Cultivars and Pod Sealants for Straight-Combining Canola in Western Canada

Chris B. Holzapfel[1], Cecil L. Vera, Sherrilyn M. Phelps, Bryan A. Nybo

[1]Corresponding Author: Indian Head Agricultural Research Foundation, PO Box 156, Indian Head, SK, S0G 2K0, Email: cholzapfel.iharf@sasktel.net

Rationale

While canola growers in Western Canada are interested in straight-combining, most canola in this region is swathed to accelerate maturity and reduce the risk of shattering losses. While Polish (*Brassica rapa*) and *juncea* canola types tend to be less prone to shattering (Yan et al. 2008), Argentine (*B. napus*) varieties yield higher and there is wide variation in resistance to shattering amongst Argentine types (Wang et. Al. 2007). Although such products have been used for years elsewhere, pod sealants to reduce shattering are relatively new in Western Canada and local, third-party research evaluating their performance in this region has been limited.

Objectives

This study was conducted to determine if two pod sealants currently available in W. Canada (Pod Ceal DC and Pod-Stik) could reduce seed loss and increase seed yields in straight-combined canola. Further objectives were to investigate the importance of cultivar selection when straight-combining canola as well as to evaluate the overall feasibility of straight-combining relative to swathing

Materials & Methods

- Field trials were located at four locations in Saskatchewan in 2009 and five in 2010 (Fig. 1).
  - Indian Head, Melfort, Scott, Swift Current and Saskatoon (2010 only)
- Experimental design was a three replicate RCBD with a factorial treatment arrangement (5 cultivars and 4 harvest methods):

Cultivars	Harvest Methods
1) InVigor 5440 (LL*)	1) Swathed
2) BY 4632 (RR)	2) Straight-Combined (untreated)
3) Pioneer 45H26 (RR)	3) Straight-Combined (Pod Ceal DC)
4) InVigor 5020 (LL)	4) Straight-Combined (Pod-Stik)
5) XCEED 8571 *juncea* (CL)	

*LL – Liberty Link®; RR – Roundup Ready®; CL - Clearfield®

- Canola was direct seeded into cereal stubble with weeds controlled using recommended herbicides at recommended rates; the specific field equipment that was used varied with location.
- Data collection included but was not limited to:
  1) Seed yield (moisture corrected to 10% seed moisture content)
  2) Seed quality (percent green seed and seed size)
  3) Seed loss from dropped and shatter pods (measured from shatter trays at two times, optimal and late)
  4) Marginal profits calculated under the following assumptions; thus harvest method #2 had \$35 ha^{-1} cost advantage over the other methods:
     - Price received for canola was \$400/Mt
     - Cost of swathing equal to that of applying a pod sealant (\$35/ha)
     - Cost of combining with a pick-up equal to that of straight-combining
- Data from 2009* were analyzed using the Mixed Procedure of SAS 9.1 with the effects of cultivar, harvest method and location considered fixed and those of replicate considered random.
  - Treatment means were separated using Tukey's studentized range test and contrasts** were used to compare 1) swathing versus straight-combining, 2) straight-combining with pod sealants to straight-combining untreated canola and 3) *napus* canola to canola quality *juncea*.

*2010 data not yet analyzed at time of publication
**Results from contrast comparisons not presented but are considered in interpretation of results

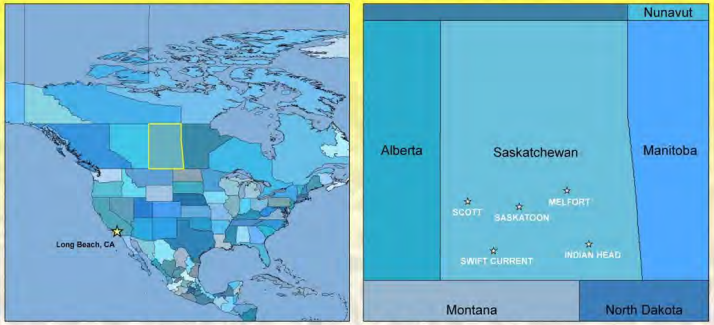

Fig. 1 Geographic location(s) of the study areas for canola field trials in Saskatchewan.

Results & Discussion

Seed Yield & Quality (Fig. 2)

- For cultivar, same relative ranking at all locations separate and combined (5440>45H26>5020>4362>8571)
- Harvest method effects varied but no differences when locations were combined
  - Swathed canola yielded higher than straight-combined canola at Melfort, opposite occurred at Scott and Swift Current and no differences were observed at Indian Head
  - No observed yield benefit to applying either pod sealant in 2009
- On average, harvest method did not affect percent green seed but swathing resulted in a slight reduction in seed size relative to straight-combining

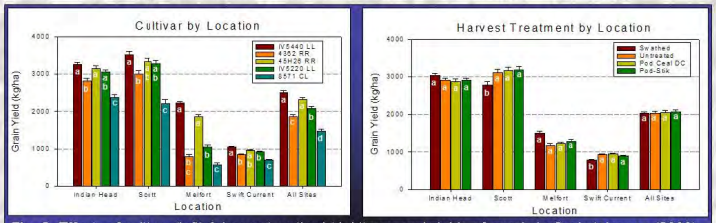

Fig. 2 Effects of cultivar (left) & harvest method (right) on seed yields of canola in Saskatchewan (2009)

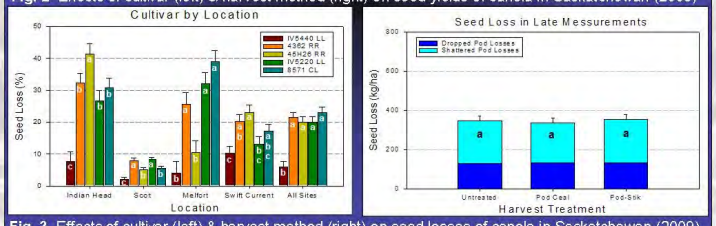

Fig. 3 Effects of cultivar (left) & harvest method (right) on seed losses of canola in Saskatchewan (2009)

Seed Loss (Fig. 3)

- Minimal seed loss at optimal harvest time – only late measurements presented
- Cultivar differences were more important than harvest method for seed losses
  - Lowest seed loss for 5440 and highest for 8571 (due to lower yields in the latter)
  - Pod sealants had no impact on seed losses
  - Seed loss from pods dropping was substantial but lower overall than shattering losses

Marginal Profits (Fig. 4)

- For cultivar, profits followed the same pattern as grain yield
- As with yield, harvest method effects on profit varied by site but there were no differences when averaged across sites
  - Swathing was more profitable than straight-combining at Melfort while straight combining was more profitable at Scott and Swift Current. No differences in profits amongst harvest methods were found at Indian Head
  - At Swift Current, straight-combining without a pod sealant was most profitable (\$39/ha > than straight-combining with pod sealants and \$94/ha > than swathing)

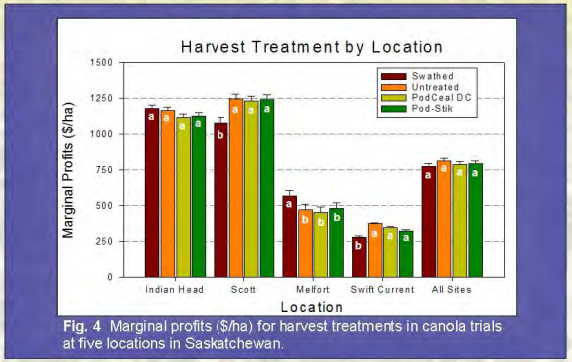

Fig. 4 Marginal profits (\$/ha) for harvest treatments in canola trials at five locations in Saskatchewan.

Summary & Conclusions

- Cultivar differences had a larger impact on the yield, shattering losses and profitability of straight-combining canola than pod sealants.
- All varieties appeared reasonably well suited for straight-combining, which we consider a viable alternative to swathing providing that harvest is completed close to optimal crop stage.
- No benefits to applying either pod sealant were observed in the first year of this study
- Growers interested in straight-combining canola should not be discouraged from doing so; however, they are advised to limit the number of acres straight-combined to reduce the risk of losing yield and profits if harvest cannot be completed close to the optimal stage.
- 2010 results to be available in a final report for early spring 2011

Acknowledgements & References

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Wheatland Conservation Area Inc.

WARC Western Applied Research Corporation

NARF Northeast Agriculture Research Foundation

SaskCanola