4.1 Straight combining: environment and timeliness matter more than variety

KEY PRACTICE: This study found that most hybrids could be straight combined successfully with minimal harvest losses when harvested in a timely manner under reasonably average environmental conditions. When making a seed decision, balance pod shatter resistance with other selection factors including yield potential, herbicide system, days to maturity and other agronomic factors.

PROJECT TITLE, LEAD RESEARCHER: "Quantifying genetic difference in seed losses due to pod drop and pod shattering in canola," 2011-15, Chris Holzapfel, Indian Head Agricultural Research Foundation (IHARF)
GROWER ORGANIZATION FUNDER: SaskCanola

Some varieties are better suited to straight combining than others, but success largely depends on environmental factors and timeliness of harvest.

This four-year, multi-site study aimed to evaluate the resistance of various varieties to environmental pod shatter and pod drop losses. More specifically, it intended to: quantify the frequency and amount of seed losses in straight combined canola across a range of environmental conditions; determine relative resistance to pod shatter and pod drop of varieties recommended for straight combining; and evaluate the environmental seed losses from pod drop versus pod shatter.

Yield losses due to pod shatter and pod drop were examined at optimal and delayed harvest dates for 15 canola hybrids at four Saskatchewan locations (Indian Head, Scott, Swift Current and Melfort) over four growing seasons (2011 through 2014). This number of site years provided a respectable range in environmental conditions over which to compare yield losses.

Since canola varieties rapidly turnover, the study was updated in 2013 to include varieties that were not available when the project started in 2011.

Results

This 13 site-year study determined that while varieties showed differences in resistance to pod drop and pod shatter within individual site-years, environmental conditions often had a greater impact on the quantity of yield losses. Furthermore, while the effects of varieties on yield losses varied between site years, strong genotype by environmental (GxE) interactions occurred for all variables.

A factor that may have impacted these findings was the varying days to maturity for each variety. The days to maturity ranged from 90 to 106 across all varieties used. (There was a tighter range of days to maturity across the 2013-14 varieties than those used in the 2011-12 seasons.)

Seed yield also varied by varieties in seven of the 13 site years, although rankings varied by site, likely due to the strong GxE impact and potentially due to varying weed populations as a result of different herbicide systems.

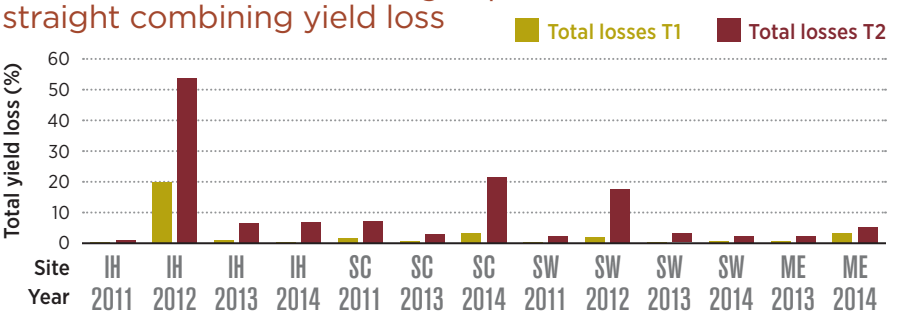
As expected, timing of harvest also affected total yield reductions. Varieties harvested when ready had very low losses (less than five percent) compared to the sites harvested three to four weeks later that reported an average yield reduction of 15 percent across all site years and varieties (although variety performance varied by site). Holzapfel determined that 25 to 50 percent of these yield losses were generally the result of pod dropping (as opposed to pod shattering). Varieties with pod shatter tolerance exhibited the lowest percent losses at five of the six sites.

Conclusions

Differences in resistance to pod drop and pod shatter were observed between varieties, but may be predominantly due to the stability of the varieties across varying environmental conditions, which generally had a larger impact on yield reductions than varieties. However, as long as harvest wasn't delayed too much, this study found that losses from straight combining any varieties shouldn't be significant under normal environmental conditions.

Although new shatter tolerant varieties have excellent potential for straight combining, pre-season variety selection should still include consideration for yield potential, days to maturity and herbicide system rotation. Another key factor is harvest timing. Growers should still strive to complete harvest as soon after the crop is fit to combine as possible in order to minimize loses while straight-combining canola. ●

Environment and late timing impact straight combining yield loss



T1 is the optimal harvest date. T2 is 3-4 weeks later.
IH is Indian Head, SC is Scott, SW is Swift Current and ME is Melfort.