



2024 Dicamba Tolerant Cotton Variety Trial – Adobe Walls Gin

**Jason Duvall Farm
Waka, 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 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 2024, six entries with dicamba herbicide tolerance technology were planted in a center pivot irrigated field in a scientifically valid trial with three replicates. One entry had ThryvOn technology, a new Bt transgenic trait (DP 2414 B3TXF) stacked with XtendFlex; one entry had Axant Flex technology (FM 765 AX); and the remainder had XtendFlex technology (DP 1822 XF, DP 2123 B3XF, NG 3434 B3XF, and NG 3457 B3XF).

Relatively good moisture conditions prevailed at the site during the early spring, then lower than normal rainfall began in May. The trial was planted May 7 and escaped hail events. Good early-season growing conditions and moderate vigor resulted in an average emergence of about 68% of the seed planted (65,000 seed/acre) when stand count observations were performed on June 17. A total of 65 days from planting to first bloom (July 11) was noted in this trial. This indicates a fairly rapid rate of development based on calendar days. This is attributed to good root health, and warm May and June growing conditions. Once the crop reached the bloom stage, its progression was excellent through the end of August and into the crop maturity phase

in September. Due to the long growing season and adequate irrigation, the trial's yield and quality were excellent. Yields were high (over 3 bales/acre) in the test and fiber maturity as measured by micronaire was excellent for the area and averaged 4.6 across all entries.

Harvest results indicated that statistically significant differences were observed. Lint yields ranged from a high of 1757 lb/acre (DP 2414 B3TXF) to a low of 1550 lb/acre (DP 2123 B3XF), and averaged 1689 lb/acre (Table 1). Average Loan value for varieties from commercially ginned and classed bales varied from a high of \$0.5674/lb (NG 3434 B3XF) to a low of \$0.5578/lb (NG 3457 B3XF). Overall Loan value for the trial across all entries was \$0.5626/lb. When including lint Loan value on a per acre basis and net gin credit (defined as seed credit minus ginning expense), statistically significant differences were found among varieties for net value/acre. Five entries were in the top tier (the "a" group) of statistical significance, and DP 2123 B3XF was in the "b" group. Net value/acre ranged from a high of \$1017/acre to a low of \$933/acre. This results in a statistically significant difference of \$84/acre.

Table 2 presents in-season data including stand establishment percentage, vigor, nodes above white flower (NAWF) on two observation dates, plant height on three observation dates, nodes above cracked boll (NACB) on October 2, and a visual estimate of storm resistance at harvest. Final plant heights ranged from a high of 24.2 inches for DP 2414 B3TXF to a low of 19.0 inches for FM 765 AX.

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 good and typically ranged from 11 to 21 across all entries. Leaf grades ranged from about 1 to 2. Staple ranged from about 35.5 (NG 3467 B3XF) to 36.5 32nds inch (NG 3434 B3XF). Micronaire averages were excellent for all entries and averaged about 4.6 across all entries. No bark contamination was noted in commercial bales. Fiber strength ranged from 29.7 to 32.4 g/tex, and uniformity ranged from 80.4 to 81.1%.

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: 3035 ft

Previous crop: Corn

Tillage system: Conventional, disk

Planted: May 7

Replicates: 3 replicates in a randomized complete block design

Plot width: 8-row plots

Plot length: Trial was planted in ~1,300 ft long rows

Seeding rate: 65,000 seed/acre

Days from planting to first bloom: 65 (July 11)

Row spacing: 30-inch rows

Total rainfall March through July: ~7.0 inches

March: 4.2, June 1.2, July 1.6

Total irrigation: ~4.2 inches

August: 4.2

Herbicide management – products, rates, and dates of application:

5/2 behind planter 1 qt/ac direx+1 qt/ac Caparol

5/29 17#/100 AMS+12 oz/ac volunteer+1 gallon/100 Crop Oil Concentrate

6/26 17#/100 ams+32 oz/ac Interline+12.8 oz/ac Engenia+16 oz/ac Outlook

6/27 17#/100 ams+32 oz/ac Powermax+14 oz/ac Volunteer+1 gal/100 Crop Oil Concentrate

7/17 17#/100 AMS+32 oz/ac Powermax+56 oz/ac Tavium

Nitrogen fertility rates, dates, and application methods: no fertility added just carryover of 42 units on a 10" sample, and 10.56 units out of MAP application on 4/23.

Other fertility (phosphate, potash, micronutrients) application rates, dates, and application methods: Spread 96#/ac 11-52-0 equivalent to 50 units P 4/23

Insecticide products, application rates and dates:

5/14 6 oz/ac acephate

5/21 6 oz/ac acephate

6/26 1.1 oz/ac Assail

Plant growth regulator products, application rates and dates:

6/15 8 oz/ac Generic Pix

6/30 16 oz/ac Generic Pix

7/17 32 oz/ac Generic Pix

Harvest aid products, application rates and dates:

10/14 32 oz/ac Ethephon + 32 oz/ac Folex

10/28 1 oz/ac Generic Aim

Harvesting: October 25 using a John Deere CS690, full length of each plot was harvested for each 8-row plot. Round modules were weighed using the integral CS690 handler scale, and all round modules were weighed at the Adobe Walls Gin.

Commercial ginning: Round modules for all 3 reps of each variety were staged together (1 per plot, with 3 reps = 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 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.

List of Tables

Table 1. Harvest results for the center pivot irrigated dicamba tolerant cotton variety trial, Duvall Farm, Waka, TX, 2024.

Table 2. Plant observation results from the center pivot irrigated dicamba tolerant cotton variety trial, Duvall Farm, Waka, TX, 2024.

Table 3. Commercial classing data for the center pivot irrigated dicamba tolerant cotton variety trial, Duvall Farm, Waka, TX, 2024.

Table 4. Mean commercial classing data across all bales by variety for the center pivot irrigated dicamba tolerant cotton variety trial, Duvall Farm, Waka, TX, 2024.

Appendix – Amarillo 2024 cotton heat units and weather data.

Acknowledgements

Adobe Walls Gin would like to thank Jason Duvall for committing equipment, land, and time to conduct and manage the trial. The Ag Ingenuity crew (Dylan Hatley, Branton Hatley, and Kramer King) planted and assisted with harvest of the trial and we thank them for their great support. Peter Martens and Peter Peters harvested the trial and we are very appreciative of their excellent skills and cooperation. Gratitude is expressed to Deltapine, FiberMax, and NexGen for providing cotton seed, and to Windstar Inc. Detailed ginning was performed by Aaron Moore, and the Adobe Walls Gin crew and a big thank you is extended to this hard-working group.



Table 1. Harvest results for the center pivot irrigated dicamba tolerant cotton variety trial, Duvall Farm, Waka, TX, 2024.

Entry	Lint turnout	Seed turnout	Bur cotton yield	Lint yield	Seed yield	Lint loan value	Lint value	Net gin credit	Net value
	----- % -----		----- lb/acre -----			\$/lb		----- \$/acre -----	
DP 2414 B3TXF	35.0	37.1	5021	1757	1864	0.5587	982	36	1017 a
DP 1822 XF	32.2	40.2	5262	1693	2116	0.5659	958	56	1015 a
NG 3434 B3XF	35.6	36.8	4862	1728	1790	0.5674	980	33	1014 a
FM 765 AX	34.1	36.5	5035	1719	1837	0.5638	969	32	1001 a
NG 3457 B3XF	34.3	39.0	4921	1688	1918	0.5578	942	46	988 a
DP 2123 B3XF	29.8	41.1	5203	1550	2140	0.5620	871	61	933 b
Test average	33.5	38.5	5051	1689	1944	0.5626	950	44	995
CV, %	--	--	2.4	2.4	2.4	--	2.4	2.3	2.4
OSL	--	--	0.0140	0.0013	0.0001	--	0.0012	0.0001	0.0111
LSD	--	--	177	60	68	--	34	2	35

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:

\$3.65/cwt commercial ginning cost.

\$235/ton for seed.

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

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

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 irrigated dicamba tolerant cotton variety trial, Duvall Farm, Waka, TX, 2024.

Entry	Final population	Stand establishment	Vigor	Nodes above white flower		Plant height			Nodes above cracked boll	Storm resistance
				Mid bloom	Late bloom	Prebloom	Mid bloom	Final		
	plants/acre 17-Jun	% 17-Jun	1-5 visual scale, 5 best 17-Jun	count			inches		count 2-Oct	1-9 visual scale, 9 tight 25-Oct
				31-Jul	13-Aug	10-Jul	31-Jul	13-Aug		
DP 1822 XF	47,626	73.3	3.9	3.1	1.5	20.1	21.5	23.1	0.3	5.7
DP 2123 B3XF	46,464	71.5	3.6	3.3	1.5	17.5	20.5	21.6	0.7	6.2
DP 2414 B3TXF	39,785	61.2	3.5	3.1	1.6	20.5	23.3	24.2	0.8	5.0
NG 3434 B3XF	47,045	72.4	3.4	3.1	0.6	17.9	20.7	21.1	1.3	6.8
NG 3457 B3XF	38,042	58.5	3.3	3.3	1.5	16.7	19.4	20.5	1.0	6.0
FM 765 AX	45,012	69.3	3.7	2.6	0.5	16.4	18.6	19.0	0.7	7.0
Test average	43,996	67.7	3.6	3.1	1.2	18.2	20.7	21.6	0.8	6.1
CV, %	5.8	5.8	3.0	14.1	47.4	5.4	3.5	2.6	52.9	4.1
OSL	0.0034	0.0035	0.0009	0.4830	0.1315	0.0017	0.0002	0.0001	0.2094	0.0001
LSD	3,781	5.8	0.2	NS	NS	1.5	1.1	0.8	NS	0.4

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.



Table 3. Commercial classing data for the center pivot irrigated dicamba tolerant cotton variety trial, Duvall Farm, Waka, TX, 2024.

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
DP 1822 XF															
9173367	21-1	2	1	2	35	4.3	.	.	31.2	81.4	8.4	1	79.8	110	54.85
9173368	21-1	2	1	1	36	4.6	.	.	34.0	80.9	8.7	1	80.4	113	56.90
9173369	21-1	2	1	2	36	4.9	.	.	32.1	80.7	8.5	1	80.2	111	56.80
9173370	21-1	2	1	1	37	4.6	.	.	33.0	81.0	8.6	1	81.7	116	57.60
9173371	11-1	1	1	1	36	4.6	.	.	31.7	81.9	8.7	1	80.8	113	56.80
Average	--	1.8	1.0	1.4	36.0	4.60	none	none	32.4	81.2	8.6	1.0	80.6	112.6	56.59
DP 2123 B3XF															
9173372	21-1	2	1	2	36	4.8	.	.	32.6	80.5	8.5	2	78.9	112	56.25
9173373	11-2	1	1	2	35	4.6	.	.	31.6	81.1	8.8	1	79.6	109	54.85
9173374	11-2	1	1	2	36	4.6	.	.	28.7	80.8	8.9	1	80.8	112	56.45
9173375	11-2	1	1	2	36	4.6	.	.	31.7	80.6	9.0	2	81.1	111	56.80
9173376	11-2	1	1	2	36	4.5	.	.	30.5	81.4	9.0	2	81.6	113	56.65
Average	--	1.2	1.0	2.0	35.8	4.62	none	none	31.0	80.9	8.8	1.6	80.4	111.4	56.20
DP 2414 B3TXF															
9173377	11-2	1	1	2	36	4.3	.	.	30.2	81.8	8.6	1	81.6	113	56.65
9173378	11-1	1	1	2	35	4.5	.	.	30.1	81.8	8.7	1	81.1	110	55.15
9173379	11-2	1	1	2	35	4.6	.	.	30.1	81.3	8.9	2	81.4	110	55.15
9173380	11-1	1	1	1	36	4.6	.	.	30.0	82.0	9.0	1	80.5	111	56.65
9173381	11-1	1	1	1	36	4.7	.	.	30.2	81.6	8.8	1	80.3	112	56.65
9173382	11-2	1	1	1	35	4.9	.	.	27.7	80.7	8.8	1	80.7	110	54.95
Average	--	1.0	1.0	1.5	35.5	4.60	none	none	29.7	81.5	8.8	1.2	80.9	111.0	55.87



Table 3 (continued). Commercial classing data for the center pivot irrigated dicamba tolerant cotton variety trial, Duvall Farm, Waka, TX, 2024.

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
NG 3434 B3XF															
9173383	21-1	2	1	2	36	4.5	.	.	29.0	81.0	8.5	1	80.8	112	56.50
9173384	21-1	2	1	1	37	4.6	.	.	31.0	80.9	8.6	1	81.1	114	57.50
9173385	21-1	2	1	2	37	4.7	.	.	31.7	80.2	9.2	2	80.7	115	57.50
9173386	21-1	2	1	2	35	4.6	.	.	30.8	80.1	9.1	1	78.7	110	54.60
9173387	11-2	1	1	2	37	4.6	.	.	28.6	80.6	9.1	1	80.6	114	57.15
9173388	11-2	1	1	2	37	4.7	.	.	27.8	80.6	9.1	2	82.1	114	57.20
Average	--	1.7	1.0	1.8	36.5	4.62	none	none	29.8	80.6	8.9	1.3	80.7	113.2	56.74
NG 3457 B3XF															
9173389	21-1	2	1	1	35	4.4	.	.	30.3	81.1	8.7	1	80.2	109	55.15
9173390	11-2	1	1	2	36	4.7	.	.	30.6	81.4	9.0	2	81.4	113	56.65
9173391	11-2	1	1	2	35	4.6	.	.	30.3	80.9	8.9	1	79.6	109	54.70
9173392	11-2	1	1	1	36	4.5	.	.	30.2	81.3	8.9	1	80.5	111	56.65
9173393	11-2	1	1	1	36	4.8	.	.	29.3	81.2	9.1	1	81.4	112	56.50
9173394	11-2	1	1	1	35	4.6	.	.	29.7	80.6	9.0	1	80.9	110	55.00
Average	--	1.2	1.0	1.3	35.5	4.60	none	none	30.1	81.1	8.9	1.2	80.7	110.7	55.78
FM 765 AX															
9173395	21-1	2	1	1	36	4.5	.	.	32.1	81.2	8.5	1	80.2	113	56.80
9173396	21-1	2	1	1	36	4.7	.	.	32.0	82.0	8.2	1	82.0	113	56.85
9173397	21-1	2	1	2	36	4.8	.	.	30.2	81.1	8.2	2	81.1	111	56.65
9173398	21-1	2	1	2	35	4.5	.	.	31.6	81.1	8.2	2	80.4	109	55.30
9173399	21-1	2	1	2	37	4.6	.	.	31.1	81.3	8.3	1	82.3	114	57.55
9173400	11-2	1	1	1	35	4.7	.	.	30.4	81.7	8.5	1	80.5	109	55.15
Average	--	1.8	1.0	1.5	35.8	4.63	none	none	31.2	81.4	8.3	1.3	81.1	111.5	56.38



Table 4. Mean commercial classing data across all bales by variety for the center pivot irrigated dicamba tolerant cotton variety trial, Duvall Farm, Waka, TX, 2024.

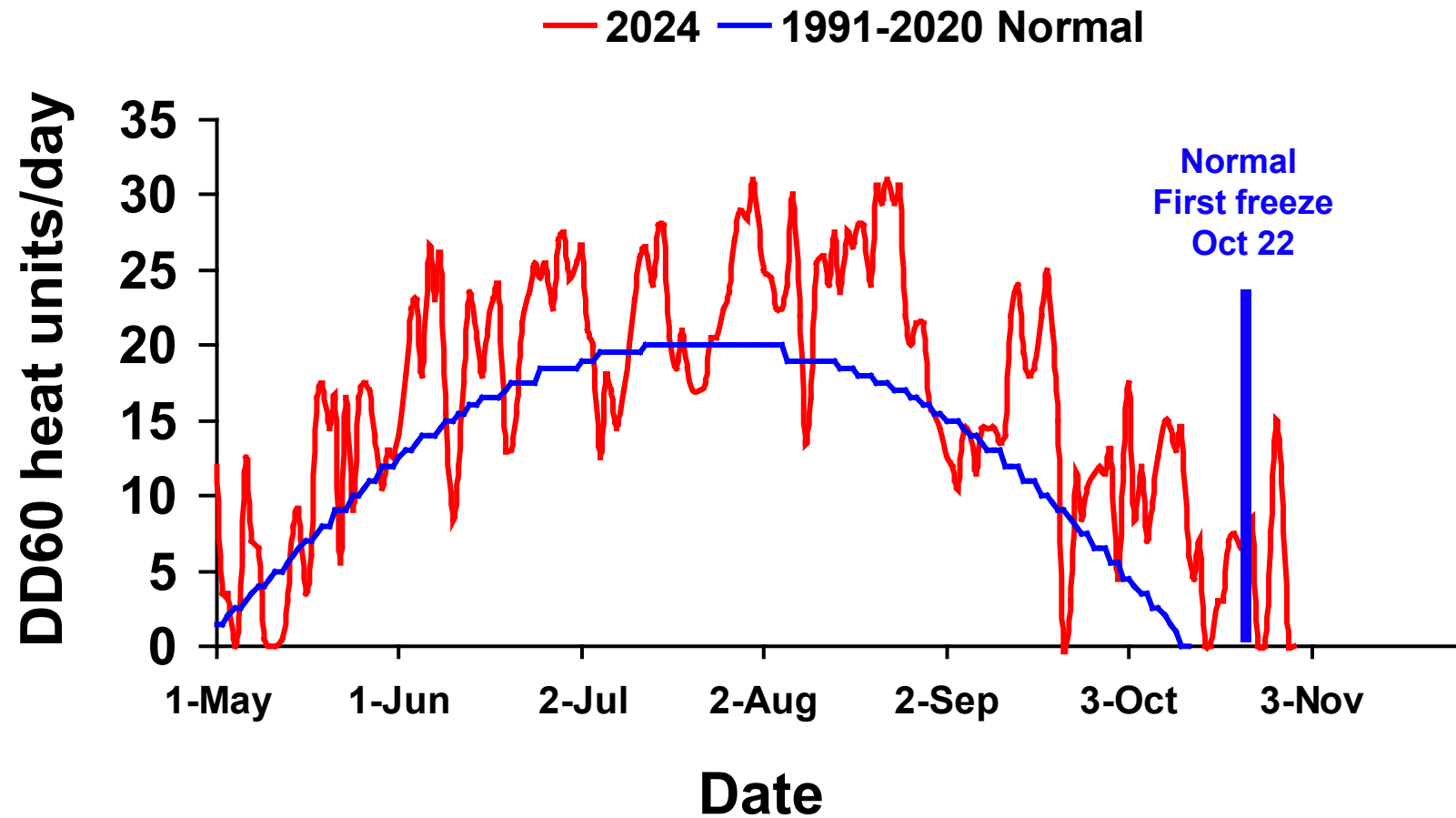
Entry	Color	Color	Leaf	Staple	Micronaire	Extraneous	Remarks	Strength	Rd	+b	Trash	Uniformity	Length	Loan rate
	digit 1	digit 2	grade	32nds inch	units	matter	--	g/tex	%	%	% area	%	100ths inch	cents/lb
DP 1822 XF	1.8	1.0	1.4	36.0	4.60	none	none	32.4	81.2	8.6	1.0	80.6	112.6	56.59
DP 2123 B3XF	1.2	1.0	2.0	35.8	4.62	none	none	31.0	80.9	8.8	1.6	80.4	111.4	56.20
DP 2414 B3TXF	1.0	1.0	1.5	35.5	4.60	none	none	29.7	81.5	8.8	1.2	80.9	111.0	55.87
NG 3434 B3XF	1.7	1.0	1.8	36.5	4.62	none	none	29.8	80.6	8.9	1.3	80.7	113.2	56.74
NG 3457 B3XF	1.2	1.0	1.3	35.5	4.60	none	none	30.1	81.1	8.9	1.2	80.7	110.7	55.78
FM 765 AX	1.8	1.0	1.5	35.8	4.63	none	none	31.2	81.4	8.3	1.3	81.1	111.5	56.38
Mean	1.4	1.0	1.6	35.9	4.61	.	.	30.7	81.1	8.7	1.3	80.7	111.7	56.26

Appendix

Amarillo 2024 cotton heat units and weather data.

Amarillo

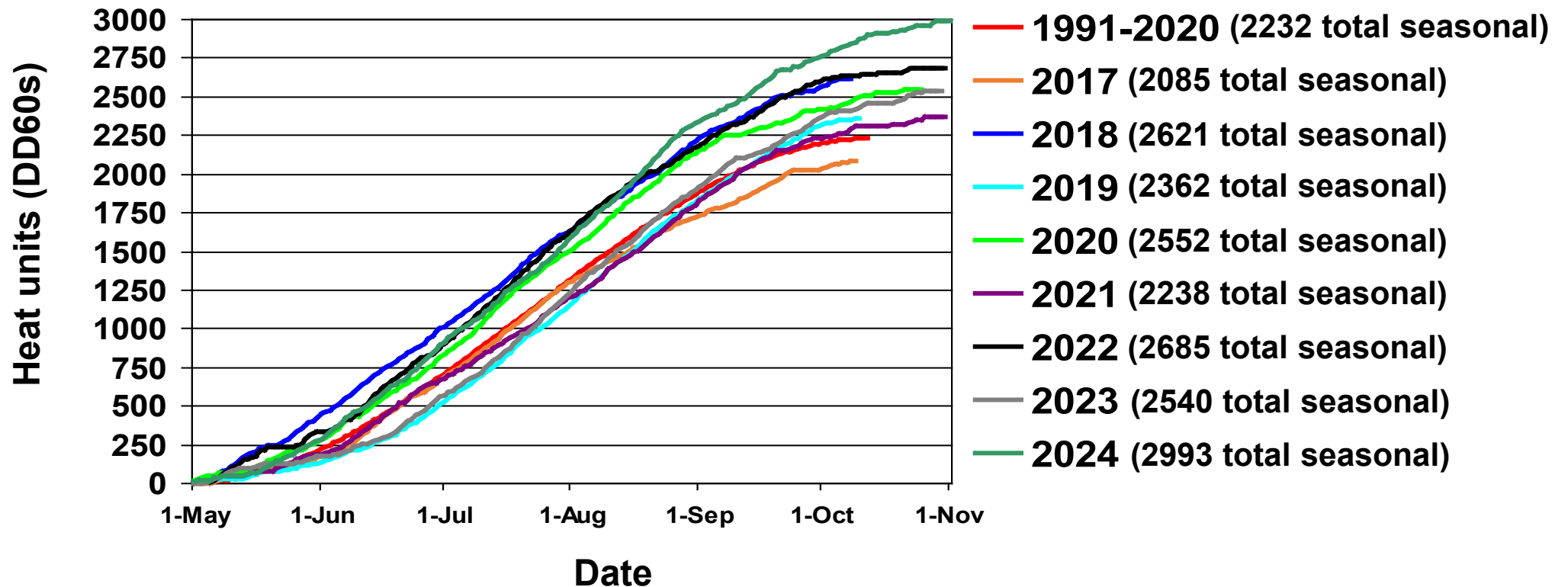
30-Year Normal (1991-2020) and 2024 Daily Heat Units



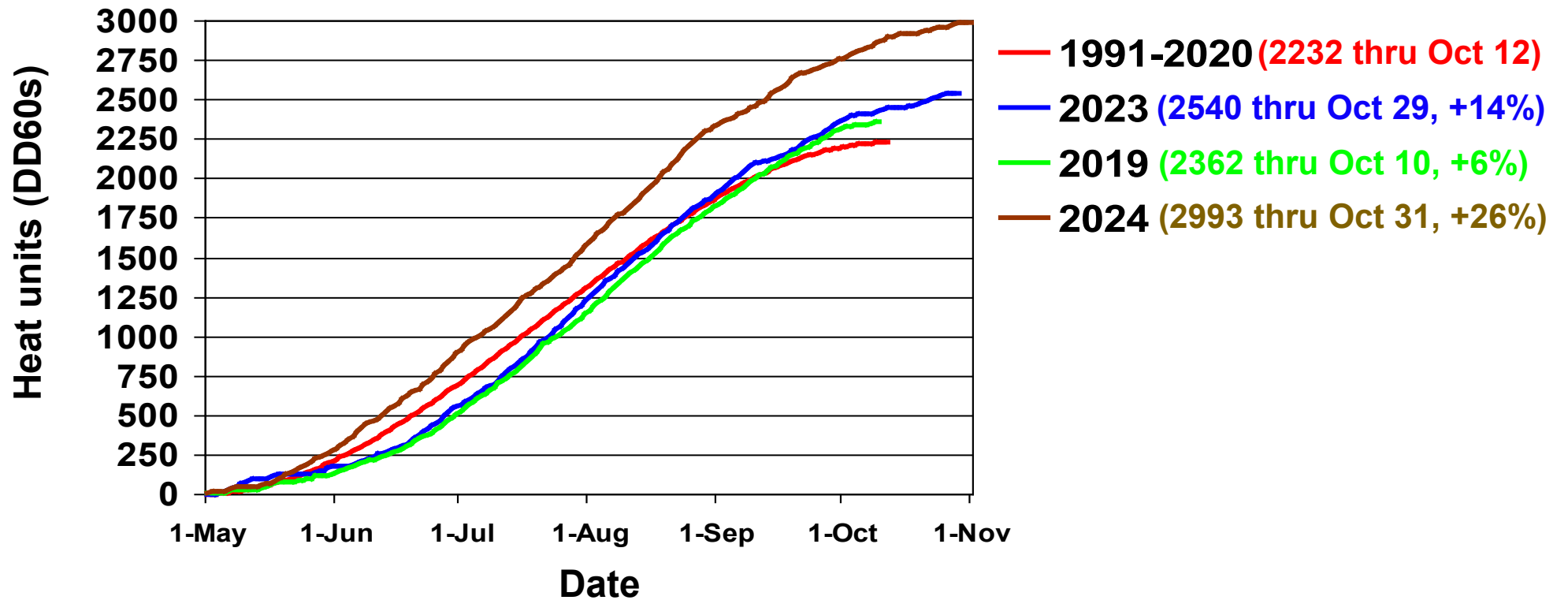
Amarillo 30-Yr Normal (1991-2020) vs. 2017 through 2024

Cotton Heat Unit Accumulation

From May 1 Through First Hard Freeze



Amarillo 30-Yr Normal (1991-2020) vs. 2019, 2023 and 2024 Cotton Heat Unit Accumulation From May 1

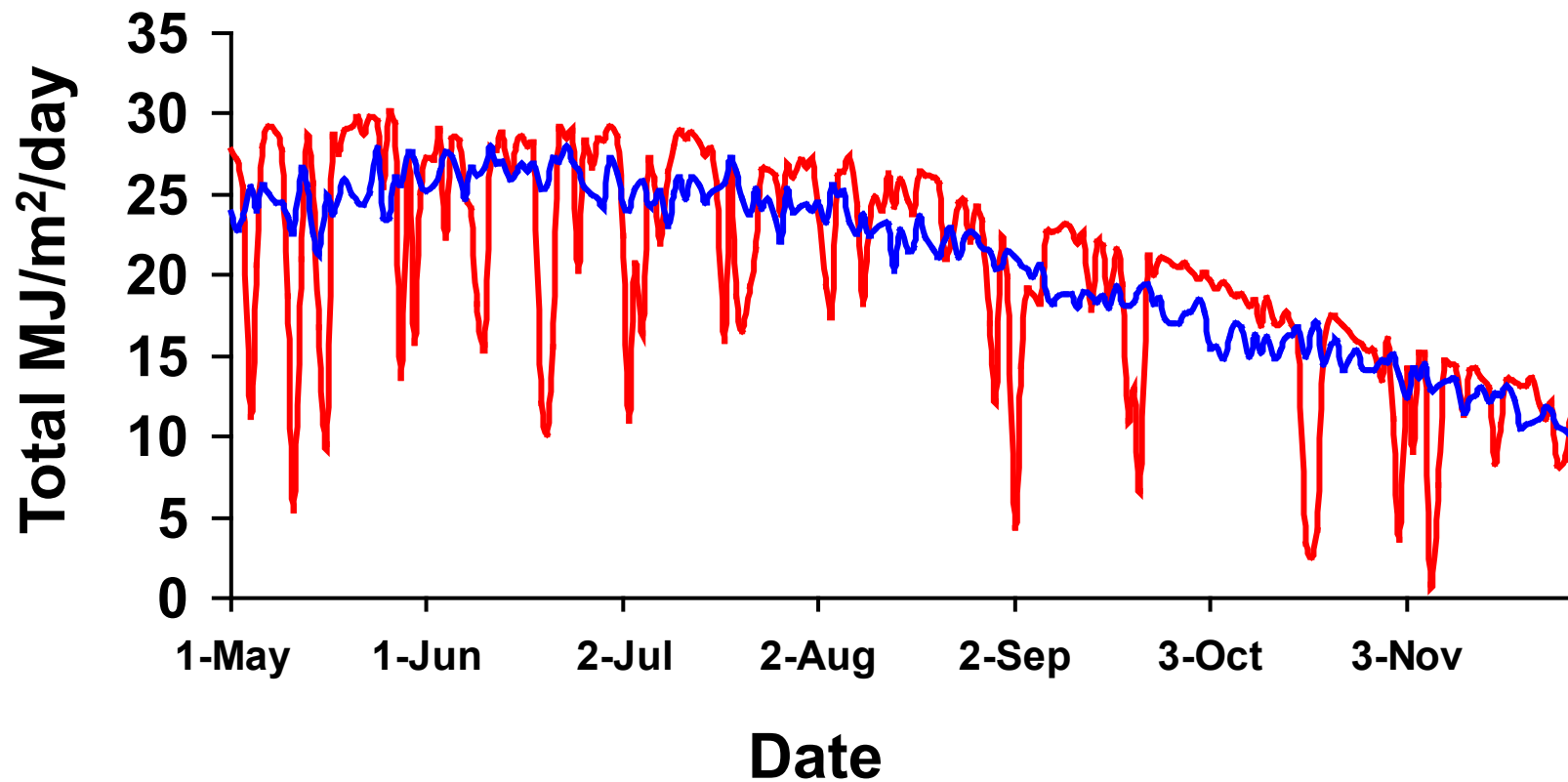


Muleshoe

18-Year Mean (2004-2021) and **2024**

Daily Total Solar Radiation (MJ/meter²)

— 2024 — Muleshoe 18-Yr Mean

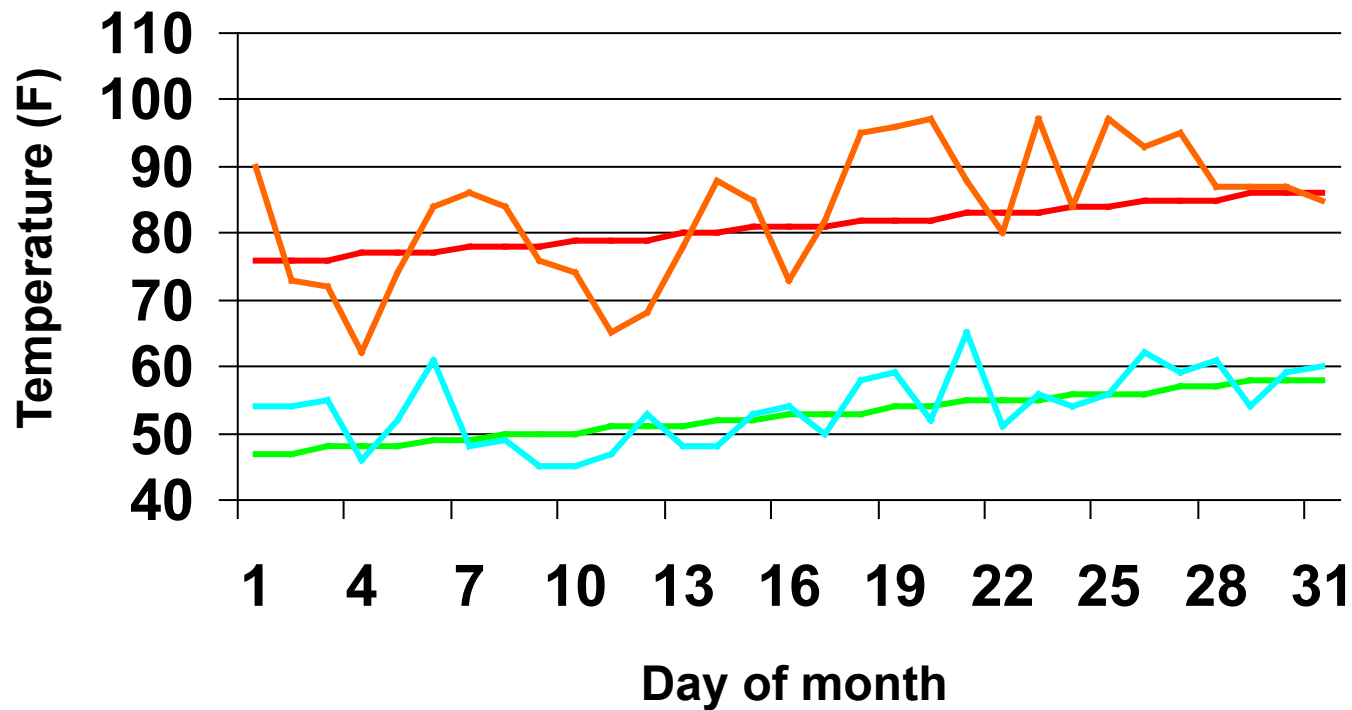


Total solar energy, in MJ/meter², calculated from the hourly average global solar radiation rates and converted to energy by integrating over time.

Amarillo

30-Yr Normal (1991-2020) and May 2024 Air Temperatures

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



Heat Units

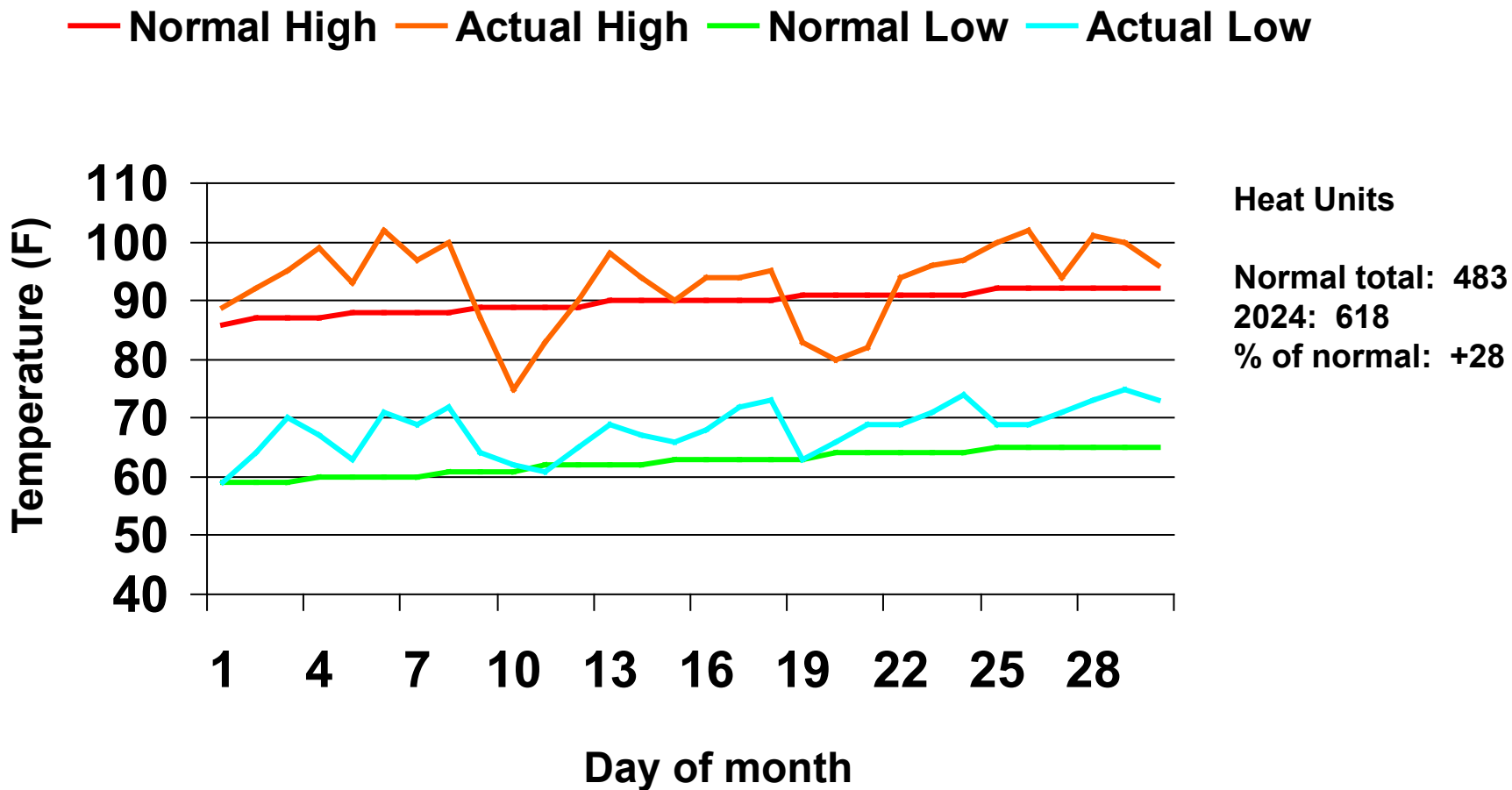
Normal total: 210

2024: 276

% of normal: +32

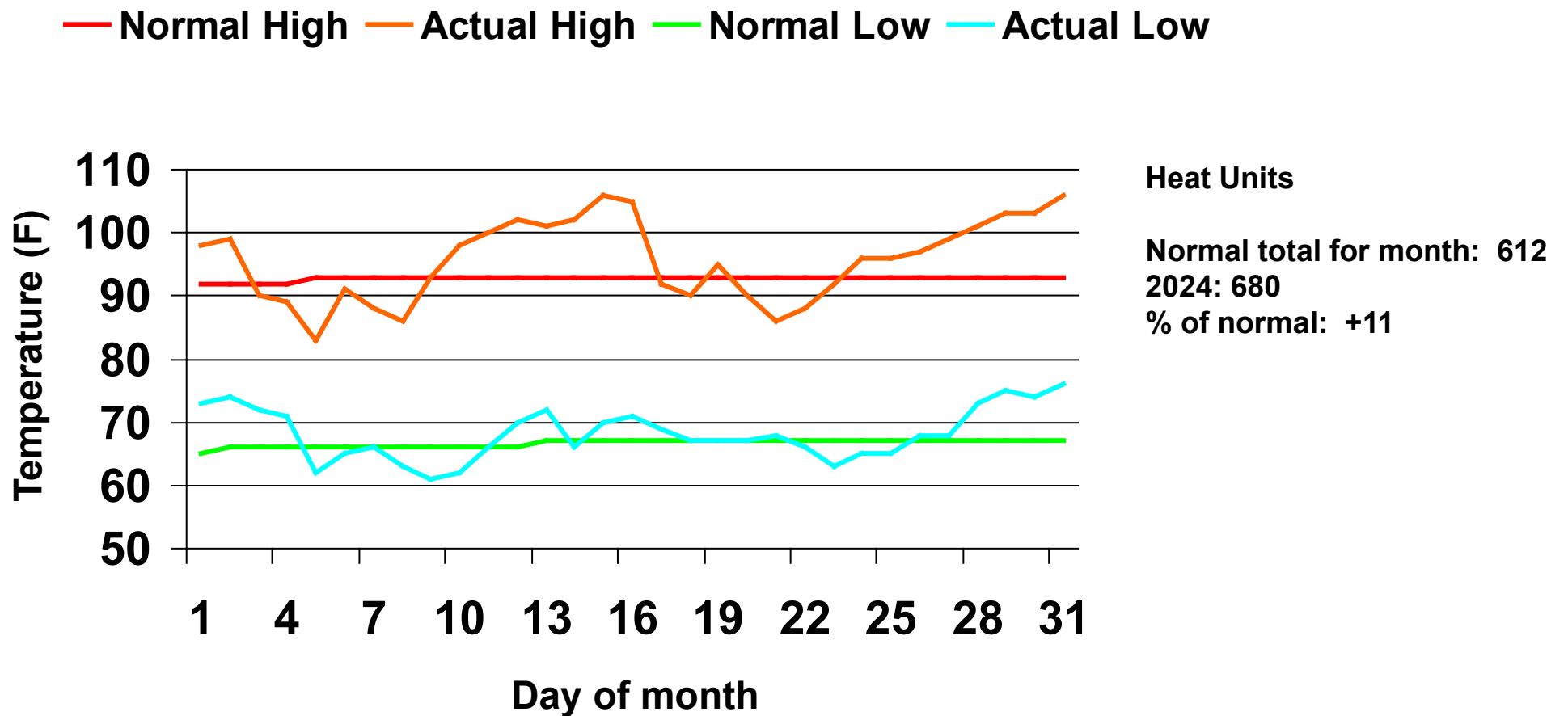
Amarillo

30-Yr Normal (1991-2020) and June 2024 Air Temperatures



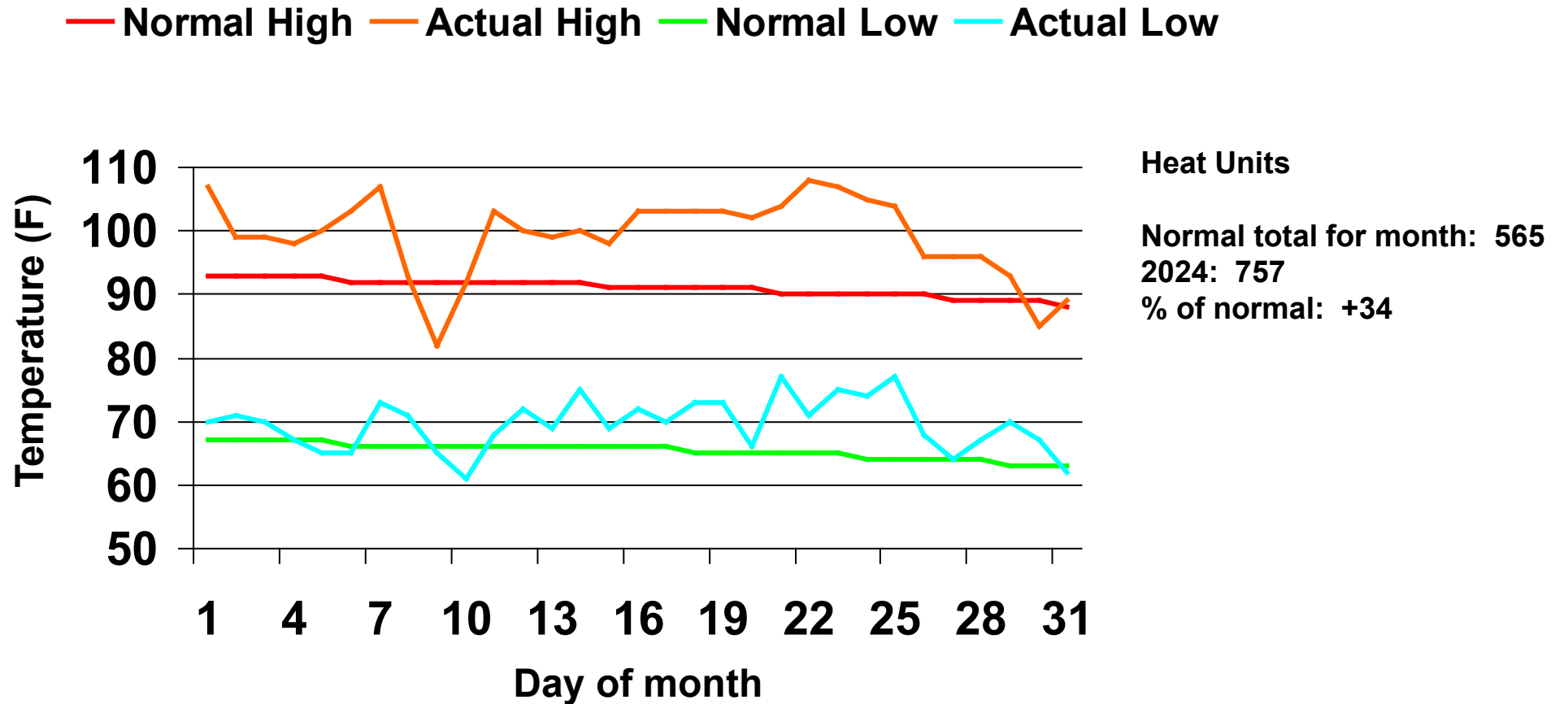
Amarillo

30-Yr Normal (1991-2020) and July 2024 Air Temperatures



Amarillo

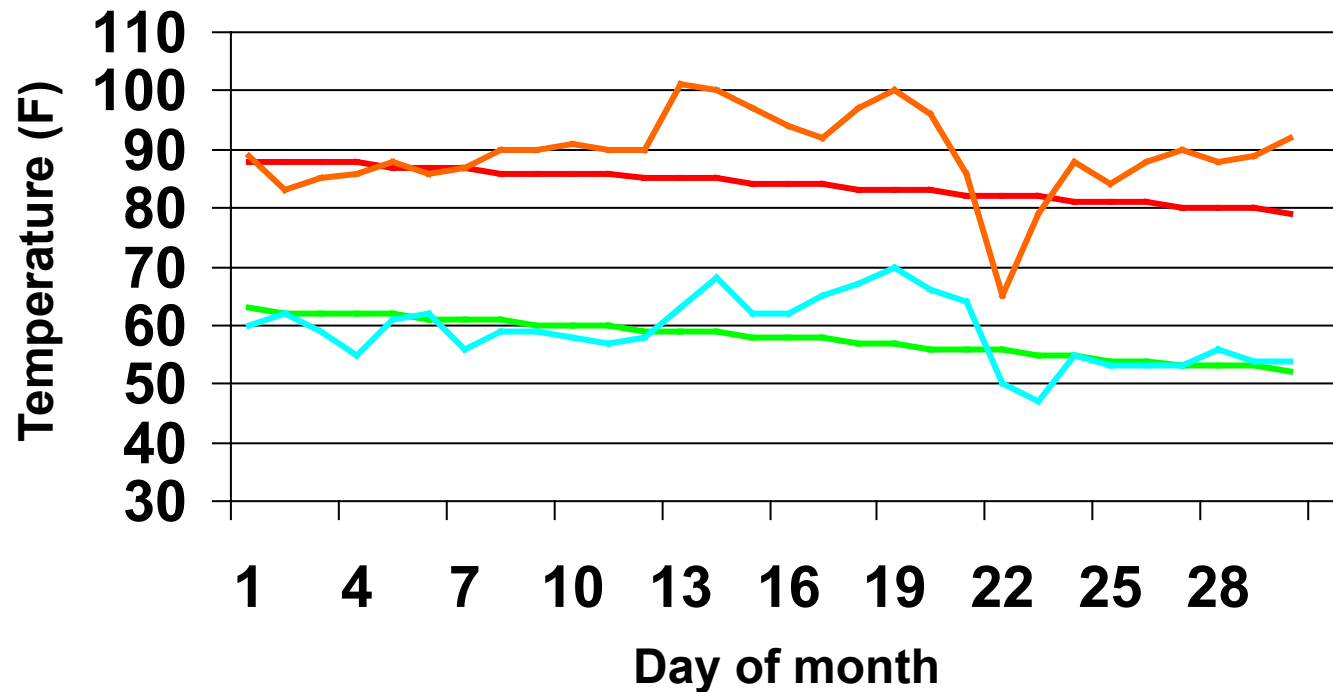
30-Yr Normal (1991-2020) and August 2024 Air Temperatures



Amarillo

30-Yr Normal (1991-2020) and September 2024 Air Temperatures

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



Heat Units

Normal total for month: 329

2024: 427

% of normal: +30

Normal Heat Units/Day

Sep 1: 16

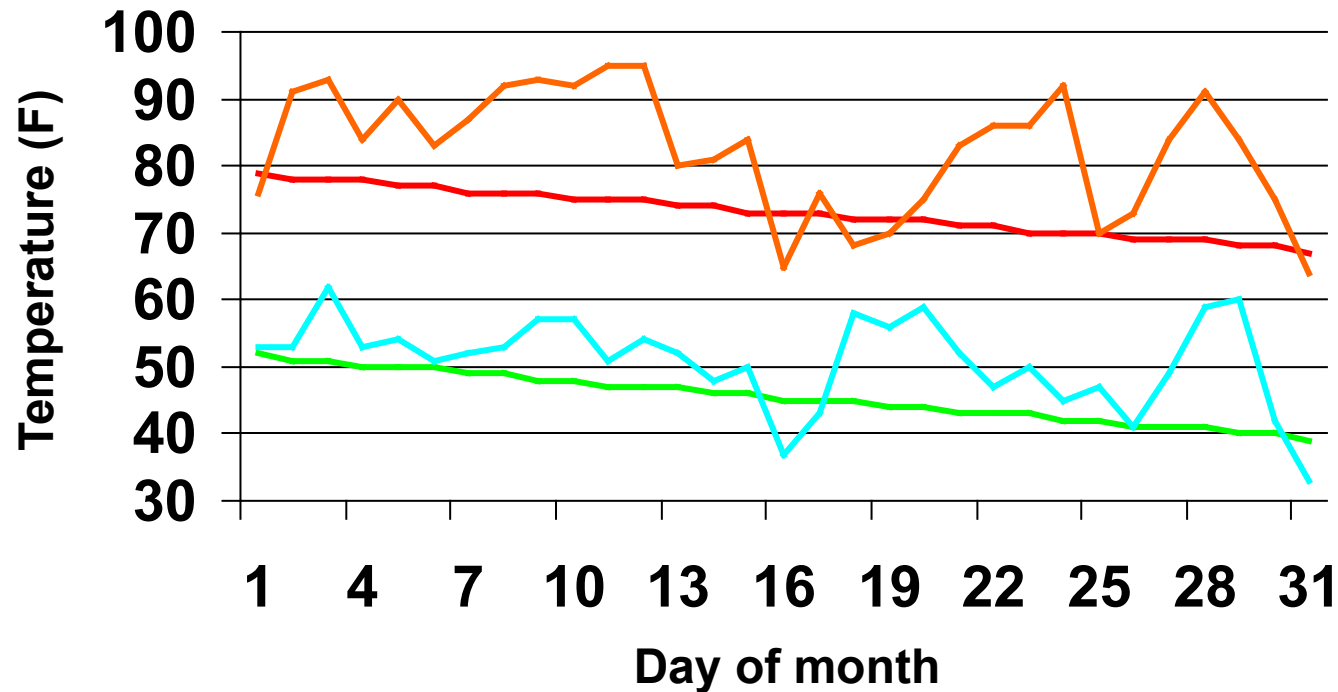
Sep 30: 6

Goes to zero on Oct 12

Amarillo

30-Yr Normal (1991-2020) and October 2024 Air Temperatures

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



Heat Units

Normal total for month: 35

2024: 235

% of normal: +571

Normal Heat Units/Day

Oct 1: 6

Oct 12: 0

Goes to zero on Oct 12

No first freeze in Oct;
first freeze on Nov 9 (32 degrees).
No hard freeze in Oct;
hard freeze on Nov 29 (25 degrees).

Amarillo 2024 DD60s vs Normal (1991-2020)

Month	May	June	July	August	September
Normal	210	483	612	565	329
Actual	276	618	680	757	427
% of Normal	+32	+28	+11	+34	+30
Number of days ≥ 100 degrees	0	6	10	17	3