

# Effect of Spring Frost on Emerging Crops

*10 year recap: previous late spring frosts - May 30, 2015 and June 6, 2009*

Don't assume because there is frost (or snow) on the ground, that your emerging crop is dead!

With the drop in temperatures in the past couple of days, there are a few things to keep in mind if the mercury dips below 0°C. The temperature is the instigator for causing frost, but whether it is -0.1°C or -4°C the damage inflicted is highly influenced on these other factors:

## 1. Duration

- Short frost = < 2 hours, may not cause much damage if frost is light (above -1 to -2°C), crop type and staging is tolerant, conditions wet and crop has become acclimatized.
- Short frost = < 2 hours, but hard frost (lower than -2°C), crops like canola are more sensitive to longer frost vs. cereals, damage can be variable in field and across area.
- Long frost = > 2 hours, whether frost is light or hard the longer the negative temperatures the more time for damage to happen. Tolerance by crop type varies.

## 2. Other Environmental Conditions

- Cloudy and wet - prior to a frost, cool temperatures slow plant growth and 'hardens' plants off, which will help them tolerate a frost. Also wet soil helps buffer the cold air effects on the plants, as wet soils change temperature slower than dry soils.
- Sunny and dry - The combination of a dramatic drop in air temperatures when plants are actively growing then a brilliant sunny day after the frost event is where we have seen the most damage. Scouting after the frost (24 and 48 hours) is very important though to assess extent and percentage of field injury.
- Field trash cover - increased trash in fields was seen to increase frost damage on very susceptible crops in the 2009 June frost

## 2. Crop Type

- Spring Cereals - more tolerant than other crops types, can tolerate temperatures as low as -6°C as growing point below ground until the 5 leaf stage.
- Winter Wheat - can withstand very low temperatures for a short period of time (-11°C for less than 2 hours) up until the tillering stage.
- Corn - smaller than V5, will recover from light frost as growing point below ground. Leaves probably will be killed, but plants will recover if the growing point is ok.

- Oilseeds - environmental conditions impact frost severity on susceptible canola and flax cotyledons. Resiliency increases at the 3-4 leaf stage (canola) or 2nd whorl (flax). Sunflowers are fairly tolerant up to the V4 stage.
- Pulses - peas are most tolerant, then soybean, edibles bean are very susceptible even before emergence. Field pea crops are rarely lost to frost. Soybean are more sensitive, but the smaller the soybean plant the more tolerant they are - from emergence to cotyledon can withstand short light frosts.

### Scouting After a Frost

Scouting should start 24 - 48 hours after the frost and continue for the 5 days following the frost event. Look for leaves wilting, looking "water-soaked" or see "frost banding". Watch for new growth in the plant. You do not want to see plants wilted and not perking back up or pinching off on the stem near the growing point (canola, flax, soybeans). Also assess the area affected by frost, small areas or a few plants damaged are ok, as other plants emerged (or just emerging) will fill in those spaces. Large dead areas may need to be re-seeded.

If in doubt of what look for, call your local agronomists, local FPE Specialist with Manitoba Agriculture or the Crop Industry office at 204-745-5660.

For more specific details on what actually occurs to plants with a frost and crop specific details and symptoms to look for (and how long after a frost to do assessment) see Manitoba Agriculture's [Spring Frost Damage Bulletin](#).



Figure 1: Canola, 24 hours after a frost event



Figure 2: Canola, 5 days after a frost event. One plant unharmed, one plant with dead cotyledon leaves, but new leaves emerging