

# Flax on the Farm

## Harvest and Storage of Flax

Harvest losses in flax can be the result of:

- frost damage
- weathering
- improper pre-harvest chemical use
- swathing or combining too early or too late
- unsuitable combine settings
- poor seed storage conditions.

Weather-related losses are a challenge to avoid but those related to chemical application, harvest timing, combine settings and seed storage conditions are relatively easier.

### PREPARING FOR HARVEST

- Pre-harvest chemicals should be applied at the 75-80% brown boll stage and within the appropriate pre-harvest interval (PHI). Certain chemicals should not be used on flax due to potential maximum residue limit (MRL) issues. Check with your grain buyer to find out if any chemicals are an issue for their market. Refer to the [MRL information](#) on the SaskFlax website for more details.
- Flax is ready to be combined when 90 to 100% of the bolls are brown. At this stage, seed will rattle loudly in the bolls and the moisture content should be 10% or less and suitable for storage.
- Refer to the [August edition of Flax on the Farm](#) for more advice on preparing for flax harvest.

### HARVEST

- Combine settings should ideally be adjusted when switching crops and even on different days of combining the same crop. Further adjustments may need to be made throughout the day due to changes in relative humidity and temperature.
  - For your flax crop start with the following settings\*:
    - concave - smaller opening
    - cylinder/rotor - higher speed setting
    - pre-cleaner/sieve - smaller opening
    - chaffer sieve - largest opening
    - tailings sieve – moderate opening
    - cleaning sieve – moderate opening\*\*
    - fan - lower speed setting
- \*settings may need to be adjusted depending on the brand or model of combine used.  
 \*\*will vary with type of combine and harvest conditions. Adjust to a lower setting to limit the amount of unthreshed material in the tank.
- Once settings have been adjusted, begin combining at a very low fan speed and increase slowly until only a few seeds are blowing out the back. After this, increase the speed of the combine and check overall performance. Measure the loss out of the back of the combine using a catch pan but remember to disengage choppers and spreaders first. Target no more than 2% mechanical losses. Also examine the quality of what is in the grain tank; too dirty or too clean means further adjustments are required.
  - Flax straw can be tough so ensure cutter/sickle bar and knives are sharp and in good working condition prior to harvest. Sharp straw chopper knives are also key. Removal of the secondary stationary knife set may ease the flow of flax straw through the combine.

- Installation of filler plates/strips at the front of the concave may be necessary on certain combines to adequately thresh flax.
- Straw is more difficult to chop under conditions of higher humidity.
- Avoid over-threshing because this will overload the cleaning system.
- Slow down for flax to avoid plugs and wrapping. Travel at speeds appropriate for acceptable losses.
- Slow down in dry conditions as breaking straw can overload the shoe and cause loss.
- Flax has a thin seed coat and can be easily damaged, especially if harvested at a low moisture content. Too high of a cylinder speed or too tight of a concave clearance will cause cracks in the seed coat.
- The fire risk when combining flax can be high, especially when combining under very hot and dry conditions. Be prepared.

## STORAGE

Flax is often one of the last crops harvested and as such storage considerations are important. Deteriorating harvest conditions such as cooler temperatures, early snowfall or late season rains can contribute to grain that is at less than optimal conditions upon binning.

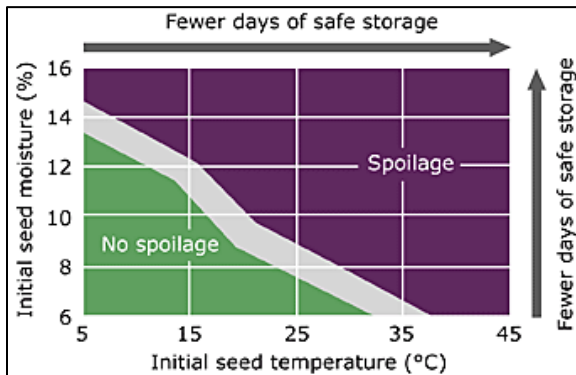
### Bin Basics

- Storage insect pests tend to be more prolific at higher temperatures so cooling your seed as quickly as possible after binning is a good preventative measure. Temperatures less than 15 to 18°C typically prevent storage insect feeding and reproduction. You can also apply an insecticide prior to storing seed. The only products registered for use on flax in storage are Protect-It and Insecto. Do not store flax in a bin treated with malathion or cyfluthrin within the past year due to potential residue issues.
- Damaged or weathered seed is more susceptible to microbial infection/attack.
- Storability is influenced by crop type and the moisture content and temperature of the grain at the time of binning. The higher the temperature and moisture at the time of binning, the shorter the safe storage period.
- Tough or damp grain needs to be dried immediately following harvest.
- To reduce the moisture content of grain, run fans when the air has the greatest capacity to dry or use a grain dryer. Refer to [equilibrium moisture content \(EMC\) charts](#) to determine the best conditions for natural air drying grain.
- Maximum drying temperature for seed that will be sown is 45°C, otherwise germination and vigour will be reduced.
- Seed that is binned at a high temperature stays hot for a long period of time, so it is important to cool (aerate) grain after drying. Even if grain is dry when stored, it often must be cooled to preserve quality and prevent spoilage. Dry flax is prone to heating due to its high oil content.
- The bottom of the bin always dries first and can even over-dry.
- Warm moist air migrates towards the top of the bin and causes moisture to condense on the underside of the roof. This moisture then drips on the grain and causes crusting.
- Pockets of higher moisture can form in a bin because of moisture migration.
- Immature, freshly harvested and high moisture seeds have high rates of respiration and produce heat. Seeds can respire up to six weeks in storage before going dormant.
- High moisture combined with fungal or microbial growth can cause seed to heat.
- Leave enough headspace at the top of the bin for adequate airflow and aeration.
- Check stored crops bi-weekly during the fall and spring and at least monthly during winter.
- Monitor stored grain regularly for signs of spoilage which include:
  - increased temperature
  - increased moisture
  - visible mould
  - insect/mite activity
  - increased CO<sub>2</sub> levels
  - clumped grain, crusting
  - off-odour

## Considerations when Storing Flax Seed

- Severe insect infestations are very uncommon in flax. Potential storage insect pests of flax are: the saw-toothed grain beetle, confused flour beetle, merchant grain beetle, red flour beetle, lesser grain borer and the rusty grain beetle. Storage insect pests are more common in warmer grain.
- Use the chart below (Figure 1) to determine if additional storage precautions need to be taken with your flax seed by plotting the temperature and moisture at binning. If your seed falls within the no spoilage zone, it will store safely for at least 5 months. If your seed falls into the spoilage zone, cool and/or dry it until it falls in the no spoilage zone. A maximum moisture content of 8.5% is recommended for long-term storage of flax seed. If the seed lot to be stored contains chaff and/or damaged seed, a moisture content less than 8.5% may be required for longterm storage.

**Figure 1. Safe storage chart for flax**



Sourced from the Canadian Grain Commission safe storage guidelines webpage

<https://www.grainscanada.gc.ca/en/grain-quality/manage/manage-storage-prevent-infestations/prevent-spoilage.html>

- Commercial flax seed typically has a moisture content of 10% or less.
- Dockage can be high in harvested flax and this can be a storage issue. Dockage contains moisture and therefore can increase the moisture content of a stored seed lot. Storage insect pests are typically more prolific in grain that has higher dockage.
- Flax is prone to moisture migration even if seed was stored dry at a uniform moisture content.
- Moisture leakage into a storage bin is bad news for flax. The seed is coated in mucilage and when this combines with water it becomes sticky and can lead to caking/adherence of seed which is challenging to remove from a bin.
- Flax seeds respire significantly immediately after harvest so can cause quick heating if stored too wet.
- Ventilation of stored flax seed is essential as damp, damaged and sprouted flax seed produces hydrogen cyanide gas.
- Flax seed can be damaged in storage due to heating and therefore aeration of the seed immediately after binning is recommended to begin the cooling process. Frequent checking of the bin is required until the seed has been sufficiently cooled.
- Due to its size and flat shape, flax seed has strong airflow resistance (static pressure), meaning that a higher air pressure is required to achieve the same air flow rates as other crops. Therefore, to ensure good airflow through flax seed bulks, it is important to not overfill bins and larger fans may be required.
- Low level heat and a longer drying time is often recommended for drying flax seed using supplemental heat due to its higher oil content and lower ignition temperature.

**For more information about harvesting and storing flax contact the following:**

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**Useful links:**

1. Combine Adjustment and Harvest Tips:

- [Don't Set it and Forget it! \(PAMI\)](#)
- [Maximizing Harvest Productivity \(PAMI\)](#)
- [Harvesting Oilseed Crops in Late Fall \(Manitoba Agriculture\)](#)
- [Managing Variable Stages at Harvest \(Saskatchewan Ministry of Agriculture\)](#)

2. Grain Drying and Storage Information:

- [Manage Stored Grain \(Canadian Grain Commission\)](#)
- [Grain Storage \(Alberta Agriculture & Forestry\)](#)
- [Crop Storage \(PAMI\)](#)
- [Grain Drying and Storage \(NDSU\)](#)
- [Drying and Storage of Damp Grain \(Manitoba Agriculture\)](#)
- [The Process of Grain Aeration \(Ron Palmer\)](#)
- [Moisture Content of Canadian Grains \(Canadian Grain Commission\)](#)
- [Flax Moisture Meter Conversion Table \(Canadian Grain Commission\)](#)

3. Storage Pests

- [Seed storage insect identification keys \(Canadian Grain Commission\)](#)
- [Insects and Mites in Farm-Stored Grain \(Manitoba Agriculture\)](#)
- [Insects in Stored Grain app \(University of Manitoba\)](#)