



Wheat Science News



Impact of March 19 Temperatures on Kentucky's Wheat Crop

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(Originally posted on KyGrains.info 03/25/2024)

Across Kentucky almost all of the wheat crop has jointed ([Feekes 6](#)) and much of it has developed at least two nodes ([Feekes 7](#)). When temperatures dropped into the teens and low 20's (°F) overnight March 19 (Table 1), we once again find ourselves asking the question: Will the low temperatures a couple of nights ago damage this year's wheat crop?

For wheat fields that are [Feekes 5](#) or less advanced, these temperatures should not harm the wheat. The growing point was still below the soil surface and well protected by the soil temperatures.

For wheat fields that were at [Feekes 6 or later](#), damage **may** be possible. The national rule of thumb is that wheat at this growth stage is damaged when temperatures are 24°F or less for 2 or more hours. Although there are certainly more factors that contribute to severity of



freeze damage than simply duration of a threshold temperature (many of which we are investigating), this is still the most widely accepted condition to ‘trigger’ a need to scout fields for damage. When scouting for freeze damage in wheat, it is important to remember that **a minimum** of four to five days of good growing conditions (high temperatures exceeding 40°F) are needed before damage becomes visible. In reality, waiting a full week to ten days generally makes it easiest to see freeze damage. Therefore, Tuesday March 26 would be the ideal time to begin scouting fields for freeze damage.

Even if freeze damage is found, this does not immediately indicate that final grain yield will be impacted. Wheat has a tremendous ability to redistribute its resources to living tillers and therefore compensate for primary stems and tillers that may be lost in the freeze. This can result in little to no yield impact. If damage is found, refer to Figure 1 and [AGR-253: Identifying Damage and Estimating Yield Reductions following a Spring Freeze in Winter Wheat](#) to help determine potential yield reductions based upon estimated damage observed in the field.

For a visual guide to identify freeze damage refer to [AGR-253: Identifying Damage and Estimating Yield Reductions following a Spring Freeze in Winter Wheat](#).

There are also videos demonstrating how to assess freeze damage at different growth stages: jointing (<https://www.youtube.com/watch?app=desktop&v=oaPiOU-s-Ro>), flowering (<https://youtu.be/u0DUgEa23bE>) and during grain fill (<https://youtu.be/OhcqjeilE8s>).

Figure 1: Estimated yield loss following spring freezes at different growth stages

Growth Stage	Feekes	Zadoks	Temp. Injury can Occur (≥ 2 hrs)	Primary Symptoms	Visual Damage	Estimated Yield Effect (% Reduction)
Stem Elongation	4 to 9	30 to 39	24°F	<ul style="list-style-type: none"> • Death of growing point • Leaf burning and yellowing • Lesions, splitting, bending of stems • Odor 	Minor	0
					Moderate	0 – 10
					Severe	0 – 20
Boot	10	40 to 49	28°F	<ul style="list-style-type: none"> • Floret sterility • Spike trapped in boot • Damage to stems and peduncles • Leaf discoloration 	Minor	0 – 20
					Moderate	n/a
					Severe	n/a
Heading	10.1 to 10.5	50 to 58	30°F	<ul style="list-style-type: none"> • Floret sterility • Bleached or white awns or spikes • Damage to stems and peduncles • Leaf discoloration 	Minor	0 – 20
					Moderate	0 – 45
					Severe	30 – 50
Flowering	10.5.1 to 10.5.3	60 to 68	30°F	<ul style="list-style-type: none"> • Floret sterility • Bleached or white awns or spikes • Damage to stems and peduncles • Leaf discoloration 	Minor	n/a
					Moderate	n/a
					Severe	60 – 85

Table 1: Minimum air temperatures, relative humidity at minimum air temperature, average relative humidity when air temperature 24°F or less, and duration that air temperatures were 24°F or less and 32°F or less for all available KY Mesonet sites overnight March 18 to early morning hours of March 19. Data obtained from KY Mesonet <http://www.kymesonet.org/>.

County	Minimum Air Temperature (°F)	Relative Humidity at Minimum Air Temperature (%)	Average Relative Humidity when Air Temperature ≤24°F (%)	Duration of Temperatures ≤24°F (hours)	Duration of Temperatures ≤32°F (hours)
Adair	22.0	76.9	76.0	3.7	7.6
Allen	22.3	86.0	85.4	1.2	10.9
Ballard	23.7	88.0	88.5	0.7	11.6
Barren	23.7	81.1	81.1	0.3	9.5
Bath	28.1	70.4	-	0.0	12.8
Boone	26.2	75.5	-	0.0	13.8
Boyle	26.3	70.8	-	0.0	10.9
Breathitt	29.3	65.3	-	0.0	13.8
Breckinridge	25.7	73.3	-	0.0	9.3
Bullitt	24.4	70.1	-	0.0	5.8
Butler	21.2	98.6	96.3	5.0	11.1
Caldwell	22.3	85.6	86.0	3.3	11.5
Calloway	22.7	88.1	87.5	2.3	10.8
Campbell	24.5	67.1	-	0.0	12.2
Carroll	26.4	78.0	-	0.0	6.6
Casey	25.6	77.3	-	0.0	7.6
Christian	24.9	89.3	-	0.0	11.5
Clark	25.7	76.3	-	0.0	11.6
Clinton	19.4	81.5	79.2	3.9	9.5
Crittenden	25.8	75.0	-	0.0	9.4
Cumberland	19.3	92.7	90.6	4.3	9.1
Fayette	26.6	72.7	-	0.0	10.9
Franklin	24.9	80.6	-	0.0	7.6
Fulton	23.1	86.9	86.9	0.4	11.0
Graves	21.8	91.3	90.5	4.2	12.1
Grayson	19.4	91.9	84.8	6.7	9.7
Hardin	20.8	92.9	90.7	1.8	8.3
Harlan	16.2	89.2	82.7	14.7	16.7
Harrison	26.2	83.2	-	0.0	8.6
Hart	23.8	84.0	83.7	0.6	8.3
Henderson	22.4	93.2	91.9	4.1	11.0
Hopkins	23.7	70.0	70.1	1.8	12.3
Jackson	27.0	68.3	-	0.0	13.8
Johnson	31.6	58.9	-	0.0	3.3
Knott	28.7	61.3	-	0.0	14.4
Knox	29.5	68.7	-	0.0	4.6
LaRue	24.1	82.0	-	0.0	7.7
Lawrence	28.1	66.1	-	0.0	8.1

County	Minimum Air Temperature (°F)	Relative Humidity at Minimum Air Temperature (%)	Average Relative Humidity when Air Temperature ≤24°F (%)	Duration of Temperatures ≤24°F (hours)	Duration of Temperatures ≤32°F (hours)
Letcher	31.8	59.7	-	0.0	3.9
Lewis	25.8	78.9	-	0.0	8.2
Lincoln	26.1	77.0	-	0.0	9.3
Logan	22.0	97.4	95.0	5.8	11.8
Madison	26.8	70.5	-	0.0	7.0
Marion	22.2	78.0	77.0	1.6	6.3
Marshall	20.0	93.9	94.0	3.7	10.9
Mason	25.3	72.5	-	0.0	13.8
McCreary	22.1	72.7	72.0	2.0	12.3
McLean	21.9	93.5	93.9	1.3	11.8
Meade	22.4	81.4	79.1	1.5	8.3
Menifee	27.8	67.0	-	0.0	13.8
Mercer	25.1	75.4	-	0.0	8.3
Metcalfe	25.2	79.0	-	0.0	9.3
Monroe	41.5	46.3	-	0.0	0.0
Morgan	29.6	57.2	-	0.0	13.8
Muhlenberg	22.1	88.8	88.0	2.7	11.5
Nicholas	26.9	74.3	-	0.0	13.4
Ohio	16.9	94.0	90.8	5.8	11.0
Oldham	25.4	77.0	-	0.0	8.7
Owen	25.9	76.7	-	0.0	11.9
Owsley	29.2	65.8	-	0.0	2.8
Pike	22.7	72.6	76.2	10.9	15.7
Pulaski	25.1	77.2	-	0.0	12.3
Rowan	29.7	60.9	-	0.0	11.6
Russell	26.1	76.0	-	0.0	7.7
Shelby	22.9	84.4	82.0	1.9	10.3
Simpson	22.8	89.4	89.3	1.6	11.8
Taylor	24.8	78.3	-	0.0	7.4
Todd	17.6	93.8	92.8	6.8	12.3
Trigg	19.3	93.0	91.0	4.8	11.1
Union	23.8	86.9	87.5	0.3	11.8
Warren	22.8	87.1	86.4	1.2	10.8
Wayne	25.9	78.4	-	0.0	6.8
Webster	20.9	93.9	91.4	7.8	12.7

UK Wheat Field Day

May 14, 2024

TOPICS INCLUDE:

- ◆ **Evolution of Carbon Markets: Are There Opportunities for Kentucky Wheat Producers?** - Dr. Jordan Shockley
- ◆ **Wheat Disease Update** - Dr. Carl Bradley
- ◆ **Wheat Breeding: Process and Methods** - Dr. Dave Van Sanford
- ◆ **Wheat Fertilization** - Dr. Edwin Ritchey
- ◆ **Residual Herbicide Timing for Ryegrass Control in Wheat** - Dr. Travis Legleiter
- ◆ **International, Domestic, and Local Trends That Inform Wheat Marketing Decisions** - Dr. Grant Gardner
- ◆ **Wheat Variety Trial (Walk Through)** - Bill Bruening

UKREC Farm

1205 Hopkinsville St,
Princeton, Ky 42445

9 am - NOON (Central time)

Registration: 8 am



EDUCATIONAL CREDITS:

CCA: PM 1hr, CM 0.5hr,
Prof Dev 0.5

Pesticide: 1 CEU cat 1A,
1CEU cat 10

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Disabilities
accommodated
with prior notification.

2024 Grain Crops Science Service Award

The University of Kentucky Martin-Gatton College of Agriculture, Food, and Environment announces the selection of Todd County UK Cooperative Extension agent Curt Judy as the 2024 UK [Grain Crops Science Service Award](#) recipient. After four decades of service, this honor highlights Judy's lasting contributions to Kentucky's agricultural community.

Previously known as the UK Wheat Science Service Award, this award now recognizes broader achievements in grain crops science including enhancing grains crops research and education.

“Curt consistently helps supervise UK corn, wheat and soybean yield contests,” said [Chad Lee](#), [Grain and Forage Center of Excellence](#) director. “He has promoted research to attain high-yielding and high-quality wheat and served on commodity boards. He genuinely enjoys working with producers & helping people.”

Judy's commitment to the agriculture community

Judy dedicated approximately 44 years to serving as an extension agent in Crittenden, Christian and Todd counties. A Harrison County native and 1977 UK agronomy graduate, Judy is celebrated for his commitment to agricultural research and education.



Pictured L-R: Maggie Gillum, Curt Judy, Sam McNeill, Chad Lee.

Throughout his career, Judy has been instrumental in supervising yield contests for multiple crops and promoting research for high-quality grains. His collaboration with researchers like [Department of Plant and Soil Science](#) professor emeritus [Lloyd Murdock](#) on studies concerning tillage, soil fertility and compaction have been essential to improving agricultural practices.

Judy has also worked on various trial research projects and engaged in soybean cyst nematode education, contributing to the state's grain crops science.

“Curt has been a great agent,” Murdock said. “He has collaborated on many different research projects and has been helpful with off-station field days as well as other educational meetings, just to name a few things.”

Judy also developed a software program in 1999 to assist growers with the [Kentucky Agricultural Water Quality Plan](#), streamlining the compliance process for over 30,000 farm plans. His efforts in educating growers about genetically modified organisms and farm trucking regulations have further demonstrated his impact on Kentucky agriculture.

“He is an outstanding, experienced and knowledgeable agent,” Murdock said. “His clientele and their needs are very important to him and he is highly respected by his clientele, as well as extension and research specialists across the commonwealth.”

Sample Courier Service 2024

UK Plant Disease Diagnostic Lab

Julie Beale - Plant Disease Diagnostician/Director,
Sara Long - Plant Disease Diagnostician Assistant,
Jason Travis - Extension Associate

Courier service for diagnostic samples from the UKREC to the Plant Disease Diagnostic Lab on campus will begin on April 18th and run once a week through September. The normal pick-up day and time will be **Wednesdays at 8 a.m. CDT**. However, note that the first pick-up will be on a Thursday due to scheduling conflicts. Samples should be dropped off at Jason Travis’s office in Office Trailer A by close of business the day before. County Extension Agents impacted by the courier service have been sent an exact schedule.

Best wishes to all for a productive growing season!

Upcoming Events



Wheat Field Day

May 14, 2024

KATS Crop Scouting Workshop

May 21, 2024

KATS Soil Properties & Their Impact on Delivering Water & Nutrients

June 6, 2024

Drone Pilot Certification Workshop (Madisonville)

June 10 & 11, 2024

Pest Management Field Day (IPM Grain Crops)

June 27, 2024

Corn, Soybean & Tobacco Field Day

July 23, 2024

KATS Field Crop Pest Management & Spray Clinic

August 29, 2024

