



2019 Enlist Technology Cotton Variety Trial – Top of Texas Gin

Lance Williams Farm
Panhandle, TX

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

Ben Benton, Cotton Development Specialist – PhytoGen Cotton Seed

Billy Sam Borchardt and Steven Birkenfeld – Co-Managers Top of Texas Gin

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 new Cotton Agronomics Manager position. The objective of this program is to work with local producers to scientifically evaluate varieties in a commercial setting from planting through ginning.

This site was in cooperation with PhytoGen Cottonseed, Cotton Development Specialist Ben Benton. Six PhytoGen varieties with Enlist technology were planted in a center-pivot irrigated field in a scientifically valid trial with three replicates. Although early weather was extremely challenging, subsequent growing conditions were such that excellent yields were obtained. Quality was negatively impacted by the early October 11 freeze.

Harvest results indicated that statistically significant differences in lint yields were noted. Lint yields ranged from a high of 1701 lbs/acre to a low of 1380 lbs/acre, and averaged 1571 lbs/acre (Table 1). Average Loan value for varieties from commercially ginned and classed bales varied from a high of \$0.4346/lb to a low of \$0.3203/lb. Net value/acre (defined as gross lint loan value/acre plus net gin credit) ranged from a high of \$742/acre to a low of \$473/acre, a difference of \$269/acre. These differences were statistically significant.

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 indicate what 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: 3406 ft

Previous crop: corn harvested in 2018

Tillage system: strip-till

Planted: May 20

Replicates: 3 replicates in a randomized complete block design

Plot width: 8-row plots

Plot length: length of planted plot ~2,000 ft

Seeding rate: 50,000 seed/acre

30-inch rows under center pivot irrigation

Total irrigation: ~11 inches of irrigation

Rainfall (inches): May - 2.00, June – 3.98, July – 0.25, August – 2.68, September – 0.32, October – 2.05.

Nitrogen fertility: 150 lbs N/acre, 60 lb/acre P₂O₅

Plant growth regulators: 3 applications of mepiquat chloride (8 oz prebloom, 24 oz early bloom, 24 oz/acre late bloom)

Harvest aids: none

Harvesting: Dec 4 using a John Deere CS690, with harvested area calculated by the GPS on the stripper monitor. 1,300 to 1,500 ft plot length was harvested in one round module per plot. Round modules were weighed using the CS690 scale, and all round modules (from each of 3 reps) for each variety were weighed at the Top of Texas Gin.

Commercial ginning: Round modules for all 3 reps of each variety were staged together and commercially ginned separately by Top of Texas 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.

List of Tables

Table 1. Harvest results for the center pivot-irrigated Enlist technology cotton variety trial, Williams Farm, Panhandle, TX, 2019.

Table 2. Plant observations for the center pivot-irrigated Enlist technology cotton variety trial, Williams Farm, Panhandle, TX, 2019.

Table 3. Commercial classing data for the center pivot-irrigated Enlist technology cotton variety trial, Williams Farm, Panhandle, TX, 2019.

Appendix – Amarillo 2019 weather data.

Acknowledgements

Top of Texas Gin would like to thank Lance Williams with Williams Farms, LLC, for committing equipment, land, and time to conduct and manage the trial. Gratitude is expressed to PhytoGen Cottonseed, Corteva, and Windstar Inc. Detailed ginning was performed by Malcom Jones and the Top of Texas ginning crew and a big thank you is extended to this hard-working group.



2019 Enlist Technology Variety Trial – Top of Texas Gin

Lance Williams Farm
Panhandle, TX

Dr. Randy Boman
Cotton Agronomics Manager

Variety Descriptions from Company Literature and Websites

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 300 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 growth habit. Semi-smooth leaf, storm tolerance - excellent. Bacterial blight - resistant. Verticillium wilt - good. ~36.2 staple, ~30.1 g/tex strength.

PHY 320 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. Medium growth habit. Semi-smooth leaf, storm tolerance – very good. Bacterial blight - resistant. Verticillium wilt - good. Root knot nematode – highly resistant. ~36.2 staple, ~30.9 g/tex strength.

PHY 350 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 - excellent. Root knot nematode – highly resistant. ~36.8 staple, ~30.0 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 – very good. Bacterial blight - resistant. Verticillium wilt - susceptible. Root knot nematode – moderately resistant. ~36.2 staple, ~31.0 g/tex strength.

For more information go to: <https://phytogencottonseed.com/varieties>



Table 1. Harvest results for the center pivot-irrigated Enlist technology cotton variety trial, Williams Farm, Panhandle, TX, 2019.

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 -----	
PhytoGen PHY 210 W3FE	28.3	38.5	5885	1665	2264	0.4346	724	18	742 a
PhytoGen PHY 250 W3FE	27.3	35.5	6184	1689	2198	0.4320	729	3	732 a
PhytoGen PHY 400 W3FE	27.9	35.3	6095	1701	2153	0.3397	578	2	580 b
PhytoGen PHY 320 W3FE	26.0	33.0	5993	1561	1978	0.3410	532	-11	521 c
PhytoGen PHY 300 W3FE	25.5	32.6	5403	1380	1761	0.3585	494	-12	483 cd
PhytoGen PHY 350 W3FE	26.3	38.2	5440	1428	2080	0.3203	457	16	473 d
Test average	26.9	35.5	5833	1571	2072	0.3710	586	3	589
CV, %	--	--	4.2	4.2	4.2	--	4.1	20.9	4.1
OSL	--	--	0.0100	0.0004	0.0004	--	0.0001	0.0001	0.0001
LSD	--	--	444	120	160	--	43	1	43

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.

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

Assumes:

\$3.15/cwt commercial ginning cost.

\$180/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 observations for the center pivot-irrigated Enlist technology cotton variety trial, Williams Farm, Panhandle, TX, 2019.

Entry	Nodes above white flower	Plant height
	count 26-Aug	inches 26-Aug
PhytoGen PHY 210 W3FE	4.9	29
PhytoGen PHY 250 W3FE	4.5	31
PhytoGen PHY 300 W3FE	5.0	38
PhytoGen PHY 320 W3FE	5.9	35
PhytoGen PHY 350 W3FE	5.2	39
PhytoGen PHY 400 W3FE	5.2	35
Test average	5.1	34.5
CV, %	7.9	3.2
OSL	0.0327	0.0001
LSD	0.7	2.0

CV - coefficient of variation.

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

LSD - least significant difference at the 0.05 level.



Table 3. Commercial classing data for the center pivot-irrigated Enlist technology cotton variety trial, Williams Farm, Panhandle, TX, 2019.

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															
6991656	22-1	2	2	4	37	2.8	.	.	33.1	76.5	9.8	5	79.1	115	45.95
6991657	31-3	3	1	5	38	2.6	11	.	33.9	76.1	9.2	7	79.1	120	37.00
6991658	31-3	3	1	4	37	2.7	.	.	31.6	76.9	9.1	5	78.8	115	46.00
6991659	31-3	3	1	4	37	2.7	.	.	32.9	77.0	9.1	5	78.5	114	46.00
6991660	21-4	2	1	3	37	2.6	11	.	33.1	77.8	9.2	4	79.0	115	40.20
6991661	21-2	2	1	3	37	2.7	11	.	34.4	77.8	9.1	6	79.6	117	44.45
6991662	21-2	2	1	3	38	2.8	11	.	33.9	78.0	9.0	4	79.3	118	44.60
Average	--	2.4	1.1	3.7	37.3	2.7	57%	none	33.3	77.2	9.2	5.1	79.1	116.3	43.46
PHY 250 W3FE															
6991663	21-2	2	1	4	37	2.5	11	.	30.7	78.3	9.0	7	77.3	114	38.50
6991664	31-3	3	1	5	37	2.6	11	.	30.3	75.9	9.0	9	77.8	115	36.20
6991665	31-3	3	1	4	37	2.8	11	.	32.6	76.1	9.3	5	76.1	115	42.10
6991666	21-4	2	1	3	37	2.7	.	.	32.5	77.0	9.4	4	79.6	117	47.80
6991667	31-1	3	1	4	37	2.7	11	.	32.0	77.2	8.9	5	79.5	117	42.65
6991668	23-1	2	3	3	36	3.5	.	.	35.6	75.3	11.4	2	79.3	112	50.05
6991669	21-2	2	1	3	38	2.7	11	.	33.5	77.6	9.1	4	80.4	120	45.10
Average	--	2.4	1.3	3.7	37.0	2.8	71%	none	32.5	76.8	9.4	5.1	78.6	115.7	43.20
PHY 300 W3FE															
6991670	22-2	2	2	3	37	2.6	.	.	30.0	75.4	10.3	5	78.2	114	41.75
6991671	32-1	3	2	4	36	2.7	11	.	30.3	74.3	10.2	6	77.0	113	39.35
6991672	32-1	3	2	5	36	2.5	11	.	27.9	72.8	10.3	9	77.8	113	33.10
6991673	32-1	3	2	5	36	2.6	11	.	28.5	73.3	10.3	7	78.1	113	33.55
6991674	32-1	3	2	5	37	2.5	11	.	31.3	72.5	10.4	8	79.3	115	34.15
6991675	32-1	3	2	5	37	2.5	11	.	27.2	73.0	10.1	8	77.4	114	33.20
Average	--	2.8	2.0	4.5	36.5	2.6	83%	none	29.2	73.6	10.3	7.2	78.0	113.7	35.85



Table 3 (continued). Commercial classing data for the center pivot-irrigated Enlist technology cotton variety trial, Williams Farm, Panhandle, TX, 2019.

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 320 W3FE															
6991676	22-2	2	2	5	37	2.5	.	.	29.2	75.7	9.9	8	79.8	117	38.90
6991677	32-1	3	2	5	37	2.5	11	.	28.4	74.0	9.8	8	77.6	114	33.20
6991678	32-1	3	2	6	37	2.5	11	.	28.3	74.0	9.7	9	78.2	115	31.65
6991679	32-2	3	2	5	36	2.5	11	.	27.3	72.8	9.9	8	78.3	112	33.55
6991680	32-1	3	2	5	37	2.5	11	.	27.3	75.1	9.5	9	78.5	116	33.65
6991681	32-1	3	2	5	37	2.5	11	.	27.2	75.4	9.4	8	78.9	116	33.65
Average	--	2.8	2.0	5.2	36.8	2.5	83%	none	28.0	74.5	9.7	8.3	78.6	115.0	34.10
PHY 350 W3FE															
6991682	22-2	2	2	4	37	2.5	.	.	27.8	76.2	9.9	6	78.6	117	41.10
6991683	32-1	3	2	4	37	2.5	11	.	27.6	74.9	9.9	6	77.1	116	34.95
6991684	32-1	3	2	5	36	2.5	11	.	27.0	73.6	9.7	8	76.7	113	33.10
6991685	32-2	3	2	7	37	2.6	11	.	25.0	73.4	9.5	11	77.6	116	28.45
6991686	32-2	3	2	6	38	2.4	11	.	26.2	74.0	9.6	11	78.2	118	27.35
6991687	32-1	3	2	5	37	2.4	11	.	25.5	75.1	9.7	8	76.4	114	27.25
Average	--	2.8	2.0	5.2	37.0	2.5	83%	none	26.5	74.5	9.7	8.3	77.4	115.7	32.03
PX3B07 (PHY 400 W3FE)															
6991688	31-3	3	1	5	38	2.6	11	.	24.4	75.9	9.3	9	77.2	118	33.95
6991689	32-2	3	2	5	37	2.5	11	.	29.9	74.2	9.6	9	78.6	117	33.70
6991690	32-1	3	2	5	37	2.6	11	.	28.6	74.2	9.9	8	77.4	115	33.20
6991691	32-1	3	2	5	37	2.6	11	.	30.1	74.4	9.8	8	78.4	115	33.90
6991692	32-1	3	2	5	37	2.5	11	.	30.1	75.1	10.0	7	77.5	115	33.45
6991693	31-3	3	1	5	37	2.5	11	.	28.2	75.7	9.5	8	77.7	117	35.95
6991694	32-1	3	2	5	37	2.5	11	.	28.7	75.1	9.4	9	78.5	117	33.65
Average	--	3.0	1.7	5.0	37.1	2.5	100%	none	28.6	74.9	9.6	8.3	77.9	116.3	33.97



Appendix

Amarillo 2019 weather data



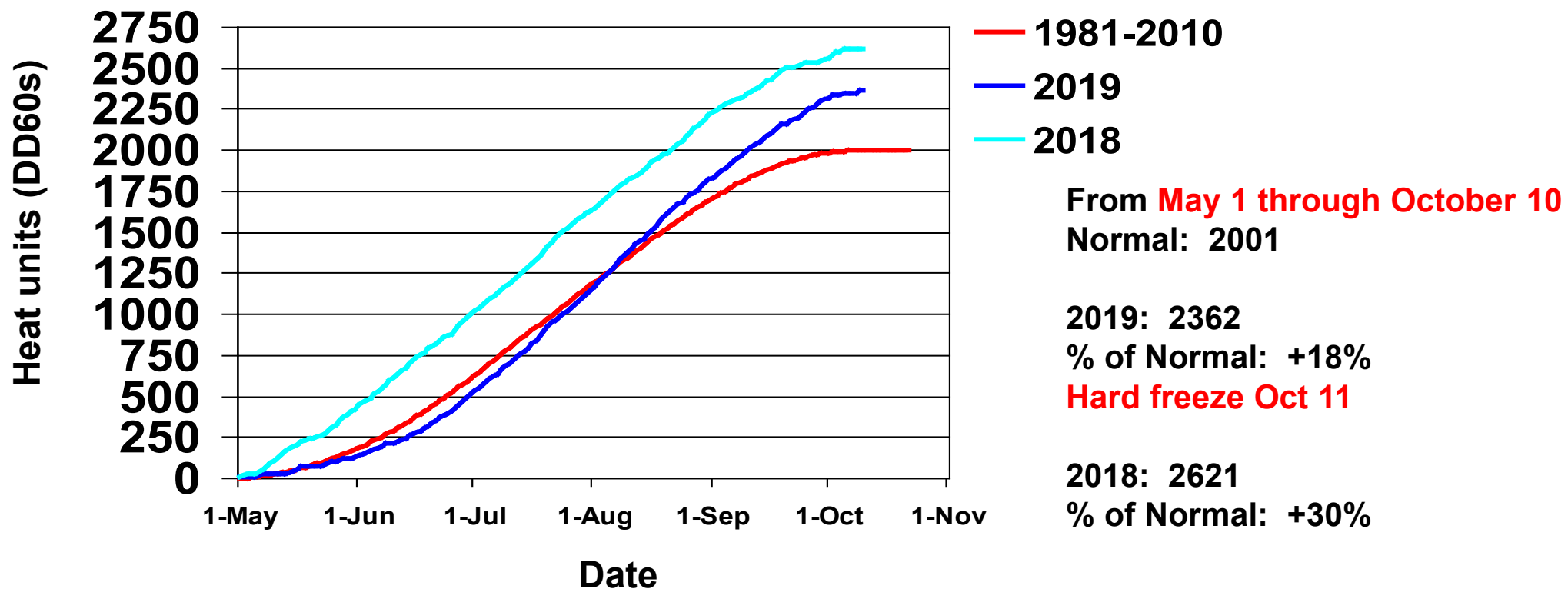
Amarillo 2019 Weather vs. 30-Year Normal

Month	Normal DD60 (Actual)	Percent of Normal
May	177 (130)	-27%
June	433 (383)	-12%
July	566 (632)	+12%
August	522 (677)	+30%
September	286 (494)	+73%
October	19 (48)	+152 Hard freeze on Oct 11
Season (May 1 to end of season)	2001 (2362)	+18%



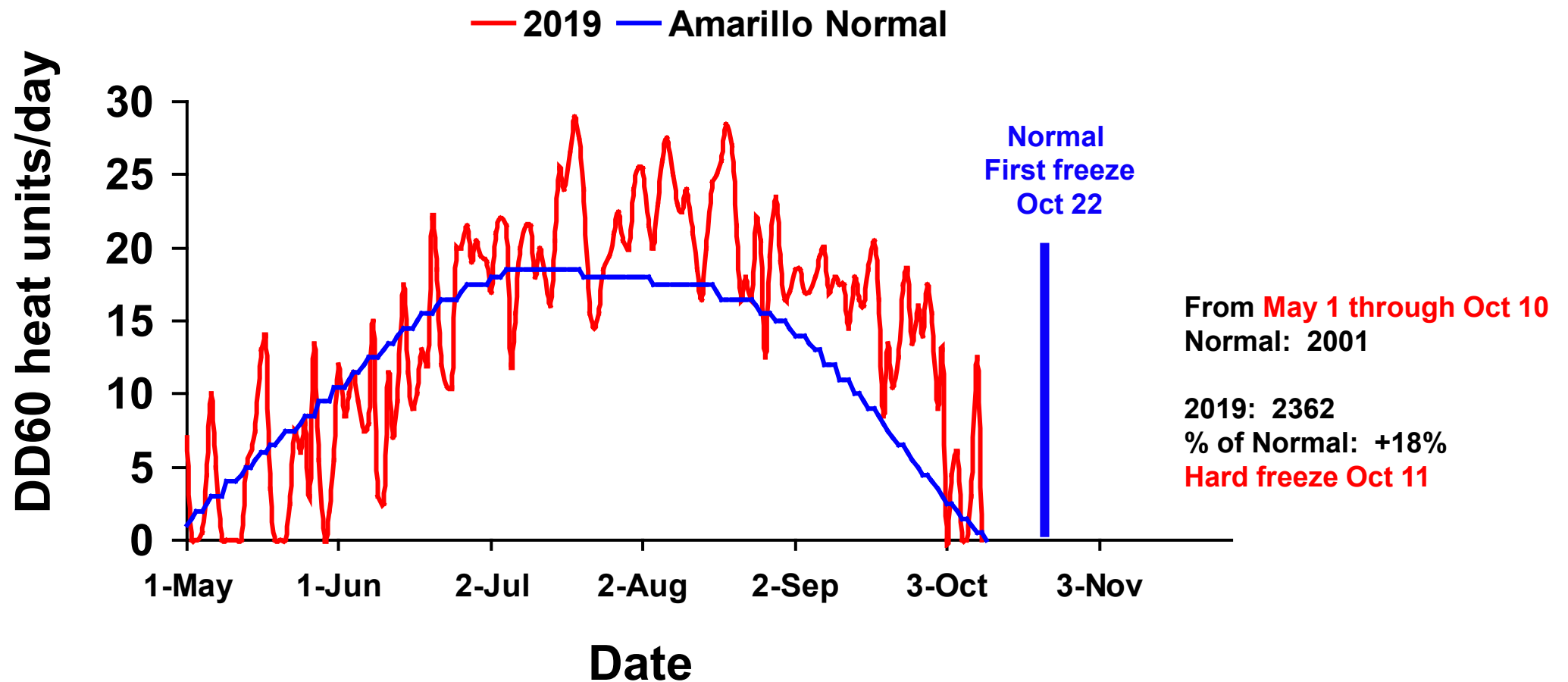
Amarillo 30-Yr Normal (1981-2010) vs. 2018 and 2019

Cotton Heat Unit Accumulation for May 1 Through October 10



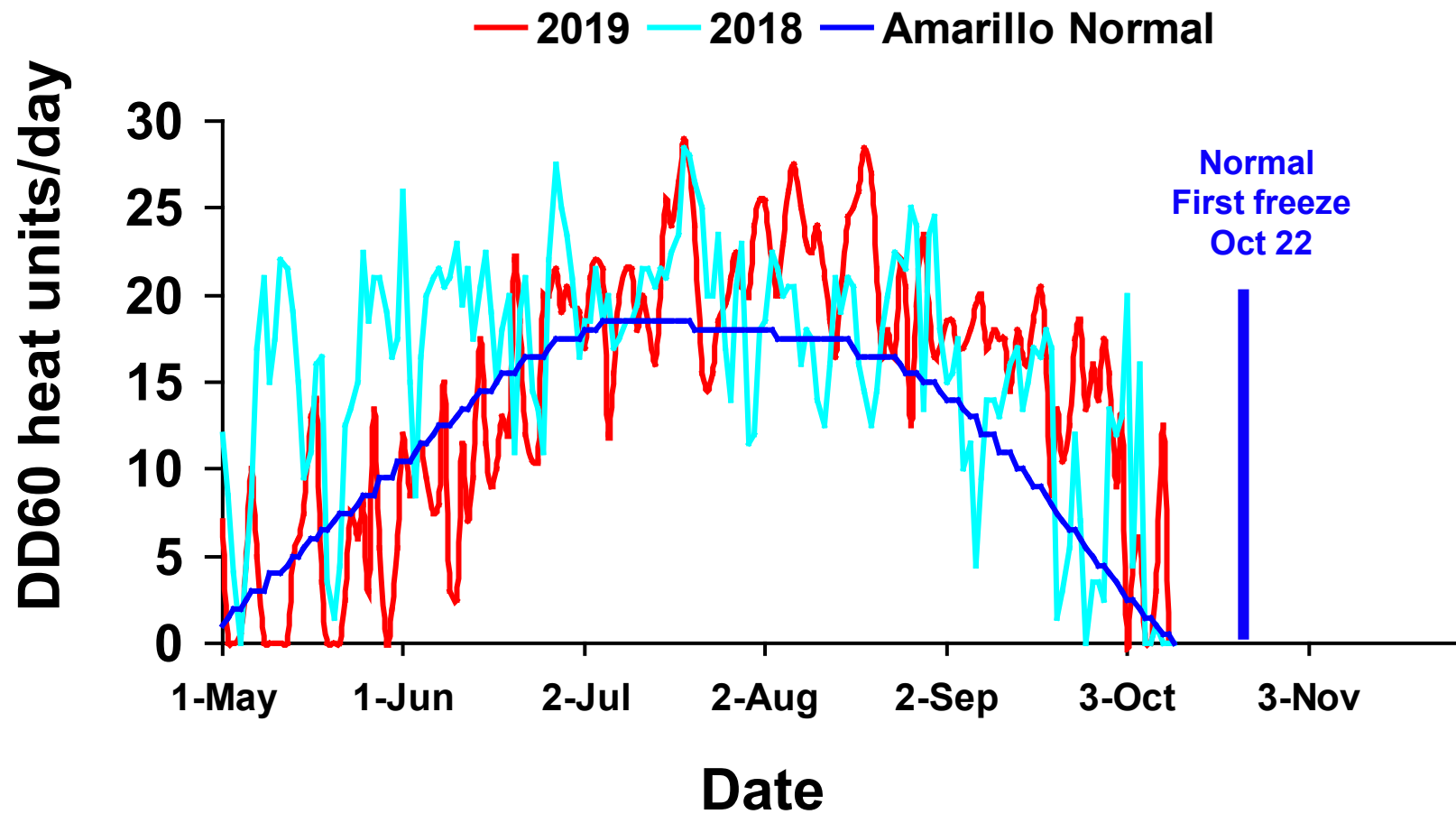
Amarillo

30-Year Normal (1981-2010) and 2019 Daily Heat Units



Amarillo

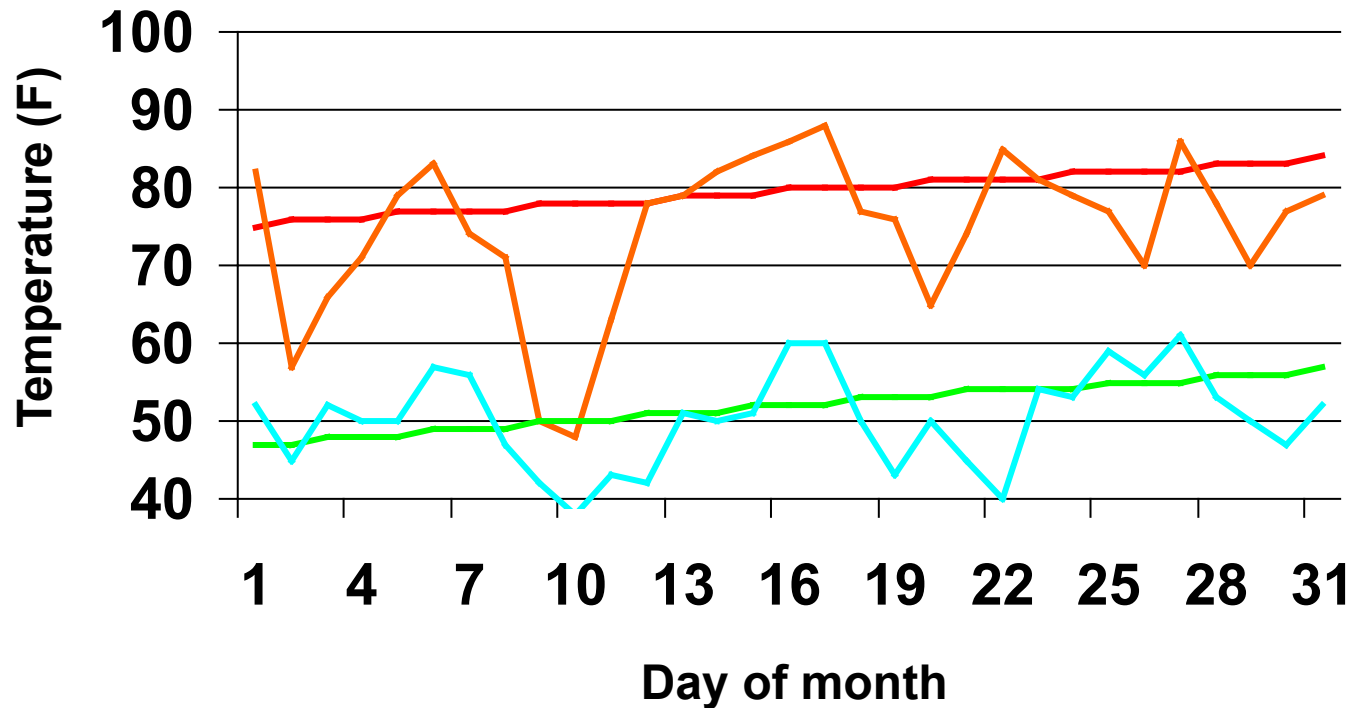
30-Year Normal (1981-2010), 2018 and 2019 Daily Heat Units



Amarillo

30-Yr Normal (1981-2010) and May 2019 Air Temperatures

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



Heat Units

Normal: 177

2019: 130

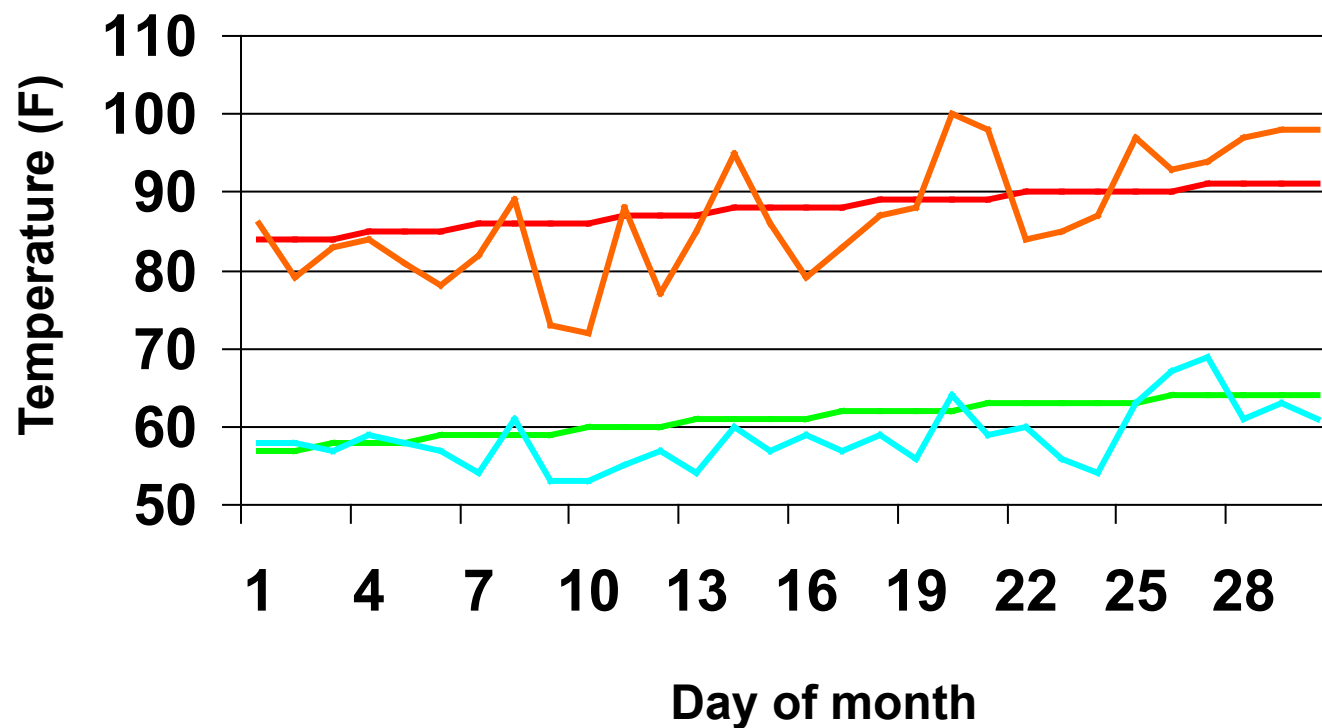
% of normal: -27%



Amarillo

30-Yr Normal (1981-2010) and June 2019 Air Temperatures

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



Heat Units

Normal: 433

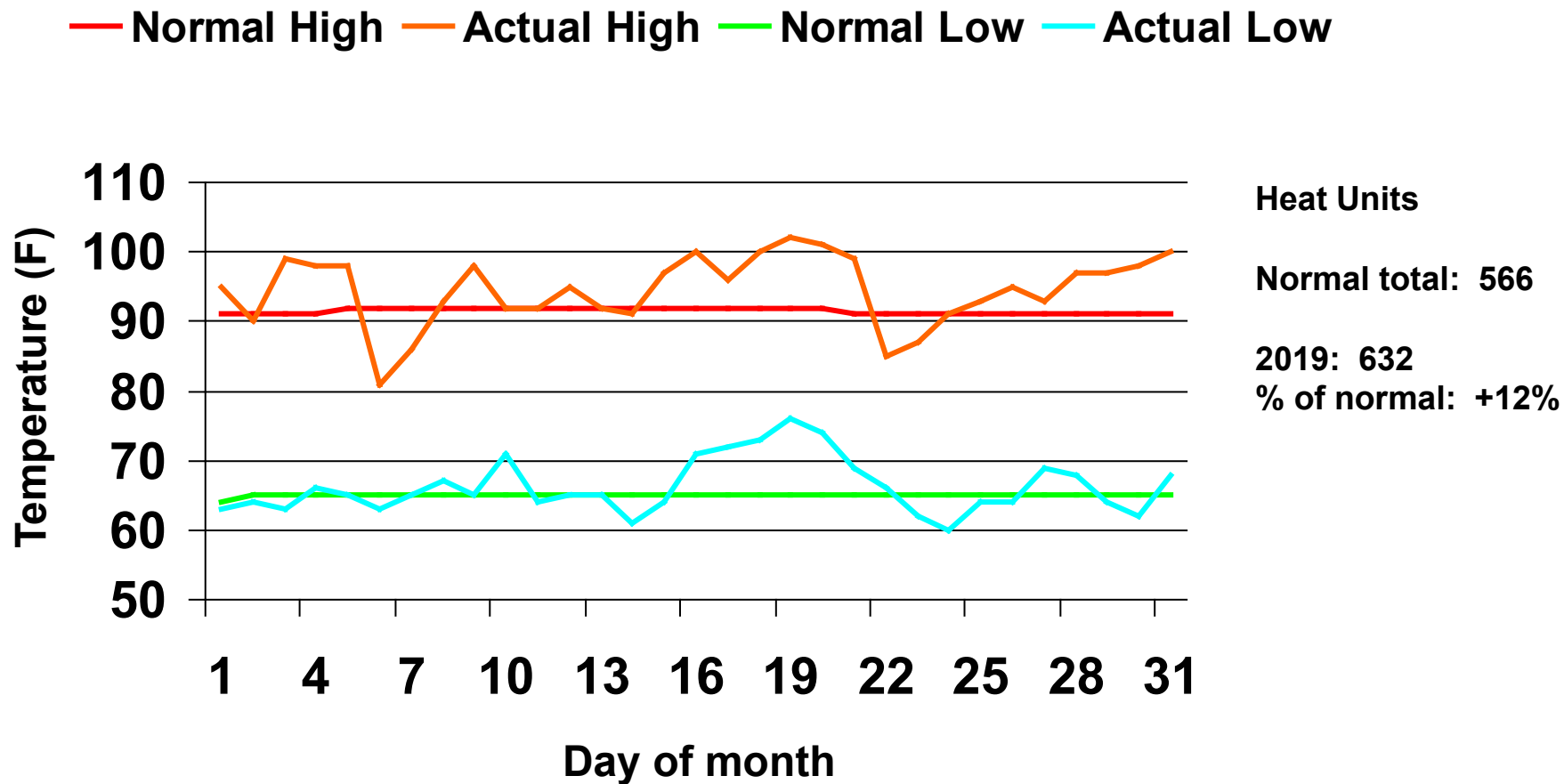
2019: 383

% of normal: -12



Amarillo

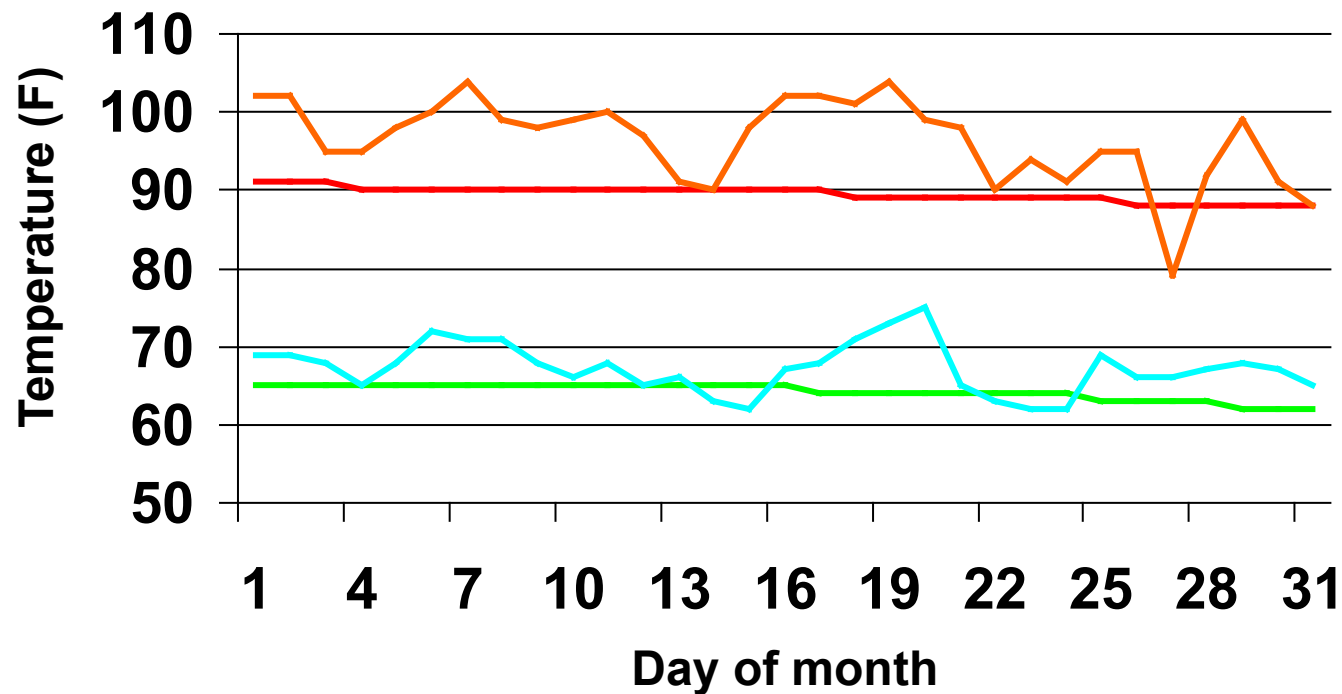
30-Yr Normal (1981-2010) and July 2019 Air Temperatures



Amarillo

30-Yr Normal (1981-2010) and August 2019 Air Temperatures

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



Heat Units

Normal for Month: 522

2019: 677

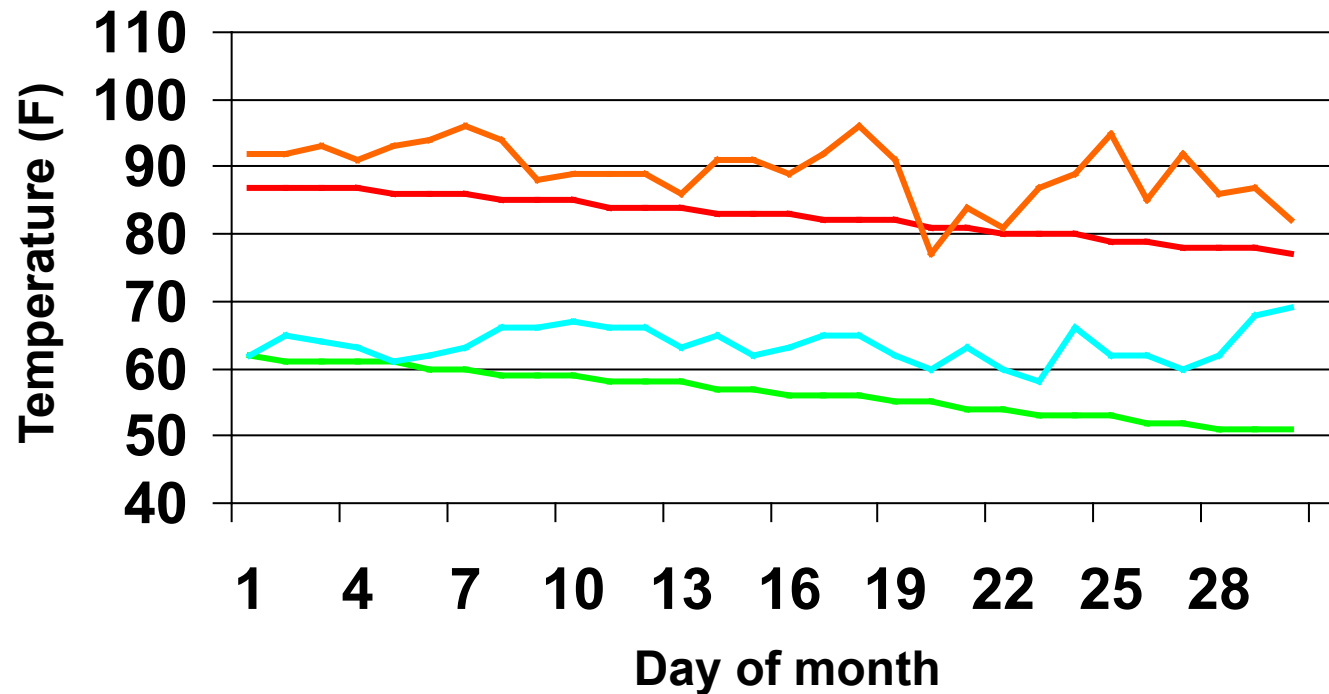
% of normal: +30%



Amarillo

30-Yr Normal (1981-2010) and September 2019 Air Temperatures

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



Heat Units

Normal for Month: 286

2019: 494

% of normal: +73



Amarillo

30-Yr Normal (1981-2010) and October 2019 Air Temperatures

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

