



Freeze Injury to Small Grain in 2016

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Below is a few notes from Dr. Wade Thomason, Small Grain Extension Specialist.

Over the past several days I have found freeze injury in both Barley and Wheat in the area. Most of the fields appear to have about one percent injury (i.e. one bushel yield loss if the potential was 100 bushels per acre). However I checked a couple fields where I fear the injury might be a lot higher (in one wheat field I pulled about 10 stalks and at least six heads were 100% damaged).

Due to the dry weather, there may be a lot of farmers who are considering harvesting their small grain as haylage instead of for grain. If this be the case, you might want to look at the heads to evaluate freeze injury. Fields with a lot of freeze injury might be good candidates for hay harvest.

The actual severity of freeze damage in a particular field or part of a field is difficult to predict because of difference in topography, elevation, and exposure. The extent of damage also is impacted by plant growth stage, moisture content within and on plants, humidity, and wind.

Common freeze injury symptoms include:

- Emerging leaf in whorl turns yellow or is brown
- Stems are flaccid, rough and collapse
- Areas below or above nodes begin to show a brown discoloration
- Head located in boot becomes milky in color, water-soaked or begins to turn tan-brown
- Exposed head turns light tan to bleach
- Developing kernels begin shriveling, turn brown.

In short, I'm expecting to see three set of symptoms depending on growth stage and level of injury.

In the first photo below – scalded leaf tips represent damaged cells in leaves, especially on those that were perpendicular with the surface (flat). This alone is likely only a cosmetic problem.

The photo to the right is the emerging head inside the stem (stem split open). This photo is just beginning to show the early stages of cold damage to the developing head. After 3-5 days (wheat actively growing again) if injury to the developing head occurs it will lose the healthy, pale green coloration and turn whitish/ brownish. Note that it does take several days after the injury to see this. To scout for this it's important to look at the bigger stems at multiple locations in the field, split them open and assess the status of the developing head.

The third photo shows stem damage from freeze. The most common symptom of stem injury is a brown 'circle' around the whole stem. This occurs due to damage to a band of cells and effectively cuts off water and nutrient movement. It can also cause lodging. You won't need to dissect any plants to find this, but make sure and look carefully at the entire stem, even close to the ground.

For what it's worth – I hope you don't see any of this!



Below are a few pictures of freeze injury that I collected in the Northern Shenandoah Valley



Picture to Left shows freeze damage to wheat. The arrow points to the seed head. The entire seed head is damaged



The picture to the left shows a barley seed head. Only the uppermost portion of the seedhead appears to be damaged.

The picture to the right shows freeze injury on barley that is a little more extensive than the picture above. I believe there is both freeze injury at the top of the seedhead and also a little lower on the plant.



More Pictures and a Quote from Wade Thomason (Extension Small Grain Specialist)

“Yesterday I took some photos of wheat stems damaged by freeze that differ from the girdled stem photo shown on page #1. From the outside these look like oval lesions or chlorotic areas. When the stem is split you can see that there's no green tissue remaining. This was first noticed because spots in the field were "going backward". They are a little off-color, shorter, etc.”

