Issue 625

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eUpdate

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These e-Updates are a regular weekly item from K-State Extension Agronomy and Steve Watson, Agronomy e-Update Editor. All of the Research and Extension faculty in Agronomy will be involved as sources from time to time. If you have any questions or suggestions for topics you'd like to have us address in this weekly update, contact Steve Watson, 785-532-7105 swatson@ksu.edu, or Curtis Thompson, Extension Agronomy State Leader and Weed Management Specialist 785-532-3444 cthompso@ksu.edu.

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1. Freeze injury update, April 11: Risk assessment to Kansas wheat

The risk of freeze damage to wheat is a function of the stage of crop development, of the minimum temperature achieved, and of the duration of time spent at potentially damaging temperatures.

Stage of crop development throughout Kansas

Our current estimates of crop development for different portions of the state are provided in Figure 1. The most advanced fields in far southeast corner of the state are between boot and flowering, and the majority of that region is already at or past flag leaf emergence. Parts of south central Kansas and northern southeast Kansas are mostly now at flag leaf emergence or at boot. Central Kansas fields and those fields that emerged last fall in southwest Kansas are past the second node and approaching flag leaf emergence. Northern and northwest Kansas have the majority of the fields now at the jointing growth stage or slightly past it.

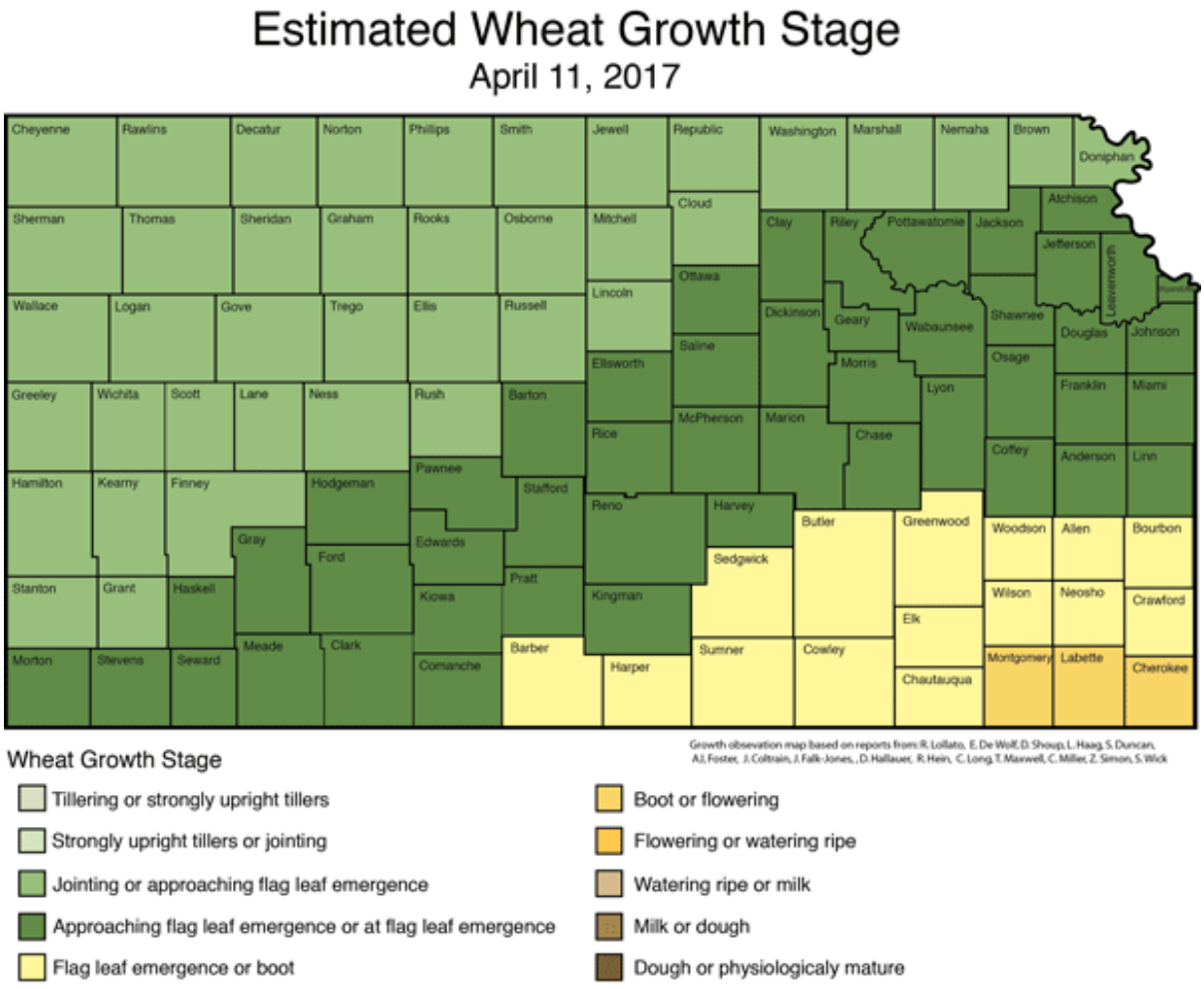
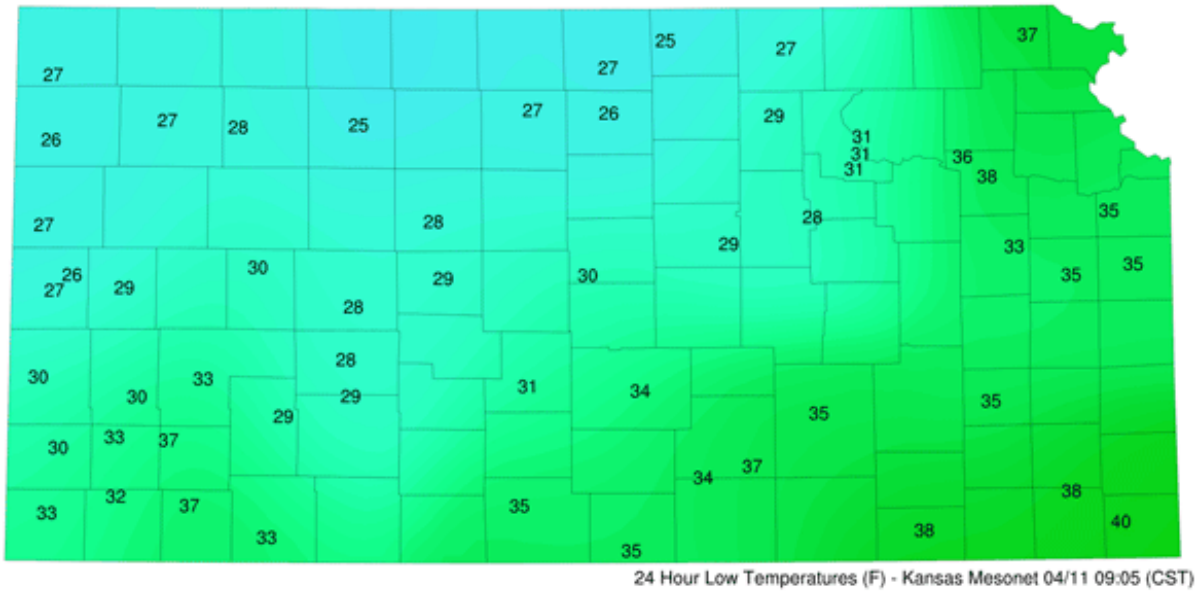


Figure 1. Estimated wheat growth stage as of April 11, 2017. Growth stage is estimated for each county based on temperatures accumulated in the season and adjusted by observations of crop stage by K-State personnel. Local growth stage may vary with planting date and variety.

Risk of freeze injury resulting from the early morning temperatures of April 11

Minimum temperatures during the morning of April 11th, 2017, reached as low as 25 degrees Fahrenheit and held below 32°F for as long as 7.7 hours in north central Kansas (Figure 2). Still, the lowest temperatures did not match areas of the state where the crop is at most sensitive phases of development to freezing temperature. Most of the wheat in north central, west central, and northwest Kansas, where the coldest temperatures were measured, is around the jointing stage of growth. Wheat at this stage should not sustain injury from temperatures greater than about 20°F. Temperatures above 32F -- as were those measured in south central and southeast Kansas, where the crop is further along in development -- should not result in damage to the crop for fields that are near boot, heading, or flowering stages of growth. Temperatures below 28-30°F are generally required to cause damage wheat at these stages.



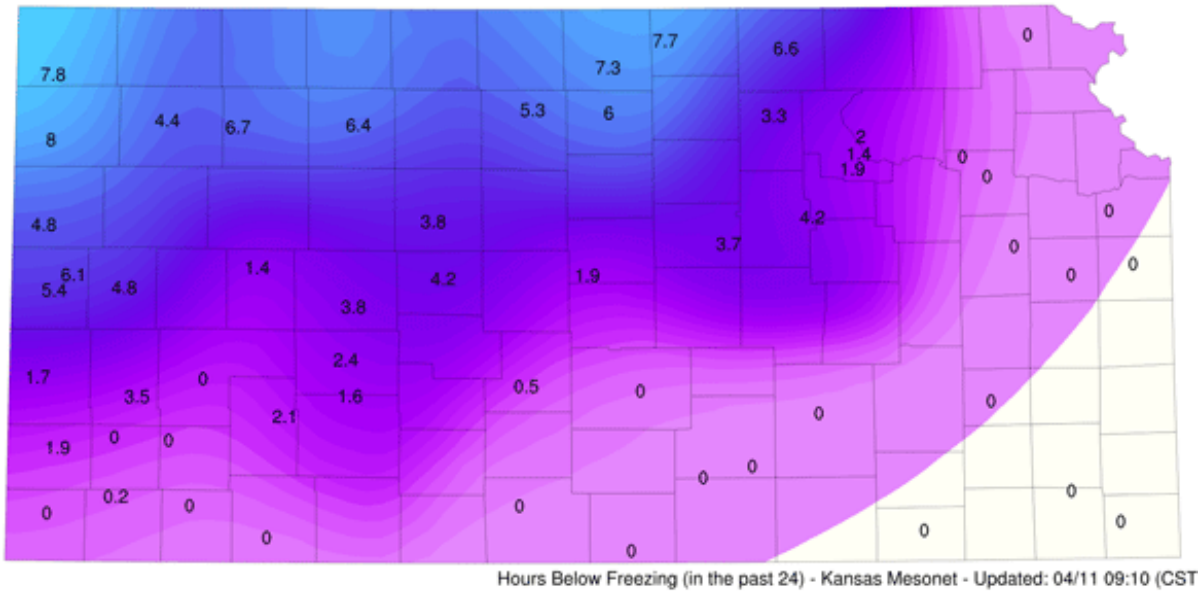


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Figure 2. Minimum temperatures (upper panel) and number of hours temperatures held below 32°F (lower panel) during the April 10-11, 2017 period. Maps retrieved from the Freeze monitor at the Kansas Weather Data Library (http://mesonet.k-state.edu/freeze/**).**

While the majority of the wheat fields across the state should not have been injured by the recent cold temperatures, some more advanced fields in regions where temperatures reached values below the critical thresholds, or in low areas in specific fields, might sustain damage. These would be sporadic cases, and dependent on field specific characteristics such as stage of development and field microclimate. For more information on symptoms of freeze to wheat and crop critical temperature thresholds for each stage of wheat development, see *Spring Freeze Injury to Kansas Wheat*, K-State Research and Extension publication C646, available at: http://www.ksre.ksu.edu/bookstore/pubs/C646.pdf

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