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Cotton Insights Newsletter

A service provided by Windstar, Inc. affiliated gins.

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Wheat Freeze Damage

Challenges just keep coming for agricultural producers. Just as an FYI, I am getting a few calls concerning freeze injury to winter wheat. Because of all of the market chaos I know some growers were planning to take existing wheat stands to harvest for grain this year.

With the recent extensive low temperatures and duration of freezes on multiple days (Apr 12, 13, 14, 15) across a considerable portion of our region, there is very likely going to be freeze damage to this standing wheat.

This will of course be dependent upon the low temperatures and duration encountered in the canopy and stage of wheat development. My guess is that this wheat is in the late jointing to early heading stages. These low temperatures across multiple days are likely going to be problematic for grain production in many areas. Concerned growers should perhaps call in an insurance adjuster for field evaluations after a few days to allow freeze damage symptomology to become visible.

I have generated a quick file showing some of the important information (see attached PDF).

For a good summary of the Oklahoma situation, two graphics are available from the Oklahoma Mesonet:

1. Hours below freezing for the past 48 hours: https://www.mesonet.org/index.php/weather/map/hours_below_freezing/air_temperature
2. Hours below freezing for the past week: https://www.mesonet.org/index.php/weather/map/hours_below_freeing_in_the_last_week/air_temperature

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- I am unaware of a similar website to get the Texas South Plains and Panhandle duration below freezing temperature data. I just know that based on the low temperatures in the mid to upper 20s, there is probably going to be an issue.
- Producers will likely be making decisions over the next few weeks concerning how to handle the damaged wheat acres. If they opt to graze out or cut and bale existing wheat forage, they can prepare these fields for planting no-till cotton. Either irrigation or late April/early May rainfall would likely be needed to replenish subsoil moisture in many of these fields, but at this time my perception is that we currently have reasonably good soil moisture over much of the area based on the latest U.S. Drought Monitor. An important consideration concerning dryland production would include timely termination of the wheat with glyphosate in order to preserve soil moisture.
- For Texas see: https://droughtmonitor.unl.edu/CurrentMap/StateDroughtMonitor.aspx?TX
- For Oklahoma see: https://droughtmonitor.unl.edu/CurrentMap/StateDroughtMonitor.aspx?OK
- In our region of Texas, non-irrigated final planting dates for insurance purposes are May 31, June 5 and June 10, depending upon the county (see Final Planting Date maps below).
- Non-irrigated final planting date for insurance purposes for many counties in Oklahoma is June 20, with the exception of the OK panhandle which is May 31. For most other counties in Oklahoma, this date is June 10.
- Irrigated cotton final planting dates in Texas are essentially the same as non-irrigated, however, in Oklahoma these dates do change for some counties.
- A lot of questions concerning crop insurance eligibility and coverage in non-irrigated cotton following non-irrigated wheat may arise so, growers should visit with their crop insurance agent for clarification of these issues.
- My experience is that the folks at K-State are generally among the best wheat experts, as KS has historically produced a large number of acres. Texas A&M has some good info too. OSU has some good info at wheat.okstate.edu, but I didn't find anything there concerning freeze damage after a quick glance.
- Some diseases may potentially be confused with freeze damage, so I have provided some links to wheat diseases below.
- This K-State publication on wheat freeze damage provides the information below: https://bookstore.ksre.ksu.edu/pubs/c646.pdf
- This one from the Texas A&M AgriLife Research and Extension Center at San Angelo website has a lot of embedded hyperlinks to photos, etc. This looks like a very good webpage with freeze damage in wheat: https://sanangelo.tamu.edu/extension/agronomy/agronomy-publications/freeze-injury-on-wheat/

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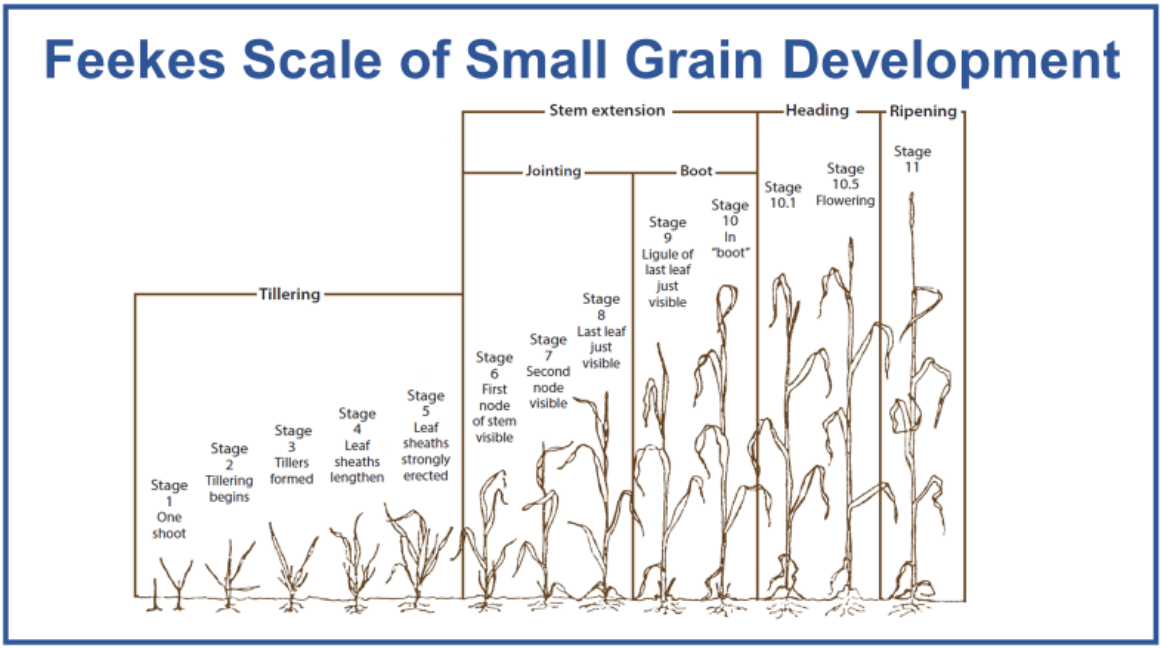
- Here is some disease information on the Texas A&M AgriLife Research and Extension Center at Amarillo website: https://agrilifecdn.tamu.edu/amarillo/files/2010/11/WheatDisMngt2015.pdf
- Here is an excellent publication from K-State with great photos of wheat diseases: https://bookstore.ksre.ksu.edu/pubs/MF2994.pdf
- Here's a link to the OSU overall wheat information page for diseases: http://wheat.okstate.edu/wheat-management/copy_of_diseases-and-insects

Feekes Scale of Small Grain Development

- Below is an excellent graphic representing small grain development. This should assist growers in staging their wheat.



- Source: Managing Insect and Mite Pests of Texas Small Grains – Extension Publication ENTO-084
- This publication is available here: https://agrilifecdn.tamu.edu/extensionento/files/2018/09/Wheat-Pest-Guide-ENTO-084_final.pdf

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Wheat Resistance to Freeze Injury (Kansas State University)

Wheat Resistance to Freeze Injury (Kansas State University)

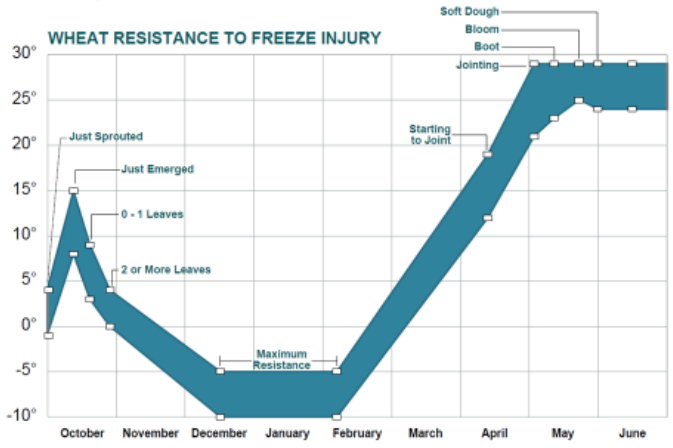

Figure 1. Temperatures that cause freeze injury to winter wheat at different growth stages. Winter wheat rapidly loses hardiness during spring growth and is easily injured by late freezes (graph adapted from A.W. Pauli).

Wheat Resistance to Freeze Injury (Kansas State University)

Table 1. Temperatures that cause freeze injury to wheat at spring growth stages and symptoms and yield effect of spring freeze injury.

Growth stage	Approximate injurious temperature (two hours)	Primary symptoms	Yield effect
Tillering	12 F (-11 C)	Leaf chlorosis; burning of leaf tips; silage odor; blue cast to fields	Slight to moderate
Jointing	24 F (-4 C)	Death of growing point; leaf yellowing or burning; lesions, splitting, or bending of lower stem; odor	Moderate to severe
Boot	28 F (-2 C)	Floret sterility; spike trapped in boot; damage to lower stem; leaf discoloration; odor	Moderate to severe
Heading	30 F (-1 C)	Floret sterility; white awns or white spikes; damage to lower stem; leaf discoloration	Severe
Flowering	30 F (-1 C)	Floret sterility; white awns or white spikes; damage to lower stem; leaf discoloration	Severe
Milk	28 F (-2 C)	White awns or white spikes; damage to lower stems; leaf discoloration; shrunken, roughened, or discolored kernels	Moderate to severe
Dough	28 F (-2 C)	Shriveled, discolored kernels; poor germination	Slight to moderate

- Source: Spring Freeze Injury to Kansas Wheat – Publication C-646. This publication can be downloaded here: https://bookstore.ksre.ksu.edu/pubs/c646.pdf

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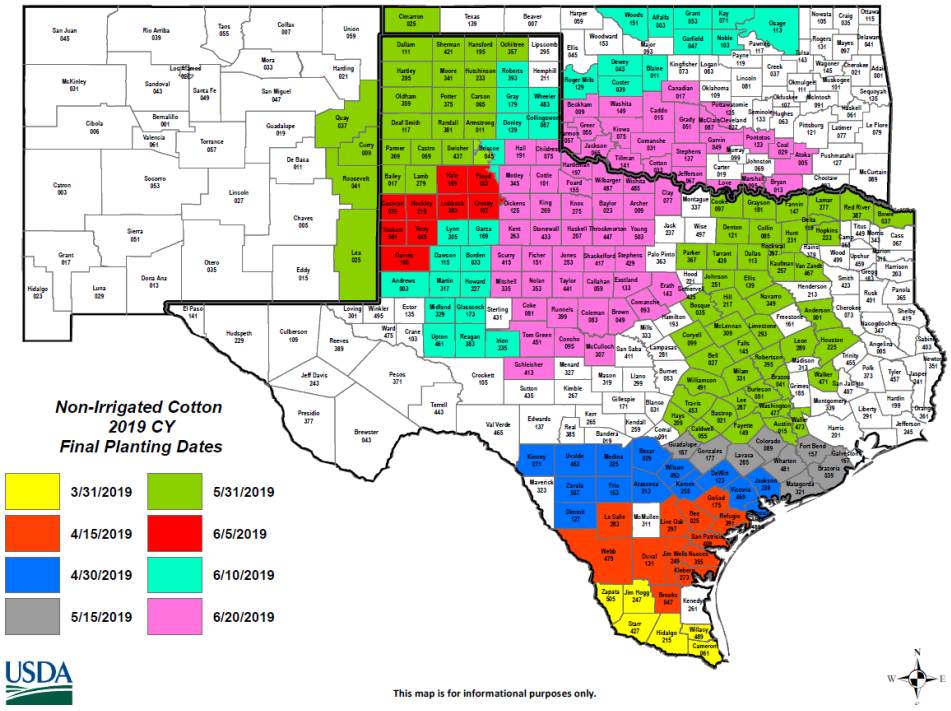
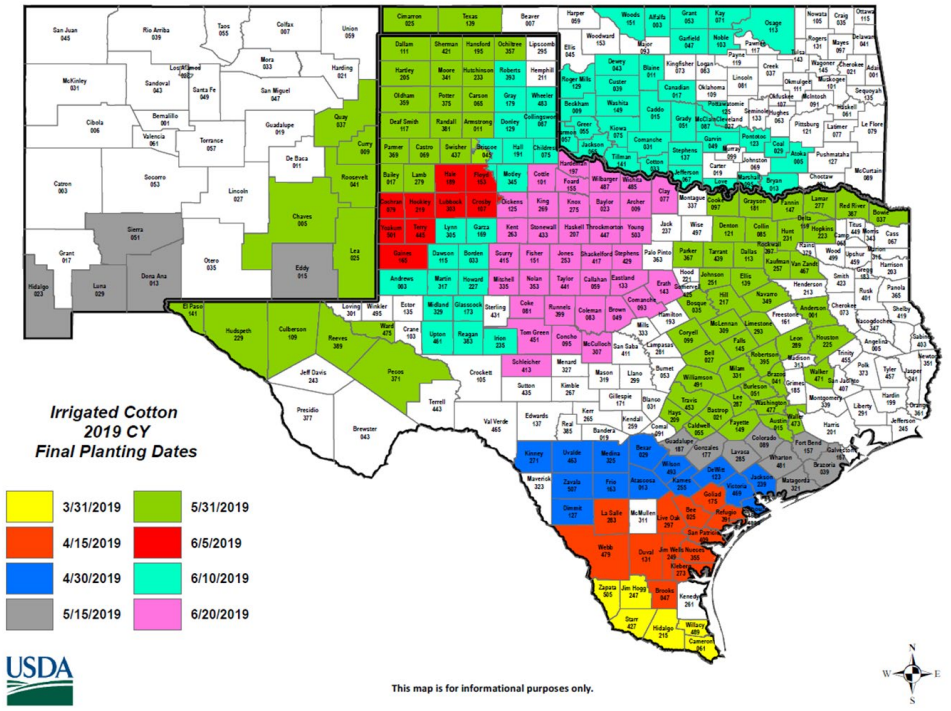
Non-Irrigated Cotton – Final Planting Dates for Insurance Purposes (2019)



Irrigated Cotton – Final Planting Dates for Insurance Purposes (2019)



- Source: USDA-Risk Management Agency, 2019

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