



2021 Limited Irrigation Enlist Technology Cotton Variety Trial – Adobe Walls Gin

**Dusty Sargent Farm
Stinnett, TX**

Dr. Randy Boman, Cotton Agronomics Manager – Windstar Inc.

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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.

At this site in 2021, six varieties with Enlist technology were planted in a low-capacity center-pivot irrigated field in a scientifically valid trial with three replicates. *This trial progressed well after planting, but encountered significant moisture stress from the late-bloom period until harvest. There were no challenging weather events in the trial. No Verticillium wilt disease pressure was noted.*

Harvest results indicated that highly statistically significant differences were observed. Lint yields ranged from a high of 1259 lb/acre (PHY 205) to a low of 1057 lb/acre (PHY 210), and averaged 1168 lb/acre (Table 1). Average Loan value for varieties from commercially ginned and classed bales varied from a high of \$0.5783/lb (PHY 400) to a low of \$0.5604/lb (PHY 205). Overall Loan value for the trial across all entries was \$0.5752/lb. When including lint Loan value on a per acre basis and net gin credit, highly statistically significant differences were found in net value/acre among varieties. PHY 205, PHY 332, and PHY 400 had similar net value at \$671, \$663, and \$651/acre, respectively, and PHY 210 had the lowest at \$570/acre.

Table 2 presents in-season data including stand establishment percentage, vigor, nodes above white flower (NAWF) on two sampling dates, plant height on three sampling dates, nodes above

cracked boll (NACB) on September 30, and a visual estimate of storm resistance. NACB values for most varieties were low (indicating excellent maturity) on September 30, and averaged 2.7.

Table 3 provides the USDA-AMS classing results from each commercial bale for each variety and the variety averages. Averages indicate that color grades were typically 11 and 21 across entries. Leaf grades were all 2 or less. Staple ranged from an average high of 37.6 (PHY 332) to an average low of 35.1 32nds inch (PHY 205). Average micronaire values ranged from a high of 4.6 (PHY 205) to a low of 3.7 (PHY 400). No bark contamination was noted in any commercial bales of any entries. Fiber strength ranged from a high of 33.2 g/tex (PHY 205) to a low of 32.6 g/tex (PHY 250, 332, and the experimental PX3E33). Uniformity ranged from a high of 82.5% to a low of 81.2%.

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: 3375 ft

Previous crop: seed sorghum 2020

Tillage system: no-till

Planted: May 25

Replicates: 3 replicates in a randomized complete block design

Plot width: 8-row plots

Plot length: trial was planted in straight rows, ~2,400 ft long

Seeding rate: 56,000 seed/acre

Days from planting to first bloom: 62 (July 25), ~7 nodes above white flower

30-inch rows under low-capacity center pivot irrigation

Fertility management:

50 lb/acre N, 50 lb/acre P₂O₅

Chemical Applications:

Preplant burndown (March) – 1 qt/acre glyphosate + 1 pt/acre Weedmaster + 3 oz/acre flumioxazin + 17 lb/100 gal ammonium sulfate

Preemergence (May 25) – 1 qt/acre paraquat + 1 qt/acre diuron + 1 gal/acre crop oil concentrate

Post emergence (June 28) – 1 qt/acre Liberty + 1 pt/acre Outlook + 0.6 oz/acre Assail + 8 oz/acre Pentia + 3 lb/acre ammonium sulfate

Post emergence (July 12) – 1 qt/acre Liberty + 0.6 oz/acre Assail + 1 pt/acre mepiquat chloride + 3 lb/acre ammonium sulfate

Post emergence (August 16) – 40 oz/acre Roundup PowerMax + 3 pt/acre Warrant + 40 oz/acre mepiquat chloride + 17 lb/100 gal ammonium sulfate

Insecticides: 0.6 oz/acre Assail on June 28 and July 12

Harvest aid application: 3 pt/acre ethephon + 12 oz/acre Folex on October 20

Harvesting: November 15 using a John Deere CS690, with harvested area calculated by the GPS on the stripper monitor. Entire plot length was harvested with 1 round module harvested/plot. Round modules were weighed using the CS690 scale, and all three round modules for each variety were weighed at the Adobe Walls Gin.

Commercial ginning: Round modules for all 3 replicates of each variety were staged together (1 per plot, with 3 replicates = 3 total per variety) and commercially ginned separately by Adobe Walls 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 variety module in 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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Acknowledgements

Adobe Walls Gin would like to thank Dusty Sargent for committing equipment, land, and time to conduct and manage the trial. Gratitude is expressed to participating seed companies for providing testing seed. These include Deltapine, FiberMax/Stoneville, and NexGen. Gratitude is also expressed to Windstar Inc. Detailed ginning was performed by the Adobe Walls crew including Malcom Jones and Aaron Moore, and a big thank you is extended to this hard-working group.



2021 Enlist Technology Trial Variety Descriptions – Adobe Walls Gin

**Dusty Sargent Farm
Stinnett, TX**

**Dr. Randy Boman
Cotton Agronomics Manager**

Variety Descriptions from Company Literature and Websites

PHY 205 W3FE Enlist Technology: Widestrike 3 Bt technology stacked with triple herbicide technologies including Roundup Ready Flex (glyphosate) tolerance, Liberty Link (glufosinate), and Enlist herbicide (2,4-D choline) tolerance. Very early maturity. Short growth habit. Semi-smooth leaf, storm tolerance - excellent. Bacterial blight - resistant. Verticillium wilt - excellent. Root knot nematode –resistant. Reniform nematode – resistant. ~35 staple, ~30 g/tex strength.

PHY 210 W3FE Enlist Technology: Widestrike 3 Bt technology stacked with triple herbicide technologies including Roundup Ready Flex (glyphosate) tolerance, Liberty Link (glufosinate), and Enlist herbicide (2,4-D choline) tolerance. Early maturity. Short growth habit. Smooth leaf, storm tolerance - excellent. Bacterial blight - resistant. Verticillium wilt - excellent. ~36.8 staple, ~31.3 g/tex strength.

PHY 250 W3FE Enlist Technology: Widestrike 3 Bt technology stacked with triple herbicide technologies including Roundup Ready Flex (glyphosate) tolerance, Liberty Link (glufosinate), and Enlist herbicide (2,4-D choline) tolerance. Early maturity. Short growth habit. Smooth leaf, storm tolerance - excellent. Bacterial blight - resistant. Verticillium wilt - excellent. ~37.1 staple, ~31.1 g/tex strength.

PHY 332 W3FE (tested as PX3D32 W3FE) Enlist Technology: Widestrike 3 Bt technology stacked with triple herbicide technologies including Roundup Ready Flex (glyphosate) tolerance, Liberty Link (glufosinate), and Enlist herbicide (2,4-D choline) tolerance. Early-mid maturity. Medium-tall plant height, Semi-smooth leaf, storm tolerance – very good. Bacterial blight - resistant. Verticillium wilt - good. Root knot nematode –resistant. Reniform nematode – resistant. ~37 staple, ~30.5 g/tex strength

PHY 400 W3FE Enlist Technology: Widestrike 3 Bt technology stacked with triple herbicide technologies including Roundup Ready Flex (glyphosate) tolerance, Liberty Link (glufosinate), and Enlist herbicide (2,4-D choline) tolerance. Early-mid maturity. Medium plant height. Semi-smooth leaf, storm tolerance – excellent. Bacterial blight - resistant. Verticillium wilt - susceptible. Root knot nematode – moderately resistant. ~36.2 staple, ~31.0 g/tex strength.

PX3E33 W3FE Enlist Technology Experimental Entry. Widestrike 3 Bt technology stacked with triple herbicide technologies including Roundup Ready Flex (glyphosate) tolerance, Liberty Link (glufosinate), and Enlist herbicide (2,4-D choline) tolerance. Early-mid maturity. Storm tolerance – excellent. Bacterial blight - resistant. Verticillium wilt - good. Root knot nematode – resistant.

For the latest Texas A&M AgriLife Research and Extension information from Dr. Terry Wheeler, and Dr. Cecilia Monclova-Santana (lubbock.tamu.edu):

Bacterial blight disease variety reaction information:

<https://lubbock.tamu.edu/files/2021/01/Variety-guide-for-bacterial-blight-ratings-Jan-2021.pdf>

Verticillium wilt disease variety reaction information:

<https://lubbock.tamu.edu/files/2021/11/Verticillium-wilt-variety-trials-2021.pdf>

Fusarium wilt disease variety reaction information:

<https://lubbock.tamu.edu/files/2021/12/Cotton-Disease-Report-2021.pdf>



Table 1. Harvest results for the center pivot limited irrigation Enlist cotton variety trial, Sargent Farm, Stinnett, TX, 2021.

Entry	Lint turnout	Seed turnout	Bur cotton yield	Lint yield	Seed yield	Lint loan value	Lint loan value	Net gin credit	Seed/tech cost	Net value	
	----- % -----		----- lb/acre -----			\$/lb		----- \$/acre -----			
PHY 205 W3FE	32.1	42.6	3925	1259	1673	0.5604	706	63	97	671	a
PHY 332 W3FE	31.4	43.5	3834	1204	1667	0.5792	698	65	100	663	ab
PHY 400 W3FE	33.0	41.5	3650	1204	1516	0.5783	696	54	99	651	ab
PX3E33 W3FE	32.4	40.8	3620	1172	1476	0.5781	677	50	100	628	bc
PHY 250 W3FE	31.4	43.8	3541	1112	1549	0.5776	642	61	97	606	cd
PHY 210 W3FE	32.1	43.6	3295	1057	1438	0.5775	610	56	97	570	d
Test average	32.1	42.6	3644	1168	1553	0.5752	672	58	98	632	
CV, %	--	--	3.9	3.9	3.9	--	3.8	4.1	--	4.5	
OSL	--	--	0.0037	0.0031	0.0032	--	0.0064	0.0001	--	0.0099	
LSD	--	--	209	67	90	--	38	4	--	42	

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 0.05 level, NS - not significant.

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

Assumes:

\$3.30/cwt commercial ginning cost.

\$230/ton for seed.

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

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



Table 2. Plant observation results from the center pivot limited irrigation Enlist cotton variety trial, Sargent Farm, Stinnett, TX, 2021.

Entry	Final population	Stand establishment	Vigor	Nodes above white flower		Plant height			Nodes above cracked boll	Storm resistance
				Early bloom	Late bloom	Prebloom	Early bloom	Final		
	plants/acre 15-Jun	% 15-Jun	1-5 visual scale, 5 best 15-Jun	count		inches			count 30-Sep	1-9 visual scale, 9 tight 15-Nov
				27-Jul	12-Aug	13-Jul	27-Jul	30-Sep		
PHY 205 W3FE	54,305	97.0	4.0	6.3	1.7	14.1	15.7	16.9	1.5	8.3
PHY 210 W3FE	44,722	79.9	3.0	5.7	2.3	13.3	14.9	15.9	2.0	8.0
PHY 250 W3FE	35,429	63.3	3.0	6.3	2.1	13.8	16.1	18.1	2.6	7.0
PHY 332 W3FE	48,787	87.1	4.2	7.0	2.1	18.2	19.7	21.4	3.3	6.0
PHY 400 W3FE	42,979	76.8	4.0	5.9	1.9	15.4	16.7	18.2	3.1	6.7
PX3E33 W3FE	45,593	81.4	4.2	6.7	1.7	17.8	19.1	20.5	3.7	7.3
Test average	45,303	80.9	3.7	6.3	2.0	15.4	17.0	18.5	2.7	7.2
CV, %	10.8	10.8	6.3	2.6	24.3	5.6	5.2	5.0	18.3	4.3
OSL	0.0155	0.0156	0.0001	0.0001	0.5082	0.0001	0.0003	0.0002	0.0024	0.0001
LSD	7,236	12.9	0.4	0.2	NS	1.3	1.3	1.4	0.7	0.5

CV - coefficient of variation.

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

LSD - least significant difference at the 0.05 level, NS - not significant.



Table 3. Commercial classing data for the center pivot limited irrigation Enlist cotton variety trial, Sargent Farm, Stinnett, TX, 2021.

Variety 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
PHY 205 W3FE															
9108406	21-1	2	1	2	35	4.7	.	.	32.2	80.3	8.5	1	82.8	110	55.80
9108407	11-2	1	1	2	35	4.6	.	.	32.6	81.5	8.4	2	82.7	109	55.80
9108408	11-2	1	1	2	35	4.5	.	.	33.6	81.5	8.4	1	82.2	110	55.85
9108409	21-1	2	1	2	35	4.6	.	.	33.5	81.3	8.5	1	82.4	110	55.85
9108410	21-1	2	1	2	35	4.6	.	.	33.2	80.7	8.6	1	82.6	109	55.85
9108411	21-1	2	1	1	35	4.4	.	.	33.1	81.3	8.7	1	82.1	110	55.85
9108412	21-1	2	1	1	36	4.5	.	.	34.2	80.9	8.7	1	82.7	111	57.25
Average	--	1.7	1.0	1.7	35.1	4.6	none	none	33.2	81.1	8.5	1.1	82.5	109.9	56.04
PHY 210 W3FE															
9108378	21-1	2	1	1	37	3.9	.	.	32.5	80.9	8.2	1	81.8	114	57.80
9108379	21-1	2	1	1	38	4.1	.	.	32.9	82.3	8.0	1	82.1	118	58.00
9108380	21-1	2	1	2	37	4.0	.	.	34.0	82.0	8.0	2	83.0	117	57.95
9108381	21-1	2	1	2	36	4.6	.	.	32.5	81.8	8.0	2	81.9	113	57.15
9108382	11-2	1	1	2	37	4.2	.	.	33.7	82.5	8.1	2	81.1	116	57.85
9108383	11-2	1	1	2	37	4.4	.	.	32.0	82.8	7.9	2	82.3	115	57.75
Average	--	1.7	1.0	1.7	37.0	4.2	none	none	32.9	82.1	8.0	1.7	82.0	115.5	57.75
PHY 250 W3FE															
9108392	21-1	2	1	2	37	3.9	.	.	32.7	81.7	8.0	1	81.0	117	57.80
9108393	21-1	2	1	2	37	4.0	.	.	34.5	81.6	8.2	2	81.6	117	57.85
9108394	21-1	2	1	2	38	4.0	.	.	32.0	81.7	8.1	2	80.2	118	57.95
9108395	21-1	2	1	2	37	3.9	.	.	32.2	81.6	8.2	2	81.3	114	57.80
9108396	21-1	2	1	2	37	4.0	.	.	31.8	81.9	8.2	2	81.8	116	57.80
9108397	11-2	1	1	3	37	4.0	.	.	33.2	81.5	8.4	3	81.9	117	57.30
9108398	21-1	2	1	2	37	4.2	.	.	31.7	81.2	8.3	1	80.4	116	57.80
Average	--	1.9	1.0	2.1	37.1	4.0	none	none	32.6	81.6	8.2	1.9	81.2	116.4	57.76



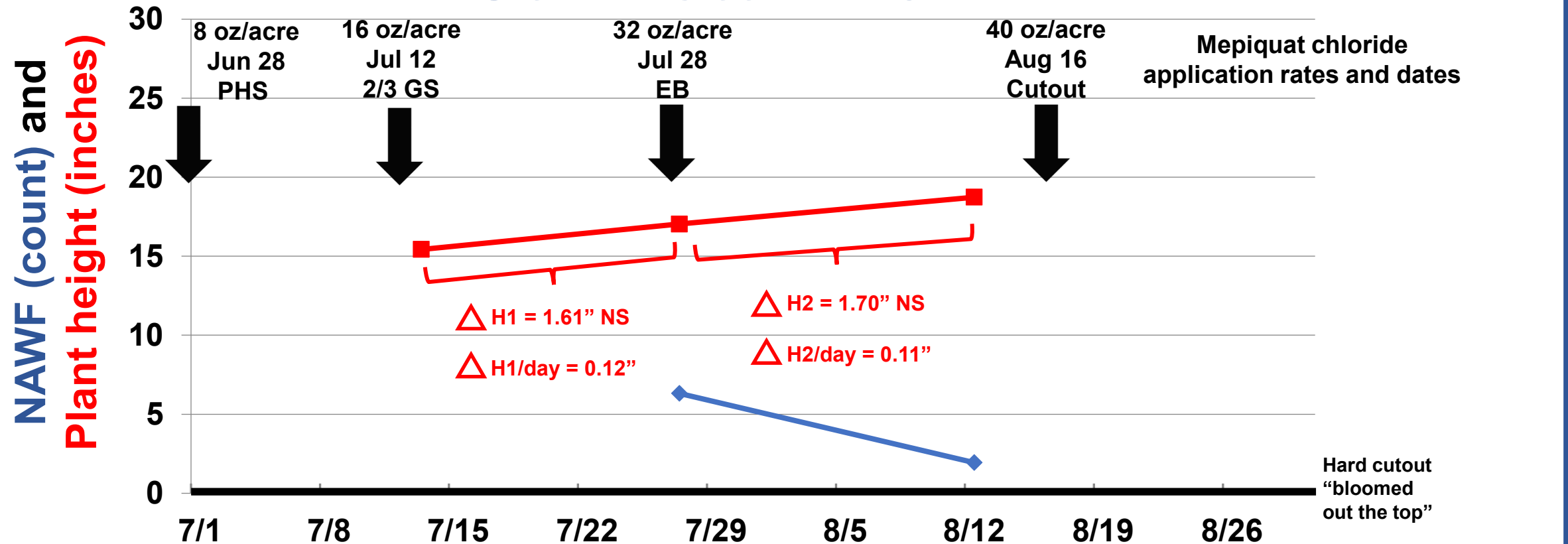
Table 3 (continued). Commercial classing data for the center pivot limited irrigation Enlist cotton variety trial, Sargent Farm, Stinnett, TX, 2021.

Variety 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
PHY 332 W3FE															
9108399	21-1	2	1	1	38	4.0	.	.	33.2	80.8	8.7	1	81.6	118	58.00
9108400	11-1	1	1	2	37	4.0	.	.	32.0	80.6	9.4	1	81.7	117	57.80
9108401	21-1	2	1	2	38	4.2	.	.	32.5	80.1	9.2	2	82.8	119	58.00
9108402	11-2	1	1	2	38	4.2	.	.	33.5	80.3	9.5	1	82.0	119	58.05
9108403	11-1	1	1	2	37	4.2	.	.	32.2	80.5	9.6	2	81.3	117	57.80
9108404	11-3	1	1	2	37	4.2	.	.	32.3	80.3	9.6	1	82.6	117	57.85
9108405	11-2	1	1	2	38	4.1	.	.	32.8	80.0	9.4	1	81.0	118	57.95
Average	--	1.3	1.0	1.9	37.6	4.1	none	none	32.6	80.4	9.3	1.3	81.9	117.9	57.92
PHY 400 W3FE															
9108384	11-2	1	1	2	38	4.0	.	.	33.2	81.6	8.5	1	82.0	119	58.05
9108385	21-1	2	1	2	37	3.8	.	.	31.6	81.4	8.6	2	81.1	114	57.80
9108386	11-2	1	1	2	37	3.8	.	.	32.4	80.9	8.8	1	80.7	114	57.80
9108387	11-2	1	1	2	37	3.8	.	.	32.2	81.0	8.9	2	80.5	115	57.80
9108388	21-1	2	1	2	37	3.6	.	.	33.2	80.4	8.9	2	81.2	117	57.75
9108389	21-1	2	1	2	37	3.6	.	.	32.6	80.4	9.0	2	80.6	114	57.70
9108390	21-1	2	1	2	37	3.7	.	.	31.6	80.1	8.9	2	81.5	115	57.80
9108391	21-1	2	1	2	38	3.6	.	.	35.4	80.1	9.1	2	82.2	119	57.95
Average	--	1.6	1.0	2.0	37.3	3.7	none	none	32.8	80.7	8.8	1.8	81.2	115.9	57.83
PX3E33 W3FE															
9108371	21-1	2	1	2	37	4.4	.	.	32.6	80.1	8.8	1	81.3	117	57.70
9108372	21-1	2	1	2	37	4.1	.	.	31.8	79.2	9.3	2	81.5	115	57.80
9108373	11-2	1	1	2	37	3.9	.	.	31.8	79.5	9.4	1	81.9	115	57.80
9108374	21-3	2	1	2	37	4.0	.	.	33.6	78.9	9.5	2	81.4	117	57.85
9108375	11-2	1	1	2	37	4.1	.	.	32.7	79.9	9.3	2	82.2	116	57.85
9108376	11-2	1	1	2	38	4.4	.	.	34.0	81.0	9.1	1	82.5	119	57.95
9108377	11-2	1	1	2	37	4.4	.	.	31.8	80.5	8.9	1	82.2	116	57.75
Average	--	1.4	1.0	2.0	37.1	4.2	none	none	32.6	79.9	9.2	1.4	81.9	116.4	57.81

Appendix

**Sargent Enlist Technology Variety Trial – Plant Height and NAWF Graph
Amarillo 2021 Cotton Heat Units and Weather Data**

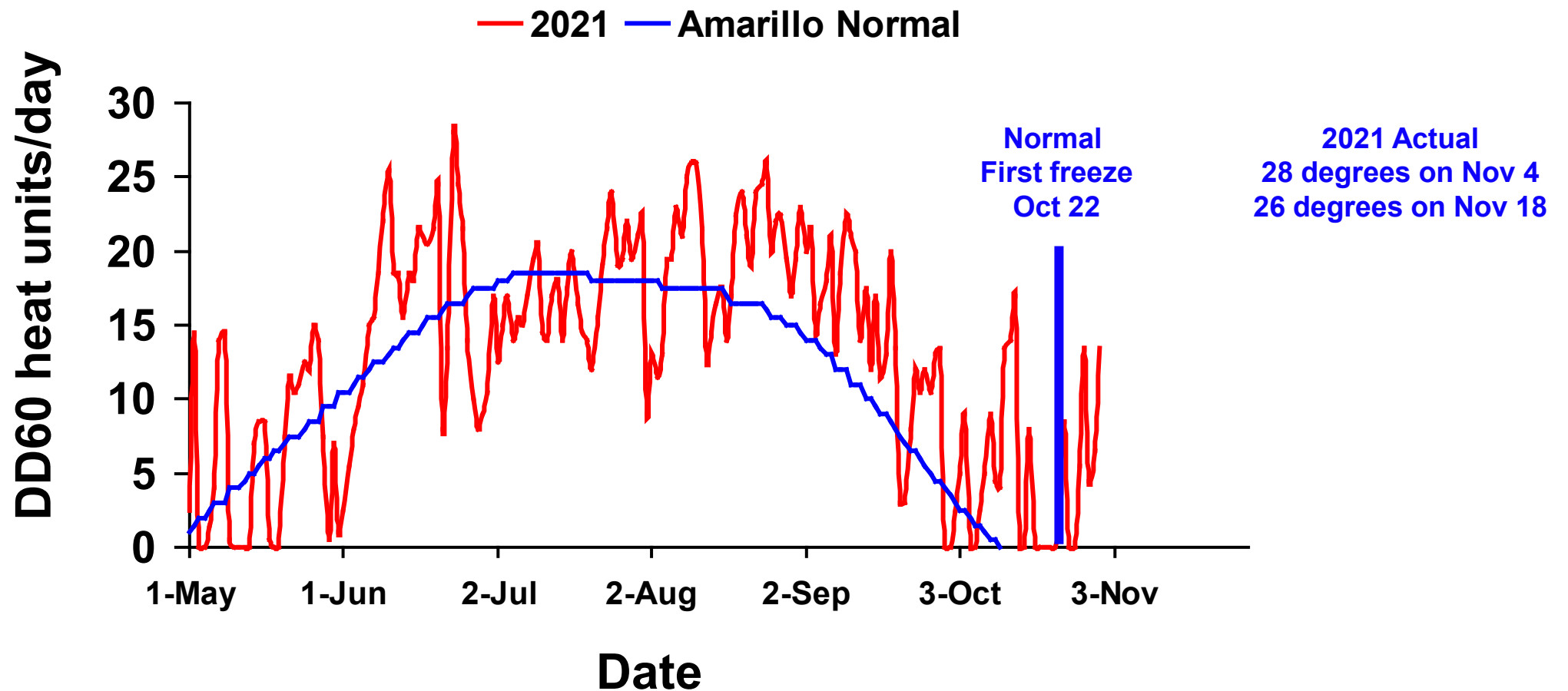
Sargent Enlist Variety Trial (Across All Entries) Stinnett – 2021



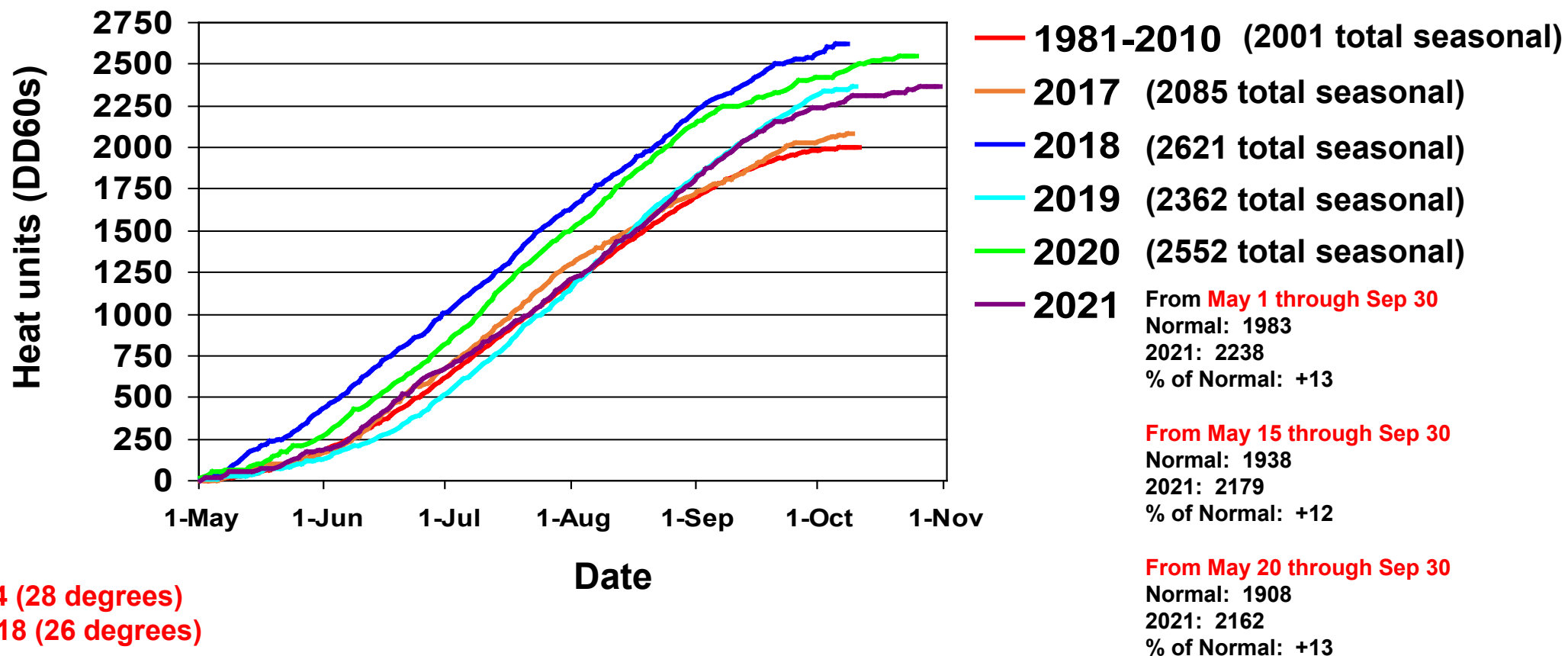
Planted: May 25
Days to bloom: 62
First bloom date: Jul 25

Amarillo

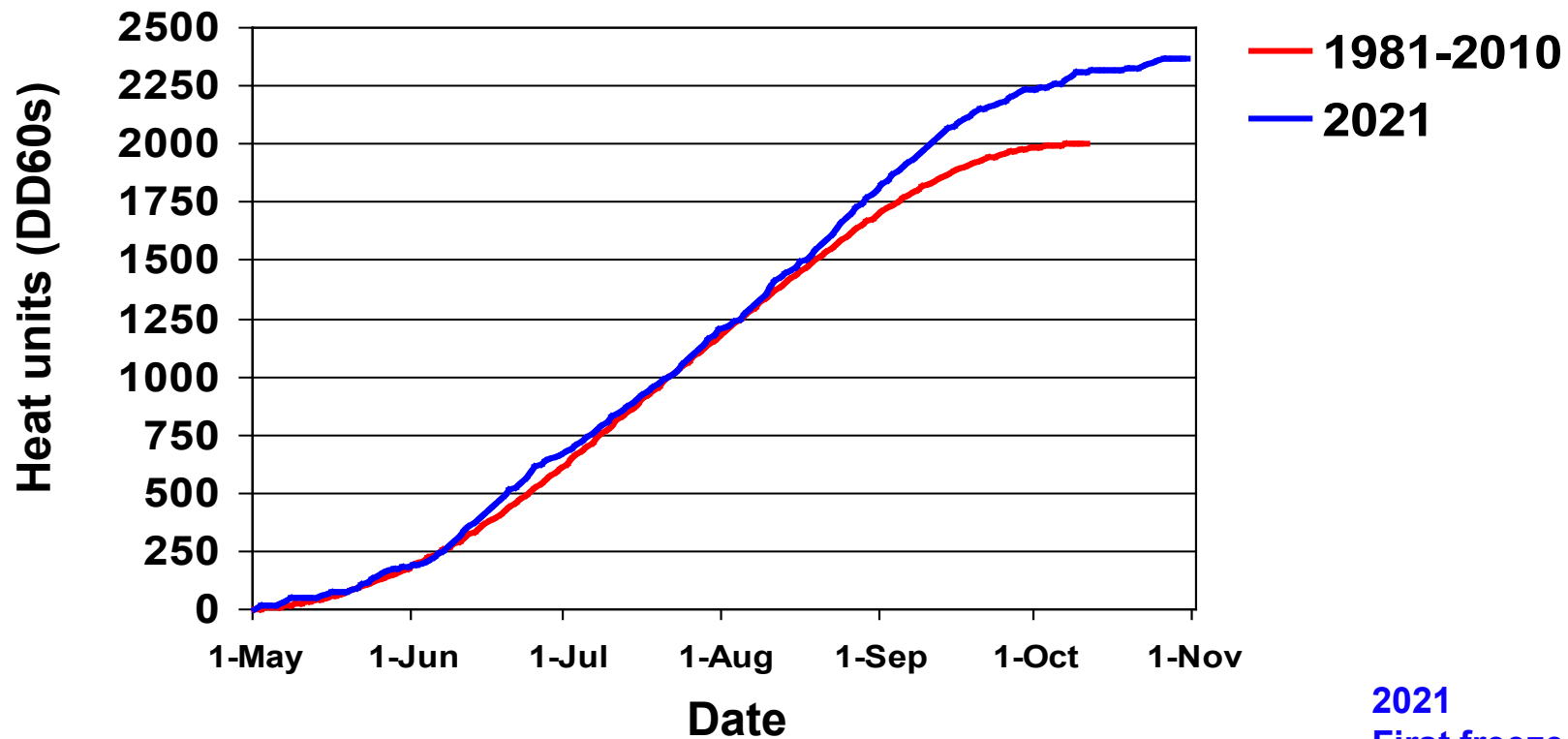
30-Year Normal (1981-2010) and 2021 Daily Heat Units



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



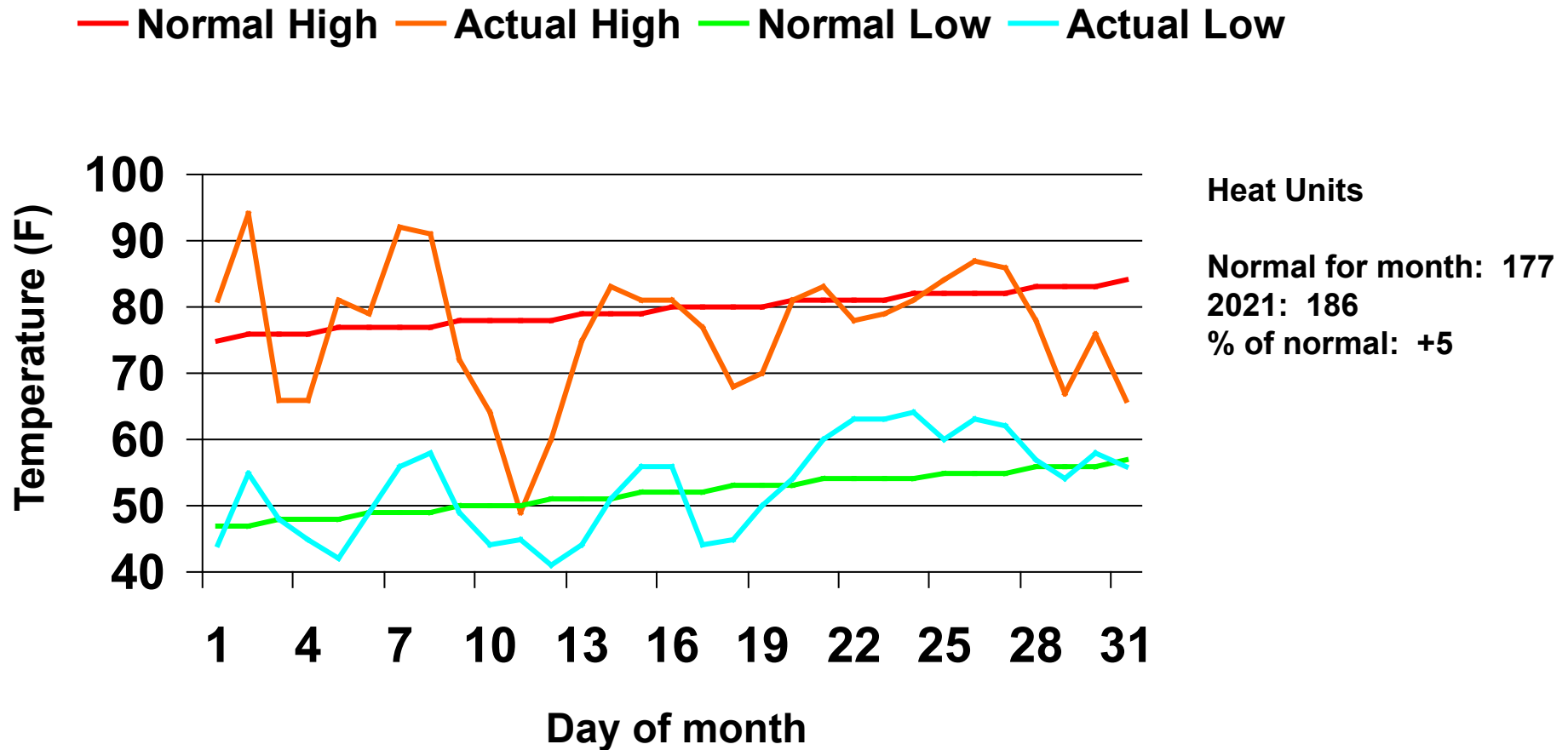
2021

First freeze on Nov 4 (28 degrees)

Hard freeze on Nov 18 (26 degrees)

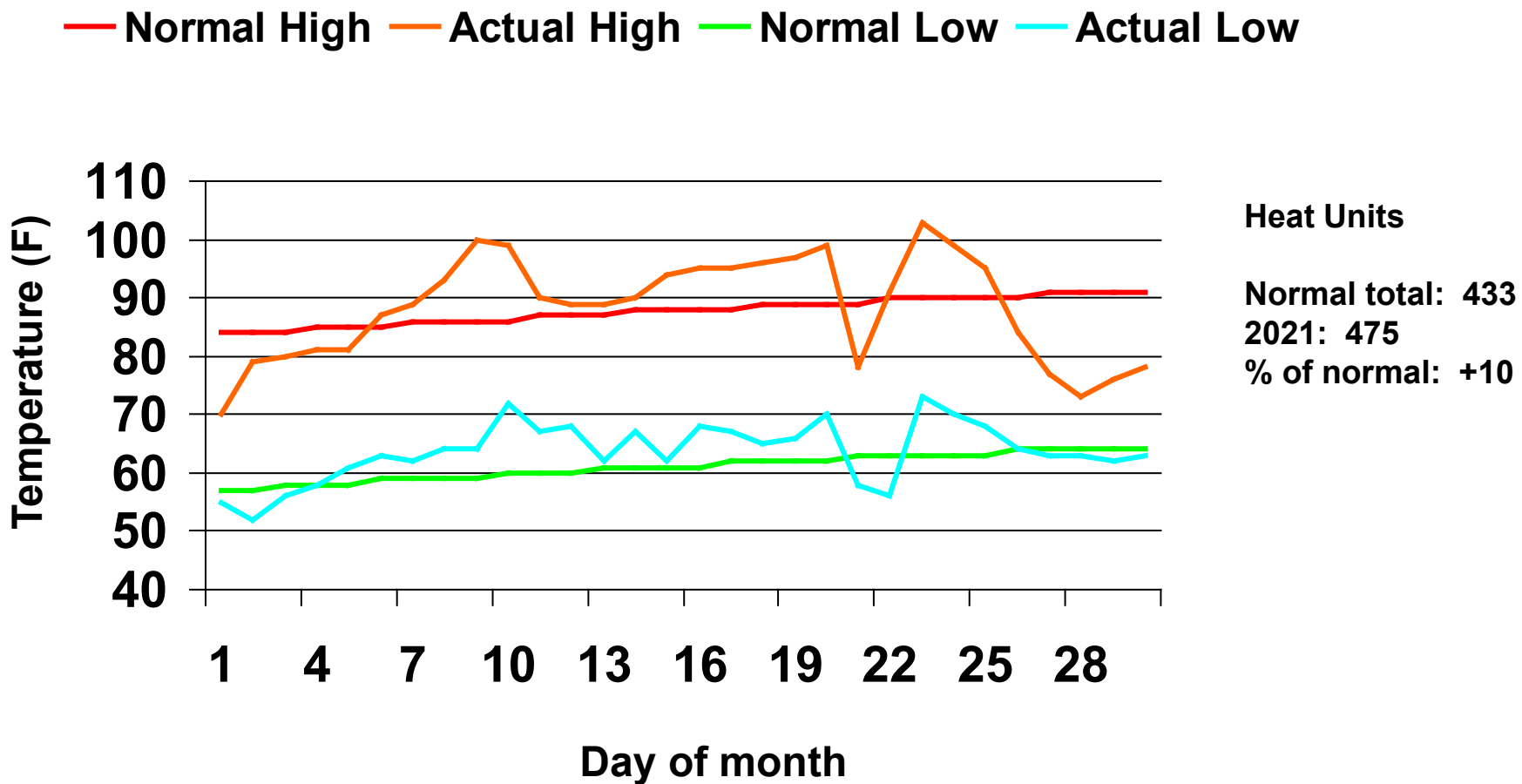
Amarillo

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



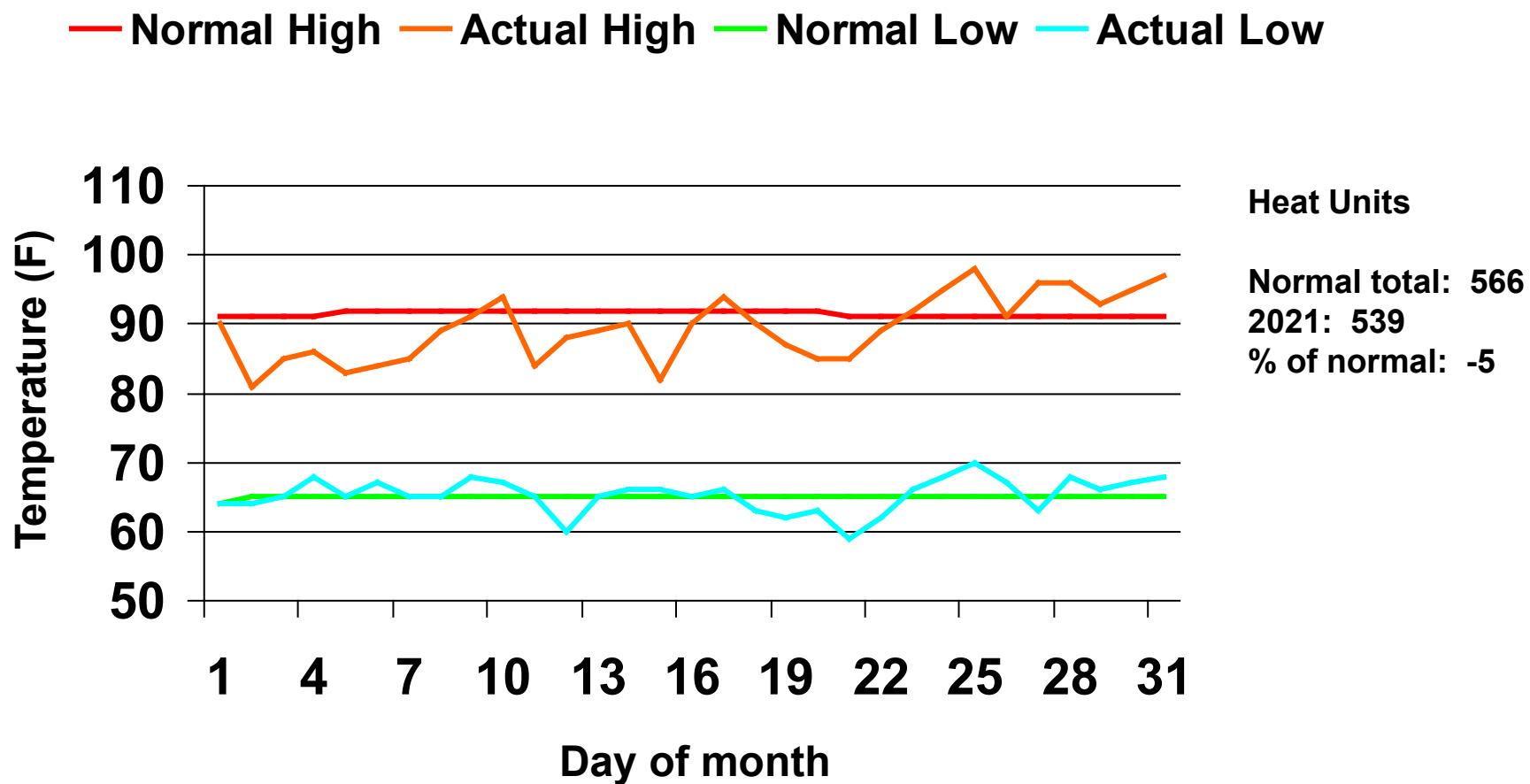
Amarillo

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



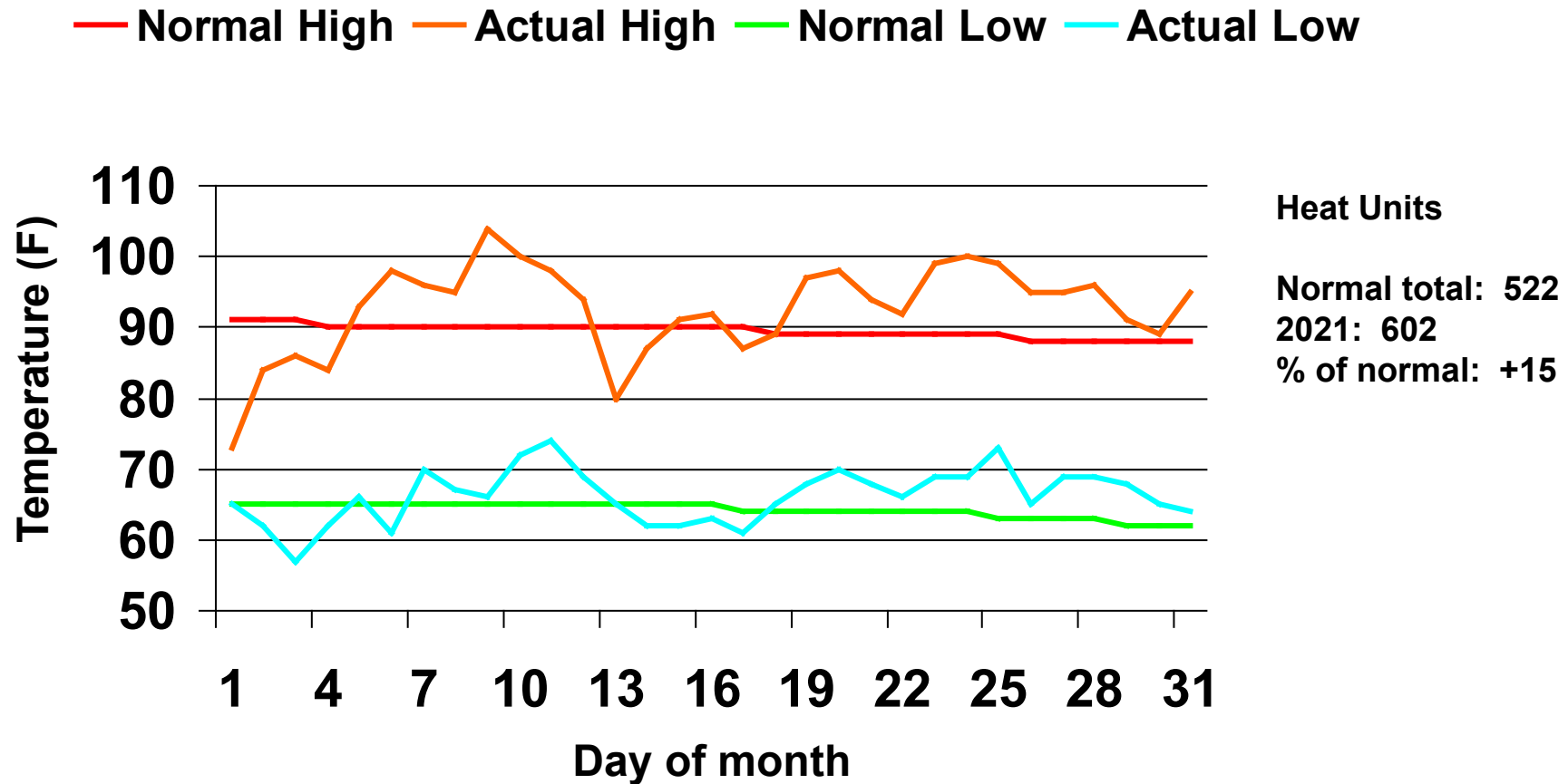
Amarillo

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



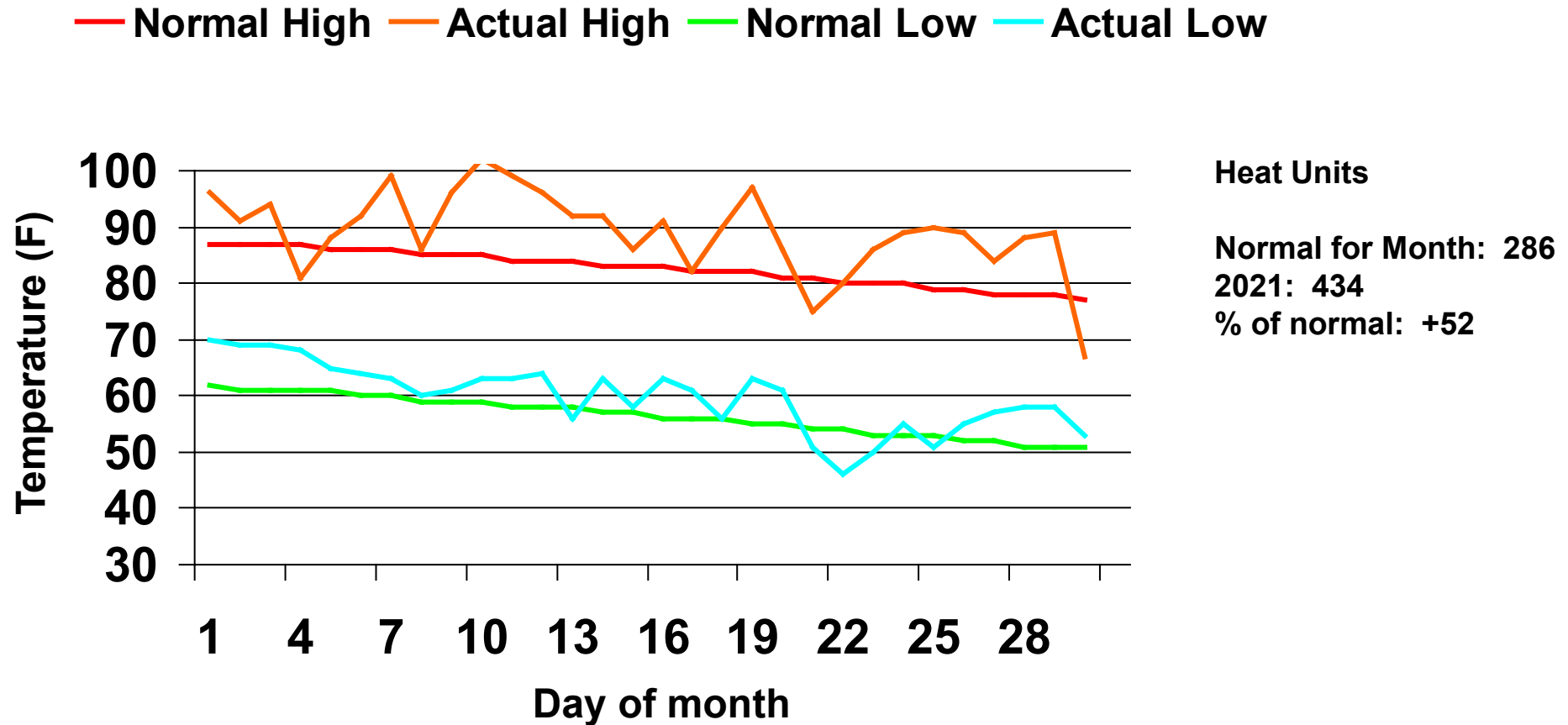
Amarillo

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



Amarillo

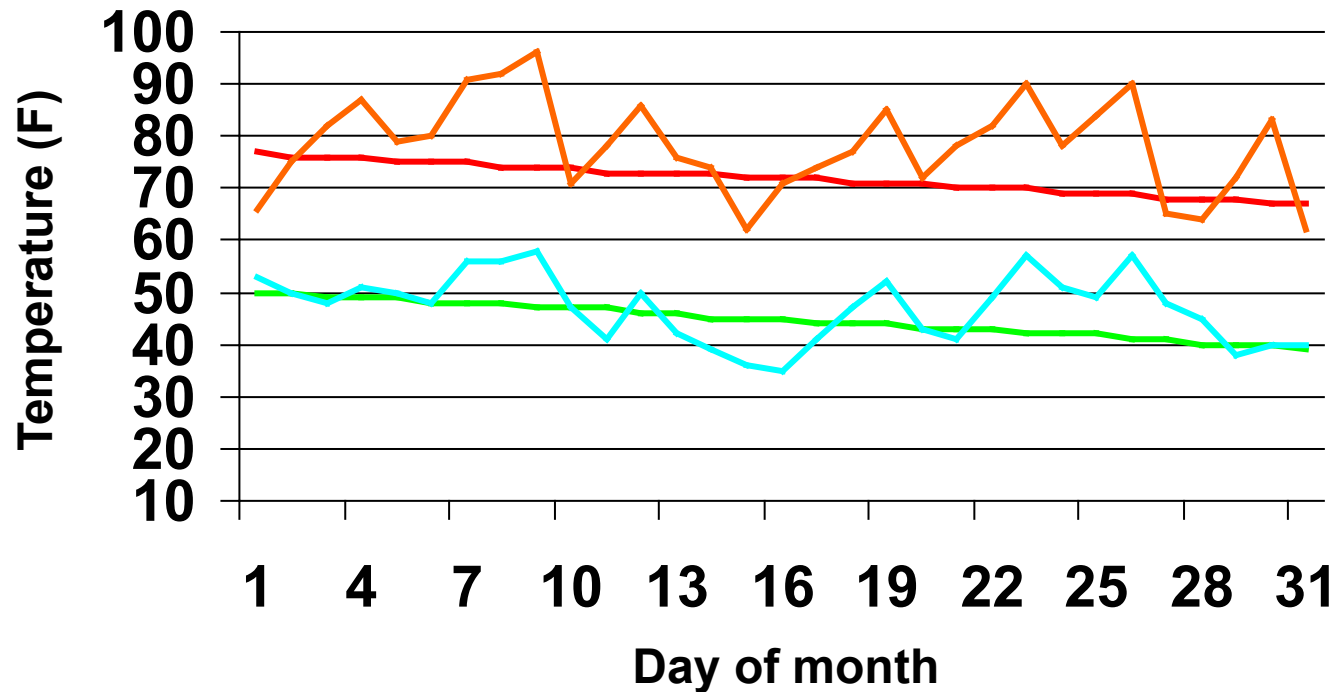
30-Yr Normal (1981-2010) and September 2021 Air Temperatures



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)