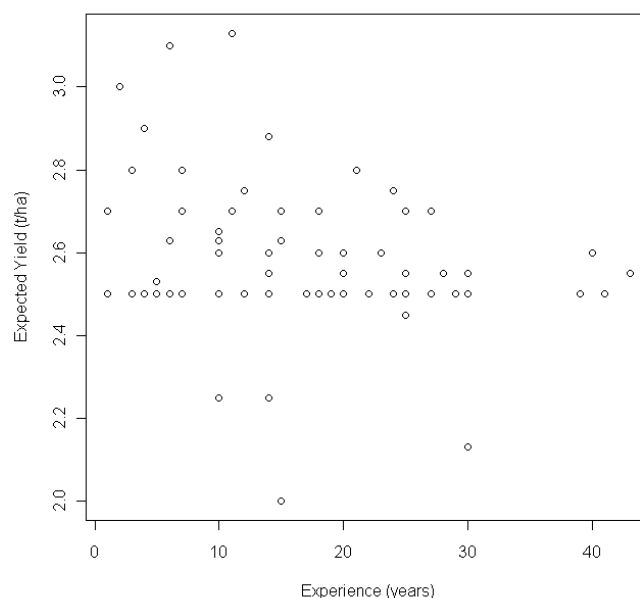


Fig. 1. Canola industry experience and expected yield response to windrowing 7-10 days later than optimum

These questions prompted a lot of discussion, with the majority of people being reluctant to nominate a figure or emphasising that it was “only a guess”. There were some individuals who refused to put forward a number. Responses overall revealed the overwhelming lack of confidence in their knowledge and understanding in crop physiology that produces final crop oil and yield “This is the least understood facet of what we do.”

The general viewpoint of the degree to which the timing of windrowing was considered to be significant was explored (Table 3).

How would you rate the importance of windrowing timing on overall crop profitability (high / medium / low)?

Table 3. Attitude to windrowing

Rating	%			
	Agronomists	Growers	Contractors	Overall
High	69.1	72	83.4	72
High / medium	5.5	4	8.3	5.1
Medium	18.2	16	16.7	17.1
Medium / Low	0	2	0	0.9
Low	7.3	6	0	6

DISCUSSION

Industry wisdom

An almost universal comment that arises when the topic of windrowing canola is discussed includes references to rules of thumb, generally accepted guidelines and often repeated motherhood statements. At the same time it is often noted that there are large variations or very different versions and contradictions with many of them – “half a dozen opinions in every district”.

This has created a lot of confusion, with less experienced growers (and agronomists) who are seeking information, discovering so many viewpoints – “we made a lot of phone calls last year and no one really knew, a lot of different answers”, and contractors encountering a wide range of opinions and beliefs.

There are high levels of frustration with the mixed messages and the logistical realities that all parties, agronomists, growers and contractors are dealing with to different degrees – “compromise between textbook and practicalities”, “We got a problem here, everyone goes agronomic style!”, “Some do some really crazy timing”, “We just do what the southerners tell us to do!”. “All the psychology of it, that’s the problem”, timing of windrowing is normally “when the contractor gets there.”

Rules of thumb that used to be strongly adhered to in past seasons, have had changes / modifications made to them. There were striking contrasts, with some feeling safer to windrow earlier than previously, others later. Most respondents have a more relaxed and flexible attitude, seeing them more as loose guidelines.

Overall, there is a strong push to refine current production practices, to understand the reasons behind variable crop performance. Attitudes to canola are reflected in comments like “There’s a fair bit of black magic in growing canola” and “It’s the biggest mystery crop out there.”

Whilst it is understood that in any crop situation there are always many variables to consider, “Canola is a different beast in the way it matures every year”, there was widespread recognition that different messages and interpretations were common. Frequently during conversation, many respondents said they didn’t really know, a lot of the “pub talk” often didn’t match their expectations and it raised more questions.

With strong industry focus on the economic management and outcomes of canola production, refinement of recommendations and guidelines would be welcomed through better understanding of crop physiology. This information would allow better understanding and greater confidence by all collaborators of the impact of decisions, particularly economic consequences.

FUTURE WORK

This paper reports the preliminary findings of a survey designed to capture a snapshot of current practices, technical skills, knowledge, understanding, and attitudes to windrowing canola in NSW. At the time of writing, the survey is still to be completed, aiming to increase the sample size and to include greater representation from all canola growing areas within NSW.

Several experiments designed to complement the survey to quantify the effects of windrowing, including the financial results have been sown in 2011. The outcomes of these experiments, the findings of the survey, together with collaborative work with Grain Orana Alliance (GOA) will form the basis of a program of future extension work to reduce the uncertainty and improve general understanding surrounding canola growth and development and the effects of windrowing timing.

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