



Canola harvest losses can be high

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Fifty combines were tested for harvest loss, with average losses of 1.3 bu/ac (72.9 kg/ha) or 2.8% of total yield. The maximum combine loss measured was 10.7 per cent of the producer's yield at 4.1 bu/ac.

Minimizing combine grain loss is usually a balance between weather conditions, ground speed and combine settings. To gain a better understanding of canola combine losses, an on-farm survey was conducted during the fall of 2019 to measure average combine losses in the field, and to help understand the causes of canola combine losses.

The survey was conducted by the Prairie Agricultural Machinery Institute (PAMI) who visited 31 canola producers across the Prairies. Combine losses were measured from 50 combines and 6 different combine manufacturers for a total of 40 different combine models.

Drop pans were used to measure combine losses in the field. Each measurement was conducted 3 times for each combine. Forty-four of the combines dropped their straw for the study, and were used in the loss analysis. The other 6 that spread their straw were not used in the analysis.

Multiple factors contribute to losses

Average canola loss was 1.3 bu/ac (72.9 kg/ha) or about 2.8% of the yield. Losses ranged from 0.2 bu/ac (11.2 kg/ha) up to 4.1 bu/ac (229.8 kg/ha), or 0.4% to 10.7% of total yield.

Multiple factors were investigated from field records and observations. Table 1 shows the factors that had a statistically significant impact on canola harvest losses.

Table 1. Variables impacting canola harvest losses

Combine Loss Variables	Variable Boundaries	Average Losses (bu/ac)	Number of Combine Test Repetitions	Conclusions
Ambient Temperature	< 23.0°C	1.4	96	Significantly lower losses experienced with higher ambient temperature.
	≥ 23.0°C	0.8	36	
Relative Humidity	< 45% RH	1.2	108	Significantly lower losses experienced with lower relative humidity.
	≥ 45% RH	1.6	24	
Weather Conditions	Sunny	1.0	33	Significantly lower losses experienced with sunny conditions compared to cloudy and partially cloudy compared to cloudy.
	Partially Cloudy	1.1	60	
	Cloudy	1.7	39	
Harvest Practice	Straight-Cut	1.5	30	More testing required to better understand results.
	Swathed	1.2	102	
Canola Variety	Shatter Resistant	1.3	87	More testing required to better understand results.
	Non-Shatter Resistant	1.1	45	
Ground Speed	< 4.3 mph	1.2	123	Significantly lower losses experienced with slower ground speed. Take note of small sample size for higher ground speed results.
	≥ 4.3 mph	2.2	9	
Grain Feed Rate	< 350.0 bu/hr	0.5	6	Significantly lower losses experienced with lower grain feed rate. Take note of small sample size for lower grain feed rate.
	≥ 350.0 bu/hr	1.3	123	
Combine Age	1993 to 2005	0.8	33	Regarding losses, a well-set older combine can outperform a poorly set newer combine.
	2006 to 2014	1.5	57	
	2015 to 2019	1.3	42	

Source: Grieger et al. 2019.

Based on 2019 canola prices of \$9.50/bu (\$418/MT), the average financial losses were an average of \$12.35/acre (\$30.52/ha) across the surveyed producers.

Significantly higher combine losses were measured during tests with:

- Lower ambient temperature (<73.4°F [$< 23.0^{\circ}\text{C}$])
- Higher relative humidity (>45%)
- Increased cloud cover
- Straight-cut harvest method (compared to swathed)
- Higher combine ground speed (≥ 4.3 mph [6.9 km/h])
- Higher grain feed rate (≥ 350.0 bu/hr [7.9 MT/hr])

The researchers recommend that continually adjusting combine settings for the crop and weather conditions is critical for minimizing losses, regardless of combine age, model or manufacturer.

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The full report can be found on PAMI's website at https://pami.ca/wp-content/uploads/2021/11/Journal-Article_Final_Oct-27-21.pdf