

MSU Grain Crops Update

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Wheat Freeze Assessment – Temperatures sustained early Tuesday morning were very near the thresholds documented as capable of producing wheat freeze injury. However, although freezing temperatures extended farther south in Mississippi than last year, temperatures were generally considerably warmer and much shorter in duration than last year in north Mississippi, where many fields sustained severe wheat yield loss.

Wheat sensitivity to freezing temperatures varies depending upon crop growth stage, and early heading stages (the current age of much of our crop) are extremely sensitive. 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 be influenced somewhat by topography, and wind.

Wheat freeze damage cannot be completely assessed for a week or more after the event and is extremely tedious. Damage is likely to differ considerably from head to head, since wheat maturity naturally ranges by a week or more in most fields. Furthermore, damage may vary depending upon floret location in the head. Overall, there are around 10 million wheat kernels per acre to potentially evaluate.

For more information about wheat freeze damage assessment, please refer to last year's newsletter: http://msucares.com/newsletters/grain/2007/april20_2007.pdf

Figure 1. Wheat freeze injury can vary from head to head, making evaluation difficult.



Will corn recover from freeze damage? The freezing temperatures which occurred Tuesday morning will likely not produce significant damage to most of our corn crop. However, you should check plants for new leaf growth for at least a week, before making any further management decisions. The more undamaged green leaf tissue is present, the higher the potential for recovery, because plants can produce energy via photosynthesis to sustain growth. Also, small plants typically recover better than older plants to early defoliation/dessication. If temperatures warm into the high seventies as forecast over the next several days, this will stimulate quick growth and recovery.

Corn recovery from freeze damage is very dependent upon favorable temperatures and growing conditions following a freeze. Small corn is relatively immune to direct damage resulting from defoliation by freeze or other physical means, because the vital growing point of young corn plants remains under the soil surface, until corn reaches the V6 growth stage (about 12 inches tall – refer to Figures 1 and 2). However, if the seed furrow slice is open, or corn seed was planted shallow, the growing point may be exposed to freeze damage.

This year's forecast is starkly better than the weather following last year's freeze when cold, cloudy weather were prevalent 10 or more days after the freeze. These 2007 temperatures slowed corn growth to a standstill, regardless of the extent of freeze-defoliation. Daily temperatures did not exceed 75 degrees high and 50 degrees low F for twelve days after the initial freeze in north MS during 2007. Growing degree day (based upon 50 degree F for corn) accumulation during this time was only about 25-45 DD50's, which is equivalent to what is normally collected in 2 to 3 days. Thus, many fields did have substantial stand loss because the poor growing conditions kept plants virtually dormant for an extended period, during which they had no ability to produce food to sustain life.

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 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.

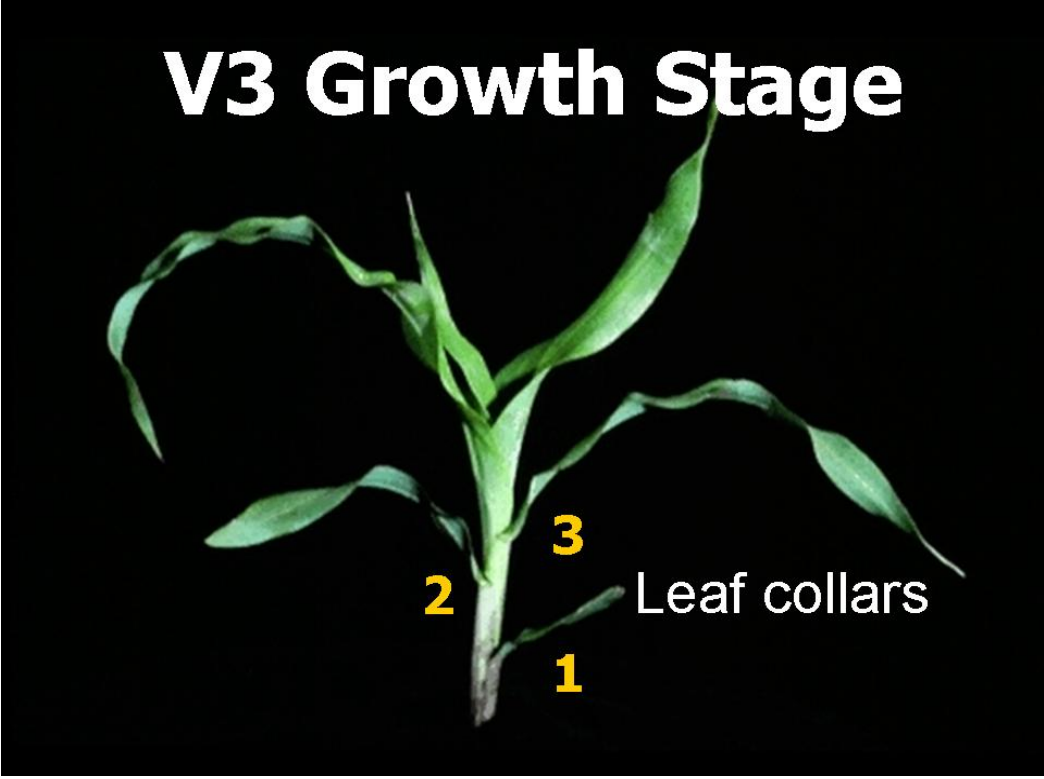
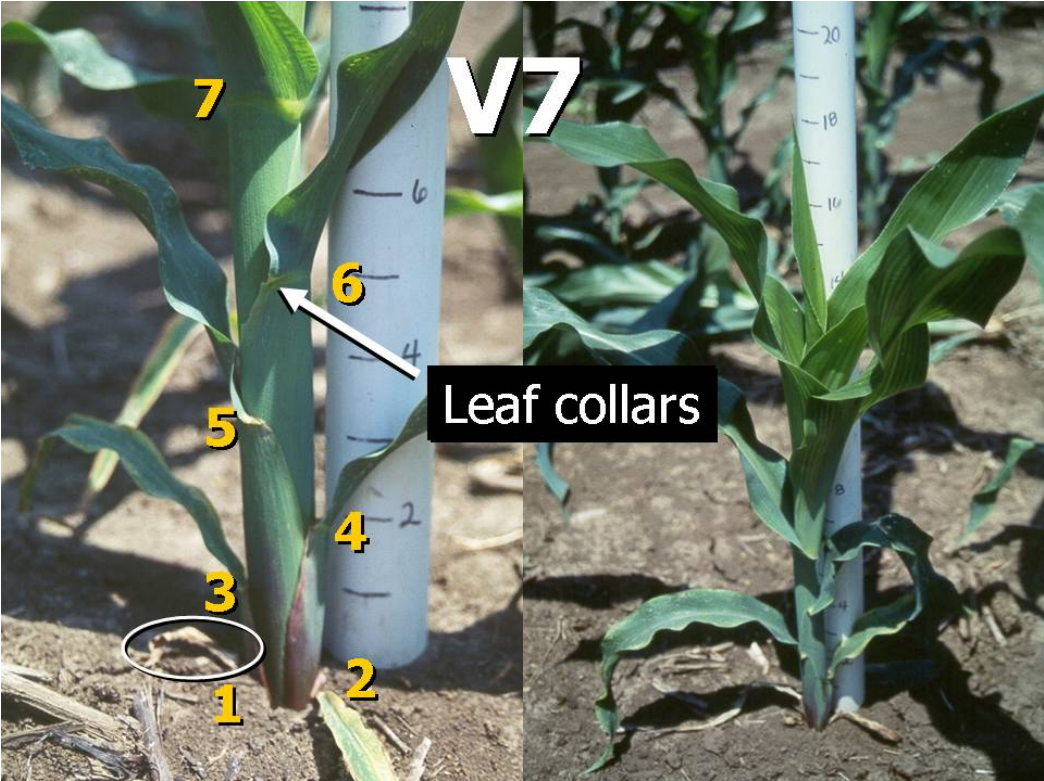


Figure 2. V7 growth stage plants showing leaf collars. V7 plants will be about 18” tall.



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