



K-STATE
Research and Extension

Extension Agronomy

eUpdate

05/02/2016

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, Jim Shroyer, Crop Production Specialist 785-532-0397 jshroyer@ksu.edu, or Curtis Thompson, Extension Agronomy State Leader and Weed Management Specialist 785-532-3444 cthompso@ksu.edu.

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1. Possible effects of recent cold temperatures on wheat in northwest Kansas

The mornings of May 1st and 2nd brought cold temperatures to the northwest region of Kansas. Minimum temperatures during the morning of May 2nd were lower than 28°F in Cheyenne, Sherman, and Wallace counties (Figure 1).

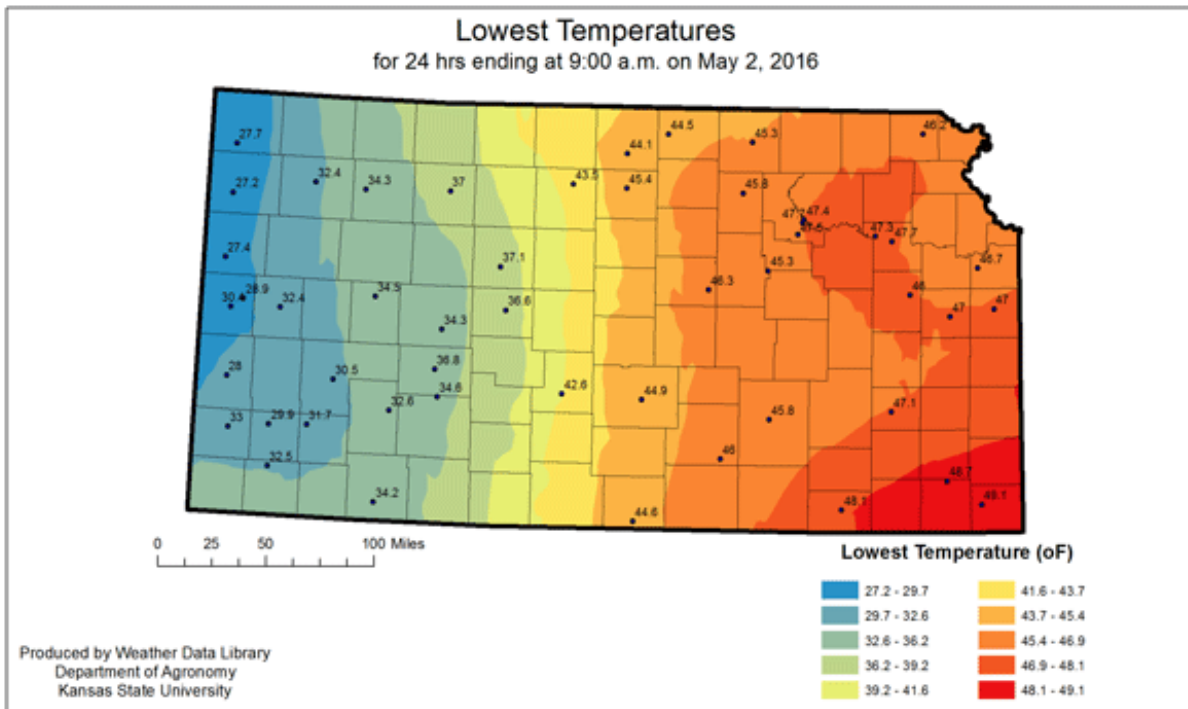


Figure 1. Minimum temperatures measured in the morning of May 2nd.

The morning of May 1st was not as cold, with temperatures not falling below 30.8°F. Still, temperatures were below freezing for as much as 14 hours in parts of the Sherman County (Figure 2, upper panel). The morning of May 2nd was colder, but temperatures were not sustained below freezing for such a long period of time, and the longest time period with below-freezing temperatures was about 7.7 hours (Figure 2, lower panel).

Freeze damage to wheat is a function of minimum temperatures, duration of cold temperatures, and whether the cold temperature matches stages of crop development that are more sensitive to cold temperatures. Our estimates of growth stage in northwest Kansas indicate that the majority of the wheat is at or approaching flag leaf emergence, with some more advanced fields reaching the boot stage (Figure 3). During these stages, the temperature threshold below which freeze damage can be sustained is about 28°F. Temperatures below 28°F for longer than approximately 2 hours can cause floret sterility, trapped spikes, leaf damage, and possible damage to the lower stem.

Temperatures only reached levels below 28°F during the morning of May 2nd, for a maximum duration of about 1.7 consecutive hours. While these temperatures did not reach the 2-hour threshold suggested for freeze damage, these thresholds are somewhat flexible because actual freeze damage is function of many other factors, including the actual canopy temperature (function of density of the stand on each field and soil temperature) and micro-meteorology of each individual field (including residue cover, wind speed, soil moisture status, temperature gradients in the field,

etc.).

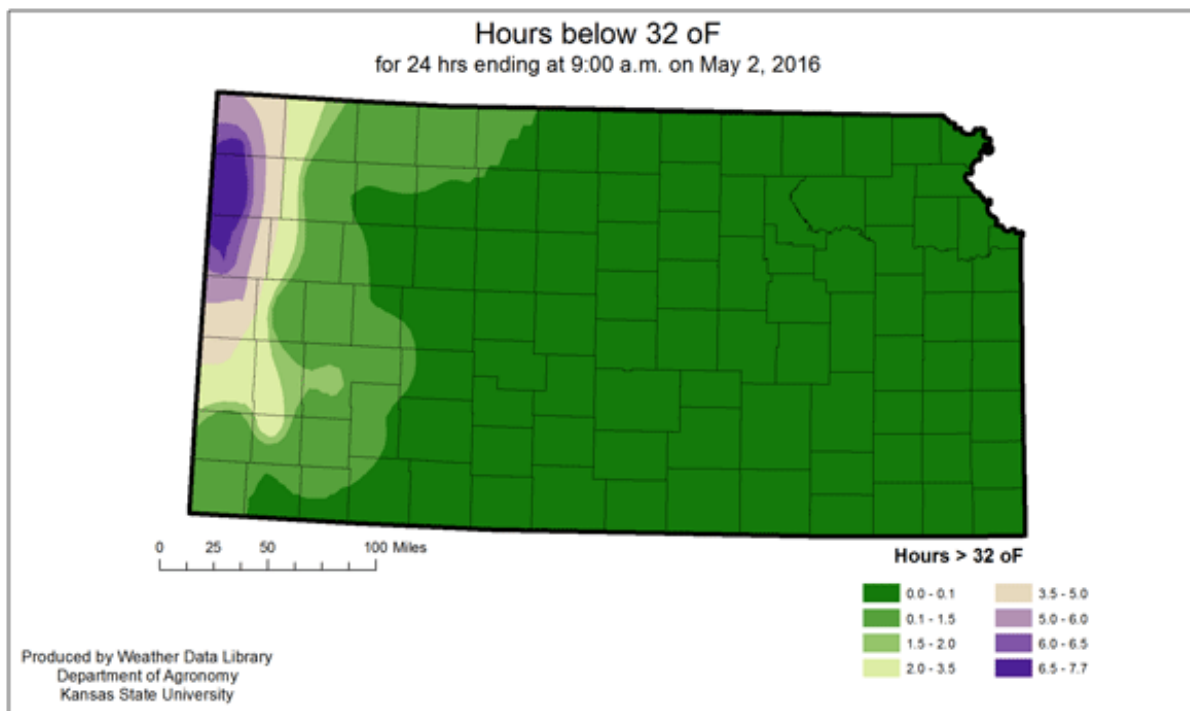
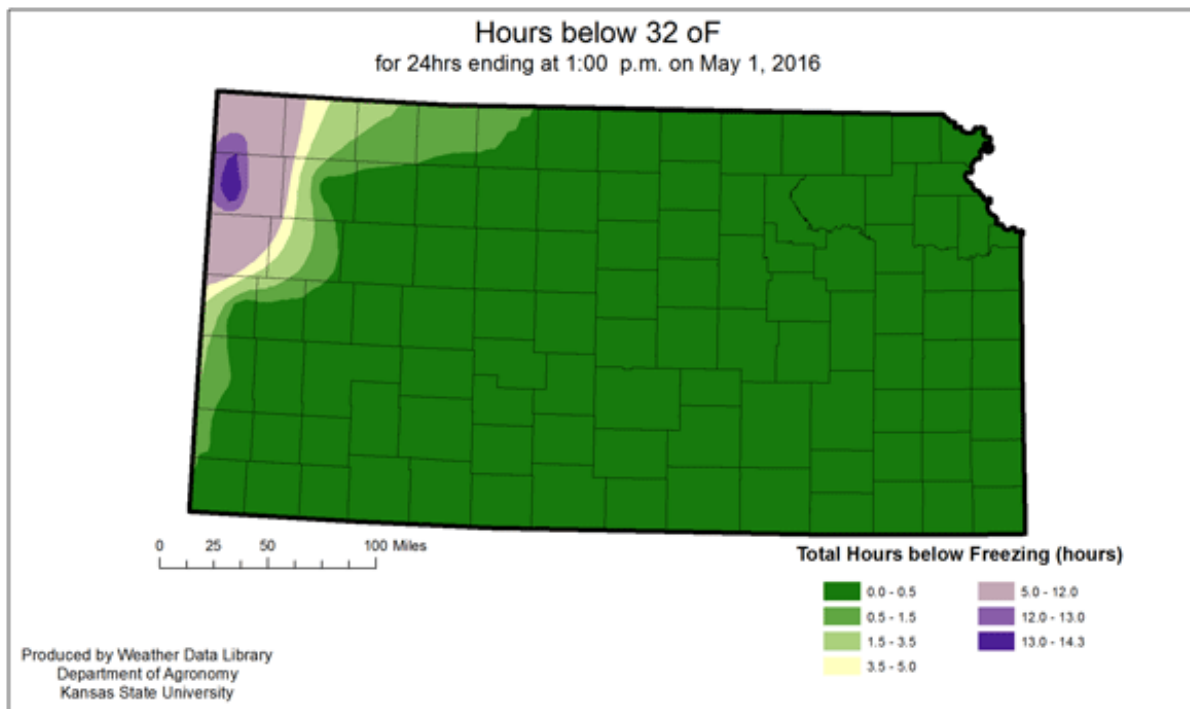
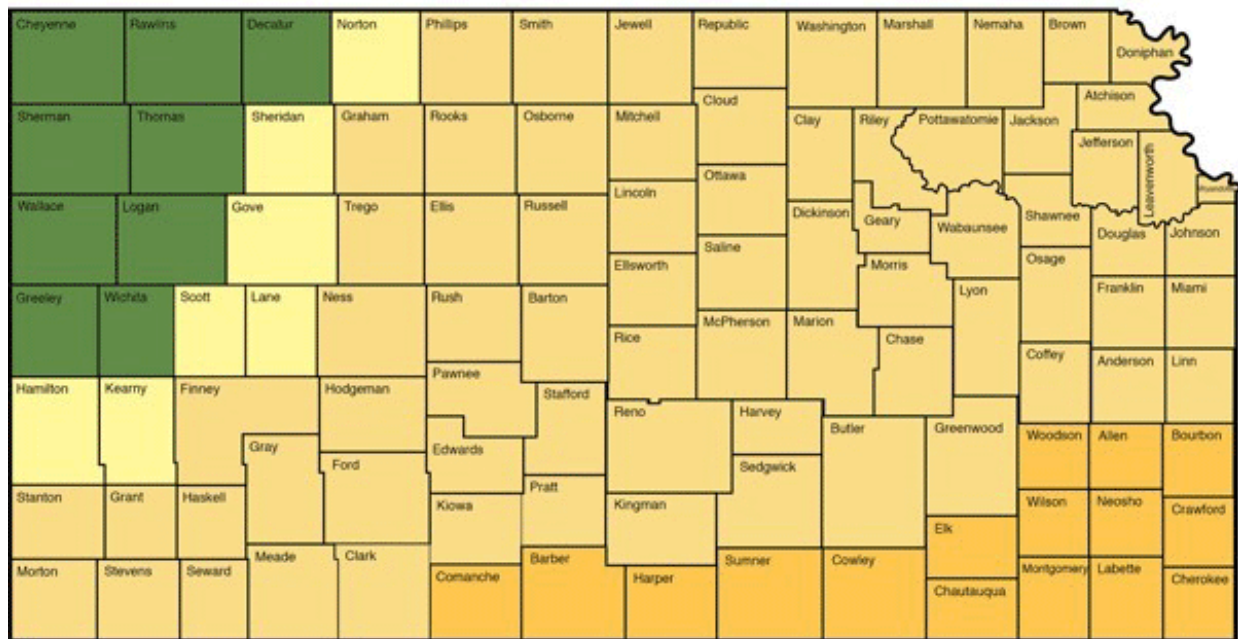


Figure 2. Number of hours temperatures were below freezing (32°F) during April 29th - May 1st (upper panel) and May 1st - May 2nd (lower panel).

Estimated Wheat Growth Stage

April 29, 2016



Growth observation map based on reports from: E. De Wulf, R. Lollato, D. Shoup, L. Haag, S. Durcan, E. Ades, M. Buchanan, G. Cramer, A.J. Foster, S. Campbell, J. Carr, J. Coltrane, J. Falk-Jones, J. Green, D. Halbauer, R. Hein, J. James, A. Johnson, K. Larson, C. Long, T. Maxwell, C. Miller, M. Ploger, Z. Simon, S. Wick

Wheat Growth Stage

- | | |
|--|--|
| Tillering or strongly upright tillers | Boot or flowering |
| Strongly upright tillers or jointing | Flowering or watery ripe |
| Jointing or approaching flag leaf emergence | Watery ripe or milk |
| Approaching flag leaf emergence or at flag leaf emergence | Milk or dough |
| Flag leaf emergence or boot | Dough or physiologically mature |

Figure 3. Estimated wheat growth stage as of April 29, 2016.

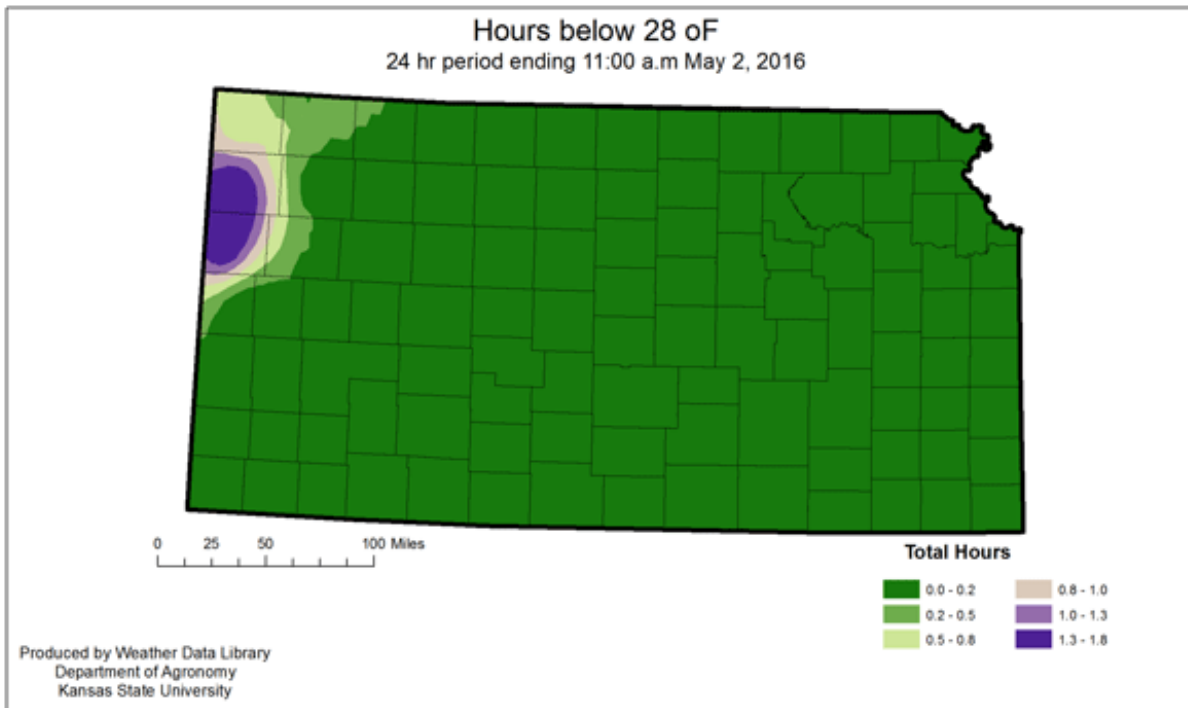


Figure 4. Number of hours temperatures were below 28°F during May 1st – May 2nd.

The above information indicates that some freeze damage may have been sustained in Sherman and Wallace counties and the surrounding region, most likely to fields further along in development. To assess freeze damage during the boot stage, producers should look for the following symptoms:

- **Heads trapped within the boot.** Heads may not emerge normally from the boot, which may result in: 1) heads remaining within the boot; 2) heads emerging out to the side of the boot; or 3) heads emerging base first from the boot.
- **Normal head emergence, but yellow/white heads.** If the heads emerge normally from the boot, but have a white or yellow appearance to them, most likely the spike has been killed.
- **Floret sterility.** The male parts of the flower are more sensitive to cold temperatures and may die when exposed to temperatures at which the female parts may still remain healthy. This can result in poor kernel set and low grain yield because wheat is self-pollinated. Producers should examine the wheat about 48 hours after the freeze event, looking for twisted and shriveled anthers, which will later turn white or whitish-brown. This pattern, rather than the usual yellow color of anthers after anthesis, would indicate that the anthers have been killed.
- **Damage to leaves and stems.** Leaves and stems might exhibit symptoms similar to those described when freeze occurs at earlier stages of crop development (see eUpdate article "[Diagnosis of late winter/early spring freeze injury on wheat](#)" in eUpdate No. 555 of March 18th 2016 for more information). Freezing temperatures that are severe enough to injure leaves and lower stems are generally fatal to male flower parts. Less severe freezing may

cause male sterility without clear symptoms to the vegetative parts.

More information on freeze damage to wheat is available in *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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2. Insect update: Alfalfa and Wheat

Alfalfa

Alfalfa weevils are still active throughout north central Kansas. Even fields that had insecticide treatments which were well timed and effective have been having more larval feeding. These fields need to be treated again as soon as possible as these larvae are still capable of considerable defoliation for the next week or so, especially as we continue to see the fluctuating temperatures.

Remember, the insecticides for alfalfa weevil control are contact insecticides so coverage is very important. Also, please pay attention to the pre-harvest interval (PHI) for whatever product you use as many fields are getting close to the first cutting.



Figure 1. Alfalfa weevil. Photo courtesy of Holly Schwarting, k-State Research and Extension.

Wheat aphids

Last week wheat aphid populations were active and had increased considerably from the previous couple of weeks in north central Kansas. Populations of bird cherry-oat aphids, English grain aphids, and greenbugs were all reproducing and still migrating in. This week however, in fields we sampled in north central Kansas, the aphid populations had decreased drastically and the beneficials, especially lady beetles, had increased greatly.



Figure 2. Lady beetle larva (left) and adult stages. Source: Kansas Insect Newsletter No. 8, May 2, 2016.

New pest in wheat

Sipha maydis is a new invasive aphid that was recently found in Colorado and could potentially be found in Kansas.

"Wheat and barley are this aphid's preferred hosts, although it can feed on many weedy grasses, corn and sorghum. It is a particular concern in wheat and barley since it can kill leaves and transmit barley yellow dwarf virus."

Read more about this potential threat here:

<http://wci.colostate.edu/shtml/Sipha.maydis.shtml>

<https://smallgrains.ces.ncsu.edu/2016/04/new-invasive-aphid-of-wheat-now-in-south-carolina/>



Figure 3. *Siphonophora* aphid. Source: Kansas Insect Newsletter No. 8, May 2, 2016.

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