2024 Enlist Cotton Variety Trial – Edcot Gin

Michael Goss Farm
Tulia, TX

Blayne Reed, Extension Agent-IPM for Hale/Swisher Counties
Texas A&M AgriLife Extension Service

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

Landon Kidd, Edcot Gin Manager

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, working with Blayne Reed, Extension Agent-IPM, two entries with Widestrike 3/Enlist 1 technology (note no glyphosate tolerance), and six entries with current Widestrike 3/Flex Enlist technology were planted in a subsurface drip irrigated field in a scientifically valid trial with three replicates. These entries included PHY 136 W3E1, PHY 137 W3E1, PHY 205 W3FE, PHY 210 W3FE, PHY 250 W3FE, PHY 332 W3FE, PHY 400 W3FE, and PHY 415 W3FE.

Relatively fair moisture conditions prevailed at the site during the early spring, then low rainfall was encountered in July and August. The trial was planted May 20 and escaped hail and wind events typically associated with spring thunderstorms. Good early-season growing conditions and outstanding vigor resulted in an average emergence of about 83% of the seed planted (45,000 seed/acre) when stand count observations were performed on July 30. Minimal seedling disease was noted. A total of 60 days from planting to first bloom (July 19) 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 early August when excessively high temperatures occurred and rainfall became sparse. Due to the long growing season and limited irrigation, the trial's yield was low (less than 2 bales/acre). Fiber quality issues were noted fiber maturity as measured by micronaire was excessively high in some entries. Micronaire averaged 4.9 across all entries, and staple was short due to high moisture stress in August and September. Substantial late season pre-harvest rainfall likely impacted the color and leaf grades in the trial.

Harvest results indicated that statistically significant differences were observed. Lint yields ranged from a high of 869 lb/acre (PHY 400 W3FE) to a low of 744 lb/acre (PHY 210 W3FE), and averaged 810 lb/acre (Table 1). Average Loan value for varieties from commercially ginned and classed bales varied from a high of $0.5198/lb (PHY 332 W3FE) to a low of $0.4880/lb (PHY 415 W3FE). Overall Loan value for the trial across all entries was 0.5062/lb. Net gin credit is defined as seed credit minus ginning expense. Net value/acre (defined as gross Loan value plus net gin credit) ranged from a high of $465/acre (PHY 400 W3FE) to a low of $397/acre (PHY 205 W3FE), a difference of $68/acre. These differences were statistically significant, and had a low coefficient of variation of under 3%, indicating low variability among entries across replicates. Three of the eight entries were in the top "t-group" indicating there were no significant differences among those three entries. These entries included PHY 400 W3FE, PHY 136 W3E1, and PHY 332 W3FE.

Table 2 provides similar information for the trial, but net value/acre is based on cash bid value. Cash bids were obtained for commercially ginned and classed bale quality for each variety. This was performed on December 13th at 69.40 cent March 2025 futures using the USDA-AMS classing results. These cash bid values ranged from a high of $0.6296/lb (PHY 332 W3FE) to a low of $0.5694/lb (PHY 415 W3FE) and averaged about $0.60/lb. Net value/acre (defined as gross lint cash value plus net gin credit) ranged from a high of $557/acre (PHY 400 W3FE) to a low of $460/acre (PHY 205 W3FE), a difference of $97/acre. These differences were statistically significant, and had a low coefficient of variation at just over 2%. Based on cash bid value, three of the entries were in the top "t-group" (denoted by the letter "a") indicating there were no significant differences among those three entries. These entries included PHY 400 W3FE, PHY 332 W3FE, and PHY 136 W3E1.

Table 3 presents in-season data including final population, stand establishment percentage, vigor, nodes above white flower (NAWF) on two observation dates, plant height on two observation dates, and nodes above cracked boll (NACB) on October 3. Final plant heights ranged from a high of 30.1 inches for PHY 415 W3FE to a low of 23.7 inches for PHY 210 W3FE.

Table 4 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 were predominantly 31 and 41 across all entries. Leaf grades ranged from about 2 to 4. Staple ranged from a low of 33.0 (PHY 205 W3FE) to a high of 34.5 32nds inch (PHY 137 W3E1). Micronaire averages were excellent for most entries and ranged from a low of 4.80 (PHY 136 W3E1) to a high of over 5 (PHY 415 W3FE). No bark contamination was noted in commercial bales. Fiber strength ranged from 29.1 to 33.0 g/tex, and uniformity ranged from 79.5 to 81.3%. Table 5 presents the mean values across all bales for each variety.

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: 3525 ft

Previous crop: Wheat cover

Tillage system: No-till

Planted: May 20

Replicates: 3 replicates in a randomized complete block design

Plot width: 8-row plots

Plot length: Trial was planted the full length of rows and were ~1,850 ft long

Seeding rate: 45,000 seed/acre

Days from planting to first bloom: 60 (July 19)

Row spacing: 30-inch rows

Harvesting: December 2 using a John Deere CS690, with entire plot length harvested into a single round module for each 8-row plot. Round modules were weighed using the integral CS690 handler scale, and round modules were weighed by variety at the Edcot 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 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 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

Acknowledgements

Edcot Gin would like to thank Michael Goss for committing equipment, land, and time to conduct and manage the trial. This trial was planted and harvested under supervision of Blayne Reed, and gratitude is expressed to him. A thank you is extended to PhytoGen Cotton Seed for providing trial seed, and to Windstar Inc. Detailed ginning was performed by “Ginner Ernie” and the crew and a big thank you is extended to this hard-working group. Landon Kidd provided capable assistance with in-season data collection and module supervision and detailed ginning procedures.

WINDSTAR GINS

Table 1. Harvest results for the subsurface drip irrigated Enlist technology cotton variety trial (Loan value), Goss Farm, Tulia, TX, 2024.

Entry	Lint turnout	Seed turnout	Bur cotton yield	Lint yield	Seed yield	Lint loan value	Lint loan value	Net gin credit	Net value	
	---------- % ----------		---------- lb/acre ----------			$/lb	---------- $/acre ----------			
PHY 400 W3FE	33.2	39.0	2683	869	1021	0.5073	441	24	465	a
PHY 136 W3E1	31.8	36.5	2780	864	991	0.5149	445	17	462	a
PHY 332 W3FE	30.4	36.9	2857	847	1027	0.5198	440	19	459	ab
PHY 137 W3E1	30.4	36.1	2832	839	997	0.5130	431	16	447	b
PHY 415 W3FE	31.9	36.9	2578	801	929	0.4880	391	17	408	c
PHY 250 W3FE	29.4	38.6	2620	750	988	0.5026	377	23	400	c
PHY 210 W3FE	29.4	36.6	2595	744	927	0.5119	381	16	398	c
PHY 205 W3FE	29.9	38.3	2610	762	976	0.4920	375	22	397	c
Test average	30.8	37.4	2694	810	982	0.5062	410	19	430	
CV, %	--	--	2.3	2.3	2.3	--	2.3	2.9	2.4	
OSL	--	--	0.0001	0.0001	0.0006	--	0.0001	0.0001	0.0001	
LSD	--	--	88	27	33	--	14	1	15	

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.

WINDSTAR GINS

Table 2. Harvest results for the subsurface drip irrigated Enlist technology cotton variety trial (cash bid value), Goss Farm, Tulia, TX, 2024.

Entry	Lint turnout	Seed turnout	Bur cotton yield	Lint yield	Seed yield	Lint cash value	Lint cash value	Net gin credit	Net value	
	---------- % ----------		---------- lb/acre ----------			$/lb	---------- $/acre ----------			
PHY 400 W3FE	33.2	39.0	2683	869	1021	0.6130	533	24	557	a
PHY 332 W3FE	30.4	36.9	2857	847	1027	0.6296	533	19	552	a
PHY 136 W3E1	31.8	36.5	2780	864	991	0.6124	529	17	546	ab
PHY 137 W3E1	30.4	36.1	2832	839	997	0.6160	517	16	534	b
PHY 415 W3FE	31.9	36.9	2578	801	929	0.5694	456	17	473	c
PHY 210 W3FE	29.4	36.6	2595	744	927	0.6014	448	16	464	c
PHY 250 W3FE	29.4	38.6	2620	750	988	0.5842	438	23	461	c
PHY 205 W3FE	29.9	38.3	2610	762	976	0.5749	438	22	460	c
Test average	30.8	37.4	2694	810	982	0.6001	487	19	506	
CV, %	--	--	2.3	2.3	2.3	--	2.3	2.9	2.3	
OSL	--	--	0.0001	0.0001	0.0006	--	0.0001	0.0001	0.0001	
LSD	--	--	88	27	33	--	16	1	17	

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 cash value/acre plus net gin credit.
Value based on cash bids for each variety on December 13 at 69.40 cent March 2025 futures using commercial ginning and USDA-AMS classing results.

Table 3. Plant observation results from the subsurface drip irrigated Enlist technology cotton variety trial, Goss Farm, Tulia, TX, 2024.

Entry	Final population	Stand establishment	Nodes above white flower		Plant height		Nodes above cracked boll
			Early bloom	Late bloom	Early bloom	Late bloom	
	plants/acre	%	count		inches		count
	30-Jul	30-Jul	30-Jul	14-Aug	30-Jul	14-Aug	3-Oct
PHY 136 W3E1	38,042	84.6	6.5	0.9	26.7	27.7	1.5
PHY 137 W3E1	38,042	84.5	5.7	1.1	25.7	27.1	1.5
PHY 205 W3FE	35,719	79.4	5.7	0.6	22.5	23.8	0.4
PHY 210 W3FE	36,590	81.3	5.7	0.8	21.5	23.7	0.6
PHY 250 W3FE	36,590	81.3	5.5	0.9	23.2	24.9	0.7
PHY 332 W3FE	40,656	90.3	5.7	1.3	26.1	26.6	1.9
PHY 400 W3FE	35,138	78.1	5.7	1.1	23.3	24.3	0.8
PHY 415 W3FE	37,171	82.6	6.3	1.3	28.8	30.1	1.3
Test average	37,244	82.8	5.9	1.0	24.7	26.0	1.1
CV, %	9.5	9.5	6.3	40.0	4.4	3.0	26.1
OSL	0.6716	0.6733	0.0689	0.4603	0.0001	0.0001	0.0001
LSD	NS	NS	0.5	NS	1.6	1.1	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.

WINDSTAR GINS

Table 4. Commercial classing data for the subsurface drip irrigated Enlist technology cotton variety trial, Goss Farm, Tulia, 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
PHY 136 W3E1															
4197043	41-3	4	1	4	33	4.6	.	.	28.9	73.9	8.4	5	79.8	103	48.40
4197044	31-1	3	1	3	33	4.9	.	.	27.8	76.7	8.4	3	79.3	102	50.10
4197045	31-2	3	1	3	35	4.9	.	.	31.2	76.1	8.5	3	80.7	108	54.60
4197046	31-2	3	1	3	35	4.6	.	.	30.6	76.1	8.3	3	79.5	109	54.00
4197047	31-1	3	1	3	34	5.0	.	.	29.6	76.5	8.5	2	80.4	107	50.35
Average	--	3.2	1.0	3.2	34.0	4.80	none	none	29.6	75.9	8.4	3.2	79.9	105.8	51.49
PHY 137 W3E1															
4197073	41-1	4	1	4	35	4.8	.	.	32.1	74.3	8.3	6	81.5	110	52.85
4197074	41-1	4	1	4	36	4.8	.	.	35.7	74.9	8.1	4	82.9	111	53.75
4197075	41-1	4	1	4	34	4.9	.	.	31.8	74.8	8.3	5	80.4	105	52.35
4197076	41-1	4	1	4	33	5.0	.	.	32.2	75.2	8.4	5	79.7	104	46.25
Average	--	4.0	1.0	4.0	34.5	4.88	none	none	33.0	74.8	8.3	5.0	81.1	107.5	51.30
PHY 205 W3FE															
4197057	31-2	3	1	3	34	4.8	.	.	30.0	76.1	8.3	3	80.6	105	53.00
4197058	41-1	4	1	4	33	5.0	.	.	30.7	74.8	8.5	5	80.6	102	46.55
4197059	31-1	3	1	3	32	4.8	.	.	28.8	76.6	8.4	4	80.3	101	49.05
4197060	31-1	3	1	2	33	5.1	.	.	28.6	77.3	8.8	1	81.0	103	48.20
Average	--	3.3	1.0	3.0	33.0	4.93	none	none	29.5	76.2	8.5	3.3	80.6	102.8	49.20

Table 4 (continued). Commercial classing data for the subsurface drip irrigated Enlist technology cotton variety trial, Goss Farm, Tulia, 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
PHY 210 W3FE															
4197065	31-1	3	1	3	34	4.8	.	.	29.4	77.8	8.1	3	81.3	107	52.85
4197066	31-2	3	1	3	34	4.9	.	.	28.9	77.0	8.2	3	80.2	106	52.80
4197067	31-2	3	1	2	33	4.9	.	.	27.6	76.8	8.1	2	80.3	103	50.70
4197068	31-1	3	1	2	33	5.0	.	.	30.5	78.8	8.4	1	80.9	104	48.40
Average	--	3.0	1.0	2.5	33.5	4.90	none	none	29.1	77.6	8.2	2.3	80.7	105.0	51.19
PHY 250 W3FE															
4197061	31-2	3	1	3	33	4.9	.	.	28.2	77.3	8.0	2	79.0	102	50.10
4197062	31-2	3	1	3	33	5.0	.	.	28.9	77.1	7.9	3	80.3	104	48.05
4197063	31-2	3	1	3	34	4.9	.	.	28.5	77.2	8.1	3	81.0	106	52.80
4197064	31-2	3	1	3	33	4.8	.	.	28.0	77.2	8.2	2	79.9	104	50.10
Average	--	3.0	1.0	3.0	33.3	4.90	none	none	28.4	77.2	8.1	2.5	80.1	104.0	50.26
PHY 332 W3FE															
4197048	31-2	3	1	3	35	4.9	.	.	29.9	76.1	8.7	3	82.6	110	54.35
4197049	31-4	3	1	3	35	4.9	.	.	29.0	74.7	8.8	3	80.8	110	54.30
4197050	31-3	3	1	3	35	5.0	.	.	29.9	75.6	8.9	3	81.1	110	51.80
4197051	31-2	3	1	3	35	5.0	.	.	29.9	75.6	8.6	2	81.8	108	51.80
4197052	31-3	3	1	2	33	5.1	.	.	28.4	76.5	9.1	2	78.1	104	47.65
Average	--	3.0	1.0	2.8	34.6	4.98	none	none	29.4	75.7	8.8	2.6	80.9	108.4	51.98

Table 4 (continued). Commercial classing data for the subsurface drip irrigated Enlist technology cotton variety trial, Goss Farm, Tulia, 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 %	Uniformity %	Length 100ths inch	Loan rate cents/lb
PHY 400 W3FE															
4197069	31-1	3	1	3	34	4.8	.	.	29.6	77.5	7.9	3	79.4	105	52.40
4197070	31-2	3	1	3	34	4.9	.	.	31.6	76.9	8.1	3	78.6	106	52.60
4197071	31-1	3	1	3	33	5.0	.	.	30.6	77.8	8.2	3	79.8	103	47.80
4197072	31-2	3	1	4	34	5.0	.	.	29.4	76.9	8.2	4	80.3	105	50.10
Average	--	3.0	1.0	3.3	33.8	4.93	none	none	30.3	77.3	8.1	3.3	79.5	104.8	50.73
PHY 415 W3FE															
4197053	31-2	3	1	2	34	5.2	.	.	30.4	76.4	8.4	1	81.6	107	50.60
4197054	31-1	3	1	2	33	5.2	.	.	29.6	76.7	8.4	2	81.7	104	48.25
4197055	31-2	3	1	3	33	5.0	.	.	29.0	76.3	8.6	2	81.2	104	48.10
4197056	31-1	3	1	2	33	5.2	.	.	29.7	76.6	8.6	2	80.8	102	48.25
Average	--	3.0	1.0	2.3	33.3	5.15	none	none	29.7	76.5	8.5	1.8	81.3	104.3	48.80

Table 5. Mean commercial classing data across all bales by treatment for the subsurface drip irrigated Enlist technology cotton variety trial, Goss Farm, Tulia, TX, 2024.

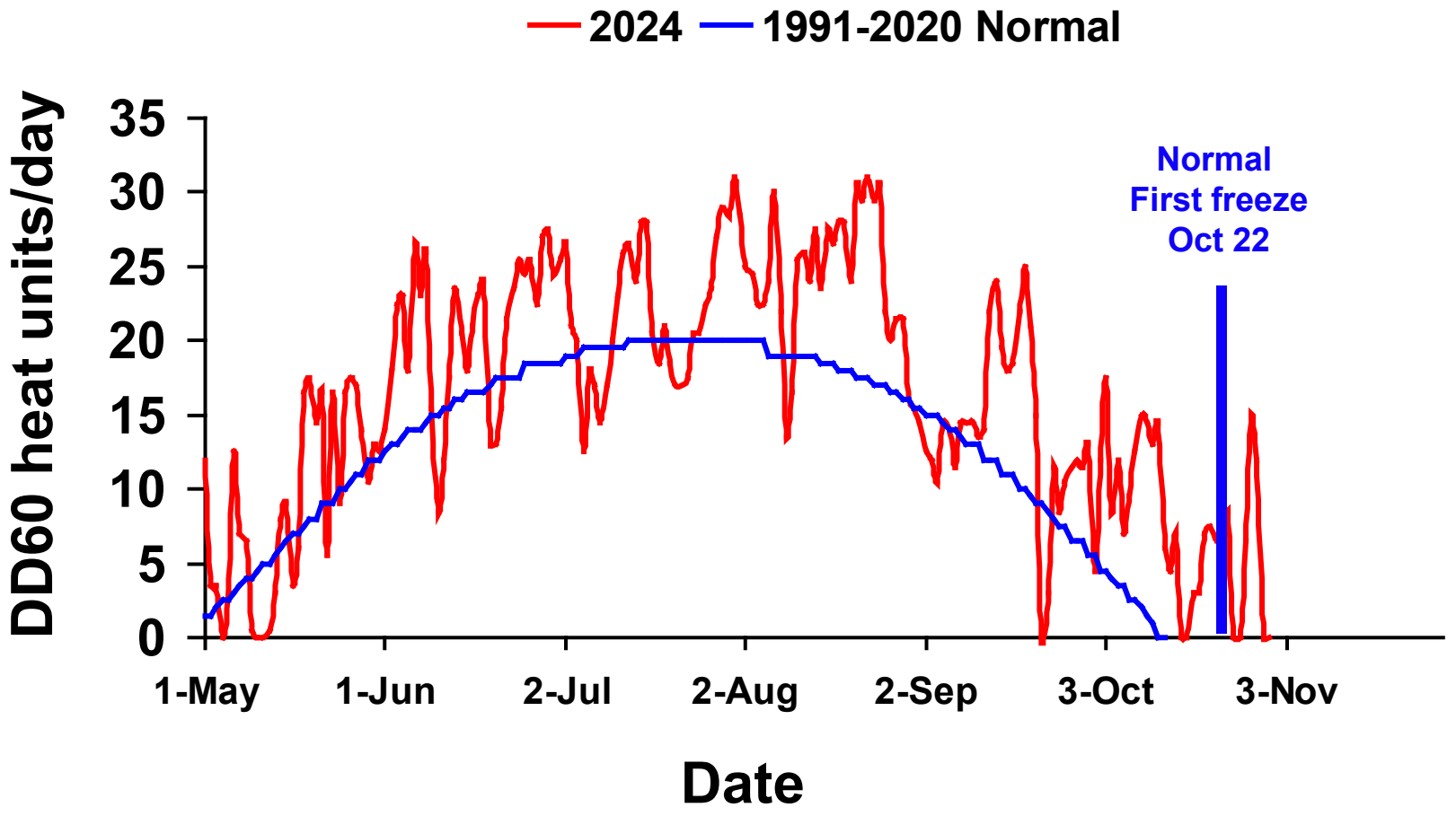
Treatment	Color	Color	Leaf	Staple	Micronaire	Extraneous	Remarks	Strength	Rd	+b	Trash	Uniformity	Length	Loan rate	Cash bid*
	digit 1	digit 2	grade	32nds inch	units	matter	--	g/tex	%	%	% area	%	100ths inch	cents/lb	cents/lb
PHY 136 W3E1	3.2	1.0	3.2	34.0	4.80	none	none	29.6	75.9	8.4	3.2	79.9	105.8	51.49	61.24
PHY 137 W3E1	4.0	1.0	4.0	34.5	4.88	none	none	33.0	74.8	8.3	5.0	81.1	107.5	51.30	61.60
PHY 205 W3FE	3.3	1.0	3.0	33.0	4.93	none	none	29.5	76.2	8.5	3.3	80.6	102.8	49.20	57.49
PHY 210 W3FE	3.0	1.0	2.5	33.5	4.90	none	none	29.1	77.6	8.2	2.3	80.7	105.0	51.19	60.14
PHY 250 W3FE	3.0	1.0	3.0	33.3	4.90	none	none	28.4	77.2	8.1	2.5	80.1	104.0	50.26	58.42
PHY 332 W3FE	3.0	1.0	2.8	34.6	4.98	none	none	29.4	75.7	8.8	2.6	80.9	108.4	51.98	62.96
PHY 400 W3FE	3.0	1.0	3.3	33.8	4.93	none	none	30.3	77.3	8.1	3.3	79.5	104.8	50.73	61.30
PHY 415 W3FE	3.0	1.0	2.3	33.3	5.15	none	none	29.7	76.5	8.5	1.8	81.3	104.3	48.80	56.94
Mean	3.2	1.0	3.0	33.7	4.93	.	.	29.9	76.4	8.4	3.0	80.5	105.3	50.62	60.01

*Value based on cash bids for each variety on December 13 at 69.40 cent March 2025 futures using commercial ginning and USDA-AMS classing results.

Appendix

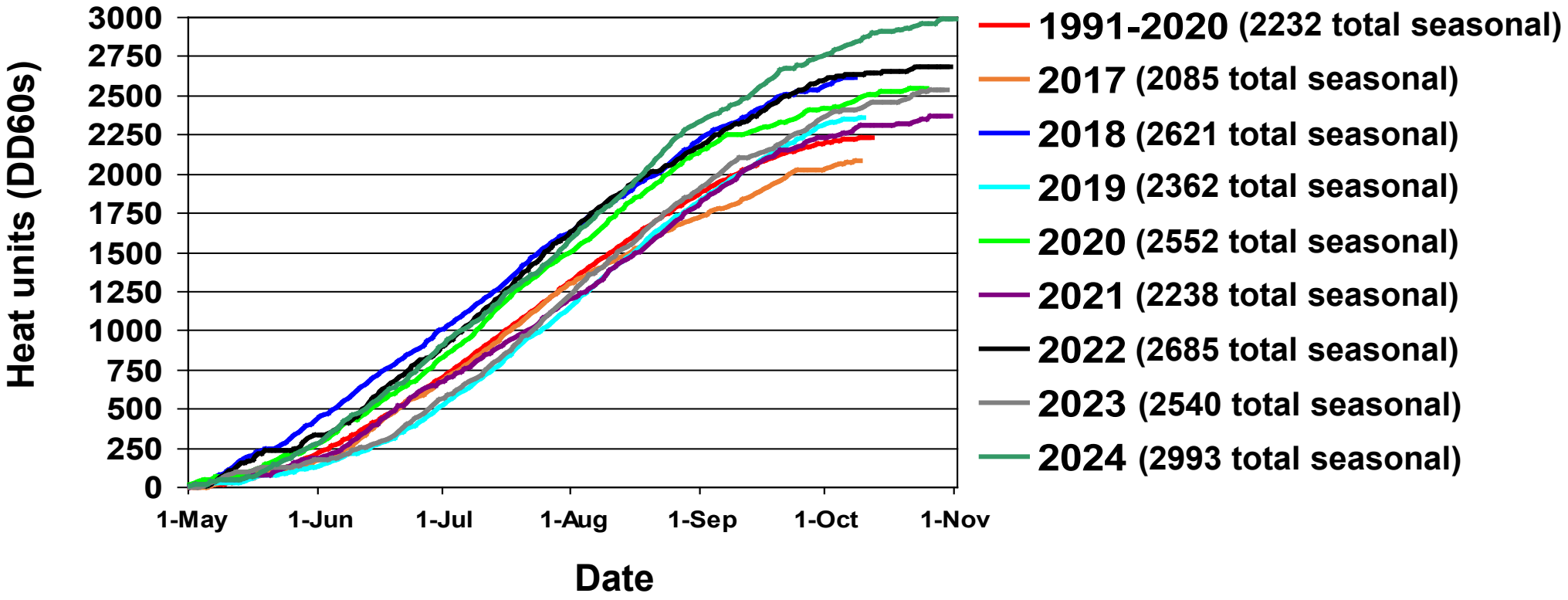
Amarillo 2024 cotton heat units and weather data.

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

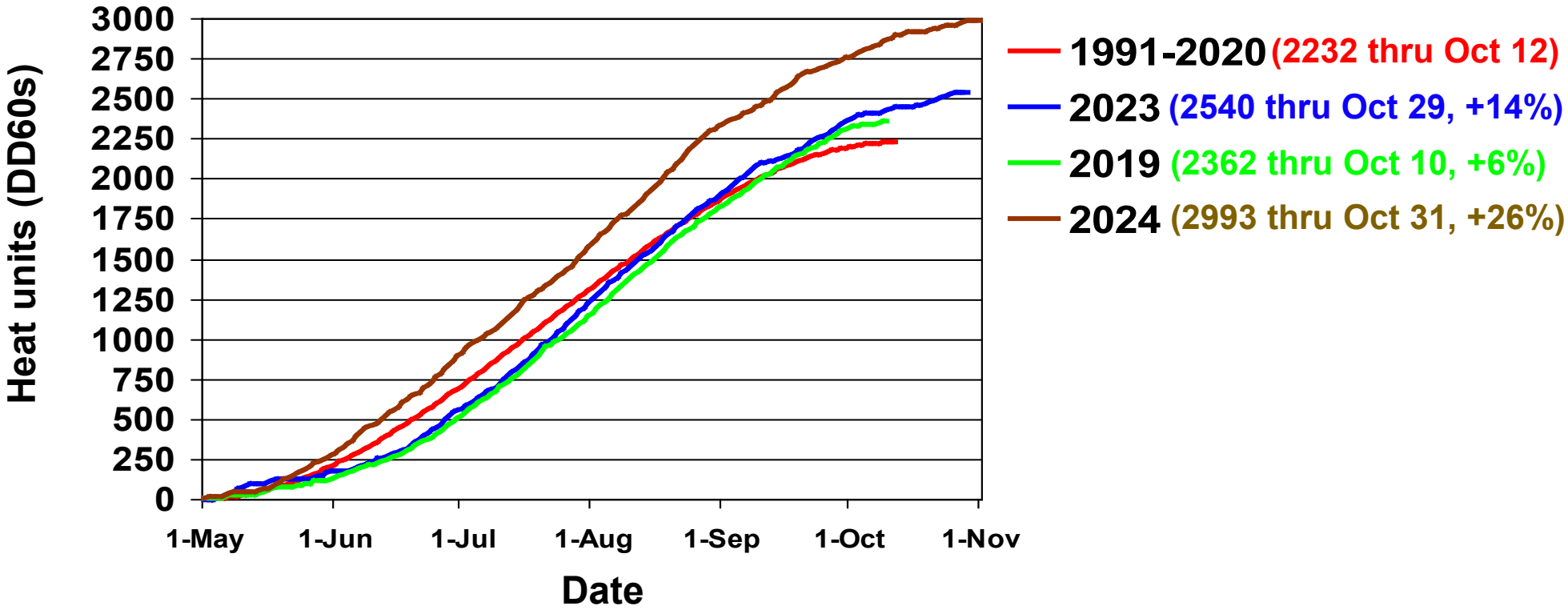


Amarillo 30-Yr Normal (1991-2020) vs. 2017 through 2024 Cotton Heat Unit Accumulation

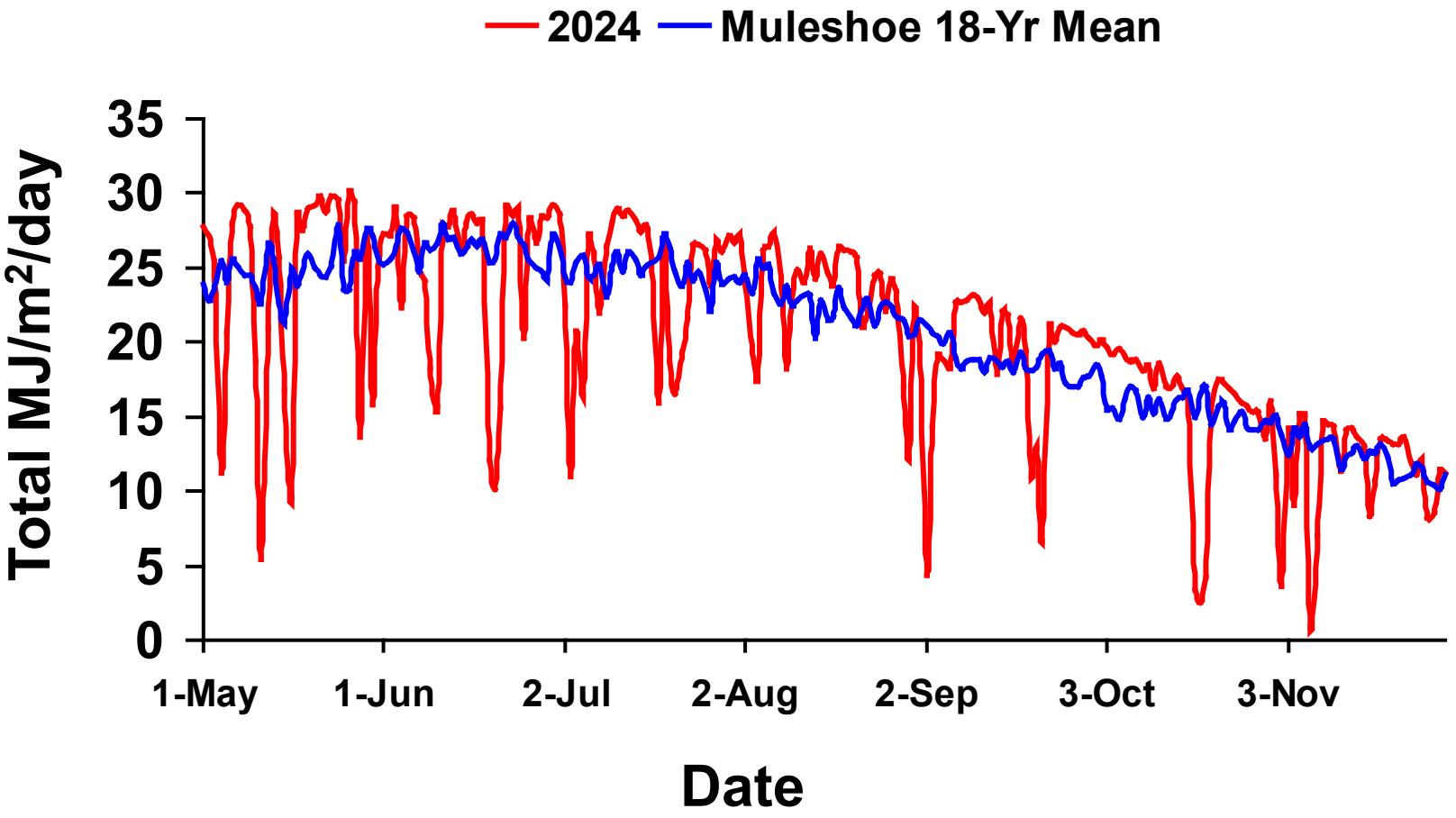
From May 1 Through First Hard Freeze



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



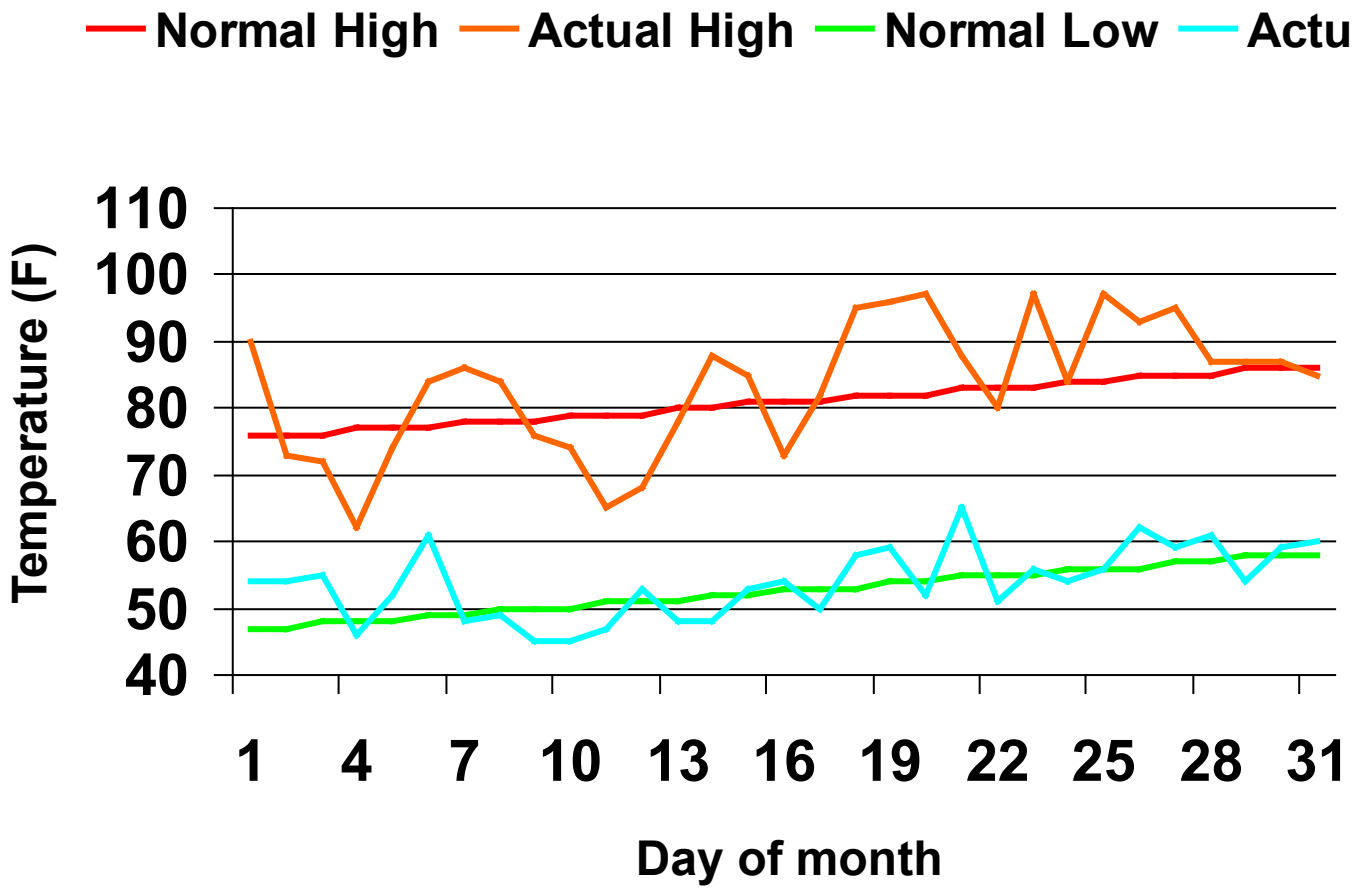
Muleshoe
18-Year Mean (2004-2021) and 2024
Daily Total Solar Radiation (MJ/meter^2)



Total solar energy, in MJ/meter^2, calculated from the hourly average global solar radiation rates and converted to energy by integrating over time.

Source: https://www.ncei.noaa.gov/pub/data/uscrn/products/daily01/2024/

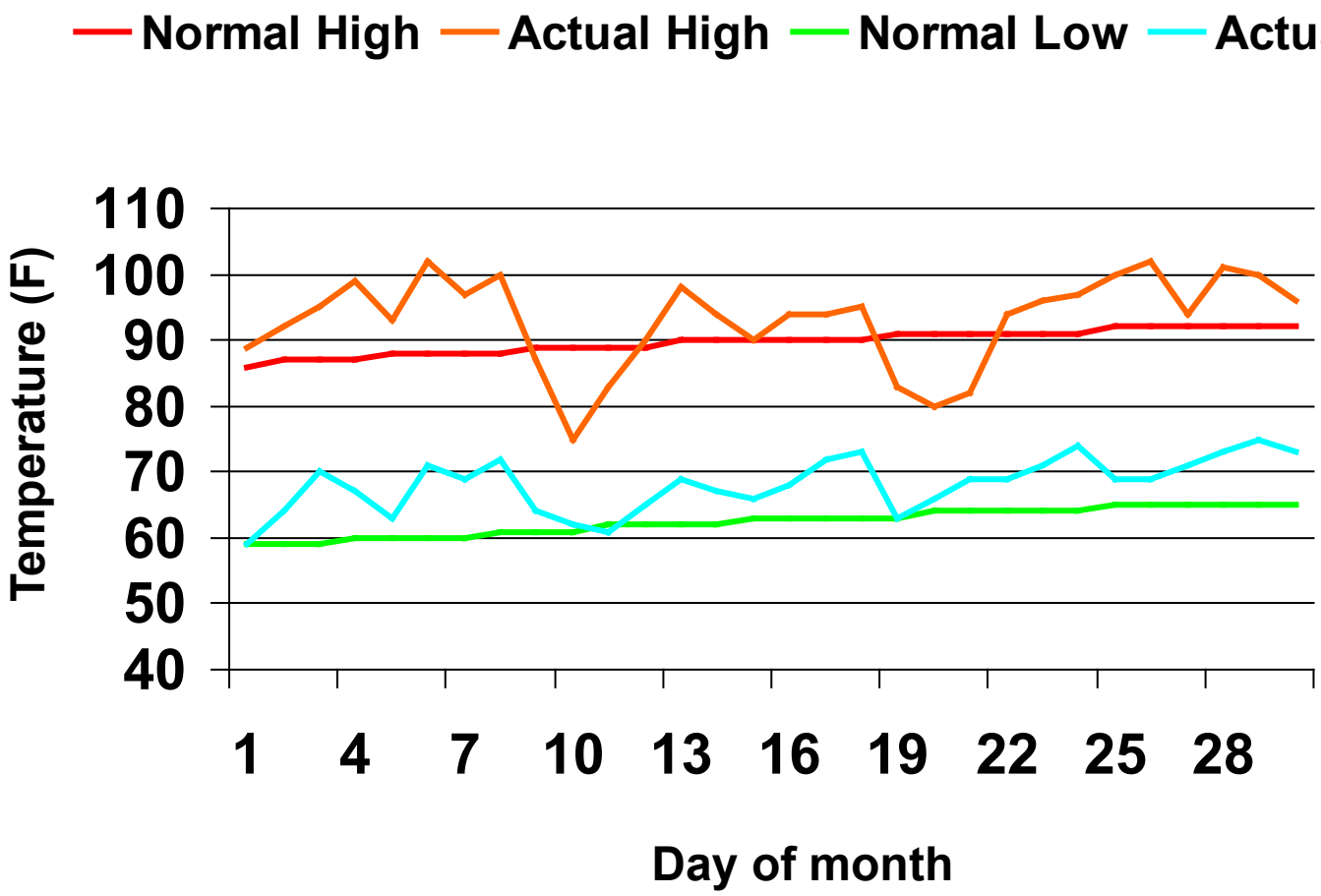
Amarillo
30-Yr Normal (1991-2020) and May 2024 Air Temperatures



Heat Units

Normal total: 210
2024: 276
% of normal: +32

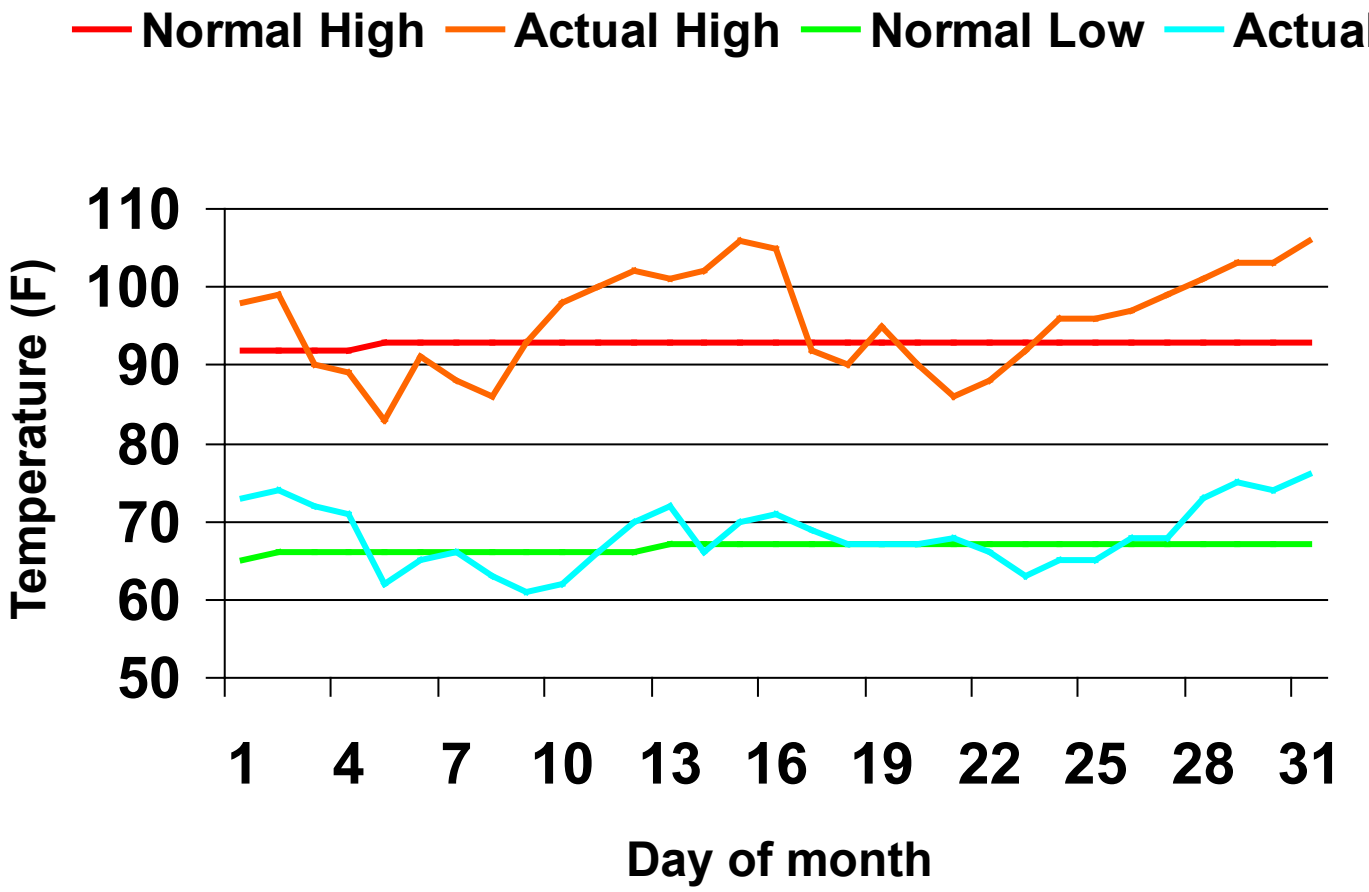
Amarillo
30-Yr Normal (1991-2020) and June 2024 Air Temperatures



Heat Units

Normal total: 483
2024: 618
% of normal: +28

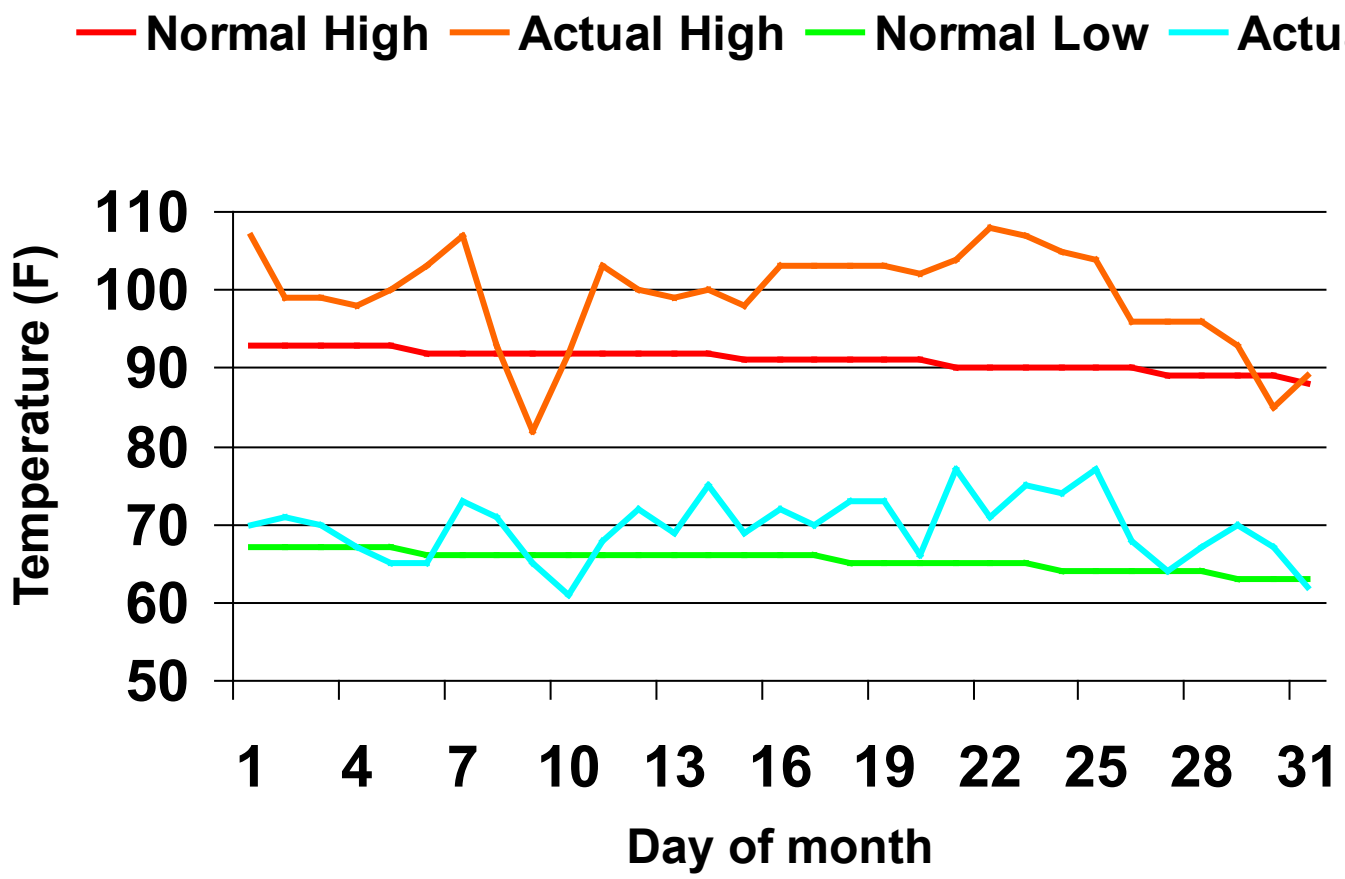
Amarillo
30-Yr Normal (1991-2020) and July 2024 Air Temperatures



Heat Units

Normal total for month: 612
2024: 680
% of normal: +11

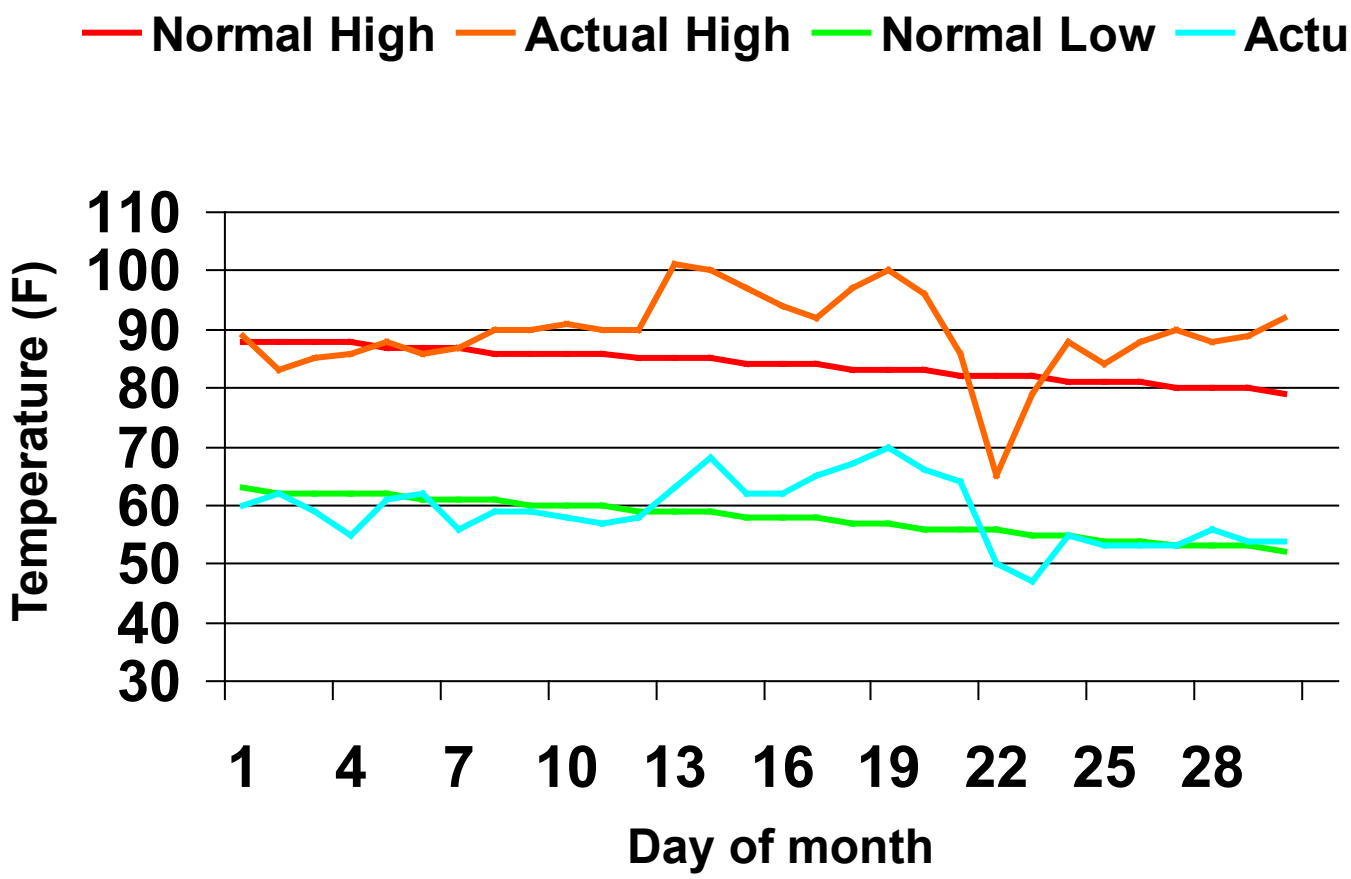
Amarillo
30-Yr Normal (1991-2020) and August 2024 Air Temperatures



Heat Units

Normal total for month: 565
2024: 757
% of normal: +34

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

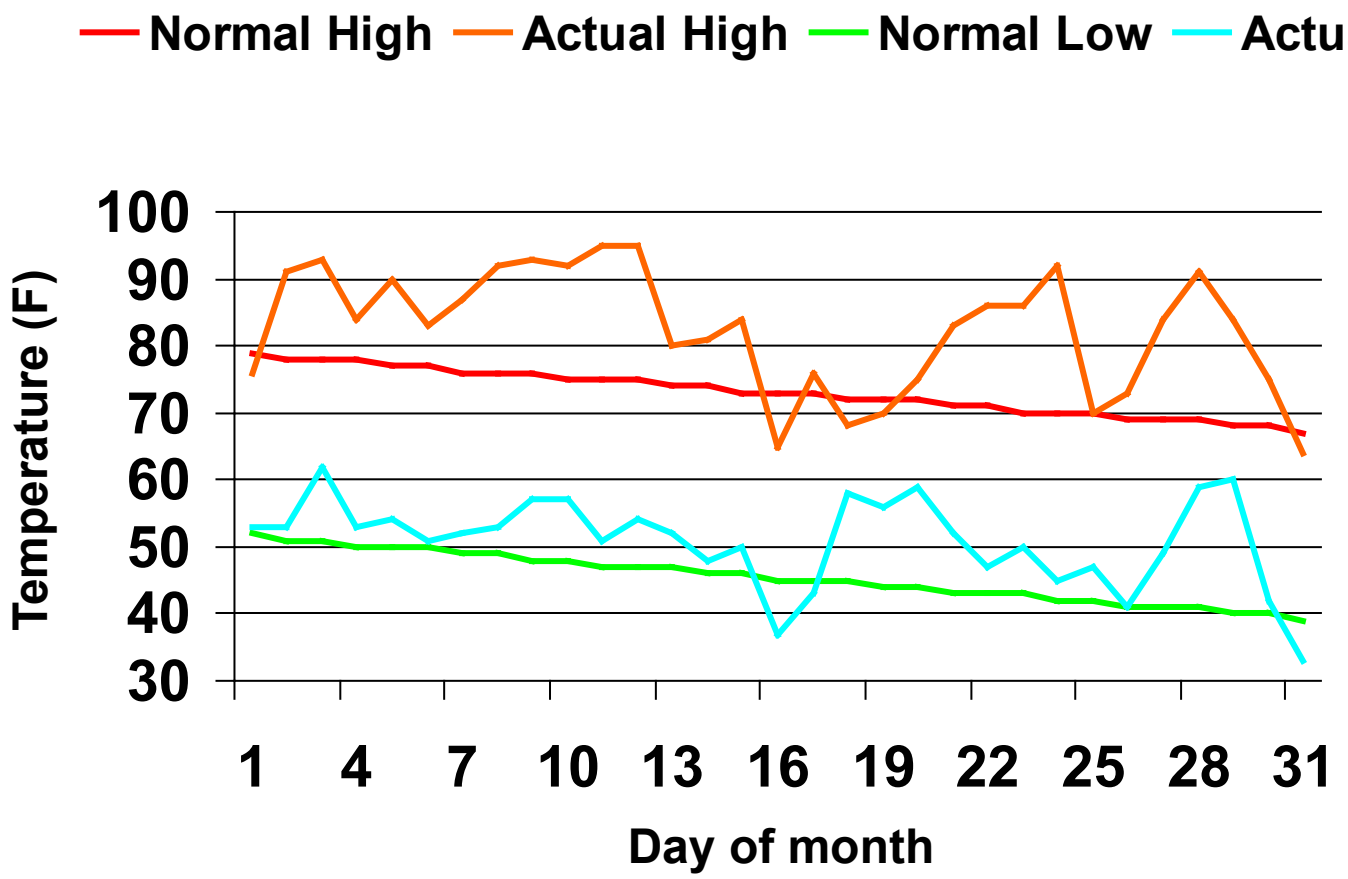


Heat Units

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



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