



2021 Dryland Foliar Fertilizer Trial – Windstar Gins

**Barry Evans Farm
Kress, TX**

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Summary

In 2019, a cotton variety testing program was established as a new service created by Windstar Inc. affiliated gins. These gins are working together to support a Cotton Agronomics Manager position. One of the components of this program is to work with local producers to scientifically evaluate varieties in a commercial on-farm setting from planting through ginning. These unique replicated trials are planted and harvested with the grower's commercial equipment. Each variety's round modules are combined across all replicates and then ginned and classed separately in an extremely detailed manner. Purging and weighing any remnant bale of from the press is also performed for each variety. All lint samples from each variety's commercial bales are then classed by the USDA-AMS classing office. This detailed ginning and classing management of all round modules for each variety is key to the success of this program and to the best of our knowledge is without peer in the U.S. ginning industry.

In 2021 the program expanded to include a dryland foliar fertilizer management component. This trial had two treatments which included an unfertilized control and a proprietary foliar fertilizer blend containing multiple nutrients. FiberMax 2498 GLT was planted in a dryland field in a scientifically valid trial with four replicates of treatments. *No major adverse weather events during the growing season were noted other than substantial drought stress which began in late August and continued through harvest. Growing conditions were such that fair to good yields were obtained.*

Harvest results indicated that no statistically significant differences were observed between treatments. Lint yields ranged from a high of 583 lb/acre with the unfertilized control, and 573 lb/acre with the foliar fertilizer blend (Table 1). Average Loan value for treatments from commercially ginned and classed bales varied from \$0.5254/lb for the foliar fertilizer blend treatment to \$0.5214/lb for the unfertilized control treatment. When including gross lint Loan value on a per acre basis and net gin credit (defined as seed value/acre minus ginning costs) and removing foliar fertilizer cost, no statistically significant differences were found between the unfertilized check and the foliar fertilizer treatment. Fertilizer cost was estimated with ground rig application cost of \$6.00/acre and foliar fertilizer blend cost of \$2.65/acre.

Table 2 provides the USDA-AMS classing results from each bale for each treatment and the averages of a minimum of 21 commercially ginned bales per treatment. Averages indicate that color grades were mostly 11 and 21, with no apparent differences among treatments. Average leaf grades were not impacted by treatment, and averaged about 2.3. Average staple was 33.9 32^{nds} inch, with minimal impact of treatment observed. Average micronaire values were 3.6 across all bales in each treatment. No bark contamination was observed. Average fiber strength was 27.2 for the untreated check and 27.4 for the foliar fertilized treatment. Uniformity was slightly higher with the foliar fertilized treatment when compared to the unfertilized control, with values of 79.3% and 78.6%, respectively. Overall various fiber quality parameters are integrated into the CCC Loan value. Average Loan values were 52.14, and 52.54 cents/lint lb for the unfertilized check and foliar fertilizer blend treatment, respectively. Therefore, in this commercial field trial, no economically substantial fiber quality impacts due to foliar fertilizer treatment were noted.

Disclaimer: Readers should realize that results from one trial do not represent conclusive evidence that the same response would occur where conditions vary. Multi-site and multi-year data are always best. For this trial, good scientific techniques were used and the results are presented to indicate what actually occurred in the trial. Context of the environment, overall growing season impact, management techniques, and trial methodology used are important and must be considered.

Site Information and Methods

Elevation: 3530 ft

Previous crop: grain sorghum harvested in 2020

Tillage system: fertilizer treatments were band applied with a ground rig sprayer on July 20

Planted: May 3 to FM 2498 GLT variety

Replicates: 4 replicates of two treatments in a randomized complete block design

Treatments: 0 (unfertilized control) and foliar treatment containing proprietary blend

Plot width: 16-rows

Plot length: length of fertilized and harvested plot ~5,100 ft

Seeding rate: 25,000 seed/acre

30-inch row spacing

Rainfall (inches) by month recorded at pivot trip gauge 1 mile south of plot: Jan 0.68; Feb 0.03; Mar 0.28; April 0.38; May 5.0; Jun 3.47; Jul 3.87; Aug 1.96; Sep 1.06

Additional fertility: none other than fertilizer treatments applied

Herbicide management:

Preplant burndown – (March 24) 3 oz/acre flumioxazin + 8 oz/acre dicamba + 1 qt/acre glyphosate

Preemergence – (May 6) 1 qt/acre paraquat + 1 qt/acre diuron

Post emergence - (June 8) 42 oz/acre glufosinate, 1 pt/acre metolachlor

Post emergence - (July 8) 42 oz/acre glufosinate + 1 pt/acre metolachlor

Insecticides: none

Plant growth regulators: (June 8) 8 oz/acre mepiquat chloride

Harvest aids: 1 qt/acre ethephon (October 6), 24 oz/acre paraquat (October 14)

Harvesting: November 18 using a John Deere CS690, with an 8-row header. Harvested area was calculated by the GPS on the stripper monitor. Approximately 10,200 ft of plot length was harvested in two round modules per individual plot. Round modules were weighed using the CS690 scale, and all round modules (from each of 4 replicates = 8 total) for each treatment were weighed at Edcot Gin.

Commercial ginning: Round modules for all 4 replicates of each treatment were staged together and commercially ginned separately by Edcot Gin. Commercial ginning included: cleaning module feeder, clearing gin stream, dumping seed rolls, and purging remnant bale in press. This process was initiated before the first variety module was ginned and then repeated for each treatment in the trial.

Remnants were ejected from the bale press and weighed, but not sampled for USDA-AMS classing. Only data from commercial bales are included in classing data for each variety.

Lint value: Table 1 is based on CCC Loan value from commercial ginning and USDA-AMS classing results.

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Table 2. Commercial classing data for the dryland foliar fertilizer trial, Evans Farm, Kress, TX, 2021.

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Acknowledgements

Edcot Gin would like to thank Barry Evans for committing his equipment, land, and time to conduct and manage the trial. Jeromy Bechtold, Bob Simmons, and Zach Simmons were critical in the harvesting, round module marking and staging operations. A big thank you is extended to them for their very capable assistance. Gratitude is expressed to Windstar Inc. Detailed ginning was performed by Edcot “Ginner Ernie” and the crew and a big thank you is extended to this hard-working group. Landon Kidd assisted with data collection, module round module tracking, weighing, and ginning.



Table 1. Harvest results for the dryland foliar fertilizer trial, Evans Farm, Kress, TX, 2021.

N rate	Lint turnout	Seed turnout	Bur cotton yield	Lint yield	Seed yield	Lint loan value	Lint loan value	Net gin credit	Fertilizer cost	Net value
lb/acre	----- % -----		----- lb/acre -----			\$/lb		----- \$/acre -----		
Untreated check	32.4	41.6	1800	583	748	0.5214	304	30	0	335 a
Foliar blend	33.0	39.7	1738	573	691	0.5254	301	26	9	318 a
Test average	32.7	40.6	1769	578	720	0.5234	303	28	4	327
CV, %	--	--	4.4	4.4	4.5	--	4.3	4.3	--	4.4
OSL	--	--	0.3407	0.6146	0.0860	--	0.7660	0.0115	--	0.2031
LSD	--	--	NS	NS	53	--	NS	2	--	NS

For net value/acre, means within a column with the same letter are not significantly different.

CV - coefficient of variation.

OSL - observed significance level, or probability of a greater F value.

LSD - least significant difference at the 0.10 level, NS - not significant.

Note: some columns may not add up due to rounding error.

Assumes:

\$3.30/cwt commercial ginning cost.

\$240/ton for seed.

Net gin credit is defined as seed credit minus ginning expense.

Fertilizer cost estimated with ground rig application cost of \$6.00/acre and foliar fertilizer blend cost of \$2.65/acre.

Net value is defined as gross loan value/acre plus net gin credit minus fertilizer cost.

Value for lint based on CCC loan value from commercial ginning and USDA-AMS classing results.



Table 2. Commercial classing data for the dryland foliar fertilizer trial, Evans Farm, Kress, TX, 2021.

Treatment and Bale Number	Color Grade-Quadrant grade-quadrant	Color digit 1	Color digit 2	Leaf grade	Staple 32nds inch	Micronaire units	Extraneous matter	Remarks --	Strength g/tex	Rd %	+b %	Trash % area	Uniformity %	Length 100ths inch	Loan rate cents/lb
Untreated check															
4075399	21-1	2	1	2	36	3.5	.	.	30.7	81.4	8.6	1	78.9	112	56.30
4075400	21-1	2	1	2	34	3.7	.	.	26.6	80.2	9.0	1	79.1	105	53.15
4075401	11-2	1	1	2	34	3.7	.	.	26.1	80.7	9.1	2	78.2	105	53.05
4075402	21-1	2	1	2	34	3.5	.	.	27.1	80.3	9.1	2	78.9	106	52.95
4075403	11-2	1	1	3	35	3.5	.	.	26.9	80.7	9.1	2	78.6	108	54.20
4075404	11-1	1	1	2	34	3.5	.	.	26.3	81.0	9.2	2	78.6	107	52.95
4075405	11-2	1	1	2	34	3.6	.	.	27.7	81.1	9.1	2	78.2	106	52.95
4075406	11-1	1	1	2	34	3.6	.	.	26.3	80.5	9.2	2	78.2	105	52.95
4075407	11-2	1	1	3	34	3.6	.	.	28.0	81.0	9.1	3	78.6	106	52.70
4075408	11-1	1	1	2	34	3.6	.	.	29.2	80.7	9.2	2	79.4	107	53.10
4075409	11-1	1	1	2	33	3.7	.	.	25.6	80.9	9.3	2	78.1	104	46.60
4075410	11-1	1	1	2	34	3.6	.	.	27.0	80.7	9.2	2	78.2	106	52.95
4075411	11-2	1	1	2	34	3.7	.	.	28.4	80.8	9.1	2	77.3	107	52.65
4075412	11-2	1	1	3	34	3.8	.	.	26.5	80.3	9.5	3	79.2	106	52.90
4075413	21-1	2	1	2	33	3.7	.	.	25.6	80.3	9.2	2	78.4	104	46.60
4075414	21-1	2	1	2	33	3.6	.	.	26.3	79.8	9.1	2	77.5	104	50.20
4075415	11-2	1	1	2	34	3.5	.	.	29.1	80.6	9.1	2	79.3	106	53.10
4075416	11-2	1	1	2	33	3.6	.	.	26.8	80.4	9.4	2	79.2	104	50.70
4075417	11-1	1	1	2	34	3.5	.	.	26.0	80.5	9.2	2	79.0	107	53.05
4075418	11-2	1	1	2	33	3.7	.	.	26.8	80.5	9.0	2	78.6	104	50.70
4075419	21-1	2	1	3	34	3.6	.	.	28.0	80.0	9.1	3	78.3	105	52.70
4075420	11-2	1	1	2	33	3.6	.	.	27.7	79.8	9.3	2	78.7	104	50.60
Average	--	1.3	1.0	2.2	33.9	3.6	none	none	27.2	80.6	9.1	2.0	78.6	105.8	52.14



Table 2 (continued). Commercial classing data for the dryland foliar fertilizer trial, Evans Farm, Kress, TX, 2021.

Treatment and Bale Number	Color Grade-Quadrant grade-quadrant	Color digit 1	Color digit 2	Leaf grade	Staple 32nds inch	Micronaire units	Extraneous matter	Remarks --	Strength g/tex	Rd %	+b %	Trash % area	Uniformity %	Length 100ths inch	Loan rate cents/lb
Foliar blend															
4075421	11-2	1	1	2	34	3.5	.	.	27.3	80.0	9.4	2	79.2	106	53.05
4075422	21-1	2	1	3	34	3.5	.	.	27.0	80.0	9.0	3	79.4	105	52.80
4075423	11-1	1	1	2	34	3.6	.	.	26.5	80.5	9.2	2	79.6	105	53.05
4075424	11-2	1	1	3	34	3.6	.	.	27.8	80.9	9.0	3	78.4	105	52.70
4075425	21-1	2	1	3	34	3.4	.	.	27.9	80.4	9.2	2	78.7	106	47.75
4075426	21-1	2	1	2	33	3.6	.	.	26.2	80.4	8.9	2	78.9	103	50.60
4075427	11-2	1	1	2	34	3.5	.	.	27.3	80.4	9.3	2	80.3	105	53.60
4075428	11-1	1	1	3	34	3.5	.	.	27.0	80.5	9.2	3	80.3	106	53.35
4075429	21-3	2	1	2	35	3.8	.	.	29.7	79.4	9.5	2	80.5	110	55.50
4075430	11-2	1	1	2	34	3.5	.	.	28.2	80.9	9.1	2	79.2	106	53.05
4075431	11-2	1	1	2	34	3.5	.	.	26.7	80.8	9.0	2	79.3	107	53.05
4075432	21-1	2	1	3	33	3.5	.	.	27.7	79.9	8.9	3	79.2	104	50.50
4075433	21-1	2	1	3	33	3.6	.	.	27.2	79.7	9.0	4	78.6	104	50.40
4075434	21-1	2	1	2	35	3.6	.	.	27.9	80.0	9.1	2	80.0	109	55.35
4075435	11-2	1	1	2	34	3.6	.	.	28.1	80.5	9.1	2	80.1	105	53.60
4075436	21-1	2	1	2	34	3.6	.	.	27.6	80.2	9.1	2	78.9	107	52.95
4075437	21-1	2	1	2	33	3.6	.	.	26.3	79.9	9.1	2	79.7	103	50.70
4075438	21-1	2	1	2	35	3.6	.	.	28.5	79.9	9.2	2	79.9	108	54.80
4075439	21-1	2	1	3	34	3.6	.	.	26.9	79.7	9.1	5	79.1	105	52.80
4075440	11-2	1	1	2	34	3.5	.	.	26.8	80.8	9.1	2	78.5	107	52.95
4075441	11-2	1	1	2	33	3.7	.	.	26.5	80.7	8.9	2	78.1	103	50.70
Average	--	1.5	1.0	2.3	33.9	3.6	none	none	27.4	80.3	9.1	2.4	79.3	105.7	52.54



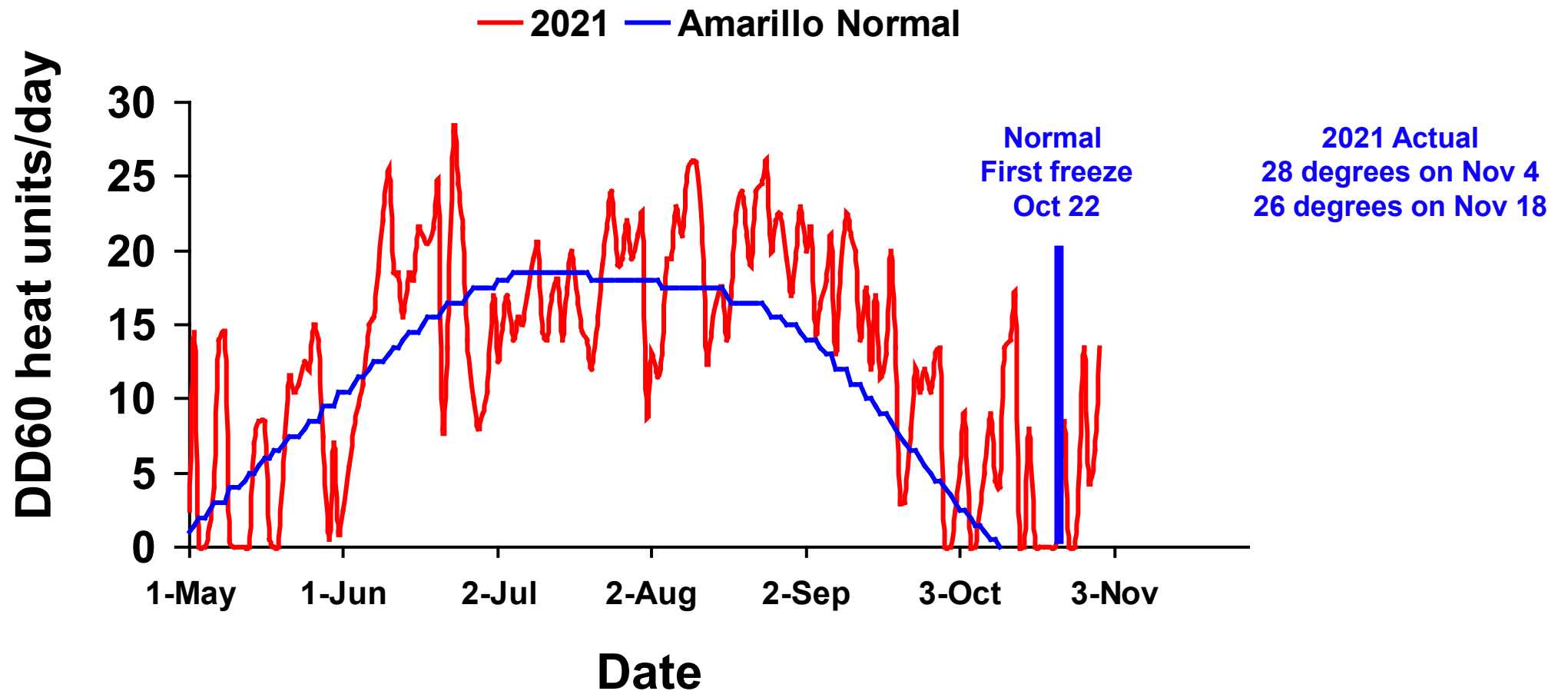
Appendix

Amarillo 2021 Cotton Heat Units and Weather Data



Amarillo

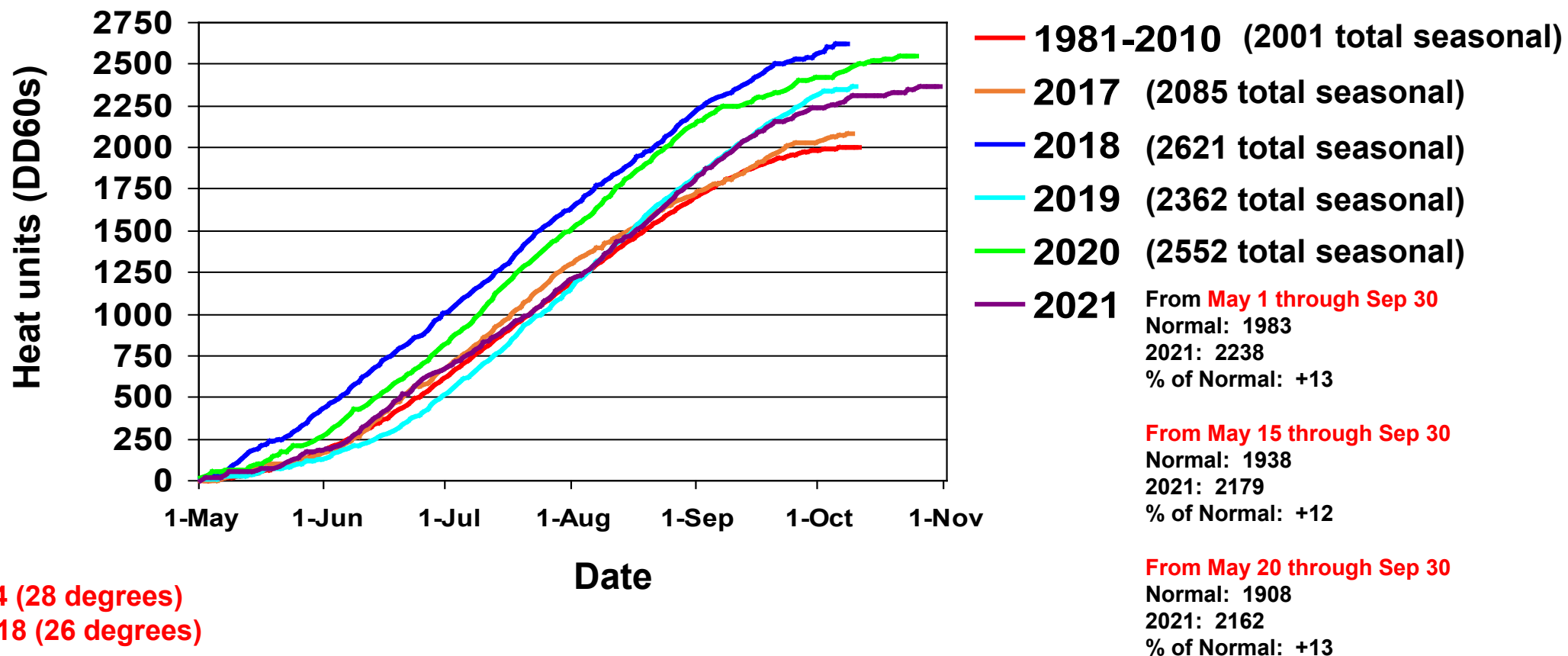
30-Year Normal (1981-2010) and 2021 Daily Heat Units



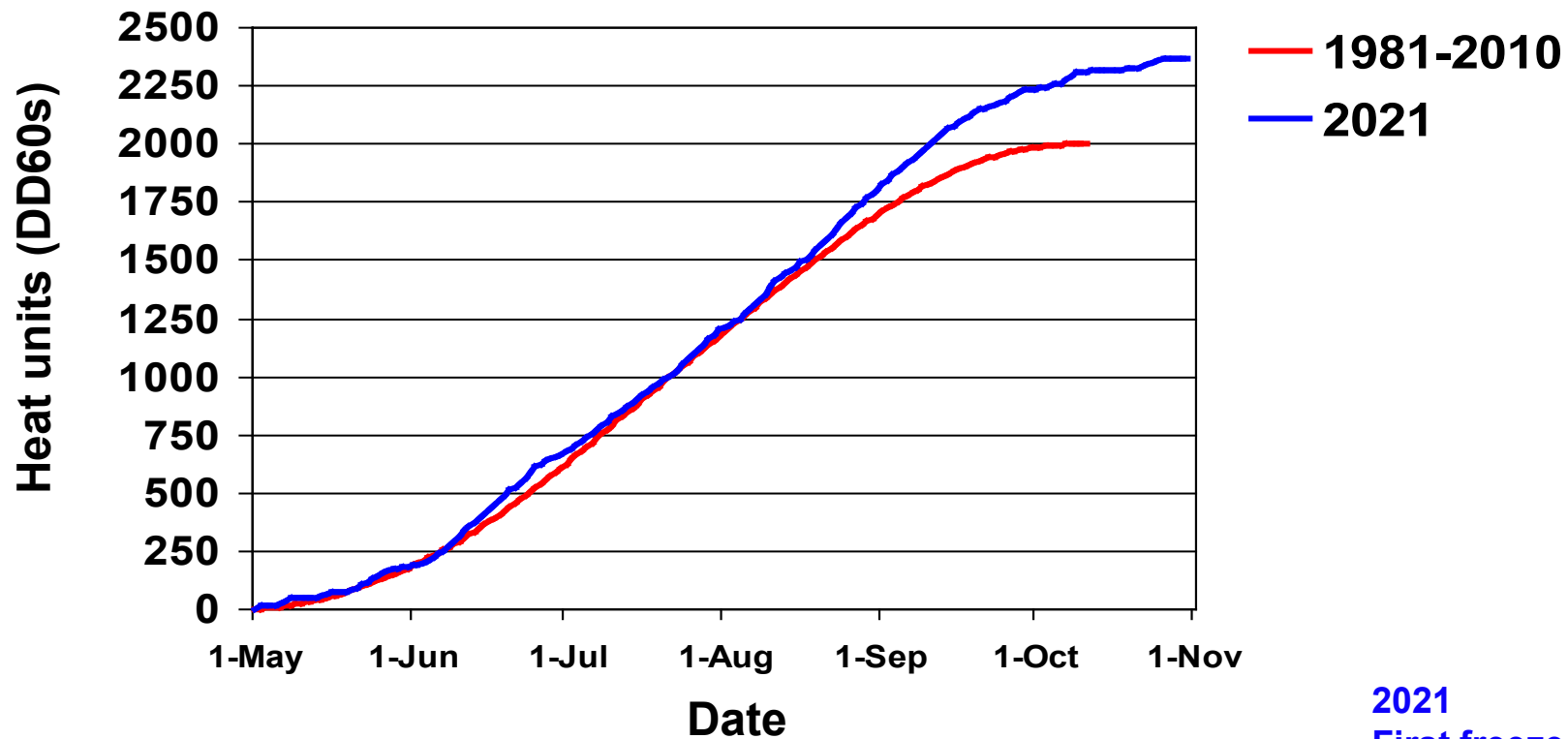
Amarillo 30-Yr Normal (1981-2010) vs. 2017, 2018, 2019, 2020, and 2021

Cotton Heat Unit Accumulation

From May 1 Through First Hard Freeze



Amarillo 30-Yr Normal (1981-2010) vs. 2021 Cotton Heat Unit Accumulation From May 1



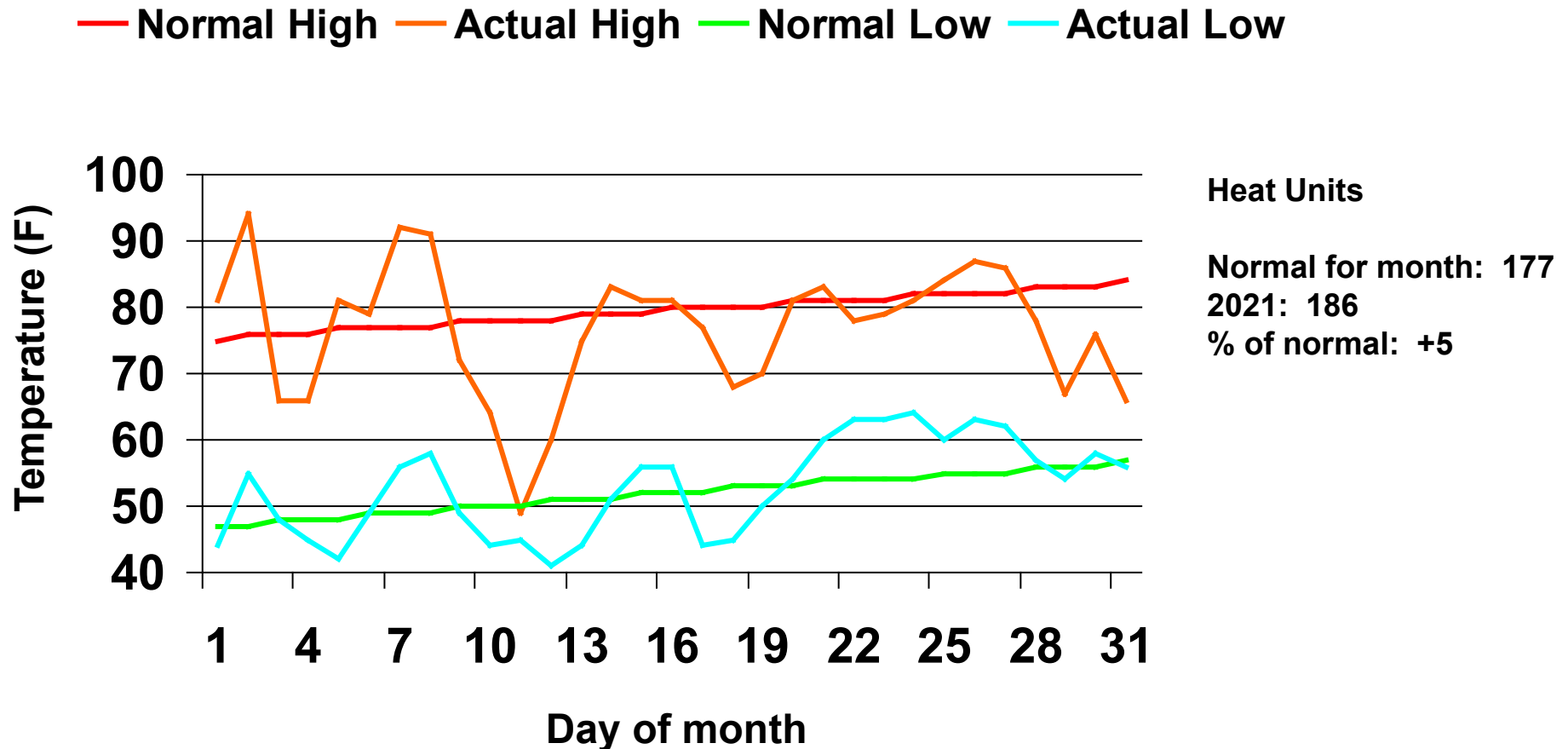
2021

First freeze on Nov 4 (28 degrees)

Hard freeze on Nov 18 (26 degrees)

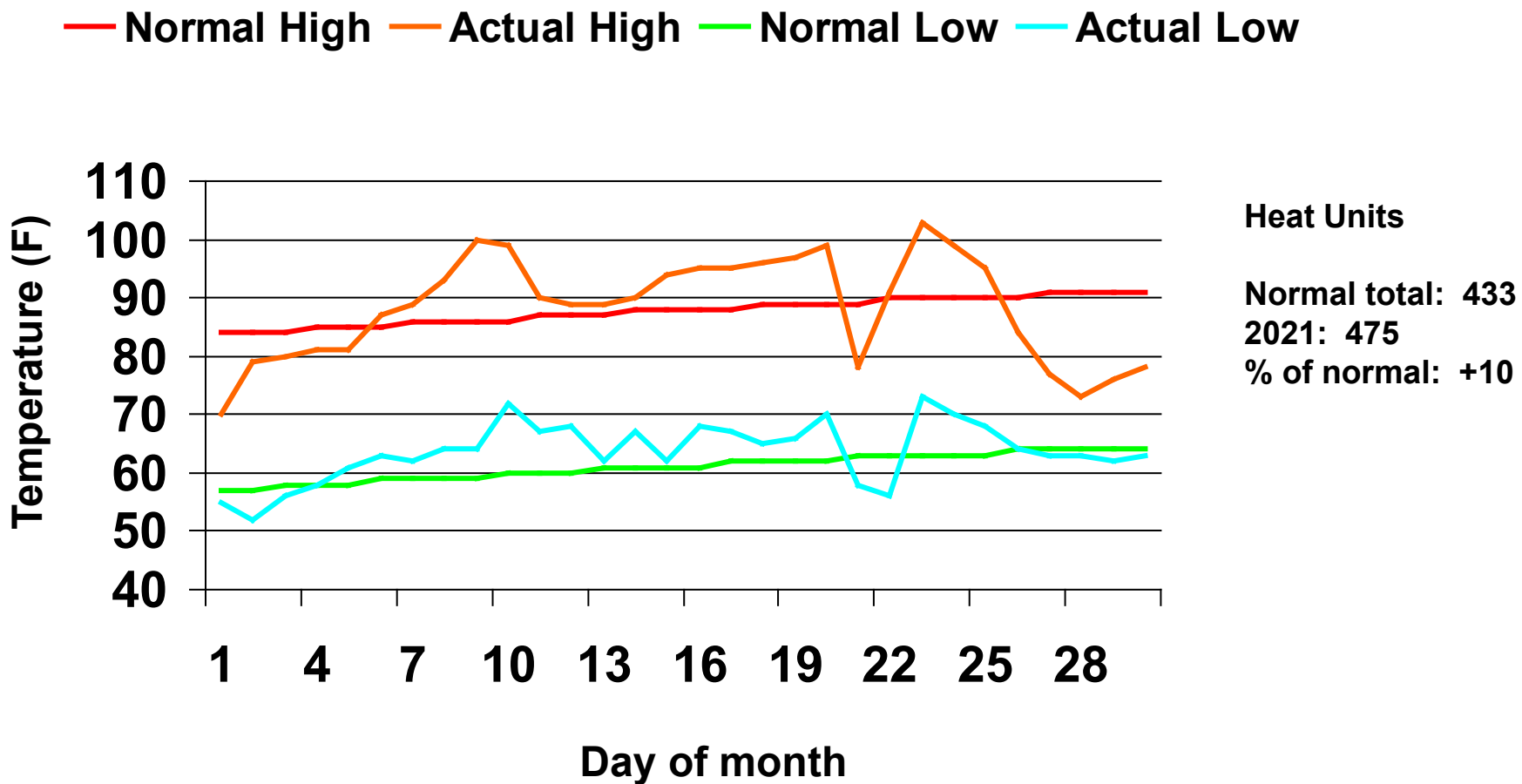
Amarillo

30-Yr Normal (1981-2010) and May 2021 Air Temperatures



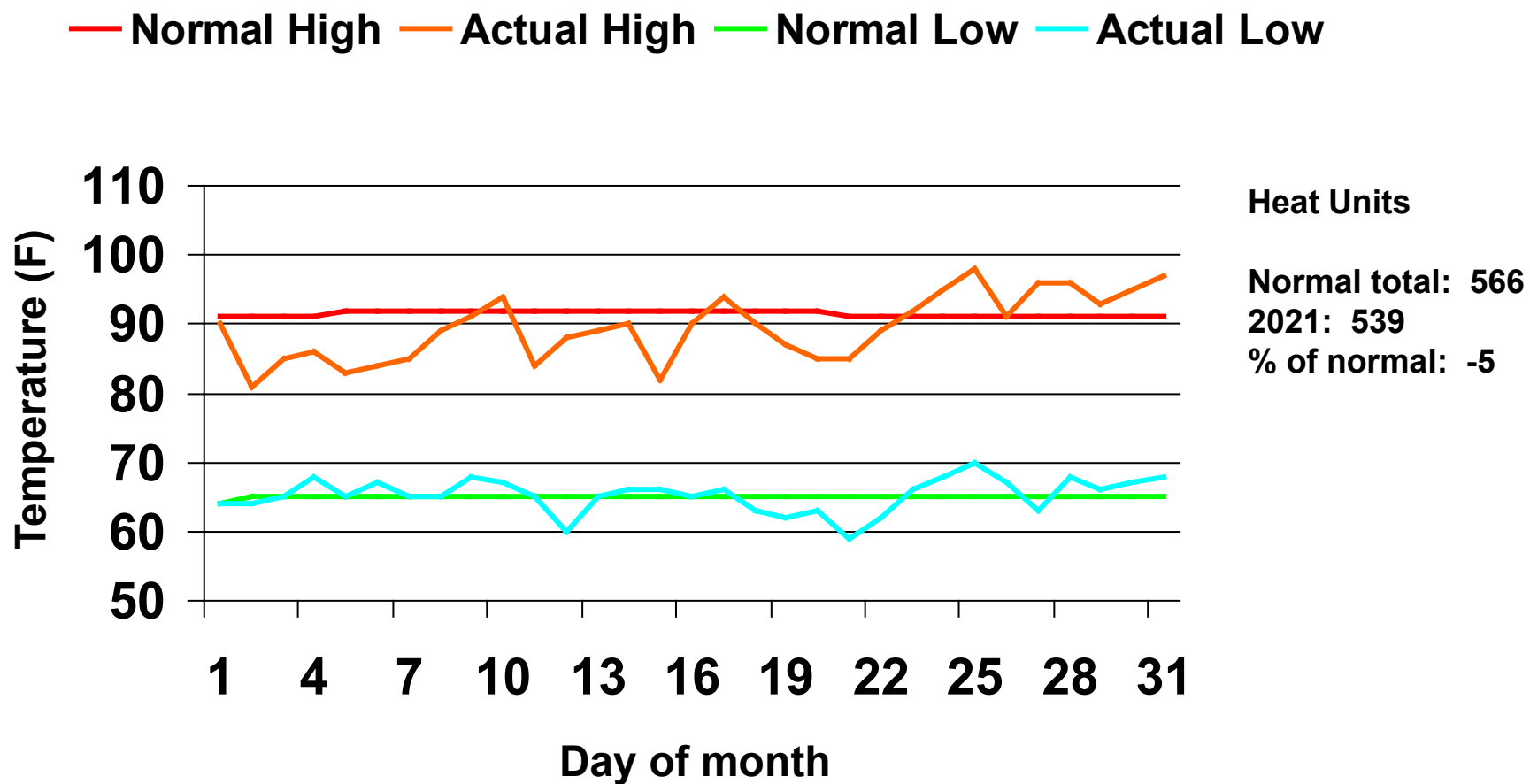
Amarillo

30-Yr Normal (1981-2010) and June 2021 Air Temperatures



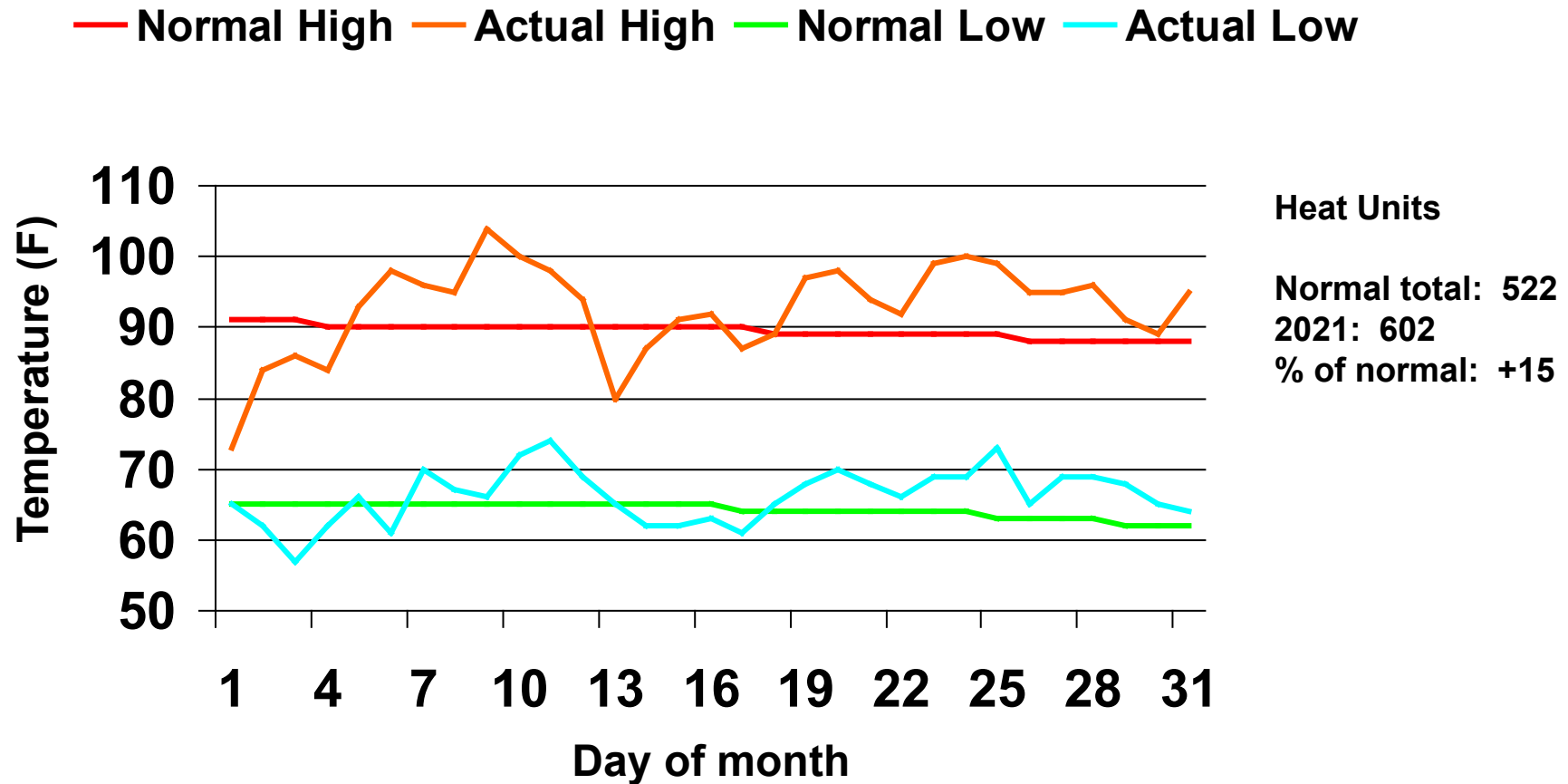
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30-Yr Normal (1981-2010) and July 2021 Air Temperatures



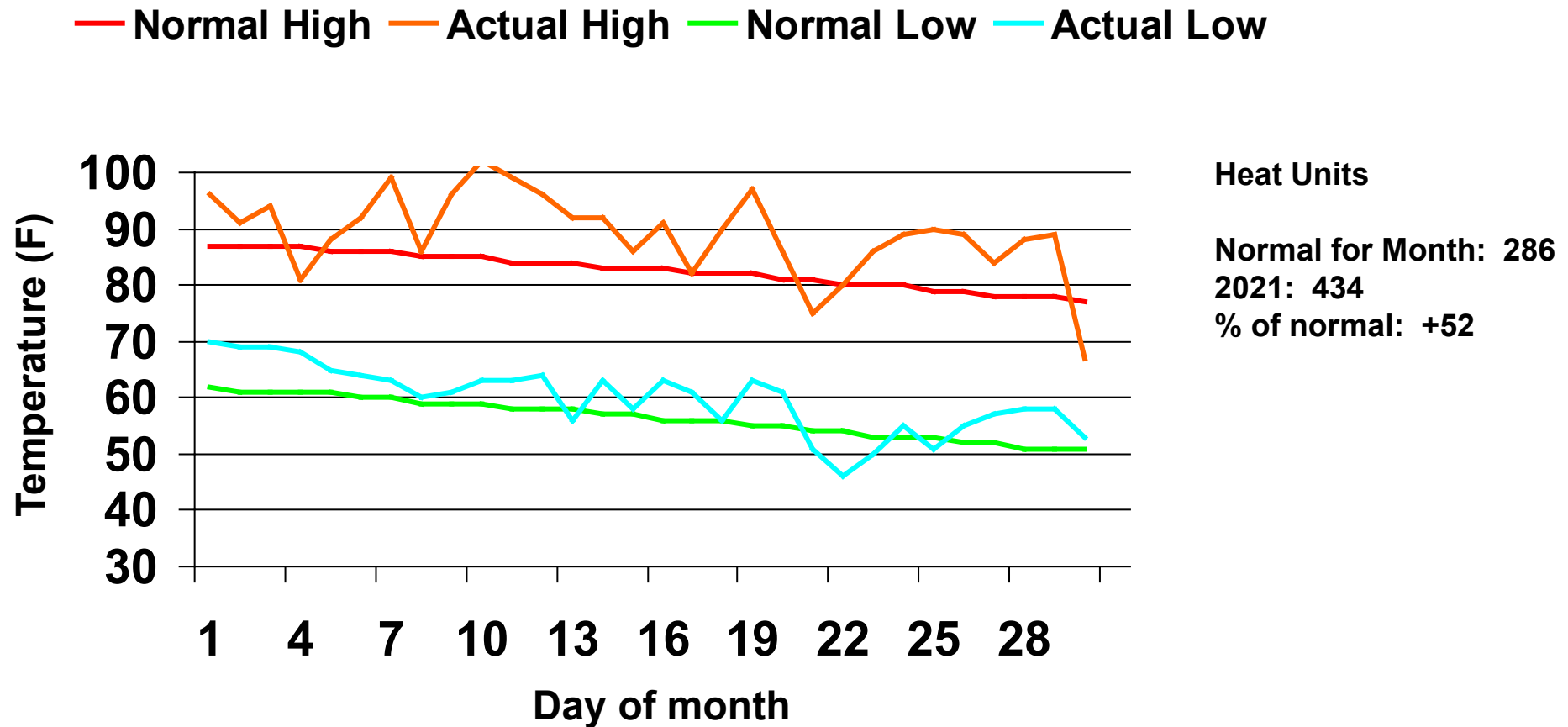
Amarillo

30-Yr Normal (1981-2010) and August 2021 Air Temperatures



Amarillo

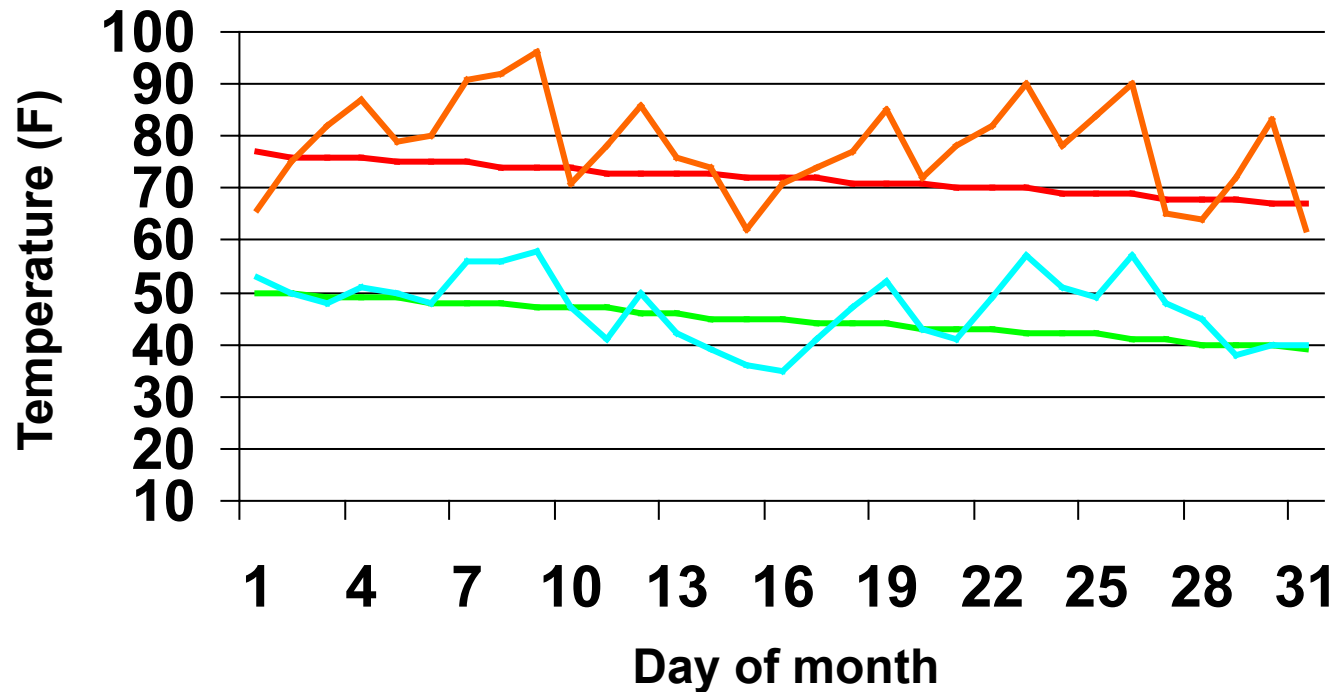
30-Yr Normal (1981-2010) and September 2021 Air Temperatures



Amarillo

30-Yr Normal (1981-2010) and October 2021 Air Temperatures

— Normal High — Actual High — Normal Low — Actual Low



Heat Units

Normal: 19

2021: 133

% of normal: +600

First freeze on Nov 4 (28 degrees)

Hard freeze on Nov 18 (26 degrees)