



2024 Enlist Cotton Variety Trial – Lonestar Gin

Friemel Farm

Groom, 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, 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 center pivot 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 411 W3FE.

Relatively good moisture conditions prevailed at the site during the early spring, and continued well into the growing season. 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 87% of the seed planted (55,000 seed/acre) when stand count observations were performed on June 24. Minimal seedling disease was noted. A total of 63 days from planting to first bloom (July 22) 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 4.2 across all entries. 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 1785 lb/acre (PHY 136 W3E1) to a low of 1533 lb/acre (PHY 250 W3FE), and averaged 1682 lb/acre (Table 1). Average Loan value for varieties from commercially ginned and classed bales varied from a high of \$0.5716/lb (PHY 332 W3FE) to a low of \$0.5487/lb (PHY 205 W3FE). Overall Loan value for the trial across all entries was \$0.5610/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 (PHY 136 W3E1, PHY 332 W3FE, PHY 411 W3FE, PHY 137 W3E1, and PHY 205 W3FE). Net value/acre ranged from a high of \$1081/acre (PHY 136 W3E1) to a low of \$951/acre (PHY 250 W3FE). This results in a statistically significant difference of \$130/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 1, and a visual estimate of storm resistance at harvest. Final plant heights ranged from a high of 26.3 inches for PHY 332 W3FE to a low of 20.7 inches for PHY 205 W3FE.

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 21 to 31 across all entries. Leaf grades ranged from about 2 to 4. Staple ranged from about 35.1 (PHY 205 W3FE) to 38.3 32nds inch (PHY 137 W3E1). Micronaire averages were excellent for all entries and ranged from a low of 3.92 (PHY 400 W3FE) to a high of 4.49 (PHY 205 W3FE). No bark contamination was noted in commercial bales. Fiber strength ranged from 31.1 to 34.5 g/tex, and uniformity ranged from 79.8 to 83.0%.

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: 3290 ft

Previous crop: Corn

Tillage system: Conventional tillage, disking

Planted: May 20

Replicates: 3 replicates in a randomized complete block design

Plot width: 12-row plots

Plot length: Trial was planted in ~2,500 ft long rows

Seeding rate: 55,000 seed/acre

Days from planting to first bloom: 63 (July 22)

Row spacing: 30-inch rows

Harvesting: December 2 using a John Deere CS770, a full round module was harvested for each 12-row plot. Round modules were weighed using the integral CS770 handler scale, and round modules were weighed by variety at the Lonestar 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 Lonestar 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.

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Acknowledgements

Lonestar Gin would like to thank Mike Friemel, Brett Friemel, and Trevor Friemel for committing equipment, land, and time to conduct and manage the trial. Gratitude is expressed to PhytoGen Cotton Seed for providing trial seed, and to Windstar Inc for support. Detailed ginning was performed by Carey McKinney and the Lonestar Gin crew and a big thank you is extended to this hard-working group.



Table 1. Harvest results for the center pivot irrigated Enlist cotton variety trial, Friemel Farm, Groom, 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 -----		
PHY 136 W3E1	35.4	42.9	5044	1785	2165	0.5661	1010	70	1081	a
PHY 332 W3FE	33.5	45.6	5014	1681	2287	0.5716	961	86	1047	ab
PHY 411 W3FE	34.8	43.4	5055	1758	2192	0.5532	973	73	1046	ab
PHY 137 W3E1	33.0	41.6	5227	1723	2176	0.5642	972	65	1037	ab
PHY 205 W3FE	34.3	43.9	5062	1735	2224	0.5487	952	77	1028	ab
PHY 400 W3FE	35.3	43.1	4796	1693	2068	0.5503	932	68	999	bc
PHY 210 W3FE	34.5	45.9	4485	1547	2060	0.5655	875	78	953	c
PHY 250 W3FE	32.4	45.4	4730	1533	2145	0.5683	871	79	951	c
Test average	34.1	44.0	4927	1682	2165	0.5610	943	75	1018	
CV, %	--	--	4.0	4.0	3.8	--	4.0	3.7	4.0	
OSL	--	--	0.0083	0.0025	0.0697	--	0.0054	0.0001	0.0136	
LSD	--	--	280	96	120	--	55	4	58	

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 value 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 irrigated Enlist technology cotton variety trial, Friemel Farm, Groom, TX, 2024.

Entry	Final population	Stand establishment	Vigor	Nodes above white flower		Plant height			Nodes above cracked boll	Storm resistance
				Early bloom	Cutout	Prebloom	Early bloom	Cutout		
	plants/acre 24-Jun	% 24-Jun	1-5 visual scale, 5 best 24-Jun	count			inches		count 1-Oct	1-9 visual scale, 9 tight 2-Dec
				29-Jul	20-Aug	16-Jul	29-Jul	20-Aug		
PHY 136 W3E1	46,174	84.0	4.1	6.5	2.1	18.7	22.1	25.3	3.7	7.2
PHY 137 W3E1	44,721	81.3	4.1	5.8	1.8	17.9	21.4	24.1	3.1	6.0
PHY 205 W3FE	46,754	85.0	4.4	5.2	1.2	15.6	19.4	20.7	0.9	8.2
PHY 210 W3FE	50,820	92.4	3.9	5.4	1.6	16.7	19.6	21.7	1.0	7.2
PHY 250 W3FE	47,045	85.5	4.4	5.4	1.9	18.0	20.3	22.9	1.7	7.3
PHY 332 W3FE	52,272	95.0	4.0	6.4	2.3	19.8	23.2	26.3	5.1	6.2
PHY 400 W3FE	47,916	87.1	3.9	6.1	1.8	17.3	20.4	22.7	3.5	7.2
PHY 411 W3FE	45,593	82.9	4.0	6.6	2.2	18.2	22.3	26.0	4.3	6.3
Test average	47,662	86.7	4.1	5.9	1.9	17.8	21.1	23.7	2.9	7.0
CV, %	6.7	6.7	5.1	5.1	12.1	5.2	4.8	5.2	22.2	3.8
OSL	0.1274	0.1275	0.0485	0.0002	0.0009	0.0027	0.0036	0.0005	0.0001	0.0001
LSD	NS	NS	0.3	0.4	0.3	1.3	1.5	1.8	0.9	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 Enlist technology cotton variety trial, Friemel Farm, Groom, 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															
2147198	31-1	3	1	3	37	4.2	.	.	33.2	78.2	8.4	3	81.1	115	56.80
2147199	31-1	3	1	3	37	4.2	.	.	33.2	78.2	8.4	3	81.1	115	56.80
2147200	31-1	3	1	3	37	4.2	.	.	33.2	78.2	8.4	3	81.1	115	56.80
2147201	31-1	3	1	3	37	4.2	.	.	33.2	78.2	8.4	3	81.1	115	56.80
2147202	31-1	3	1	3	37	4.0	.	.	31.2	79.0	8.2	3	79.8	115	56.25
2147203	31-1	3	1	3	37	4.0	.	.	31.2	78.9	8.3	3	79.8	115	56.25
2147204	31-1	3	1	3	37	4.0	.	.	31.2	79.0	8.4	3	79.8	115	56.25
2147205	31-1	3	1	3	37	3.9	.	.	32.8	79.3	8.1	3	80.7	117	56.70
2147206	31-1	3	1	3	37	3.9	.	.	32.8	79.4	8.1	3	80.7	117	56.70
2147207	31-1	3	1	3	37	3.9	.	.	32.8	79.3	8.2	3	80.7	117	56.70
Average	--	3.0	1.0	3.0	37.0	4.05	0/10 bales	level 1 bark	32.5	78.8	8.3	3.0	80.6	115.6	56.61
PHY 137 W3E1															
2147208	31-1	3	1	5	39	3.9	.	.	34.9	77.5	8.0	8	83.3	121	52.95
2147209	31-2	3	1	4	39	3.9	.	.	34.9	77.4	8.1	5	83.3	121	55.65
2147210	31-2	3	1	3	39	3.9	.	.	34.9	77.4	8.2	3	83.3	121	57.00
2147211	31-1	3	1	3	38	4.2	.	.	34.4	77.8	8.4	3	82.5	119	56.95
2147212	31-1	3	1	3	38	4.2	.	.	34.4	77.8	8.4	3	82.5	119	56.95
2147213	31-1	3	1	2	38	4.2	.	.	34.4	77.5	8.2	2	82.5	119	57.25
2147214	31-2	3	1	2	38	4.4	.	.	34.1	77.1	8.2	2	83.2	118	57.20
2147215	31-1	3	1	3	38	4.4	.	.	34.1	77.6	8.4	2	83.2	118	56.90
2147216	31-1	3	1	3	38	4.4	.	.	34.1	77.6	8.4	2	83.2	118	56.90
Average	--	3.0	1.0	3.1	38.3	4.17	0/9 bales	level 1 bark	34.5	77.5	8.3	3.3	83.0	119.3	56.42
PHY 205 W3FE															
2147217	31-1	3	1	3	36	4.4	.	.	33.0	79.1	7.9	3	82.9	112	56.25
2147218	31-1	3	1	3	36	4.4	.	.	33.0	79.1	7.9	3	82.9	112	56.25
2147219	31-1	3	1	3	36	4.4	.	.	33.0	79.1	7.9	3	82.9	112	56.25
2147220	31-1	3	1	3	36	4.4	.	.	33.0	79.1	7.9	3	82.9	112	56.25
2147221	31-1	3	1	3	35	4.5	.	.	32.0	78.4	8.3	3	82.4	109	54.65
2147222	31-1	3	1	2	35	4.5	.	.	32.0	78.9	8.2	2	82.4	109	54.85
2147223	31-1	3	1	3	35	4.5	.	.	32.0	78.3	8.3	2	82.4	109	54.65
2147224	31-1	3	1	3	34	4.6	.	.	32.3	78.8	8.4	3	81.9	107	53.15
2147225	31-1	3	1	3	34	4.6	.	.	32.3	78.4	8.3	3	81.9	107	53.15
2147226	31-1	3	1	2	34	4.6	.	.	32.3	79.0	8.3	2	81.9	107	53.25
Average	--	3.0	1.0	2.8	35.1	4.49	0/10 bales	level 1 bark	32.5	78.8	8.1	2.7	82.5	109.6	54.87



Table 3 (continued). Commercial classing data for the center pivot irrigated Enlist technology cotton variety trial, Friemel Farm, Groom, 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															
2147227	31-1	3	1	3	36	4.4	.	.	32.8	79.1	8.0	3	82.0	112	56.15
2147228	31-1	3	1	3	36	4.4	.	.	32.8	79.1	8.0	3	82.0	112	56.15
2147229	31-1	3	1	3	36	4.4	.	.	32.8	79.1	8.0	3	82.0	112	56.15
2147230	31-1	3	1	3	36	4.4	.	.	32.8	79.1	8.0	3	82.0	112	56.15
2147231	31-1	3	1	2	36	4.4	.	.	31.9	79.8	8.0	2	82.2	113	56.40
2147232	31-1	3	1	2	36	4.4	.	.	31.9	79.2	8.1	2	82.2	113	56.40
2147233	31-1	3	1	2	36	4.4	.	.	31.9	79.7	7.9	2	82.2	113	56.40
2147234	31-1	3	1	2	37	4.1	.	.	32.6	80.2	7.8	2	81.3	115	57.05
2147235	31-1	3	1	2	37	4.1	.	.	32.6	79.7	7.8	2	81.3	115	57.05
2147236	21-2	2	1	2	37	4.1	.	.	32.6	80.6	7.8	1	81.3	115	57.60
Average	--	2.9	1.0	2.4	36.3	4.31	0/10 bales	level 1 bark	32.5	79.6	7.9	2.3	81.9	113.2	56.55
PHY 250 W3FE															
2147237	31-1	3	1	2	37	4.3	.	.	31.9	79.3	7.7	2	81.3	114	56.95
2147238	31-1	3	1	2	37	4.3	.	.	31.9	79.3	7.7	2	81.3	114	56.95
2147239	31-1	3	1	2	37	4.3	.	.	31.9	79.3	7.7	2	81.3	114	56.95
2147240	31-1	3	1	2	37	4.3	.	.	31.9	79.3	7.7	2	81.3	114	56.95
2147241	31-1	3	1	3	37	4.1	.	.	32.5	79.7	7.9	3	80.9	116	56.70
2147242	31-1	3	1	3	37	4.1	.	.	32.5	79.5	7.9	3	80.9	116	56.70
2147243	31-1	3	1	3	37	4.1	.	.	32.5	79.8	7.8	2	80.9	116	56.70
2147244	31-1	3	1	3	37	4.2	.	.	33.0	79.9	7.7	3	81.5	116	56.80
2147245	31-1	3	1	3	37	4.2	.	.	33.0	79.3	7.9	3	81.5	116	56.80
2147246	31-1	3	1	3	37	4.2	.	.	33.0	79.4	7.8	2	81.5	116	56.80
Average	--	3.0	1.0	2.6	37.0	4.21	0/10 bales	level 1 bark	32.4	79.5	7.8	2.4	81.2	115.2	56.83
PHY 332 W3FE															
2147247	31-1	3	1	2	37	4.1	.	.	32.9	78.1	8.4	2	81.3	117	57.05
2147248	31-1	3	1	2	37	4.1	.	.	32.9	78.1	8.4	2	81.3	117	57.05
2147249	31-1	3	1	2	37	4.1	.	.	32.9	78.1	8.4	2	81.3	117	57.05
2147250	31-1	3	1	2	37	4.1	.	.	32.9	78.1	8.4	2	81.3	117	57.05
2147251	31-1	3	1	2	38	4.5	.	.	33.2	77.9	8.6	2	81.5	118	57.10
2147252	31-1	3	1	2	38	4.5	.	.	33.2	77.8	8.6	2	81.5	118	57.10
2147253	21-2	2	1	2	38	4.5	.	.	33.2	78.1	8.9	2	81.5	118	57.65
2147254	21-2	2	1	3	37	4.7	.	.	31.9	78.1	8.9	3	81.6	116	57.05
2147255	31-1	3	1	2	37	4.7	.	.	31.9	77.9	8.8	2	81.6	116	56.95
2147256	21-2	2	1	2	37	4.7	.	.	31.9	77.9	8.9	2	81.6	116	57.50
Average	--	2.7	1.0	2.1	37.3	4.40	0/10 bales	level 1 bark	32.7	78.0	8.6	2.1	81.5	117.0	57.16



Table 3 (continued). Commercial classing data for the center pivot irrigated Enlist technology cotton variety trial, Friemel Farm, Groom, 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 400 W3FE															
2147257	31-1	3	1	3	36	4.1	.	.	32.9	78.6	8.0	4	79.9	112	55.75
2147258	41-2	4	1	7	36	4.1	.	.	32.9	74.9	6.5	13	79.9	112	46.90
2147259	31-1	3	1	3	36	4.1	.	.	32.9	78.3	7.9	3	79.9	112	55.75
2147260	31-1	3	1	3	36	4.1	.	.	32.9	78.8	8.3	2	79.9	112	55.75
2147261	31-1	3	1	3	36	3.8	.	.	32.0	78.4	8.3	4	79.5	111	55.75
2147262	31-1	3	1	3	36	3.8	.	.	32.0	78.6	8.2	2	79.5	111	55.75
2147263	31-1	3	1	3	36	3.8	.	.	32.0	78.4	8.1	3	79.5	111	55.75
2147264	31-1	3	1	3	36	3.8	.	.	32.9	78.1	8.0	3	80.1	113	56.20
2147265	31-1	3	1	3	36	3.8	.	.	32.9	78.6	8.0	4	80.1	113	56.20
2147266	31-1	3	1	2	36	3.8	.	.	32.9	80.1	7.7	2	80.1	113	56.45
Average	--	3.1	1.0	3.3	36.0	3.92	0/10 bales	level 1 bark	32.6	78.3	7.9	4.0	79.8	112.0	55.03
PHY 411 W3FE															
2147267	31-1	3	1	2	36	4.4	.	.	31.5	79.8	7.5	2	82.3	111	56.40
2147268	31-1	3	1	2	36	4.4	.	.	31.5	79.8	7.5	2	82.3	111	56.40
2147269	31-1	3	1	2	36	4.4	.	.	31.5	79.1	7.5	2	82.3	111	56.40
2147270	31-1	3	1	2	36	4.4	.	.	31.5	79.7	7.7	3	82.3	111	56.40
2147271	31-1	3	1	2	35	4.3	.	.	31.3	79.9	7.5	1	81.5	110	54.80
2147272	31-1	3	1	2	35	4.3	.	.	31.3	80.2	7.7	2	81.5	110	54.80
2147273	31-1	3	1	3	35	4.3	.	.	31.3	79.9	7.6	3	81.5	110	54.60
2147274	31-1	3	1	3	35	4.4	.	.	30.5	80.1	7.5	3	81.2	110	54.45
2147275	31-1	3	1	3	35	4.4	.	.	30.5	79.8	7.6	3	81.2	110	54.45
2147276	31-4	3	1	3	35	4.4	.	.	30.5	75.4	8.6	4	81.2	110	54.45
Average	--	3.0	1.0	2.4	35.4	4.37	0/10 bales	level 1 bark	31.1	79.4	7.7	2.5	81.7	110.4	55.32



Table 4. Mean commercial classing data across all bales by variety for the center pivot irrigated Enlist technology cotton variety trial, Friemel Farm, Groom, TX, 2024.

Variety	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	3.0	1.0	3.0	37.0	4.05	0/10 bales	level 1 bark	32.5	78.8	8.3	3.0	80.6	115.6	56.61
PHY 137 W3E1	3.0	1.0	3.1	38.3	4.17	0/9 bales	level 1 bark	34.5	77.5	8.3	3.3	83.0	119.3	56.42
PHY 205 W3FE	3.0	1.0	2.8	35.1	4.49	0/10 bales	level 1 bark	32.5	78.8	8.1	2.7	82.5	109.6	54.87
PHY 210 W3FE	2.9	1.0	2.4	36.3	4.31	0/10 bales	level 1 bark	32.5	79.6	7.9	2.3	81.9	113.2	56.55
PHY 250 W3FE	3.0	1.0	2.6	37.0	4.21	0/10 bales	level 1 bark	32.4	79.5	7.8	2.4	81.2	115.2	56.83
PHY 332 W3FE	2.7	1.0	2.1	37.3	4.40	0/10 bales	level 1 bark	32.7	78.0	8.6	2.1	81.5	117.0	57.16
PHY 400 W3FE	3.1	1.0	3.3	36.0	3.92	0/10 bales	level 1 bark	32.6	78.3	7.9	4.0	79.8	112.0	55.03
PHY 411 W3FE	3.0	1.0	2.4	35.4	4.37	0/10 bales	level 1 bark	31.1	79.4	7.7	2.5	81.7	110.4	55.32
Mean	3.0	1.0	2.7	36.6	4.24	.	.	32.6	78.7	8.1	2.8	81.5	114.0	56.10



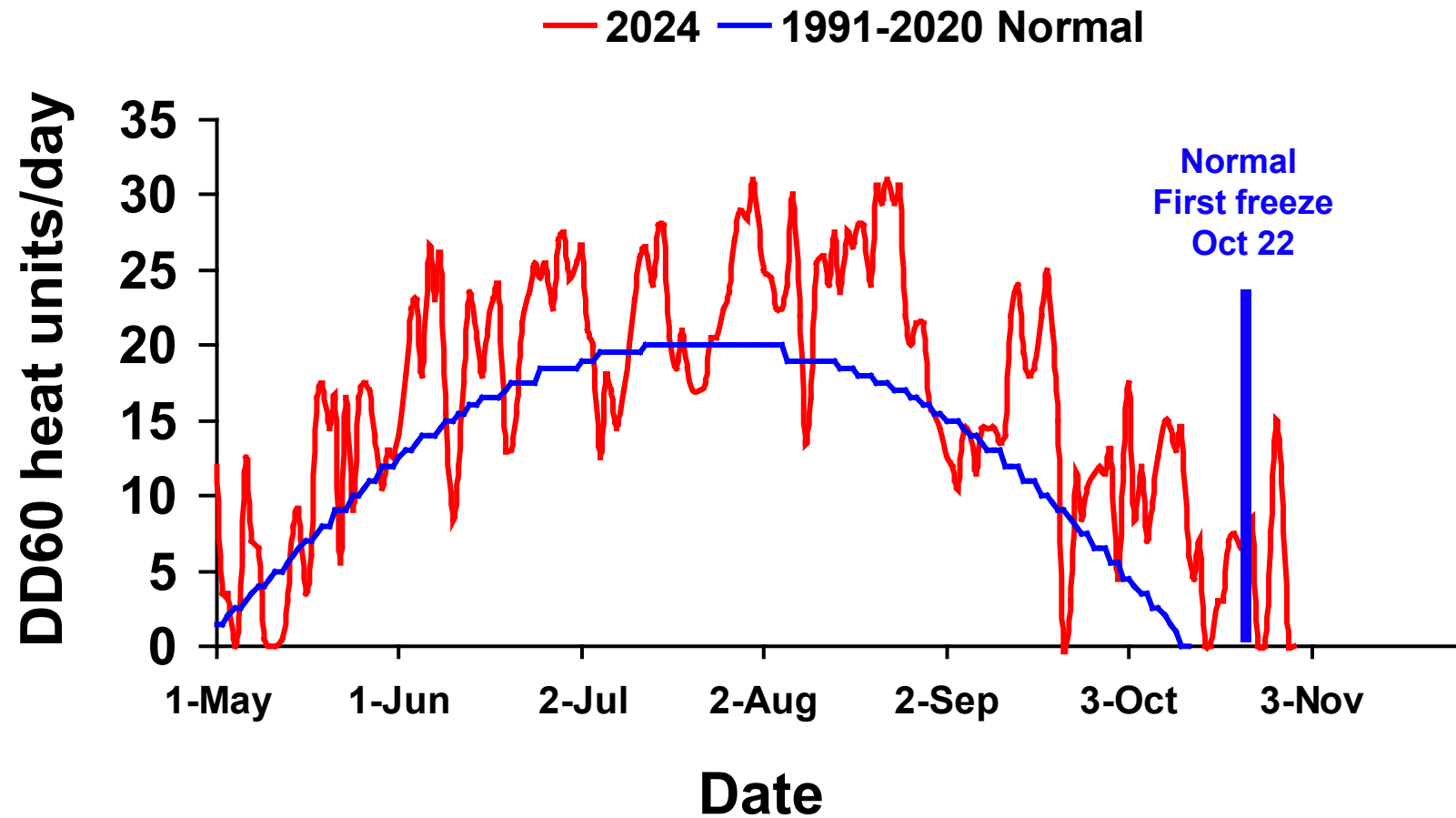
Appendix

Amarillo 2024 cotton heat units and weather data.



Amarillo

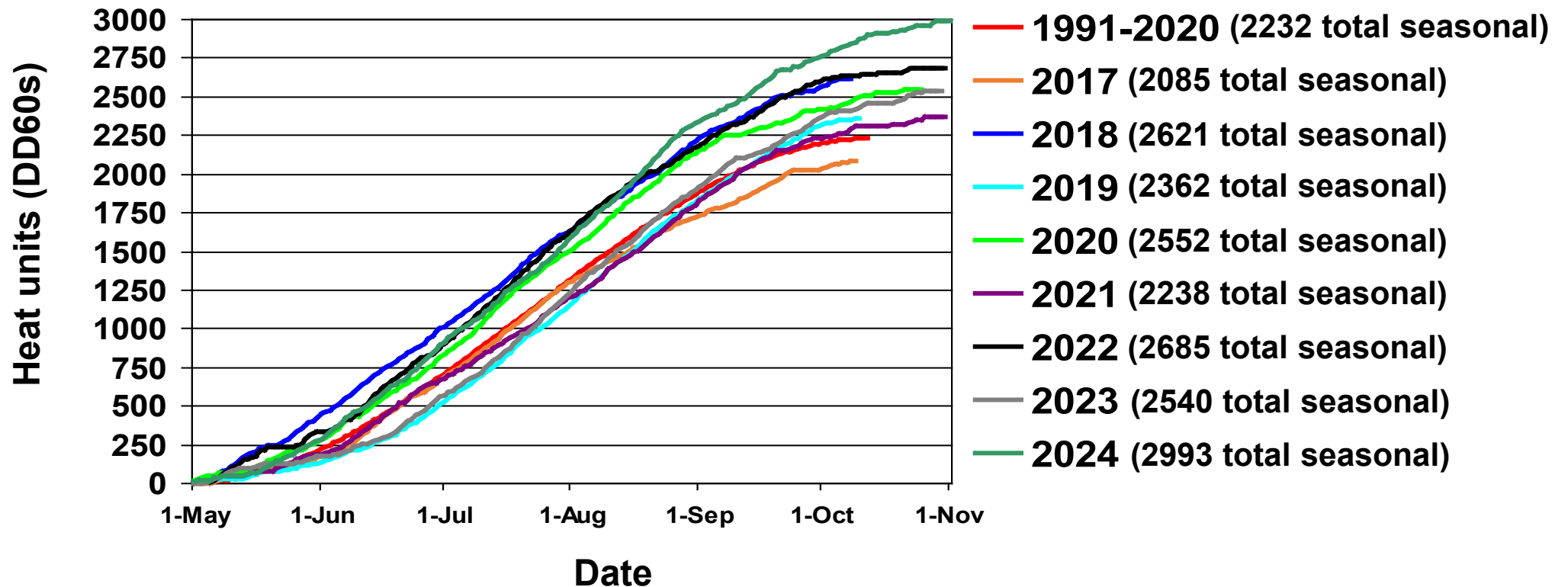
30-Year Normal (1991-2020) and 2024 Daily Heat Units



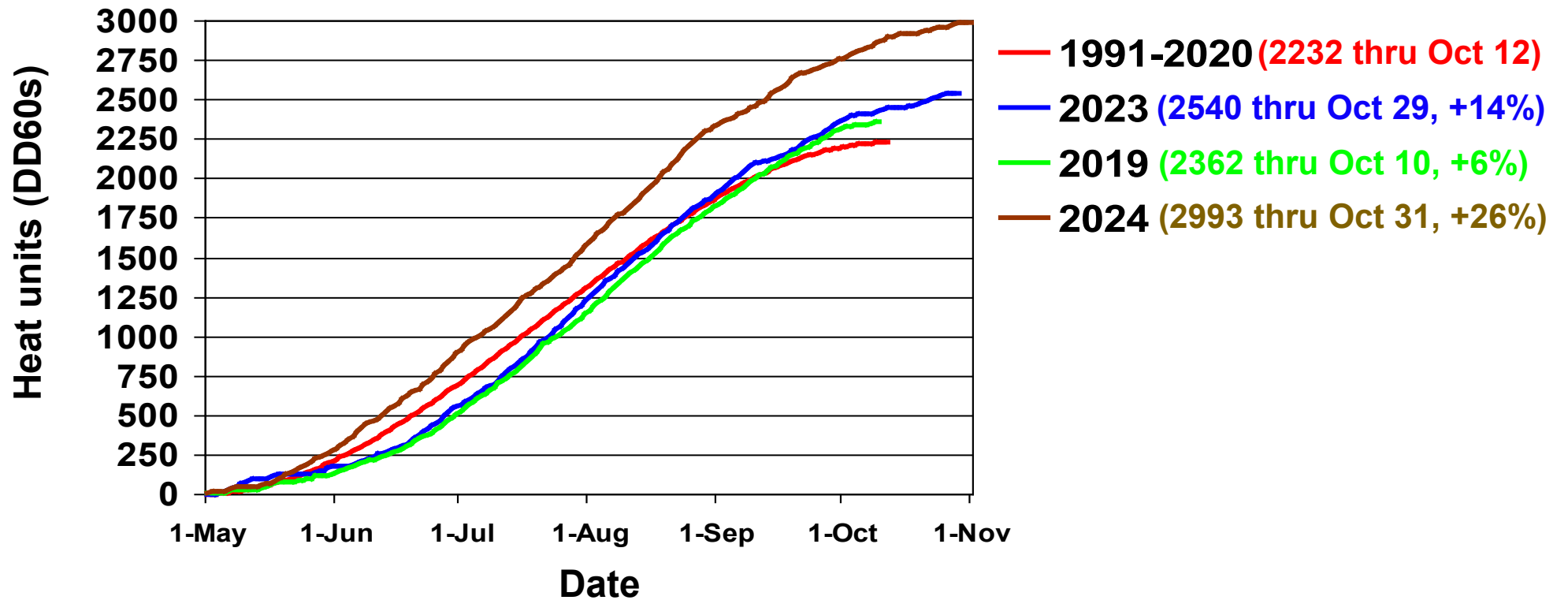
Amarillo 30-Yr Normal (1991-2020) vs. 2017 through 2024

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

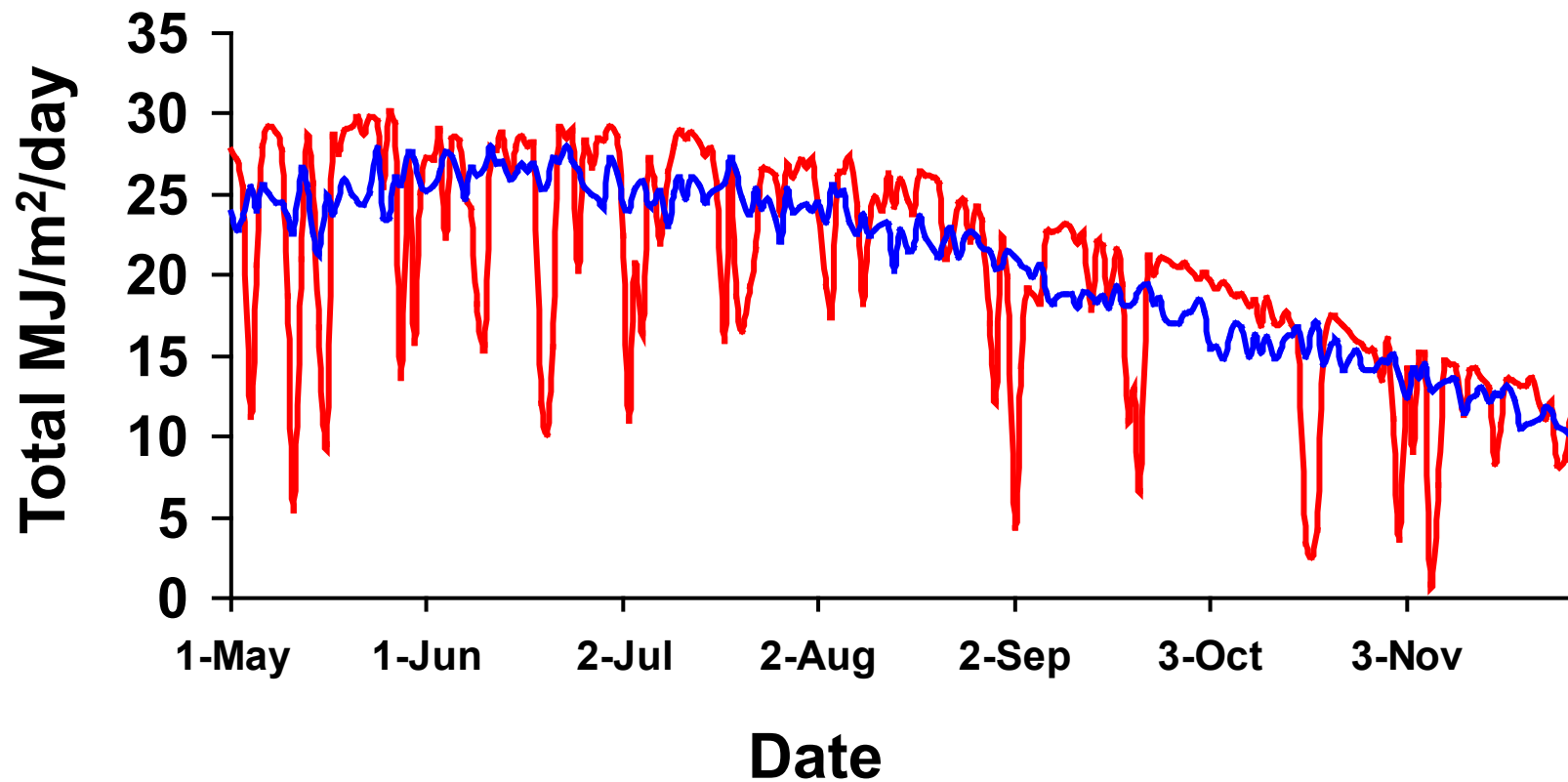


Muleshoe

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

Daily Total Solar Radiation (MJ/meter²)

— 2024 — Muleshoe 18-Yr Mean

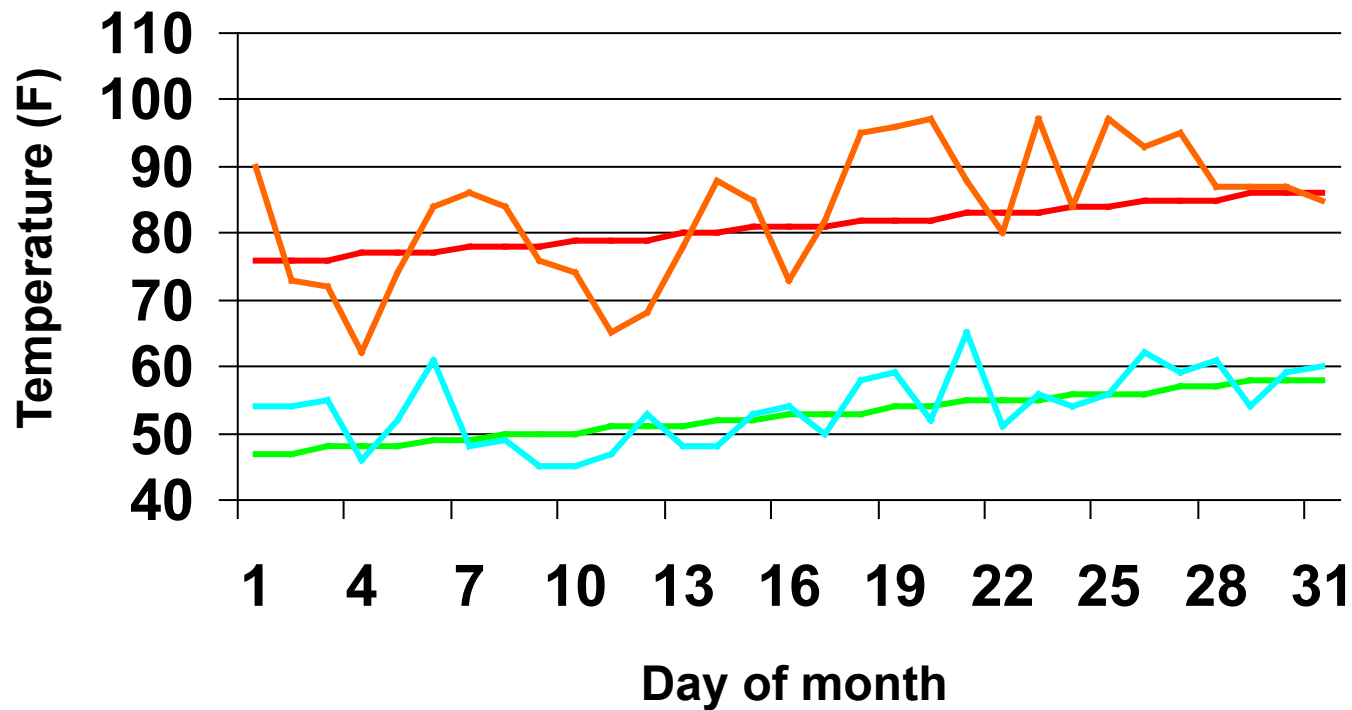


Total solar energy, in MJ/meter², calculated from the hourly average global solar radiation rates and converted to energy by integrating over time.

Amarillo

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

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



Heat Units

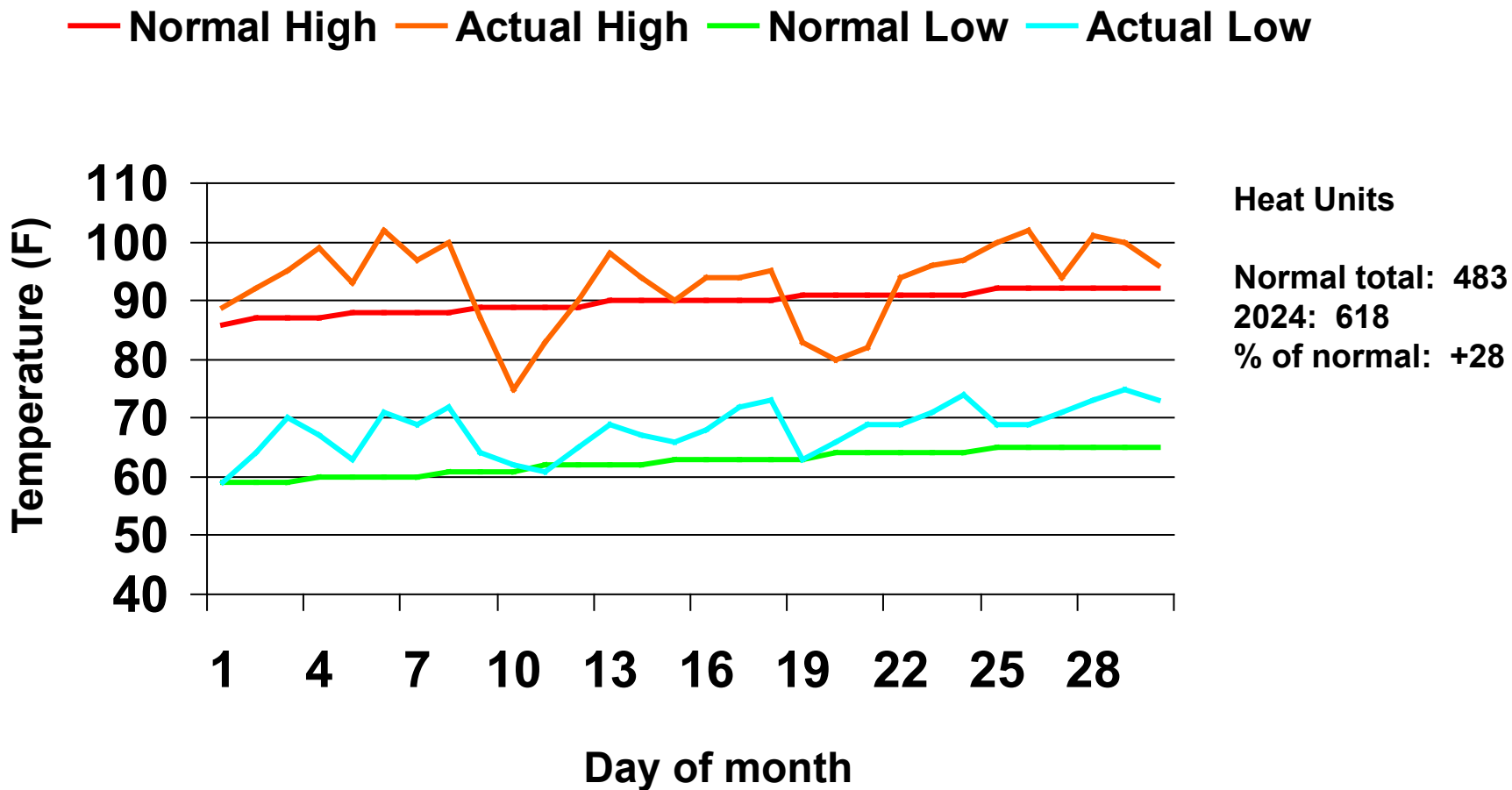
Normal total: 210

2024: 276

% of normal: +32

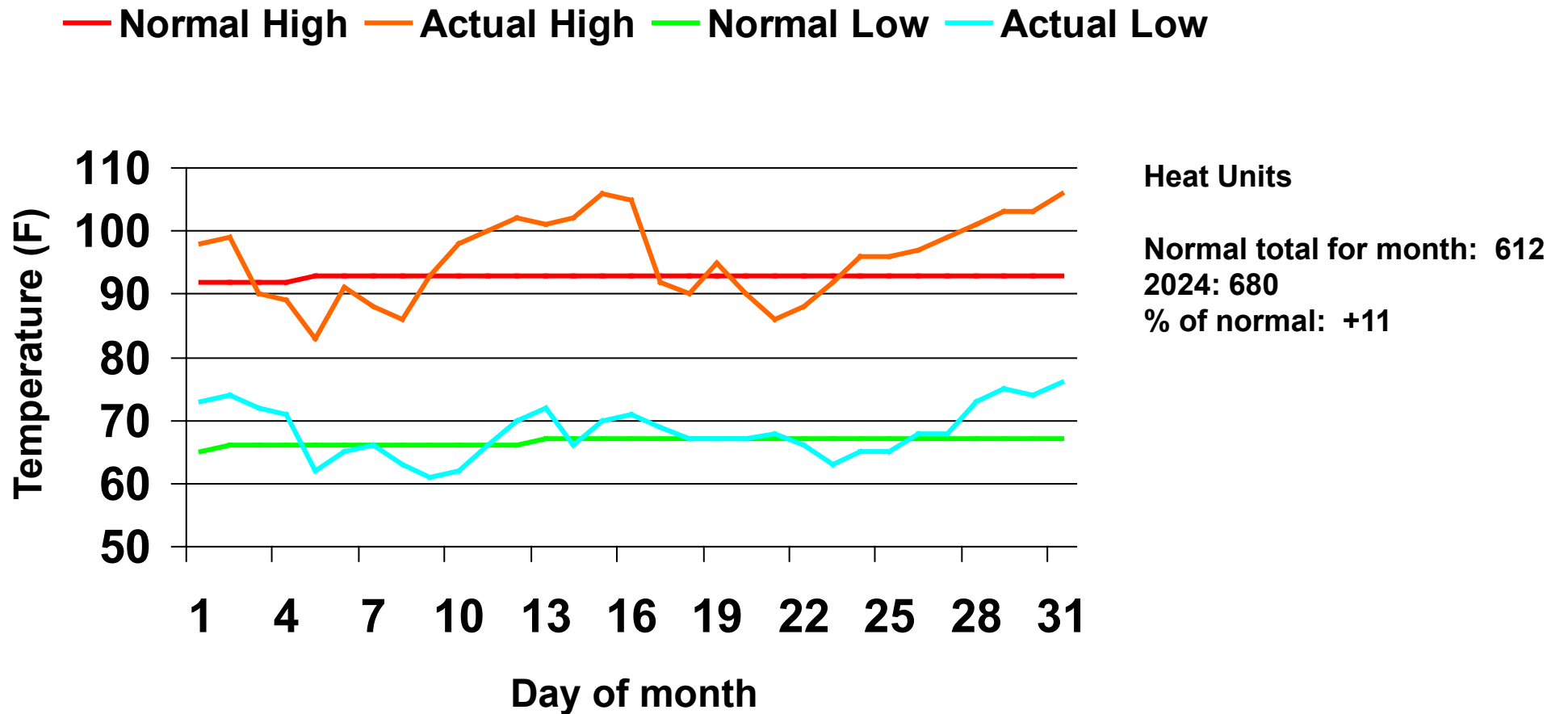
Amarillo

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



Amarillo

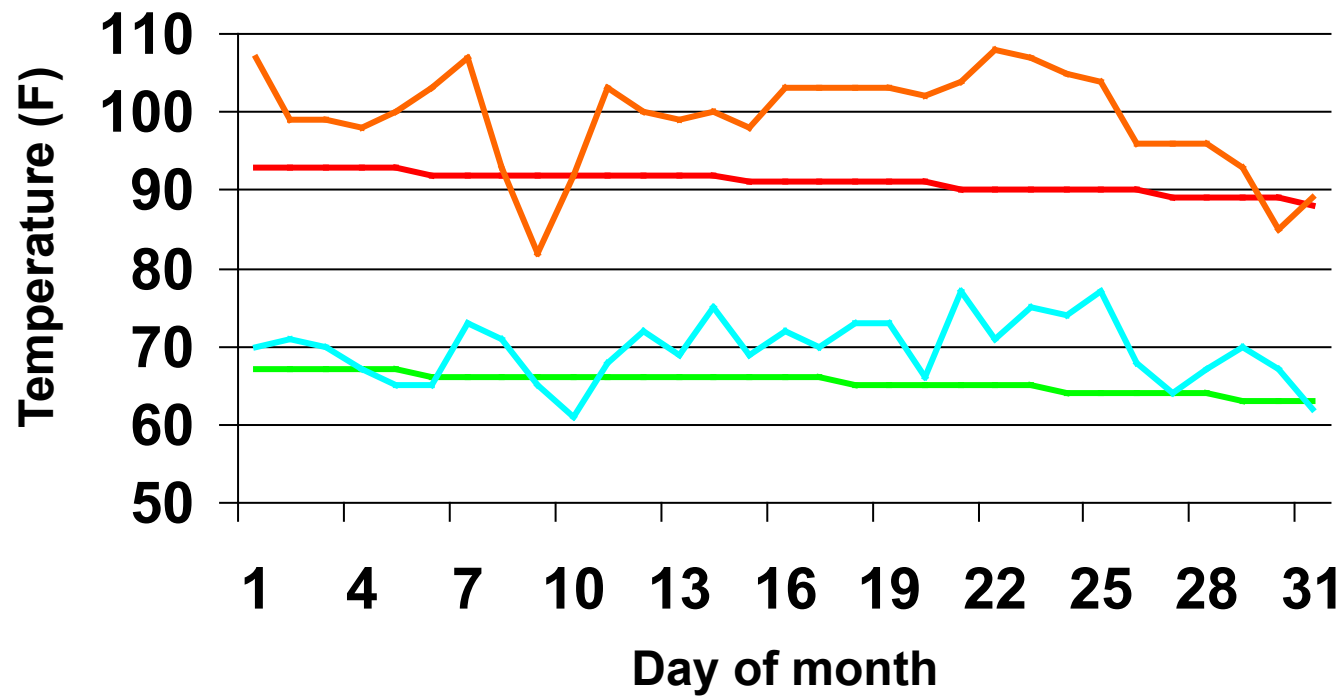
30-Yr Normal (1991-2020) and July 2024 Air Temperatures



Amarillo

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

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



Heat Units

Normal total for month: 565

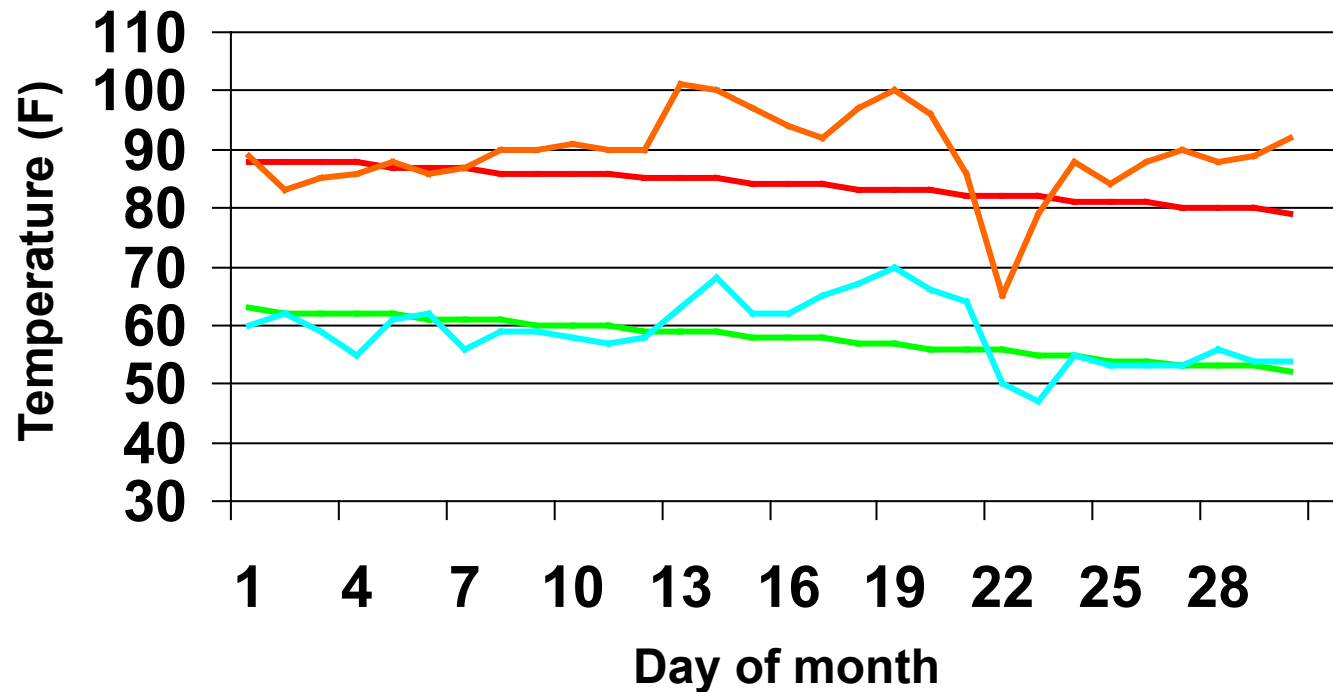
2024: 757

% of normal: +34

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

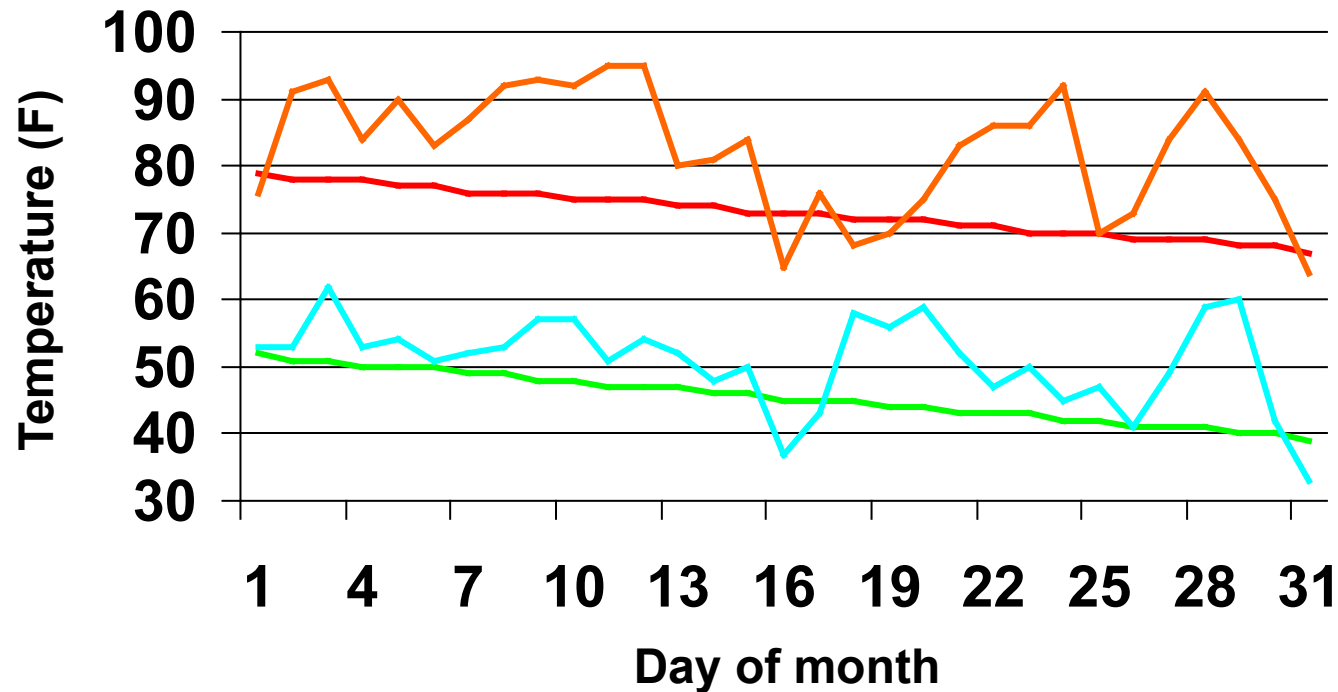
Sep 30: 6

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