Storage bags work best with dry canola

KEY RESULT: This research looked at the feasibility of bag storage for canola and the effects on seed quality based on moisture content and length of storage time. Dry canola seeds can be safely stored for six to eight months in bags, but canola at 12 per cent moisture should be stored only temporarily.

PROJECT TITLE, PRINCIPAL INVESTIGATOR:
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In the first year of study, canola seed at three different moisture contents – 8.9 per cent (or "dry" based on grading standards), 10.5 per cent ("tough") and 14.4 per cent ("damp") – were stored in silo bags from autumn 2010 to summer 2011 in Winnipeg, Manitoba. Seed germination, free fatty acid value (FAV) and moisture content of canola were analyzed at seven locations in each silo bag every two weeks, along with carbon dioxide concentrations of intergranular air and temperature of canola.

For the dry canola, germination was maintained above 90 per cent and FAV stayed within 1.5 times the initial value during the 40-week storage. Tough canola maintained its initial germination value in most parts of the silo bags, except at the top layer. However, germination of damp canola dropped to below 80 per cent and FAV doubled its initial value within eight weeks of storage. High levels of CO_2 and localized hotspots in damp canola indicated intense biological activity and degradation of seed quality.

Canola put into a bag at 14 per cent moisture looked like this after 40 weeks. This is from the 2010-11 experiment.

Canola which graded No.1 at the beginning of the storage remained No.1 for dry canola, became No.2 for tough canola and dropped to Feed grade for damp canola. Results from this study indicate that dry canola can be stored in silo bags for up to 40 weeks without seed quality loss, but tough and damp canola could not be safely stored for very long.

Another study was conducted for two storage years (2011-12 and 2013-14) to determine the changes in grain quality for canola stored at around 12 per cent moisture. Canola was stored in three silo bags (67 tonnes /bag). One was unloaded after 20 weeks (the middle of winter), one at 28 weeks (the end of winter) and one at 40 weeks (in summer).

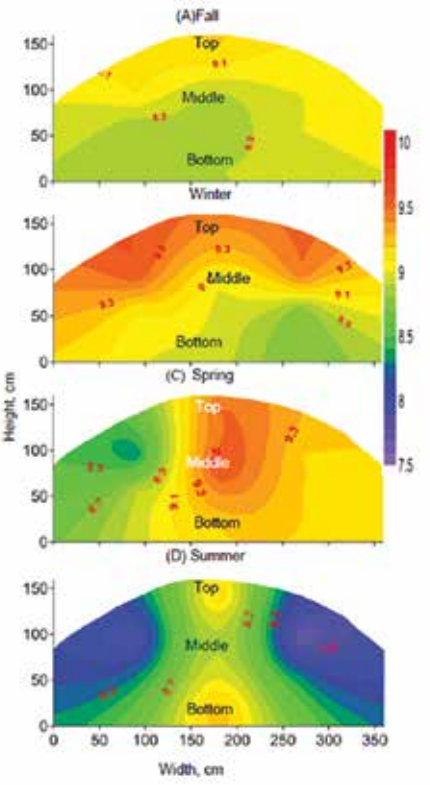
The canola showed no significant change in quality parameters up to 16 weeks of storage. Germination of canola at most parts of the silo bags stayed above a safe level up to the end of the winter season (20 weeks of storage). After 40 weeks, germination of canola decreased to below 30 per cent at the top layer.

The commercial grades after first, second and third unloading were No.1, No.2 and No. 2, respectively, in year 1. In the second year, these were No.1, No.1 and No.2, respectively.

Findings from this study were published in two parts in the transactions of the American Society of Agricultural and Biological Engineers*.

MOISTURE MIGRATION

These images show how the moisture profile in a silo bag of "dry" canola changes throughout the four seasons.



Moisture profile of silo bag with dry moisture content canola in (A) Fall, (B) Winter, (C) Spring, and (D) Summer seasons.

These experiments show that storing dry canola seeds for short duration was the best way of using harvest bags under Prairie conditions. To avoid quality and quantity losses, dry canola seeds can be stored for up to six to eight months, but tough moisture canola should be stored no more than five months, and damp canola should be stored only for three to four weeks.