

MSU Grain Crops Update
April 5, 2007
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Wheat Freeze Alert - If freezing temperatures occur this weekend, as predicted, Mississippi's wheat crop may suffer moderate to catastrophic yield loss. Wheat sensitivity to freezing temperatures varies depending upon crop growth stage, and unfortunately, early heading stages (the current age of much of our crop) are extremely sensitive to freezing temperatures. Well above normal March temperatures promoted wheat maturity about two weeks earlier than normal this season. Wheat is most sensitive to freezing temperatures while flowering, about a week after head emergence. Injury can be expected from temperatures around 30 degrees F on heading wheat or around 28 degrees F on wheat in the boot stage, where heads are nearly ready to emerge from within the upper leaf sheath. The extent of freeze injury will vary depending upon actual temperature in the crop canopy and the duration of freezing temperatures, which can also be influenced somewhat by topography, and wind.

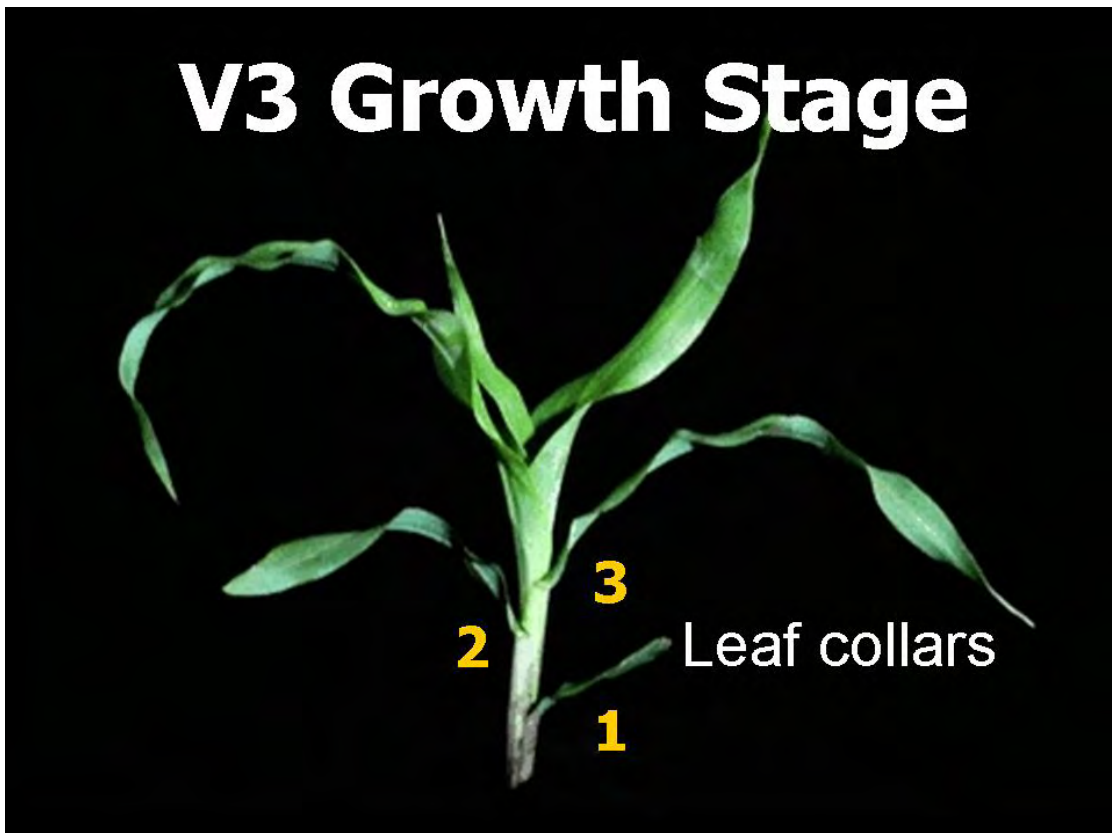
The male reproductive parts (anthers) are particularly sensitive to freeze damage. Since wheat is primarily self-pollinated, dead anthers may sterilize spikelets (the part that develops an individual kernel), resulting in complete or partial head sterility and severe grain yield loss.

Freeze injury may be diagnosed by the presence of initially water-soaked, discolored heads which may initially appear yellow, before turning white or light brown as the tissue dries. Wheat varieties possessing awns or beards are also quite vulnerable and may be white and/or misshapen. Freeze injury severe enough to burn leaves, will likely be fatal to anthers. Injured anthers will appear desiccated or shriveled, and white, instead of their normal yellow-green color. Using hand lens will likely help detect this injury.

For more detailed information and photos, please refer to:
"Spring Freeze Injury to Kansas Wheat" – Kansas State University
<http://www.oznet.ksu.edu/library/crpsl2/c646.pdf>

Will corn recover from freeze damage? The freezing temperatures predicted this weekend hopefully will only produce minor to inconsequential damage to most of our corn crop, although nothing is certain. Although emerged corn foliage will be burnt by frost, sometimes producing the visually striking appearance of “dead plants” within a few days – young plants have the capability to fully recover, if mother nature cooperates. This is because the vital growing point of young corn plants remains under the soil surface and generally protected, until corn reaches the V6 growth stage (about 12 inches tall – refer to Figures 1 and 2). Thus, freeze-damaged corn plants should quickly recover, given favorable growing conditions (warm temperatures and adequate, but not excessive moisture). Conversely, some plants may die, if unfavorable weather persists and/or diseases flourish. The recoverability potential of smaller or younger plants are generally better than larger or older plants, because energy reserves in the seed are greater, than that of older plants. On a side note, if blackbirds have succeeded in extracting a seed after seedling emergence without extracting or otherwise killing the plant, completely defoliated plants will have little energy reserve to sustain growth. Of course, the more undamaged foliage capable of producing energy via photosynthesis, remaining after a marginal freeze, the greater the recoverability.

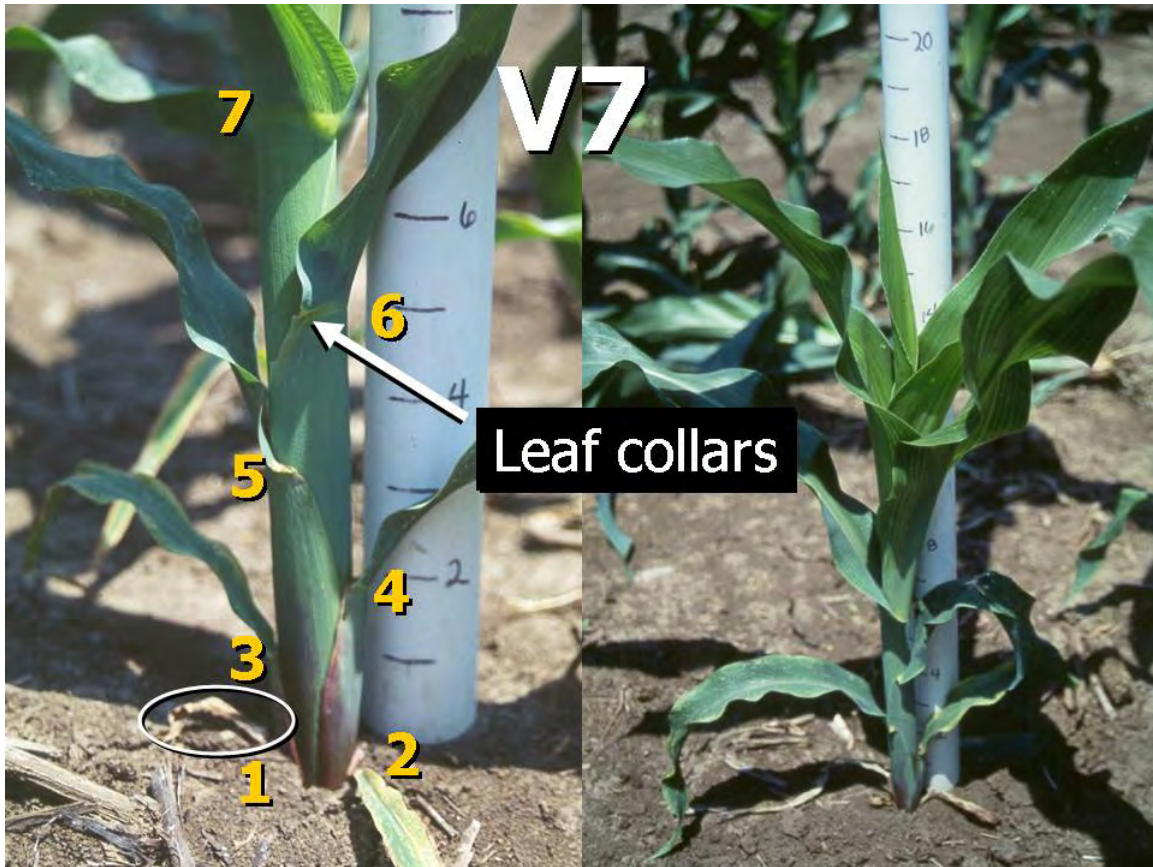
Figure 1. V3 growth stage corn plant. V stages are assigned based upon number of completely emerged leaves with leaf collars present. This does not include the leaves in the whorl.



Assessing corn recovery will require monitoring plants daily for new leaf growth at least a week or more after the last freeze event. Newly emerging leaves often experience some initial resistance from dead leaves stuck in the whorl, twisting or bending leaves as they attempt to unfurl. The growing point may be evaluated by splitting the stem and observing the pyramid-shaped stalk tissue stacked within the stem.

Crop yield reduction will be primarily dependent upon the degree of stand reduction resulting from injured plants which die from starvation and/or secondary pathogens infecting damaged tissue.

Figure 2. V7 growth stage plants showing leaf collars. V7 plants will range around 18 inches tall.



For more information, please refer to:
"Assessing Hail and Freeze Damage to Field Corn and Sorghum" - Texas
Agricultural Extension Service
<http://tcebookstore.org/tmppdfs/17417800-B6014.pdf>

To add your address to the Corn and/or Wheat email list, please send a request to: elarson@pss.msstate.edu.



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