

Bag Storage of Canola under Western Canadian Prairie Conditions

V. Chelladurai¹, F. Jian¹, D.S. Jayas¹ and N.D.G. White²

¹Biosystems Engineering, University of Manitoba, Winnipeg, MB, R3T 5V6

²Cereal Research Centre, Agriculture and Agri-Food Canada, Winnipeg, MB, R3T 2M9

Canola seeds with three moisture contents (8, 10 and 14% wet basis) were loaded into nine silo bags (three replicates per moisture content) on October 7, 2010 using a bag loader. Each bag was filled with approximately 20 t of canola seeds and stored until August 10, 2011.

Inside each bag, nine sampling locations for collecting seed and gas samples and temperature monitoring were established at 0.15, 0.8 and 1.35 m from the top of the bag, which represent the top, middle and bottom layers of the stored seeds in the bag. There were three locations at each layer: center and 0.15 m from the two sides. Seed temperatures were measured every 30 min. Every two weeks, intergranular gas and canola seeds were sampled using syringes and a standard torpedo probe, respectively. The FAV, moisture content, and germination rate of the sampled seeds and CO₂ concentration of the sampled gas were measured inside the laboratory.

Results showed germination rate of 14% m.c. canola seeds reduced to less than 50%, but there was no significant loss in germination rate of dry seeds (8 or 10% m.c.) throughout the 40 wk storage period. In all nine bags, moisture content of seeds at the top of bags was higher than the other parts of the bags because of the moisture migration inside the bag. FAV also increased twice the initial value in 14% m.c. seeds after 16 wk of storage. High CO₂ concentrations were recorded in first 8 weeks of storage because of high biological activity. In all of the nine bags, temperature of seeds near the bottom of bags was higher than other parts of the bag, and seeds near the top of bags were close to the ambient temperature.

The canola seeds inside the nine bags were unloaded on August 10th, 2011. A bag extractor was used to unload 8 and 10% m.c. canola. A front end loader was used to unload 14% m.c. canola because the 14% m.c. canola was spoiled and caked together.

From these preliminary results, we summarize that, canola seeds might be able to be stored at less than 10% m.c. in silobags for 10 months without significant quality deterioration when stored October onwards. But further tests are required to assess the quality changes of early harvest (mid to late August) canola. Wet canola seeds (higher than 14% m.c.) can only be stored for a short time (less than few months) without any quality deterioration.