



Cold Snap Reality Check: Frost Injury in Spring Cereals Before Heading

A spring frost can turn spring wheat or spring barley from “looks great” to “what happened?” overnight—leaf tips burned, plants looking wilted, and fields taking on a gray-green cast. The mistake is making a yield call based on leaf color.

Before heading, the most important question is simple: did the growing point survive? If it did, the crop often rebounds. If it didn’t, you’ll see delayed development, missing heads, or sterile spikes later.

This guide walks through how to evaluate spring cereals for frost injury prior to heading, what symptoms matter, and how to avoid costly knee-jerk decisions.

1) Why frost hits spring cereals differently

Spring cereals tend to move through stages quickly once temperatures warm. That can put a lot of acres in vulnerable windows at the same time—especially during stem elongation and boot stage.

A quick growth stage refresher helps because what you check (and how you interpret damage) depends on whether the crop is tillering, jointing, or near boot stage. [1]

2) What frost injury can look like before heading (and what it doesn’t mean)

Frost symptoms can show up as burned leaf tips, twisted or kinked newest leaves, water-soaked tissue that later turns tan/brown, and uneven field color (low pockets often show injury first).

Key point: leaf injury alone does not equal yield loss. Before heading, yield loss is most often tied to injury of the growing point or developing head. [2][3]

3) The #1 check: growing point viability (split stem test)

When to sample

Wait until tissue thaws (often the next morning). Frost injury is patchy, so sample multiple zones: low pockets, field edges, thin stands, sandy/low-residue areas, and exposed ridges.

How to do it

- Cut several whole plants at the base (don't just pull leaves).
- Split stems lengthwise from the crown upward with a knife.
- Locate the growing point and evaluate color and firmness.

What “alive” looks like

Healthy growing point tissue is typically white to pale green and firm. [2][3]

What “injured” looks like

Damaged tissue often turns brown/tan or becomes water-soaked, then dries down. [2][3]

Practical interpretation: if most sampled plants have healthy growing points, yield risk is usually limited. If many plants show damaged growing points—especially main stems—yield risk increases quickly. [2]

4) Boot stage: check the developing head (pre-heading but high sensitivity)

Boot stage is one of the most frost-sensitive windows before heading because the developing head is enclosed in the stem and can be injured even when the outside looks “okay.” [2][3]

Boot-stage frost injury can show up later as partial heading, blank spikelets, sterile florets, or white heads in severe cases.

How to check heads in boot

- Split the stem above the last node (where the head is enclosed).
- Examine the head: healthy tissue stays light-colored and firm; injured tissue often becomes discolored and soft, then necrotic. [2][3]

Because symptoms can lag, re-check the same zones several days later to confirm progression and uniformity. [2]

5) Read the field pattern before you make a decision

Frost injury rarely affects a field evenly. Mapping patterns helps you decide whether injury is cosmetic, localized, or widespread.

Common drivers: cold air drainage into low spots, thin stands with less canopy buffering, bare soil with less thermal buffering, and low-residue zones that cool faster at night. [2]

6) What to do after frost: wait, watch, and measure

The most common mistake is making a major management decision in the first 24–48 hours.

A better approach:

- Confirm growth stage (tillering vs jointing vs boot). [1]
- Split stems across zones to check the growing point or developing head. [2][3]
- Re-check in 3–7 days; tissue breakdown can progress after the event. [2]
- Measure stand/tiller survival and development, not just leaf color.

Spring cereals can compensate, especially if secondary tillers remain viable. That's why accurate diagnosis matters—fields can look ugly and still produce if the growing points are intact. [2]

7) Management implications (what changes, what doesn't)

Herbicide timing

If the crop is stressed, be cautious with herbicide timing. Label cautions and regional guidance commonly warn that applications to stressed crops can increase injury risk and slow recovery. [4]

Fertility timing

If growing points are intact, your fertility plan may stay largely the same. In patchy injury, consider whether timing or rate needs adjustment to support recovery and reduce lodging risk.

Replant decisions

Replant decisions in spring cereals are more feasible than winter cereals, but the decision still depends on severity, uniformity, calendar date, and alternative crop options. Use viability and stand measurements—not field color—to guide that call. [2]

8) A quick, field-ready frost checklist

Use this after a frost event:

- Step 1 — Identify stage: tillering / jointing / boot? [1]
- Step 2 — Check the right tissue: tillering–jointing → split stems and evaluate growing point; boot → split stems and evaluate developing head. [2][3]
- Step 3 — Sample smart: pull plants from at least 5–10 areas (low spots + ridges + average) and record percent healthy.
- Step 4 — Re-check: revisit in 3–7 days to confirm progression and regrowth. [2]

Schedule a field walk

If you've had frost conditions and you're unsure whether your spring wheat or spring barley is "fine" or "in trouble," we can help you get a confident answer quickly.

During a Western Seeds field walk, we'll confirm growth stage, split stems and evaluate growing point/head survival across zones, and quantify how widespread injury is.

Reach out to schedule a field walk. A short assessment now can save a season's worth of second-guessing.

Reference List

[1] University of Idaho Extension. Southcentral and Southeast Idaho Cereals Program – Growth Stages (Wheat/Barley). (Growth stage identification to support management decisions.)

[2] Kansas State University Extension / K-State Research and Extension. Freeze/Frost Injury Assessment in Wheat. (Growing point evaluation; patchiness; timing to re-check; boot-stage sensitivity concepts.)

[3] North Dakota State University Extension. Assessing Frost/Freeze Injury in Small Grains. (Stem-splitting methods; interpreting healthy vs injured growing points/heads; sensitivity by growth stage.)

[4] Pacific Northwest Pest Management Handbooks (OSU/WSU/UI). Weed Management Handbook – Cereal Grain. (Herbicide timing and cautions related to crop stress and application conditions.)

***concept by Trenton Stanger, developed with the help of ChatGPT