

# Flax on the Farm

## Six Early Growing Season Considerations for a Successful Flax Crop

### 1. Seed preparation

- The first step to a successful flax crop is to start with high quality seed. Vigour and performance decrease over time with farm-saved seed.
- If using farm saved seed, a seed sample should be sent to an accredited seed lab to verify that it is free from CDC Triffid.
- If seed quality is questionable, or if seeding into cool, wet soil, treating the seed with a fungicide may be beneficial to minimize the impact of seed rot, root rot, or seedling blights and improve emergence.

**Table 1. Currently registered seed treatment products for flax**

Seed Treatment Product	Fungicide Group	Root rot/ stem rot Pathogens Controlled
Insure Pulse	4, 7, 11	Fusarium, Rhizoctonia
INTEGO Solo	22	Pythium
Vitaflo	7, M3	Fusarium, Rhizoctonia

### 2. Seeding date

- Flax is frost tolerant. Newly emerged (cotyledonary) plants can withstand temperatures down to -3.9°C (25°F). Plants at the two-leaf stage can tolerate down to -8°C (18°F) if acclimated.
- Flax grows well at 13°C (55°F) and grows at a faster rate than weeds at low temperatures.
- Flax is a longer season crop requiring 95 to 125 days to mature.
- Ideally, flax should be seeded by the end of the third week of May to maximize yield.
- Early seeding increases the crop's competitiveness with weeds, avoids high temperatures during flowering, makes the plants more resistant to diseases and increases the chances of the straw being dry at the time of combining.
- Flax resists the elements very well during tough harvest conditions, so even if it is seeded early it can stand until other crops are harvested or until the weather improves without much negative impact.
- Growing 'northern adapted' flax varieties can take the pressure off seeding earlier in a more northern location. Detailed information on registered and up and coming varieties is available in the provincial seed guides:
  - Alberta: <http://www.seed.ab.ca/magazine/>
  - Saskatchewan: <http://saskseed.ca/seed-guides/>
  - Manitoba: <http://www.seedmb.ca/digital-edition/pdf-editions-and-separate-section-pdfs/>

### 3. Seeding rate and depth

- Target plant population after emergence is between 300 and 600 plants/m<sup>2</sup> (28 to 56 plants/ft<sup>2</sup>).
- The emergence rate of flax is typically 50 to 60%, which translates to a desired seed population at planting between 600 and 1,200 seeds/m<sup>2</sup> (56 to 112 seeds/ft<sup>2</sup>).
- At a typical germination rate of 90% and an average seed size of 5 grams per 1,000 seeds, the target seeding rate for flax is between 33 kg/ha (30 lb/ac) and 67 kg/ha (59 lb/ac).
- How to calculate seeding rate for flax:

Seeding rate = desired seeding population x area conversion x TSW x weight conversion x inverse of germination rate as a decimal

$$= \frac{800 \text{ seeds}}{\text{m}^2} \times \frac{10,000 \text{ m}^2}{\text{ha}} \times \frac{5.8 \text{ g}}{1,000 \text{ seeds}} \times \frac{\text{kg}}{1,000 \text{ g}} \times \frac{1}{0.9}$$

$$= 52 \text{ kg/ha (46 lb/ac)}$$

- Lower seeding rates under dry conditions are recommended to limit competition for moisture. Low seeding rates under wet conditions can translate to delayed maturity.
- Higher seeding rates are recommended under wet conditions and may also improve competitiveness with weeds.
- Ideally, flax should be planted at 1” (2.5 cm) deep into moisture, but depths can range from 0.75 to 1.5” (2 to 3.8 cm) depending on moisture availability at seeding.

#### 4. Field preparation

- Good seed-to-soil contact and adequate moisture will improve germination and emergence. Loose and/or clumping seed beds reduce seed-to-soil contact, so for this reason flax performs well in reduced and no-till conditions. If tillage is used, a firm seed bed with adequate moisture is recommended.
- Bunched straw from the previous year’s crop may reduce plant populations by impeding emergence or may contribute to variable emergence. Low plant stands may then contribute to low yields and increased weed pressure. Large amounts of crop residue may also cause frost injury.
- Crop rotation choices impact flax yield. Flax on flax and flax after canola/mustard may reduce yield and volunteer canola can be challenging to control in a flax crop.
- Several herbicides have re-cropping restrictions for flax, so a review of the field history and a provincial crop protection guide (links below) prior to seeding is advised.
  - Alberta: [https://www1.agric.gov.ab.ca/\\$department/deptdocs.nsf/all/agdex32](https://www1.agric.gov.ab.ca/$department/deptdocs.nsf/all/agdex32)
  - Saskatchewan: <http://www.publications.gov.sk.ca/details.cfm?p=77706>
  - Manitoba: <https://www.gov.mb.ca/agriculture/crops/guides-and-publications/#gfcg>

#### 5. Early season weed control

- Flax is a poor competitor with weeds, so good early season weed control gives the crop a head start and improves its ability to compete with later emerging weeds.

**Table 2. Currently registered pre-seed and pre-emergent herbicides for flax**

Herbicide	Group	Pre-plant	Pre-emerg	Weeds Controlled (most common and those with confirmed herbicide resistance)																					
				buckwheat, wild	chickweed	cleavers	cow cockle	dandelion	foxtail, green	foxtail, yellow	hemp-nettle	kochia	lamb's quarters	mallow, round-leaved	mustard, wild	narrow-leaved hawk's beard	oat, wild	Persian darnel	pigweed, redroot	shepherd's purse	smartweed, annual	sow-thistle, annual	stinkweed	thistle, Canada	thistle, Russian
Aim	14	√			√							√	√	√							√		√	√	
Authority*	14	√	√	√	S							√	√												
Authority Charge (Aim + Authority)*	14	√		√	√							√	√	√							√		√	√	
Avadex*	8	√															√								
CleanStart (Credit + Aim)	9,14	√	√	√	√	√	SS	√		√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√
Eptam Liquid EC**	8	√			√			√	√			√				√		√							√
Fortress MicroActiv*	3, 8	√		S				√	√		S	S			√		S						S		
Glyphosate	9	√	√	√	√			√		√	S	√		√	√	√	√	√	√	√	√	√	√	√	√
Glyphosate + Aim	9,14	√		√	√			√		√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√
Glyphosate + Bromoxynil/MCPA	4,6,9	√		√	√	√	TG	√		√	√	√	√	√	√	√	√	√	√	√	√	√	√	TG	√
Glyphosate + MCPA	4,9	√		√	√		TG	√		√	√	√	√	√	√	√	√	√	√	√	√	√	√	TG	√
Koril 235 + Aim	6,14	√		√	√	√					√	√	√	√				√	√	√	√	√	√	√	√
Koril 235 + Aim + Glyphosate	6,9,14	√		√	√	√				√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√

Adapted from the Alberta, Saskatchewan and Manitoba crop protection guides. Check product labels for application rates, complete list of weeds controlled and restrictions.

\*re-cropping restrictions (may be further influenced by drought conditions)

\*\*not recommended in Saskatchewan due to risk of crop injury

Type of control: S=suppression, SS=spring seedlings, TG=top growth

## 6. Fertilizer

- Flax is sensitive to seed-placed nitrogen and phosphorous, so side or mid-row banding is important.
- Nitrogen rates (soil residual N + fertilizer N) from 45 to 110 kg/ha (40 to 98 lb/ac) are recommended.
- Recent research has shown that flax yields steadily increase with nitrogen levels up to approximately 100 kg/ha (89 lb/ac).
- Flax can be responsive to phosphorous, but results vary based on environment such that no standard recommendation is in place. The flax crop responds to high levels of reserve phosphorous in the soil, and planting flax after a mycorrhizal crop (e.g. cereals, legumes) increases its ability to take advantage of residual phosphorous.
- Application of potassium and sulphur can be beneficial but tends to be field-specific, so a soil test is recommended to determine whether application of these nutrients is necessary.
- Flax can be very sensitive to deficiencies of iron and zinc, especially if seeded into calcareous (high lime) soils when soil moisture is high. Under these conditions, irregular patches of chlorotic plants (pale green to yellow leaves) may appear in the field. Research has shown that even when soils are deficient, flax may not respond to the addition of micronutrients. Therefore, the application of these to a small area is recommended before applying to the entire field, so that the response of the plants can be observed. Yield may decrease if micronutrients are applied when not necessary. Soil and plant tissue tests are recommended to confirm the amounts of micronutrients.

### For more information about seeding flax contact the following:

Michelle Beath  
Agronomist  
Saskatchewan Flax Development Commission  
(306) 664-1901  
[michelle@saskflax.com](mailto:michelle@saskflax.com)

Dane Froese  
Industry Development Specialist – Oilseeds  
Manitoba Agriculture  
(204) 750-2840  
[dane.froese@gov.mb.ca](mailto:dane.froese@gov.mb.ca)

Matthew Bernard  
Provincial Specialist, Oilseed Crops  
Saskatchewan Ministry of Agriculture  
(306) 787-4668  
[matthew.bernard@gov.sk.ca](mailto:matthew.bernard@gov.sk.ca)

Murray Hartman  
Oilseed Specialist  
Alberta Agriculture and Forestry  
(403) 782-8024  
[murray.hartman@gov.ab.ca](mailto:murray.hartman@gov.ab.ca)

