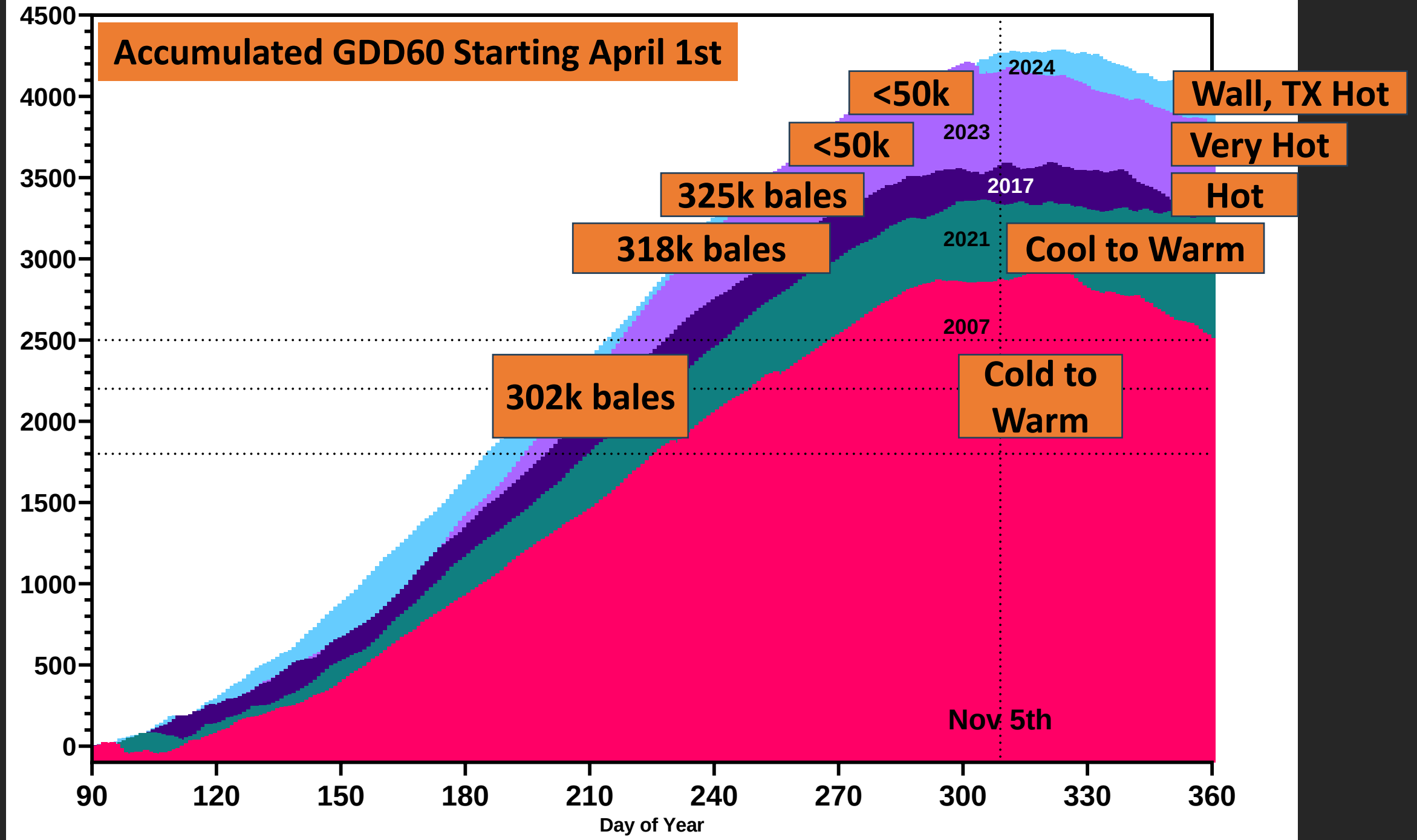
Gregory Bryan Wilson
IPM Program Specialist, TAMU AgriLife Extension

Tom Green / Runnels
Districts 3, 6, and 7
gregory.wilson@ag.tamu.edu
972-743-0045

From 2022 to 2024, the area experienced prolonged heat waves during the critical growing months of May to August.

- Managing insect and weed pests has been tremendously challenged.


Accumulated GDD60 Starting April 1st
4500
4000
3500
3000
2500
2000
1500
1000
500
0
90
120
150
180
210
240
270
300
330
360
Day of Year
2024
<50k
Wall, TX Hot
2023
<50k
Very Hot
2017
325k bales
Hot
2021
318k bales
Cool to Warm
2007
302k bales
Cold to Warm
Nov 5th

Wireworms, Thrips, Pillbugs
until 3rd week in May

Grasshoppers, Aphids, Stink Bugs, and Leaf Footed from
June until Sept

Very few seed treatments, sprays, or over-threshold pests

Severely reduced yield
AVG Bale : Acre = 0.13
(2022-2024)

Per Acre Value of Program for:
Sorghum- $18.22
Cotton- $27.50
Wheat- $15.00

12 Weeks of Pest Trapping

889 Traps-checked in 23

682 Traps in 24 (missing Corpus)

Don’t Worry!
There is nothing to fear,
We didn’t catch anything of importance.

12 Weeks of Pest Trapping

889 Traps-checked in 23

682 Traps in 24 (missing Corpus)

Plus, some fall monitoring

12-15/4d CBW (Miles)
3-5/4d CBW (Wall)

4/4d FAW (Miles)
4-5/4d CBW (Wall)

Both peaked end of Sept. Until crashing the last week in November.

27 IPM-based lessons / programs for various AgriLife and industry events across 12 counties.

Top 4 most discussed topics in 2024.

1. BGSM-mgmt
2. Modes of Action
3. What's up with these wasps/hoppers/desert termites?
4. When should I plant?

The Future

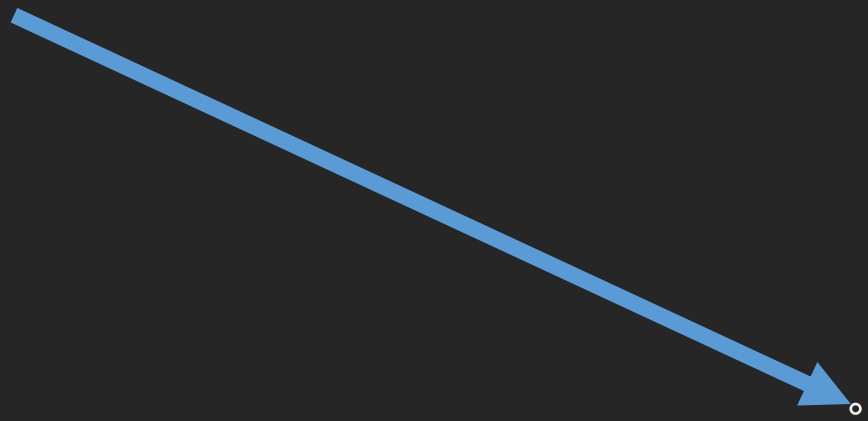
Top 10 Goals for 2025

1. Greater involvement with growers (more interactions)
2. Increase presence in D7 programs
3. Hire a wonderkind
4. Scout roughly the same area
5. No drought
6. Pillbugs, Corn Leafhopper, Wireworms, Planting date, and Residue Management
7. Gain 10 pounds
8. Improve online availability of past data and newsletters
9. Automate my weather station datasets
10. Not get my butt-kicked by #Farm-Life

Gregory Bryan Wilson
IPM Program Specialist, TAMU AgriLife Extension

Tom Green / Runnels
Districts 3, 6, and 7
gregory.wilson@ag.tamu.edu
972-743-0045

The Grain of Salt



I am not trying to prove anything.

I needed insight into my growing region. (I’m still a rookie)

Seeking your experience to serve my growers better.

If there's a 10-20% chance of a significant drought in any given year

the serial probability of four in a row = 0.01% to 0.16%

Remember the drought of record from 1950 to 1957. Are we there again? Or are we in something different?

HOW HOT IS TOO HOT?

Southern Rolling Plains

Zone 8a

min avg temp - 10–15°F

Zone 8b

min avg temp - 15–20°F

2022-2024, suffered major droughts.

Stratford
Dallam
Sherman
Perryton
Hansford
Spearman
Ochiltree
Lipscomb
Lipscomb
Dalhart
Hartley
Dumas
Hutch-
inson
Roberts
Canadian
Stinnett
Channing
Moore
Miami
Hemphill
Pampa
Oldham
Potter
Carson
Wheeler
Panhandle
Vega
Gray
Wheeler
Amarillo
Deaf Smith
Claude
Donley
Colling
sworth
Canyon
Armstrong
Clarendon
Wellington
Hereford
Randall
Memphis
Parmer
Swisher
Hall
Child-
ress
Dimmitt
Tulia
Silverton
Childress
Farwell
Castro
Briscoe
Quanah
Muleshoe
Plainview
Floyd
Motley
Cottle
Harde-
man
Vernon
Bailey
Lamb
Hale
Paducah
Wilbarger
Wichita
Littlefield
Floydada
Matador
Crowell
Foard
Wichita Falls
Henrietta
Morton
Hockley
Crosby
King
Knox
Baylor
Archer
Clay
Montague
Grayson
Levelland
Crosbyton
Guthrie
Montague
Sherman
Lamar
Red
River
Titus
Franklin
Lubbock
Dickens
Benjamin
Seymour
Archer City
Gainesville
Paris
Bonham
Clarksville
Cochran
Lubbock
Dickens
Cooke
Fannin
Delta
Boston
Yoakum
Terry
Lynn
Garza
Jayton
Haskell
Throck-
morton
Young
Jack
Wise
Denton
Collin
Cooper
Hopkins
Bowie
Morris
Plains
Tahoka
Post
Stonewall
Haskell
Throckmorton
Decatur
McKinney
Mount Vernon
Cass
Brownfield
Kent
Aspermont
Graham
Jacksboro
Denton
Greenville
Sulphur Springs
Mount Pleasant
Linden
Rock-
wall
Hunt
Rains
Pittsburg
Daingerfield
Gaines
Dawson
Scurry
Rockwall
Emory
Camp
Breckenridge
Weatherford
Parker
Tarrant
Marion
Seminole
Lamesa
Gail
Snyder
Roby
Anson
Albany
Palo Pinto
Fort
Worth
Dallas
Quitman
Gilmer
Jefferson
Borden
Fisher
Jones
Shack-
elford
Stephens
Palo Pinto
Dallas
Kaufman
Van
Zandt
Wood
Upshur
Harrison
Kaufman
Marshall
Sweetwater
Abilene
Eastland
Granbury
Johnson
Canton
Gregg
Andrews
Martin
Howard
Colorado City
Baird
Erath
Hood
Cleburne
Waxahachie
Tyler
Longview
Andrews
Big Spring
Eastland
Henderson
Smith
Rusk
Stanton
Mitchell
Nolan
Callahan
Stephenville
Glen Rose
Ellis
Athens
Henderson
Carthage
Panola
Midland
Glasscock
Coke
Comanche
Somer-
vell
Hill
Corsicana
El Paso
El Paso
Hudspeth
Loving
Kermit
Odessa
Garden City
Robert Lee
Comanche
Hillsboro
Navarro
Anderson
Shelby
Winkler
Ector
Midland
Sterling City
Meridian
Bosque
Palestine
Rusk
Nacog-
doches
San
Augustine
Center
Culberson
Mentone
Monahans
Sterling
Hamilton
Hamilton
Waco
Freestone
Cherokee
Nacogdoches
Crane
Brown
Mills
Fairfield
Groesbeck
San Augustine
Pecos
Ward
Crane
Upton
Reagan
Irion
Goldthwaite
Gatesville
McLennan
Limestone
Houston
Sabine
Reeves
Rankin
Mertzon
McCulloch
San Saba
Lamp-
asas
Coryell
Falls
Marlin
Crockett
Lufkin
Hemphill
Big Lake
Centerville
Angelina
Sierra Blanca
San
Saba
Lampasas
Bell
Leon
Trinity
Newton
Van Horn
Schleicher
Belton
Franklin
Madison
Groveton
Jasper
Jeff Davis
Fort Stockton
Crockett
Eldorado
Menard
Menard
Burnet
Cameron
Rober-
tson
Madisonville
Polk
Newton
Ozona
Mason
Llano
Burnet
Williamson
Milam
Walker
Woodville
Livingston
Pecos
Mason
Georgetown
Bryan
Huntsville
Fort Davis
Kimble
Mason
Llano
Caldwell
Brazos
Grimes
Coldspring
Tyler
Jasper
Sonora
Junction
Lee
Burleson
Anderson
San
Jacinto
Marfa
Alpine
Sutton
Gillespie
Austin
Travis
Conroe
Kountze
Fredericksburg
Johnson City
Giddings
Washington
Montgomery
Liberty
Hardin
Terrell
Edwards
Kerr
Blanco
Bastrop
Brenham
Sanderson
Orange
Presidio
Kerrville
Kendall
Hays
Bastrop
Hempstead
Liberty
Beaumont
Brewster
Rocksprings
Boerne
San Marcos
Lockhart
Bellville
Harris
Val Verde
Real
Bandera
Comal
Cald-
well
Fayette
La Grange
Austin
Houston
Jefferson
Leakey
Bandera
New Braunfels
Seguin
Columbus
Anahuac
Kinney
Uvalde
San Antonio
Guad-
alupe
Gonzales
Colorado
Richmond
Orange
Del Rio
Brackettville
Hondo
Bexar
Gonzales
Hallettsville
Fort
Bend
Chambers
Uvalde
Medina
Floresville
Wilson
Lavaca
Wharton
Galveston
Cuero
Dewitt
Wharton
Brazoria
Angleton
Galveston
Maverick
Zavala
Jourdanton
Karnes City
Edna
Bay City
Eagle Pass
Pearsall
Frio
Atascosa
Kames
Victoria
Jackson
Matagorda
Crystal City
Goliad
Victoria
Carrizo Springs
Tilden
Bee
Goliad
Port Lavaca
Cotulla
Beeville
Refugio
Calhoun
Dimmit
La Salle
McMullen
George West
Refugio
Live Oak
Aransas
Sinton
San
Patricio
Rockport
Webb
Duval
Jim Wells
Corpus Christi
San Diego
Alice
Nueces
Laredo
Kingsville
Kleberg
Hebbronville
Falfurrias
Sarita
Zapata
Jim
Hogg
Brooks
Kenedy
Zapata
Starr
Raymondville
Rio Grande City
Hidalgo
Willacy
Edinburg
Cameron
Brownsville
County Seat
© geology.com

Characterized by hot, dry summers, a distinct dry period during the summer with high evaporation rates;

essentially a semi-arid climate with significant temperature fluctuations between seasons.

Key points

Rainfall: Historical - avg annual 20 to 28 inches.

Wind: Moderate to strong winds are common.

Precipitation pattern: A noticeable dry period during the summer months.

MEAN (2007-2024)

Degrees >100 = 90 (sum of degrees)

Days of Heat >100 = 28

Most Consecutive-Days >100 = 11

Total-Days >100 = 22

Bale Output = 200,897

Seasonal Rainfall (May-Aug) = 9.7 inch

Post-Seasonal Rainfall (Sept-Dec) = 7.5

Pre-Seasonal Rainfall (Jan-Apr) = 4.1

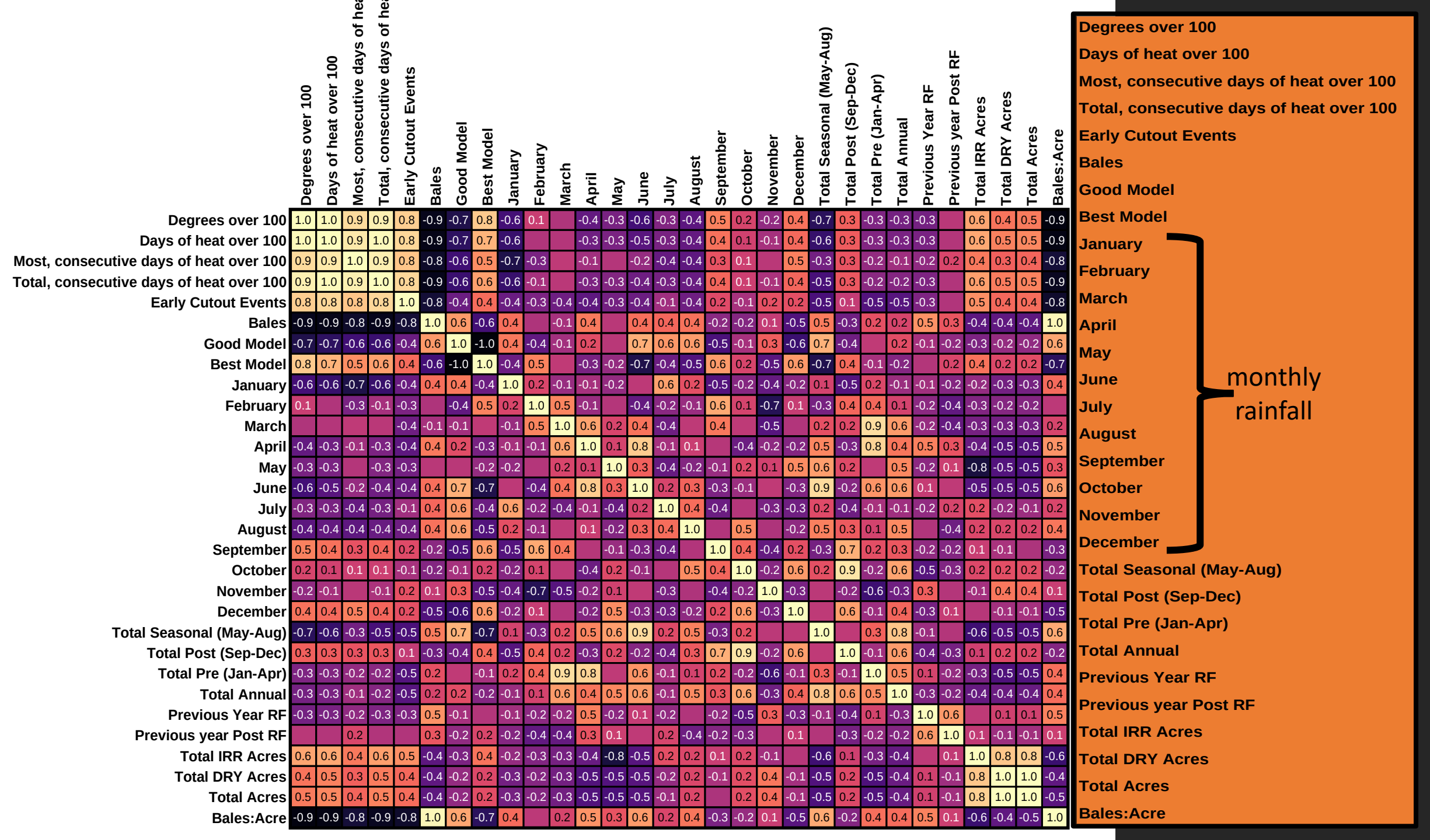
Total Annual = 21

Irrigated Acres = 33873

Dryland Acres = 214383

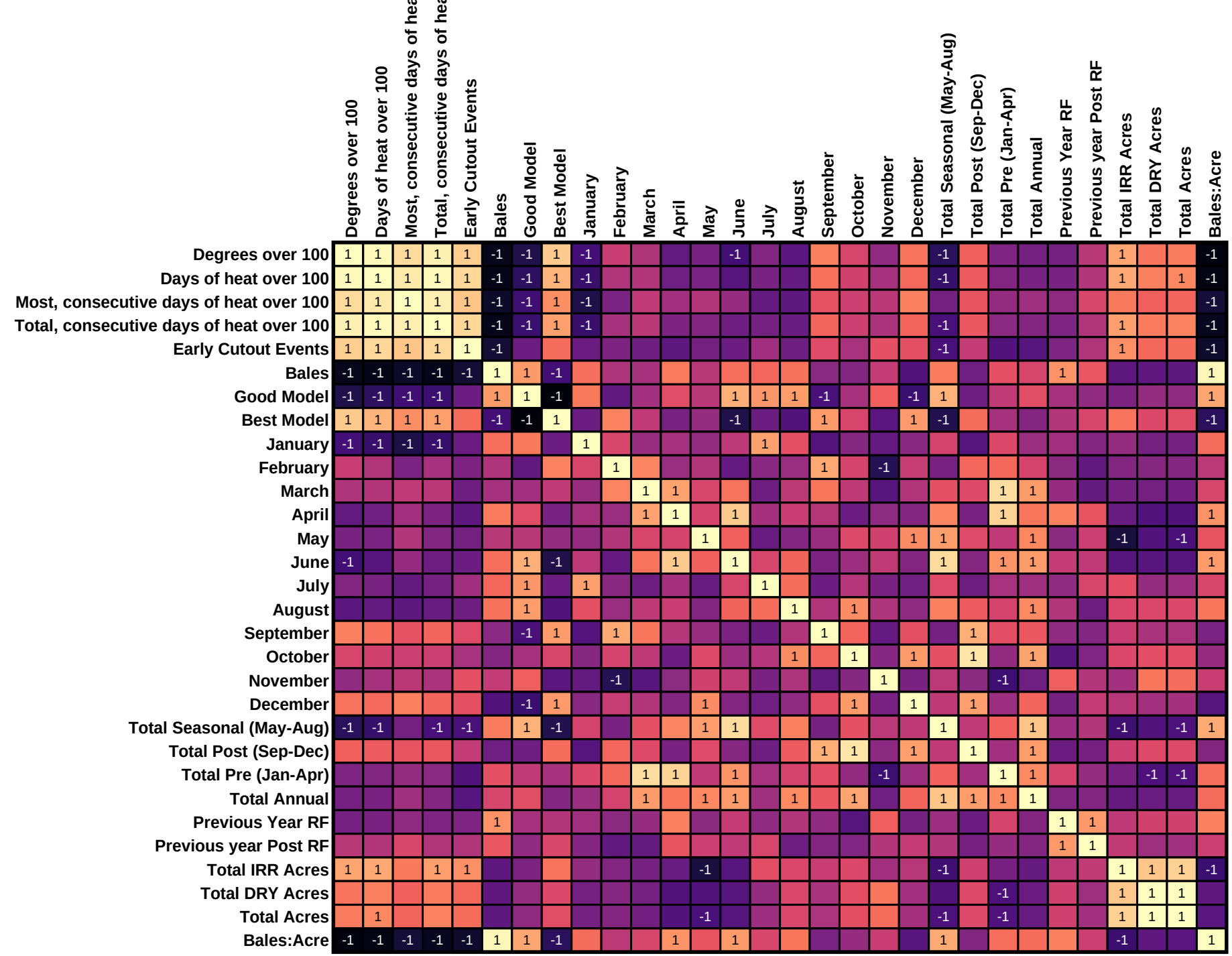
Total = 248,256

Bale to Acre Ratio = 0.80


Degrees over 100
Days of heat over 100
Most, consecutive days of heat over 100
Total, consecutive days of heat over 100
Early Cutout Events
Bales
Good Model
Best Model
January
February
March
April
May
June
July
August
September
October
November
December
Total Seasonal (May-Aug)
Total Post (Sep-Dec)
Total Pre (Jan-Apr)
Total Annual
Previous Year RF
Previous year Post RF
Total IRR Acres
Total DRY Acres
Total Acres
Bales:Acre
monthly rainfall

	Degrees over 100	Days of heat over 100	Most, consecutive days of heat over 100	Total, consecutive days of heat over 100	Early Cutout Events	Bales	Good Model	Best Model	January	February	March	April	May	June	July	August	September	October	November	December	Total Seasonal (May-Aug)	Total Post (Sep-Dec)	Total Pre (Jan-Apr)	Total Annual	Previous Year RF	Previous year Post RF	Total IRR Acres	Total DRY Acres	Total Acres	Bales:Acre
Bales	-0.9	-0.9	-0.8	-0.9	-0.8	1.0	0.6	-0.6	0.4		-0.1	0.4		0.4	0.4	0.4	-0.2	-0.2	0.1	-0.5	0.5	-0.3	0.2	0.2	0.5	0.3	-0.4	-0.4	-0.4	1.0

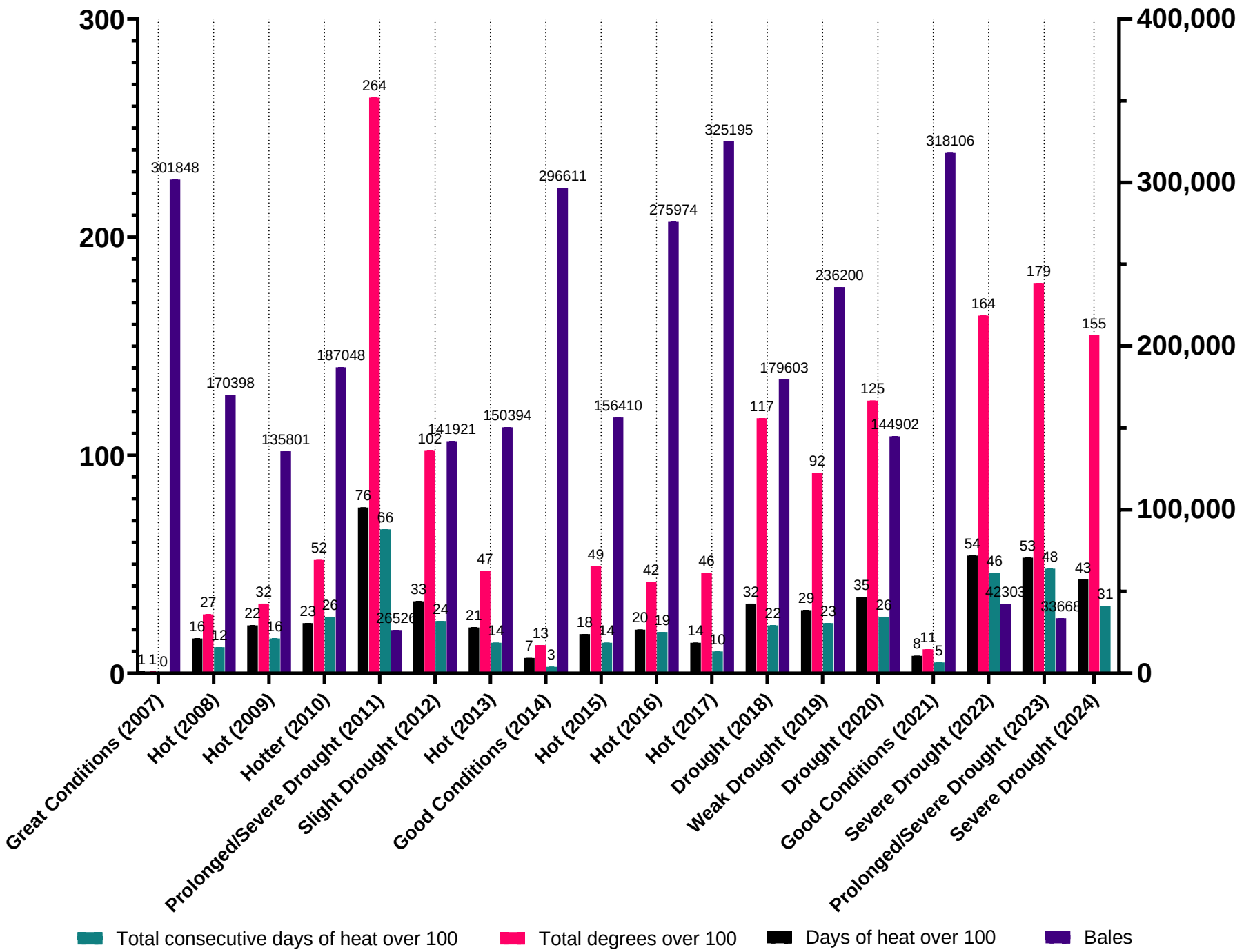
Degrees over 100
Days of heat over 100
Most, consecutive days of heat over 100
Total, consecutive days of heat over 100
Early Cutout Events
Bales
Good Model
Best Model
January
February
March
April
May
June
July
August
September
October
November
December
Total Seasonal (May-Aug)
Total Post (Sep-Dec)
Total Pre (Jan-Apr)
Total Annual
Previous Year RF
Previous year Post RF
Total IRR Acres
Total DRY Acres
Total Acres
Bales:Acre

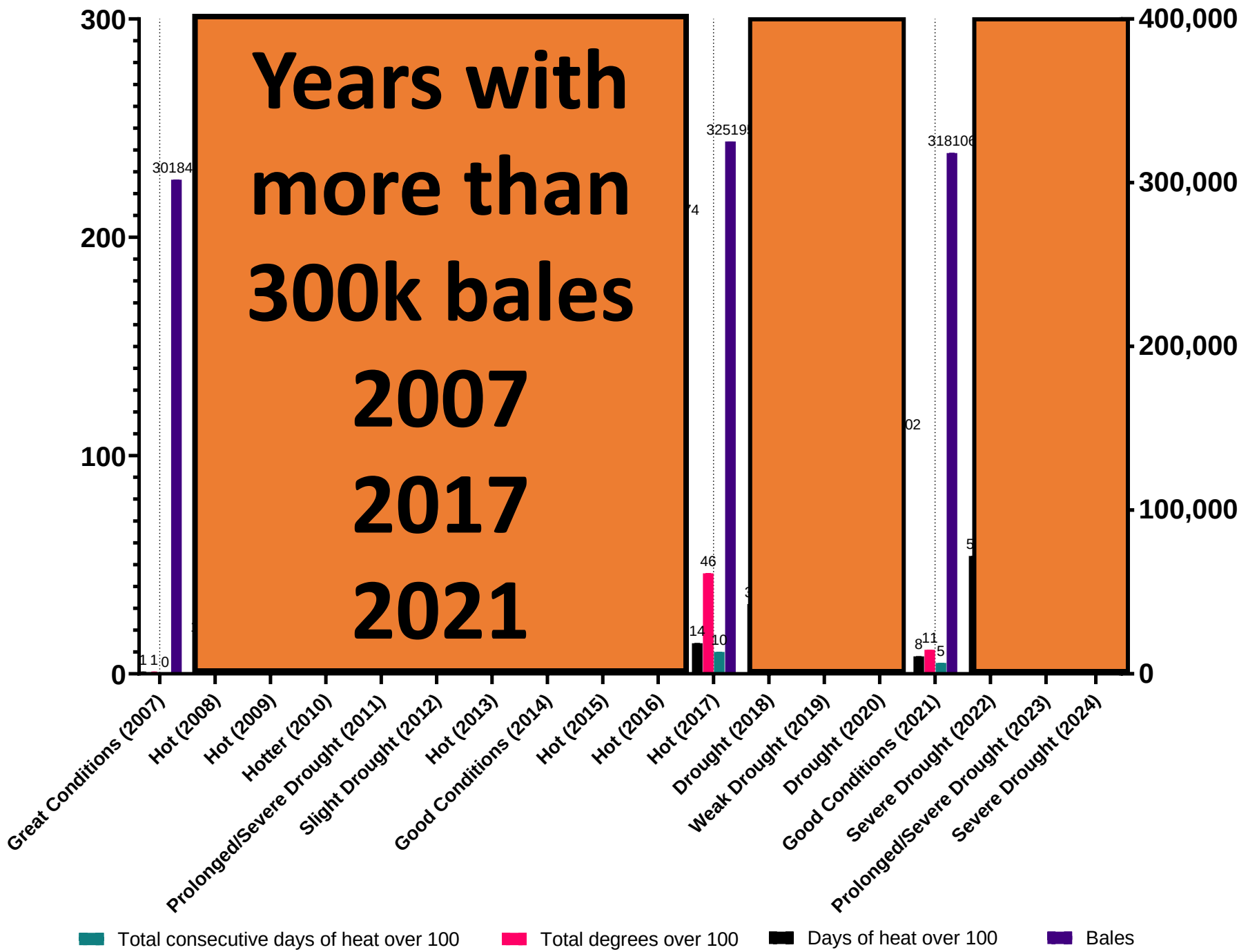

Degrees over 100
Days of heat over 100
Most, consecutive days of hea
Total, consecutive days of hea
Early Cutout Events
Bales
Good Model
Best Model
January
February
March
April
May
June
July
August
September
October
November
December
Total Seasonal (May-Aug)
Total Post (Sep-Dec)
Total Pre (Jan-Apr)
Total Annual
Previous Year RF
Previous year Post RF
Total IRR Acres
Total DRY Acres
Total Acres
Bales:Acre

Degrees over 100
Days of heat over 100
Most, consecutive days of heat over 100
Total, consecutive days of heat over 100
Early Cutout Events
Bales
Good Model
Best Model
January
February
March
April
May
June
July
Augus
Septe
October
November
December
Total Seasonal (May-Aug)
Total Post (Sep-Dec)
Total Pre (Jan-Apr)
Total Annual
Previous Year RF
Previous year Post RF
Total IRR Acres
Total DRY Acres
Total Acres
Bales:Acre

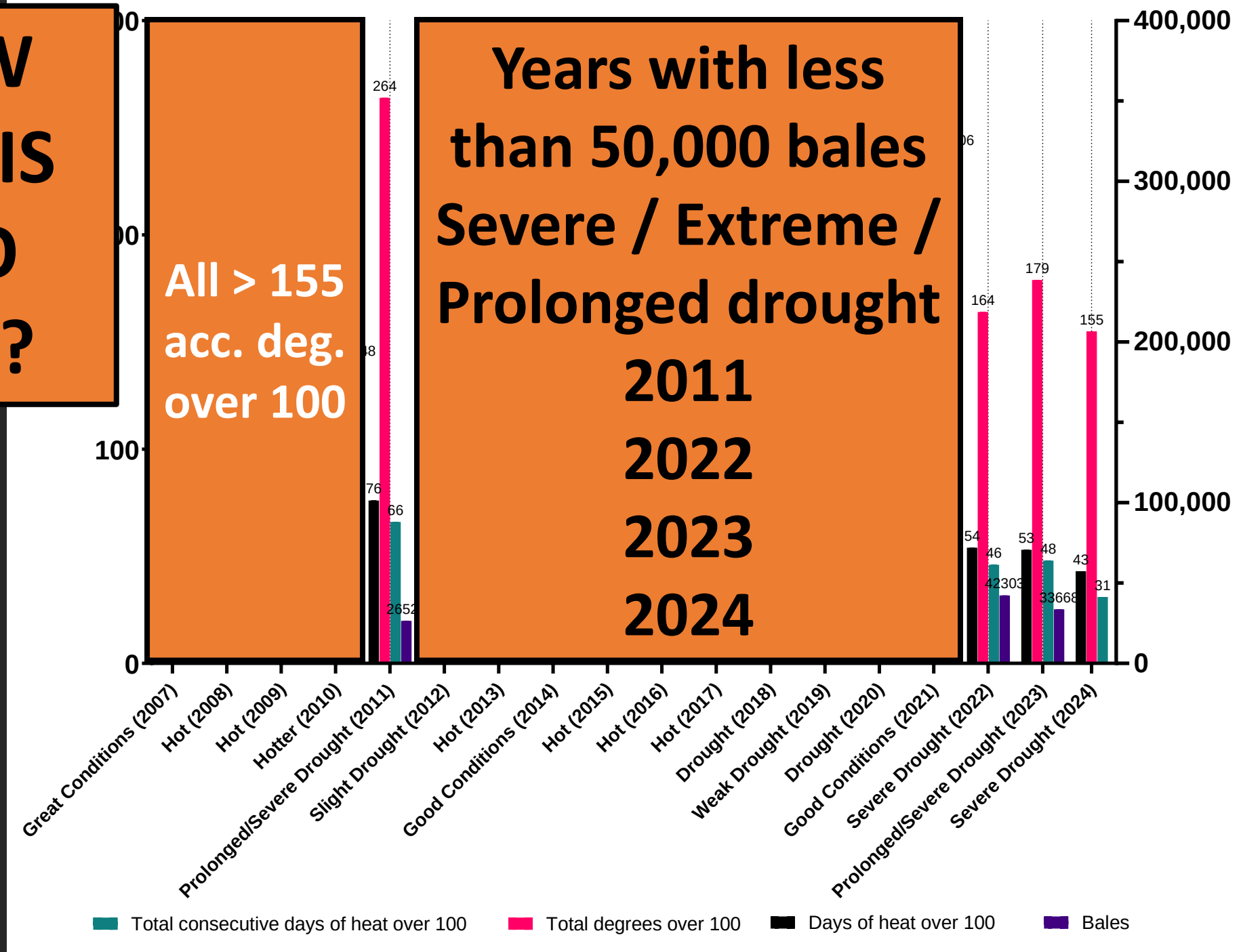
Degrees over 100
Days of heat over 100
Most, consecutive days of heat over 100
Total, consecutive days of heat over 100
Early Cutout Events
Bales
Good Model
Best Model
January
February
March
April
May
June
July
August
September
October
November
December
Total Seasonal (May-Aug)
Total Post (Sep-Dec)
Total Pre (Jan-Apr)
Total Annual
Previous Year RF
Previous year Post RF
Total IRR Acres
Total DRY Acres
Total Acres
Bales:Acre

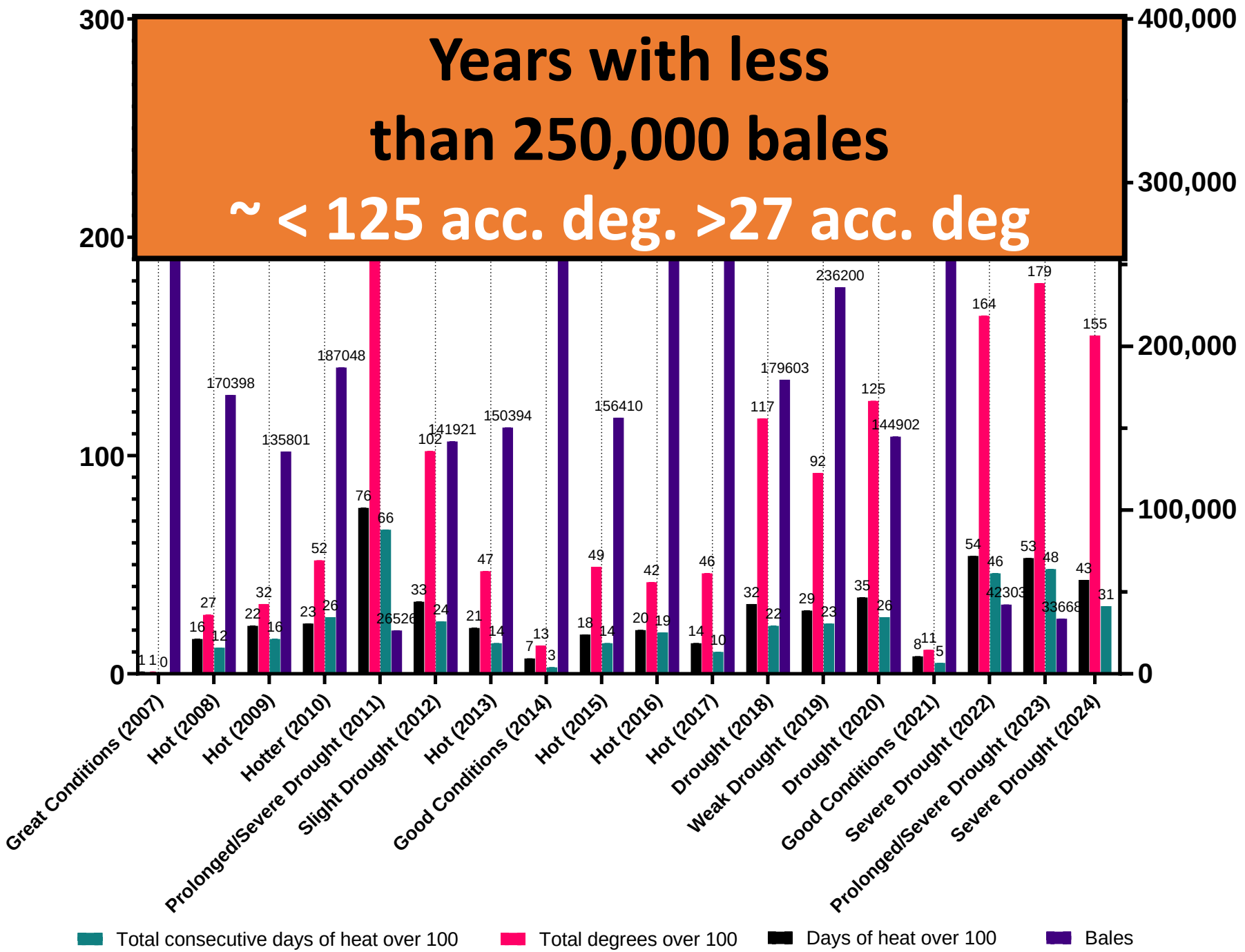
Bales	-1	-1	-1	-1	-1	1	1	-1																			1				1

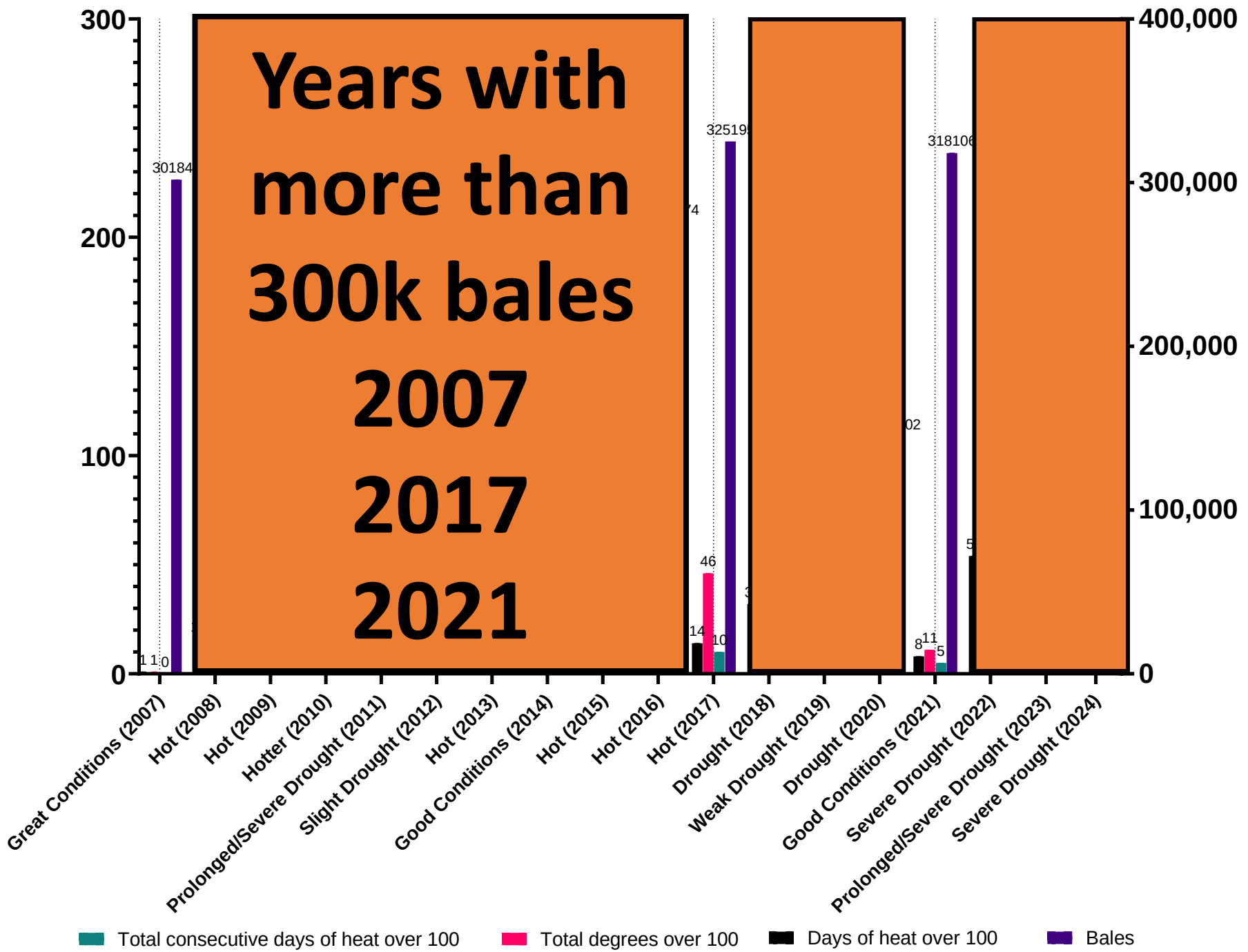

300
200
100
0
400,000
300,000
200,000
100,000
0
1 1 0
301848
16 27 12
170398
22 32 16
135801
23 52 26
187048
76 264 66
26526
33 102 24
141921
21 47 14
150394
7 13 3
296611
18 49 14
156410
20 42 19
275974
14 46 10
325195
32 117 22
179603
29 92 23
236200
35 125 26
144902
8 11 5
318106
54 164 46
42303
53 179 48
33668
43 155 31
Great Conditions (2007)
Hot (2008)
Hot (2009)
Hotter (2010)
Prolonged/Severe Drought (2011)
Slight Drought (2012)
Hot (2013)
Good Conditions (2014)
Hot (2015)
Hot (2016)
Hot (2017)
Drought (2018)
Weak Drought (2019)
Drought (2020)
Good Conditions (2021)
Severe Drought (2022)
Prolonged/Severe Drought (2023)
Severe Drought (2024)
Total consecutive days of heat over 100
Total degrees over 100
Days of heat over 100
Bales


Years with more than 300k bales
2007
2017
2021
300
200
100
0
400,000
300,000
200,000
100,000
0
30184
325195
318106
46
14
10
8
11
5
1 1 0
Great Conditions (2007)
Hot (2008)
Hot (2009)
Hotter (2010)
Prolonged/Severe Drought (2011)
Slight Drought (2012)
Hot (2013)
Good Conditions (2014)
Hot (2015)
Hot (2016)
Hot (2017)
Drought (2018)
Weak Drought (2019)
Drought (2020)
Good Conditions (2021)
Severe Drought (2022)
Prolonged/Severe Drought (2023)
Severe Drought (2024)
Total consecutive days of heat over 100
Total degrees over 100
Days of heat over 100
Bales

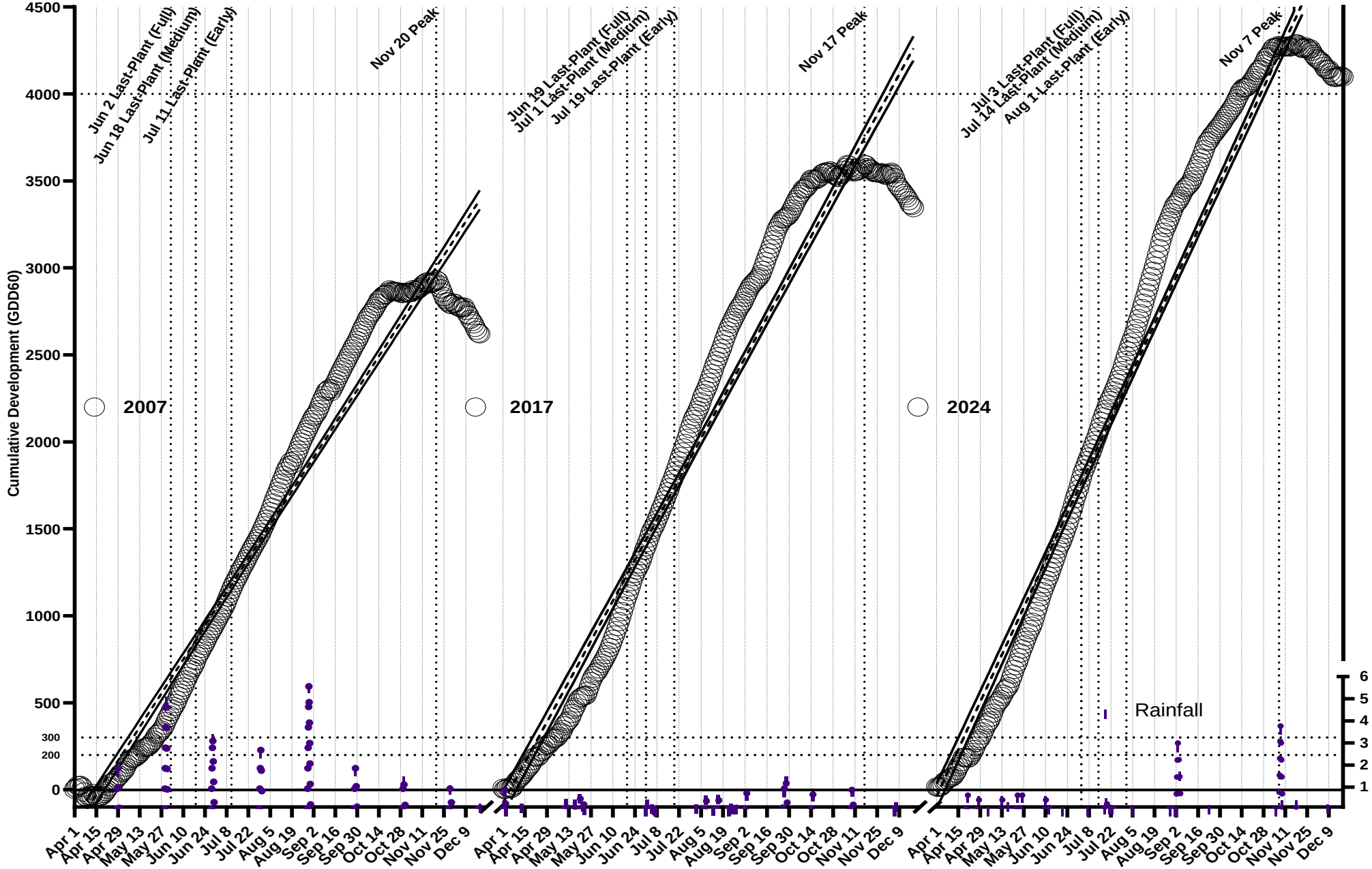
HOW HOT IS TOO HOT?




Years with less
than 250,000 bales
~ < 125 acc. deg. >27 acc. deg
300
200
100
0
400,000
300,000
200,000
100,000
0
1 1 0
16 27 12 170398
22 32 16 135801
23 52 26 187048
76 66 26526
33 102 24 141921
21 47 14 150394
7 13 3
18 49 14 156410
20 42 19
14 46 10
32 117 22 179603
29 92 23 236200
35 125 26 144902
8 11 5
54 164 46 42303
53 179 48 33668
43 155 31
Great Conditions (2007)
Hot (2008)
Hot (2009)
Hotter (2010)
Prolonged/Severe Drought (2011)
Slight Drought (2012)
Hot (2013)
Good Conditions (2014)
Hot (2015)
Hot (2016)
Hot (2017)
Drought (2018)
Weak Drought (2019)
Drought (2020)
Good Conditions (2021)
Severe Drought (2022)
Prolonged/Severe Drought (2023)
Severe Drought (2024)
Total consecutive days of heat over 100
Total degrees over 100
Days of heat over 100
Bales


Years with more than 300k bales
2007
2017
2021
300
200
100
0
400,000
300,000
200,000
100,000
0
30184
325195
318106
46
14
10
8
11
5
1 1 0
Great Conditions (2007)
Hot (2008)
Hot (2009)
Hotter (2010)
Prolonged/Severe Drought (2011)
Slight Drought (2012)
Hot (2013)
Good Conditions (2014)
Hot (2015)
Hot (2016)
Hot (2017)
Drought (2018)
Weak Drought (2019)
Drought (2020)
Good Conditions (2021)
Severe Drought (2022)
Prolonged/Severe Drought (2023)
Severe Drought (2024)
Total consecutive days of heat over 100
Total degrees over 100
Days of heat over 100
Bales

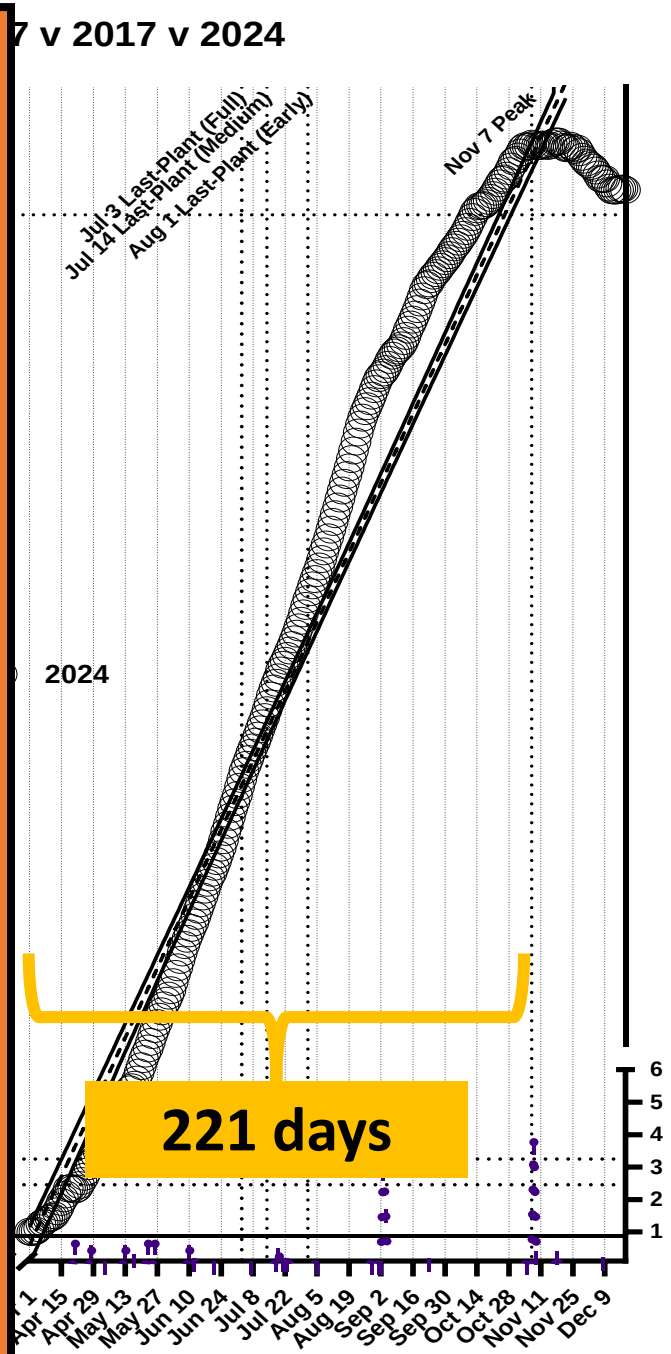
April 1st - Dec 21st Cumulative Development 2007 v 2017 v 2024



2024

- Strong El Nino to weak La Nina
- Cool start, but ended hot persistent drought
- Low Rainfall

April 1
to
Accumulation Peak, Nov 07
= 221-day season

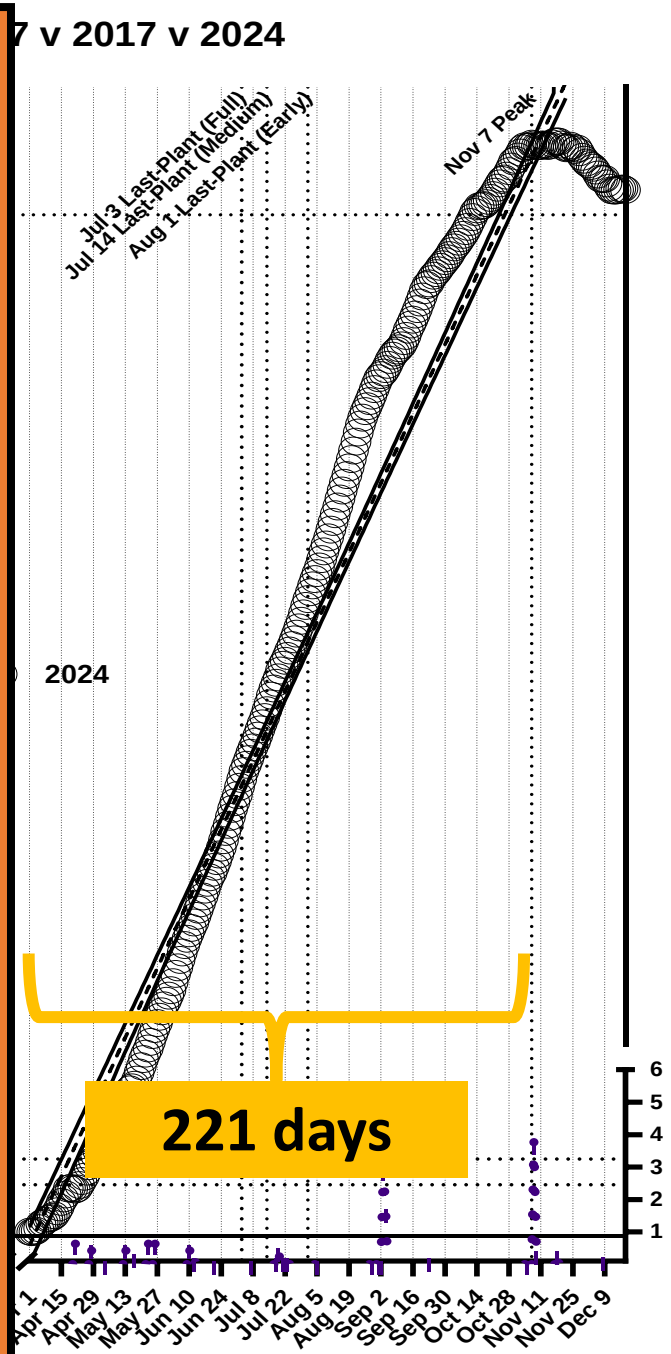


Cumulative Seasonal Development = 4,279 GDD60

19.36 avg GDD per day

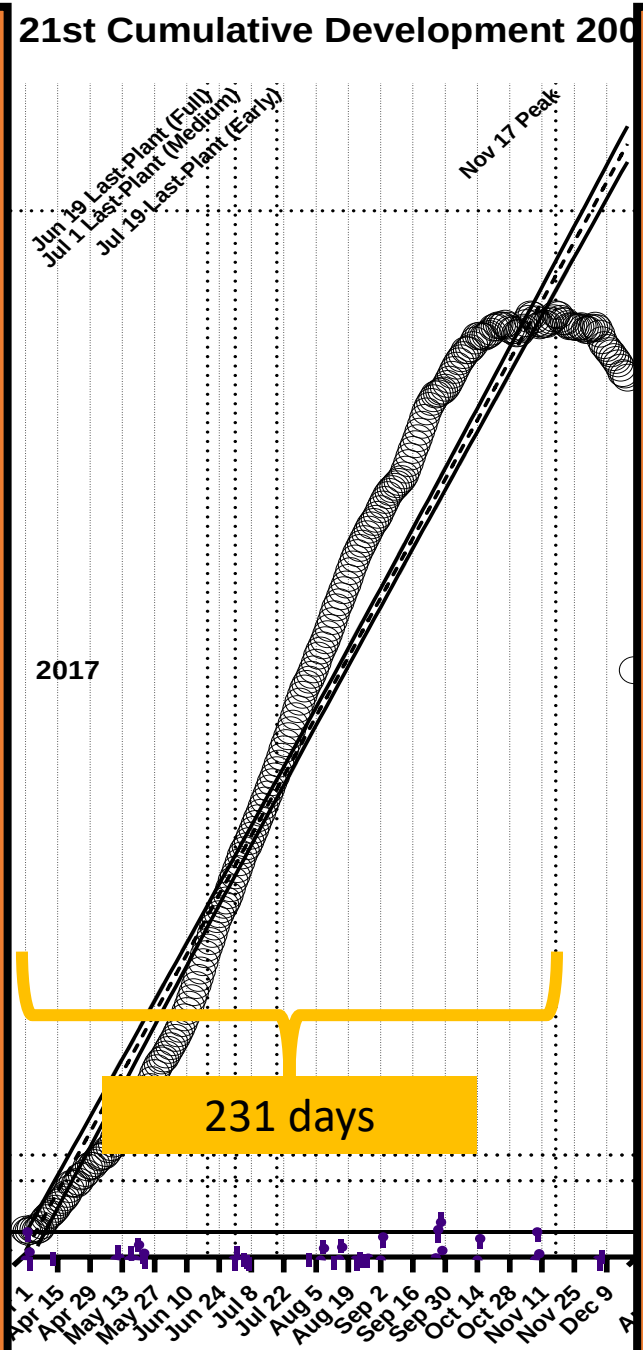
2,582 Bales per GDD per day

11.68 Bales per GDD



2017

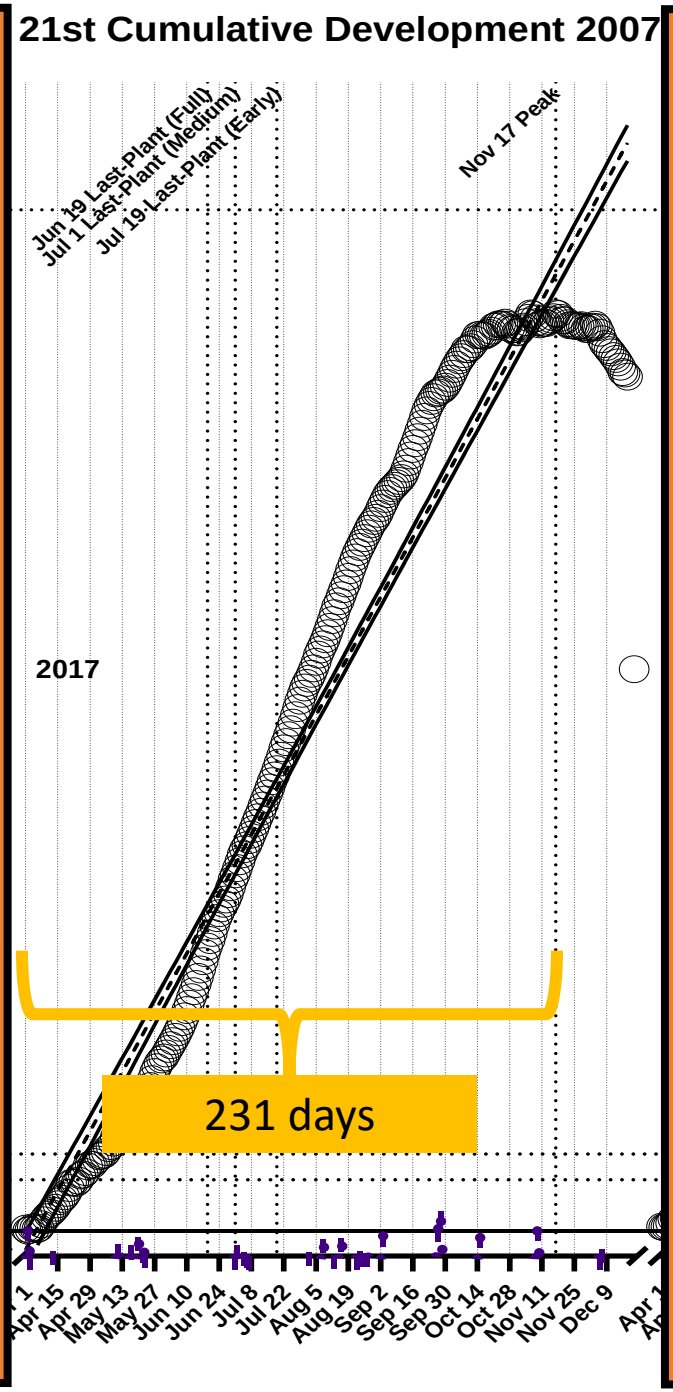
- 325k Bales
- Hot, but with a warm start and cool finish
- Low Rainfall
- Neutral to weak La Nina



April 1 to Accumulation Peak, Nov 17 = 231-day season

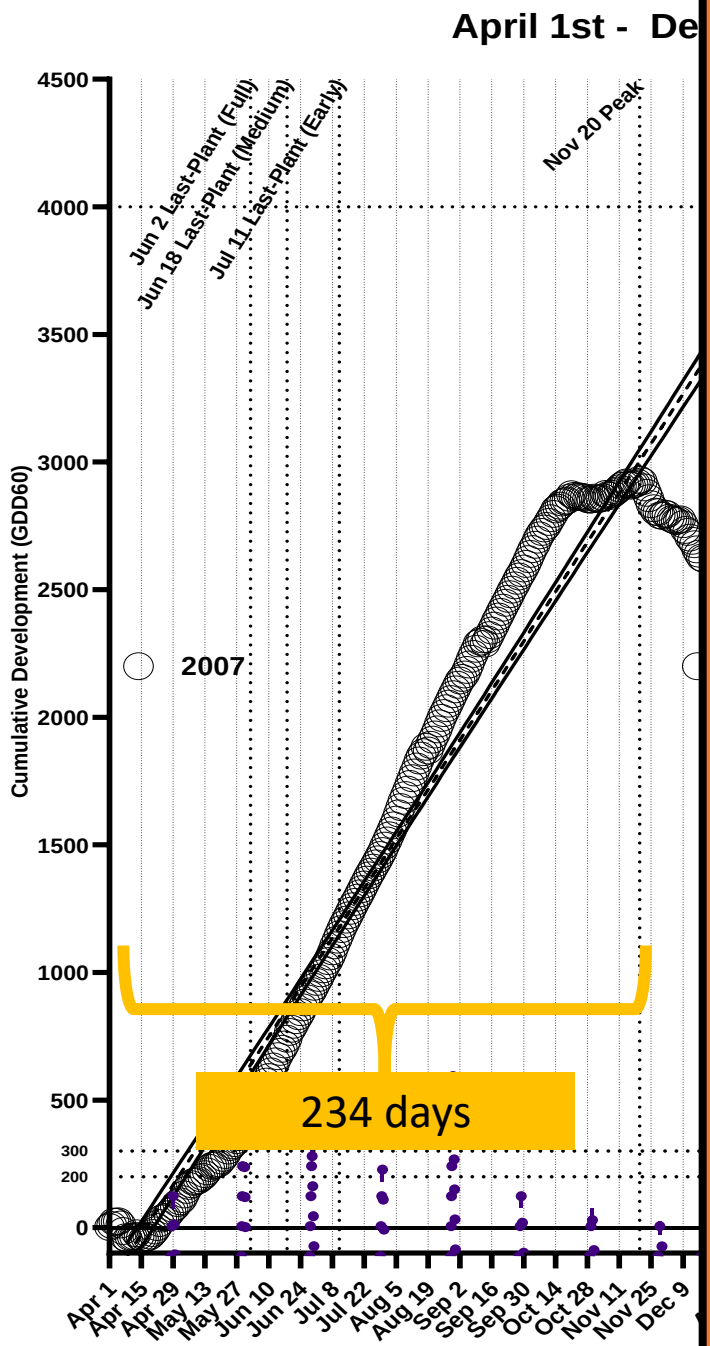
Cumulative Seasonal Development = 3,594 GDD60

15.55 avg GDD per day



20,900 Bales per GDD per day

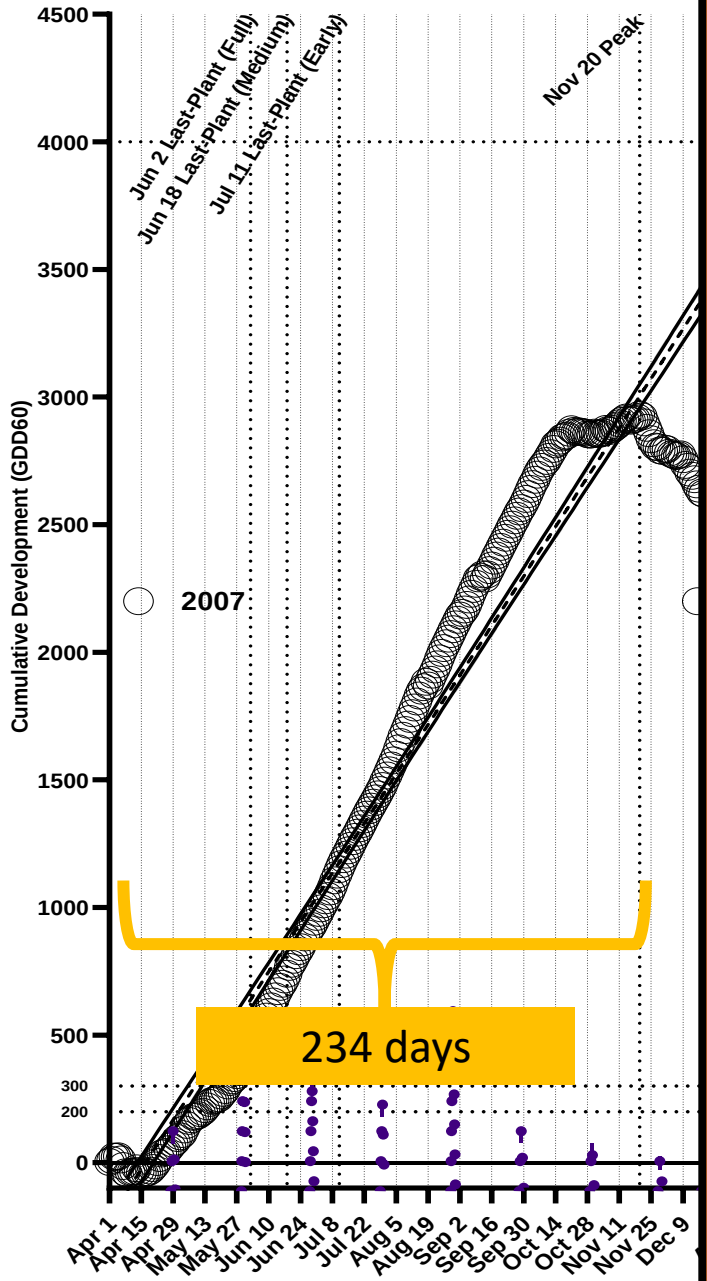
<u>90.42 Bales per GDD</u>



2007

- 301k Bales
- Easter Freeze– *cold-year*
- Good Rainfall
- Weak El Nino to La Nina

April 1
to
Accumulation Peak, Nov 20
= 234-day season



Cumulative Seasonal Development = 2,931 GDD

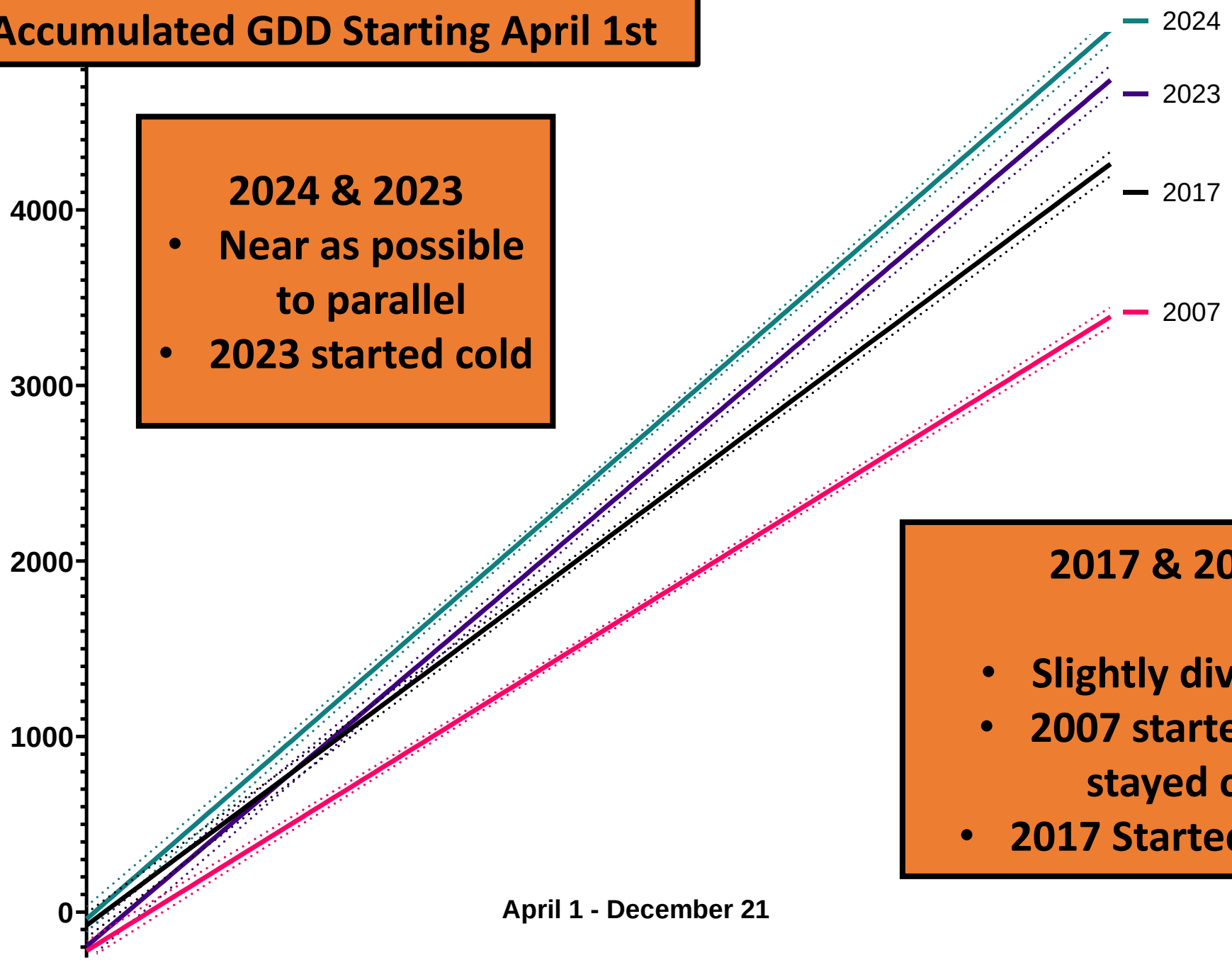
12.52 avg GDD per day

24,041 bales per GDD per day

102 bales per GDD

linear relationship with cumulative development

Accumulated GDD Starting April 1st

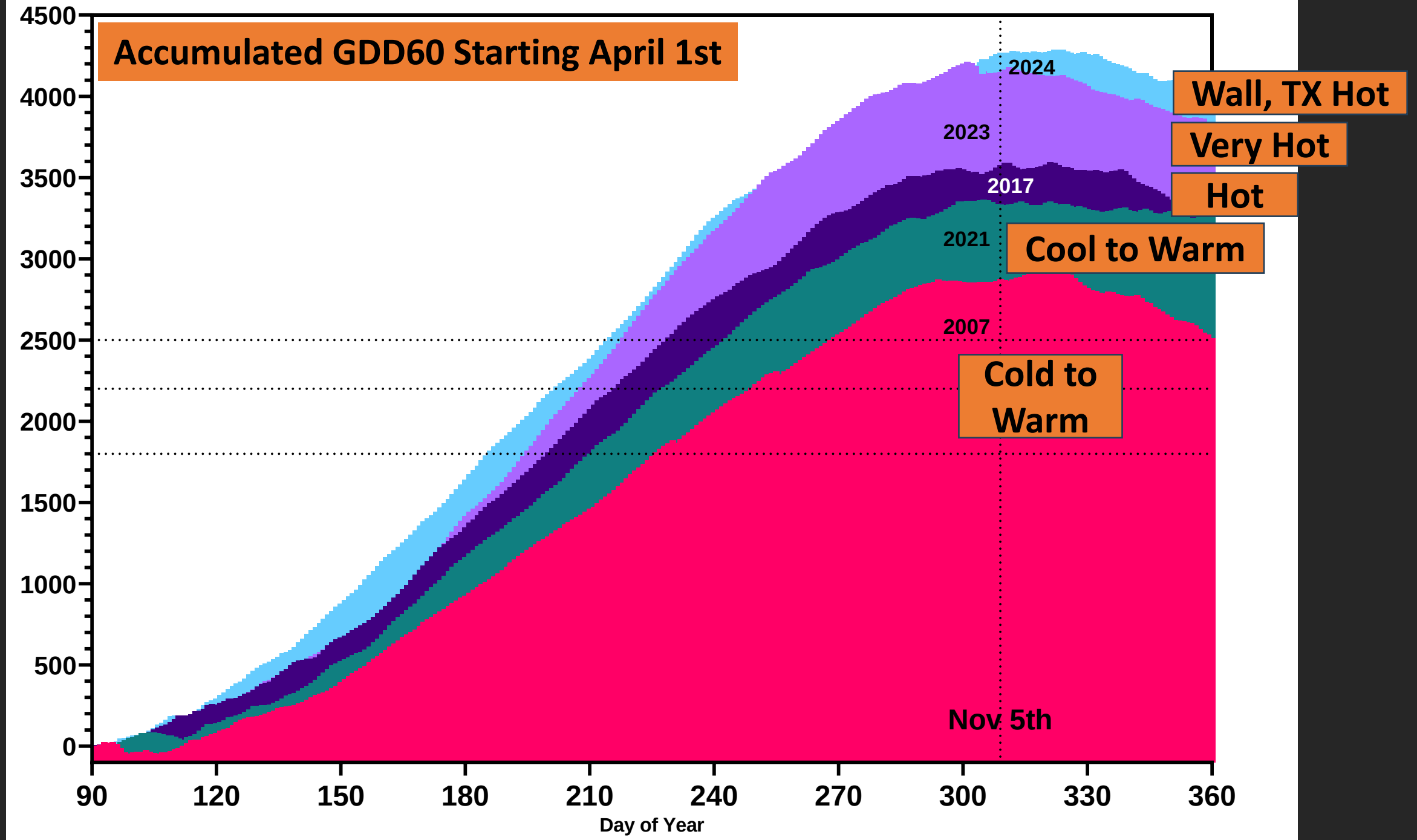


2024 & 2023

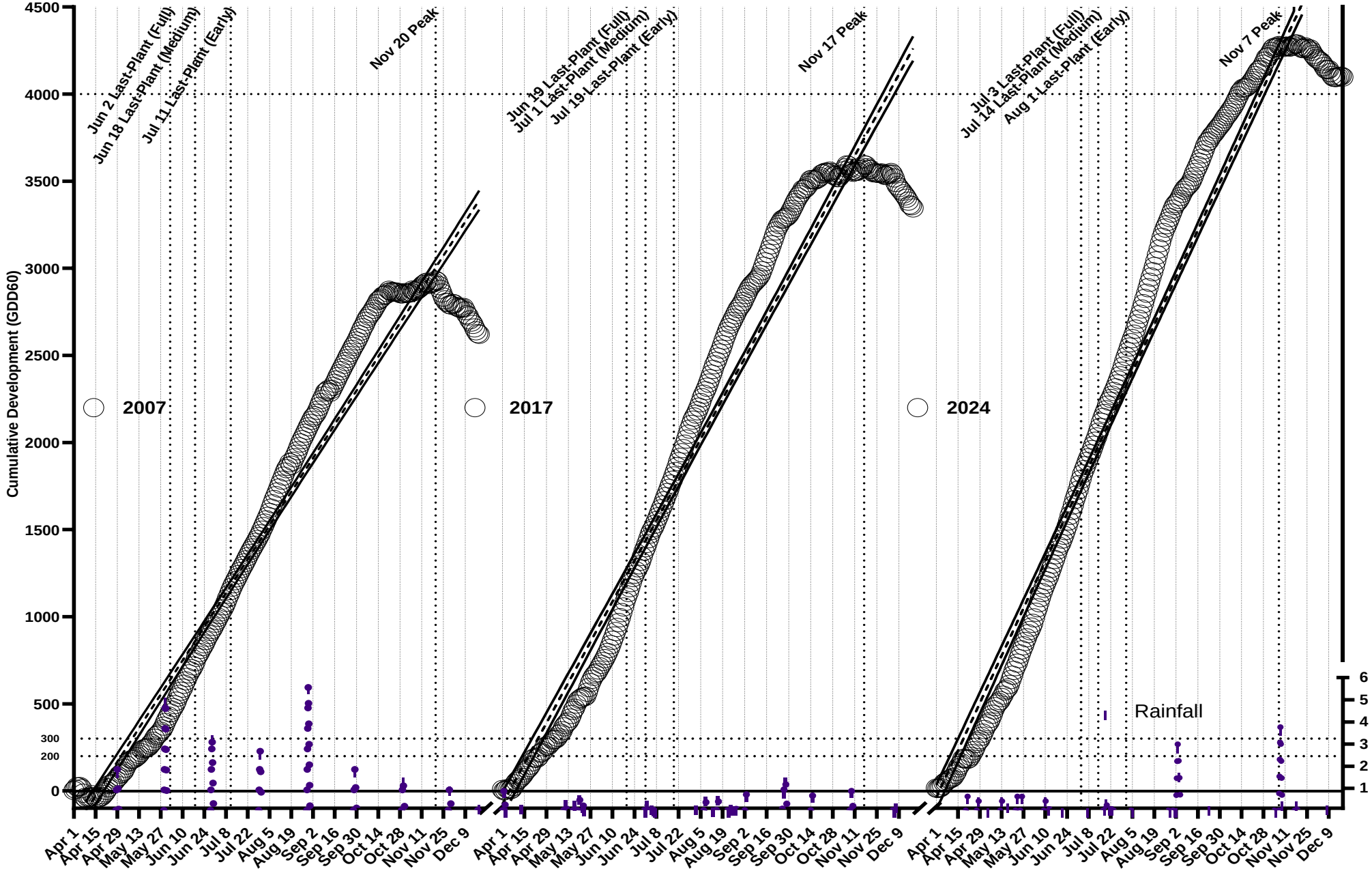
- Near as possible to parallel
- 2023 started cold

2017 & 2007

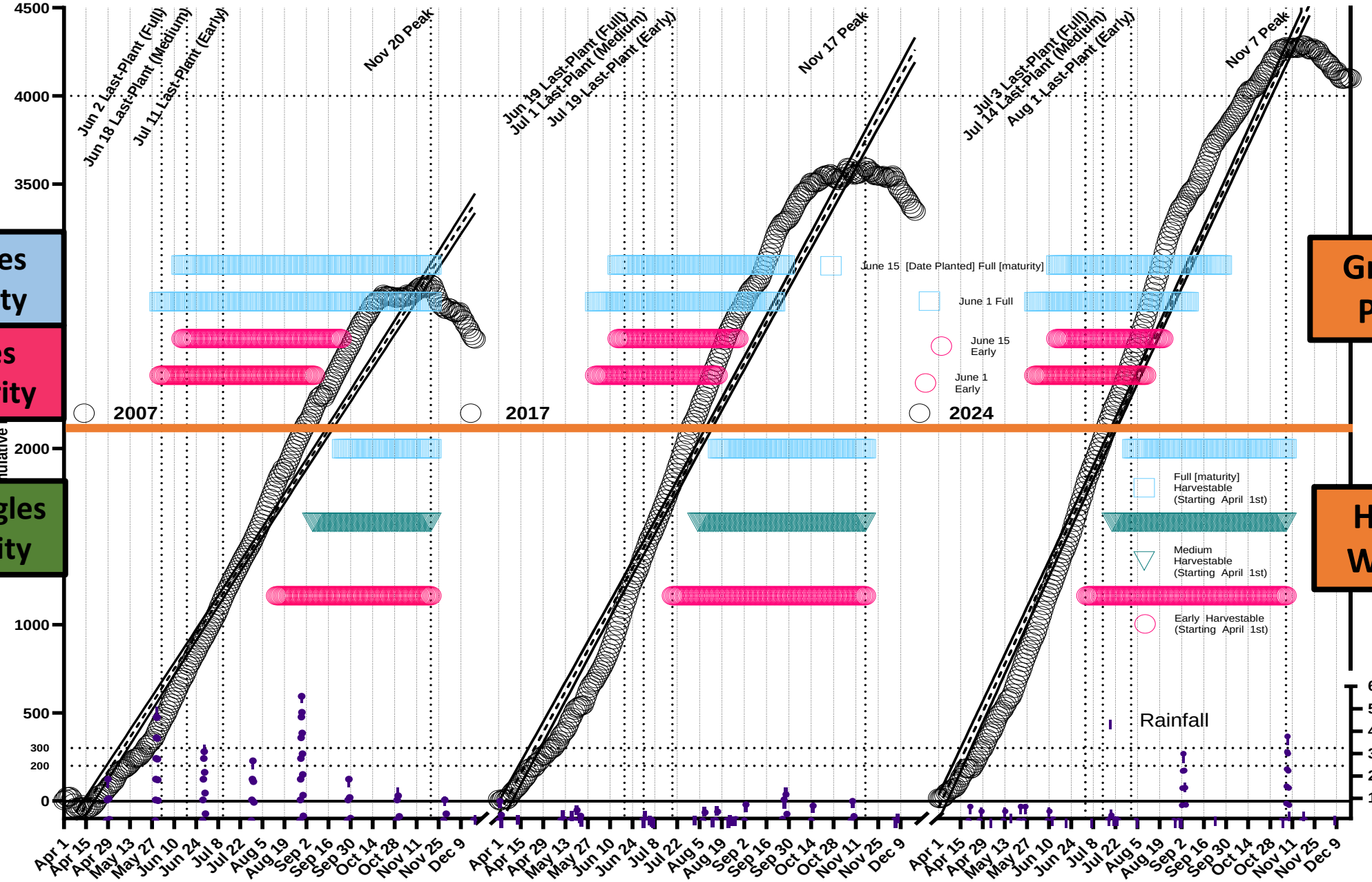
- Slightly diverging
- 2007 started cold stayed cool
- 2017 Started Warm


Accumulated GDD60 Starting April 1st
2024
2023
2017
2021
2007
Wall, TX Hot
Very Hot
Hot
Cool to Warm
Cold to Warm
Nov 5th
4500
4000
3500
3000
2500
2000
1500
1000
500
0
90
120
150
180
210
240
270
300
330
360
Day of Year

April 1st - Dec 21st Cumulative Development 2007 v 2017 v 2024



April 1st - Dec 21st Cumulative Development 2007 v 2017 v 2024



Blue Squares
Full Maturity

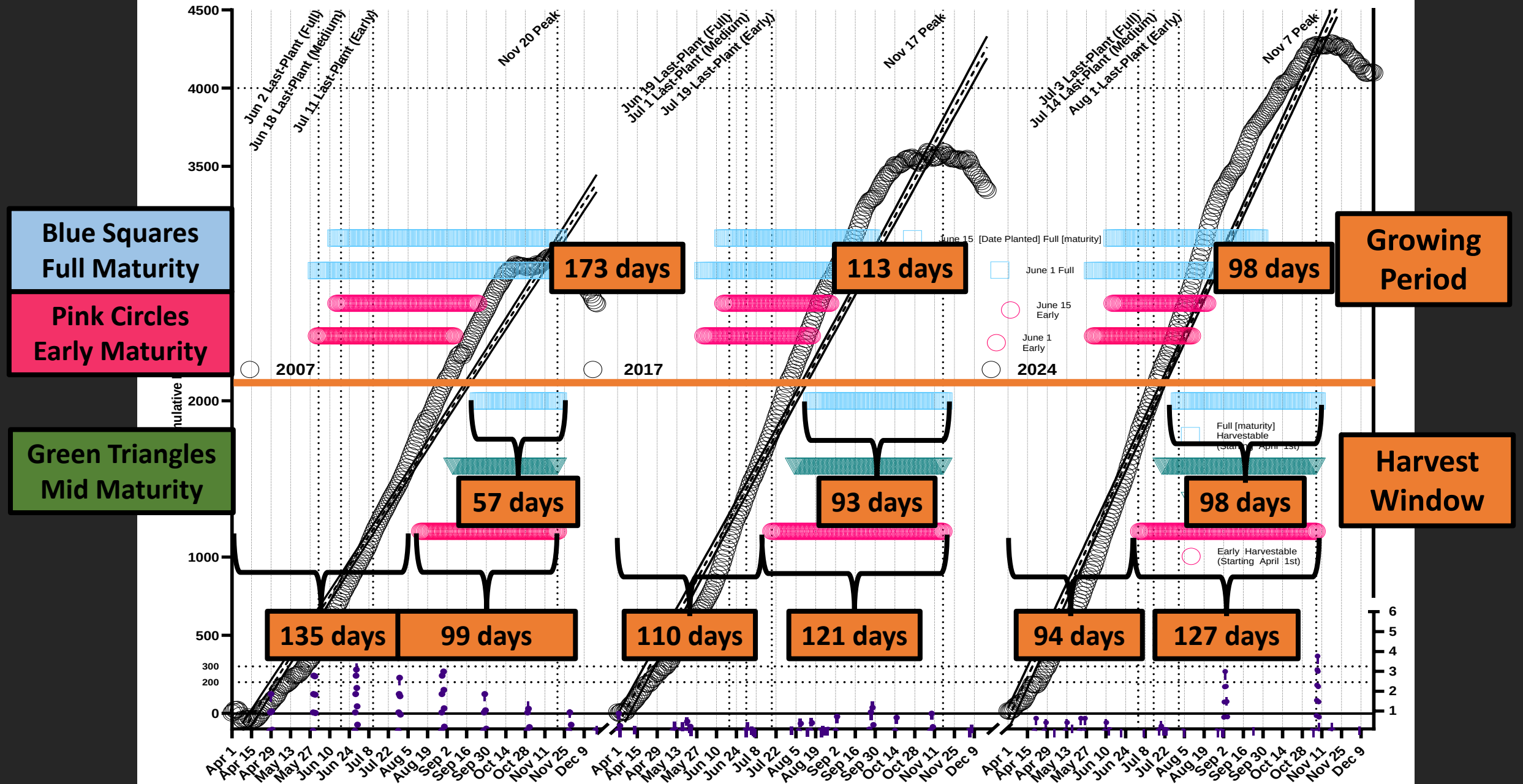
Pink Circles
Early Maturity

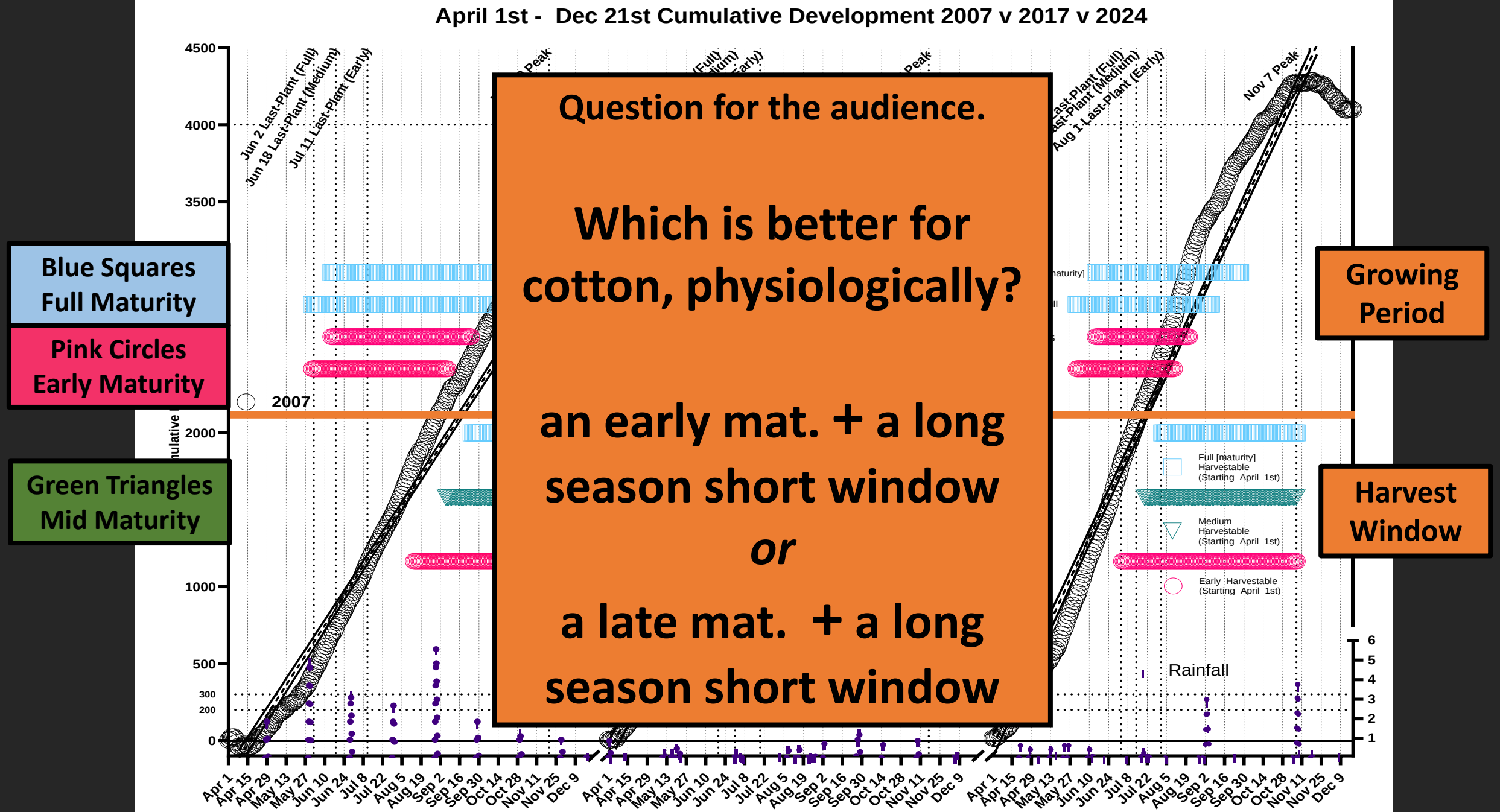
Green Triangles
Mid Maturity

Growing Period

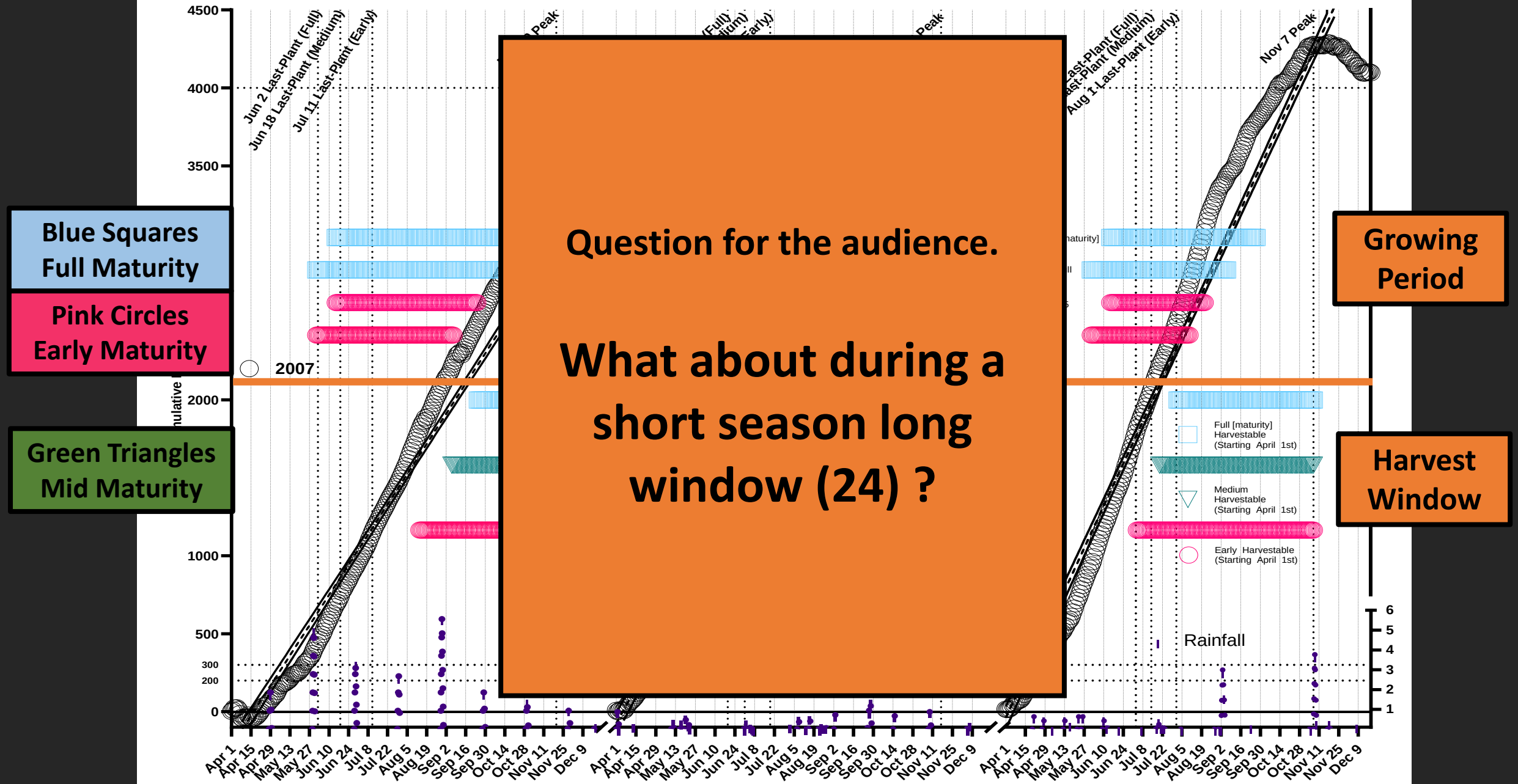
Harvest Window

April 1st - Dec 21st Cumulative Development 2007 v 2017 v 2024




April 1st - Dec 21st Cumulative Development 2007 v 2017 v 2024
Question for the audience.
Which is better for cotton, physiologically?
an early mat. + a long season short window
or
a late mat. + a long season short window
Blue Squares Full Maturity
Pink Circles Early Maturity
Green Triangles Mid Maturity
Growing Period
Harvest Window
Jun 2 Last-Plant (Full)
Jun 18 Last-Plant (Medium)
Jul 11 Last-Plant (Early)
Aug 1 Last-Plant (Full)
Nov 7 Peak
2007
Full [maturity] Harvestable (Starting April 1st)
Medium Harvestable (Starting April 1st)
Early Harvestable (Starting April 1st)
Rainfall
4500
4000
3500
2000
1000
500
300
200
0
6
5
4
3
2
1
Apr 1
Apr 15
Apr 29
May 13
May 27
Jun 10
Jun 24
Jul 8
Jul 22
Aug 5
Aug 19
Sep 2
Sep 16
Sep 30
Oct 14
Oct 28
Nov 11
Nov 25
Dec 9

April 1st - Dec 21st Cumulative Development 2007 v 2017 v 2024



Popular Related Questions for IPM by Customers

- When should I plant?
- Can I plant on the backside of the season?
- Can I plant as early as possible?
- Should I use a seed treatment?

Prioritizing:

Lower Nodes
First Fruiting
Branches
Main Stem Nodes

Cost - effectiveness of management

Effects of temperature (UV) on foliar pesticide & length of residual

Length / intensity of pest cycle

Authentic IPM Answers

1. When should I plant?

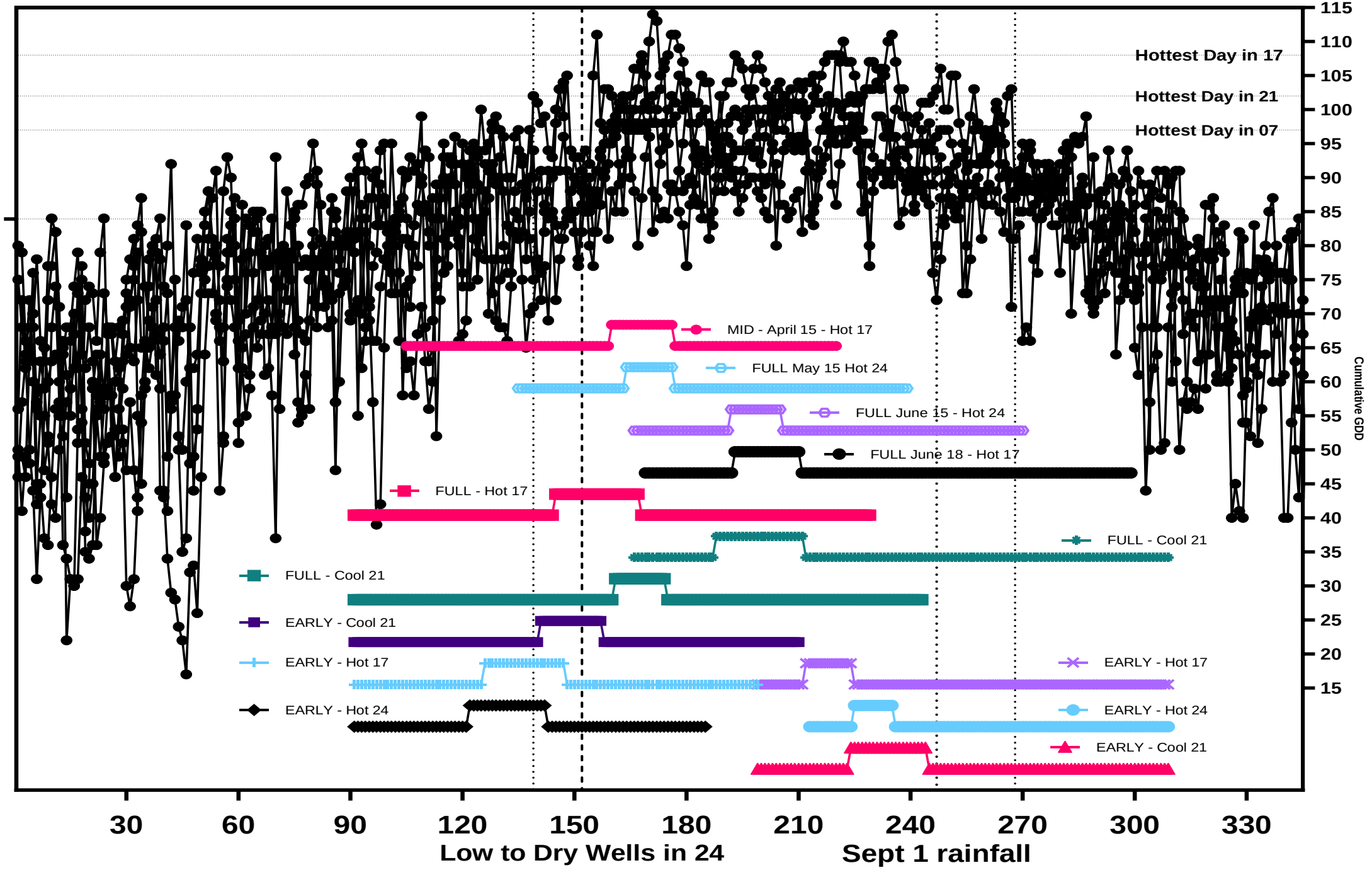
   That depends.

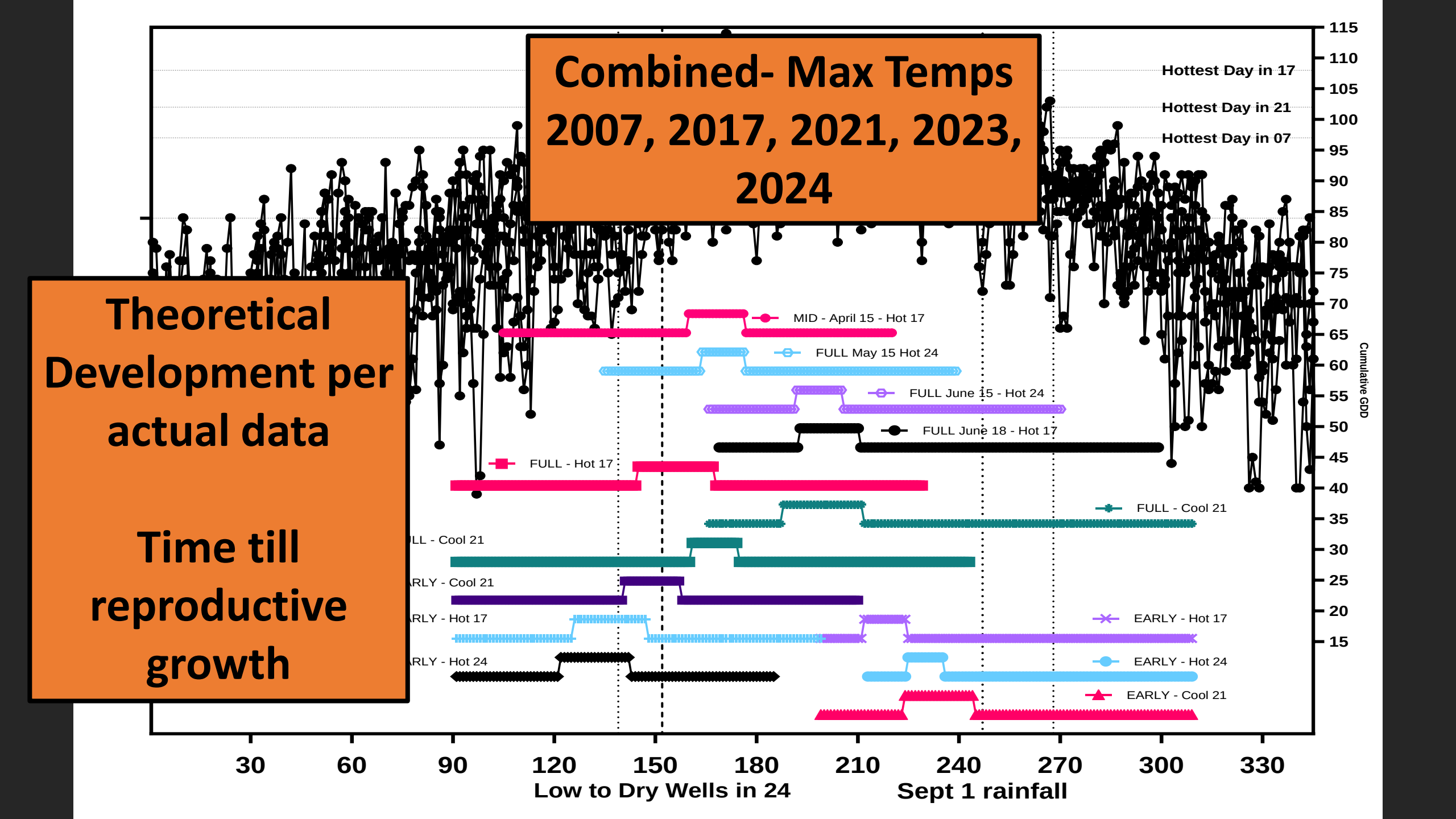
2. Can I plant on backside/frontside of the season?

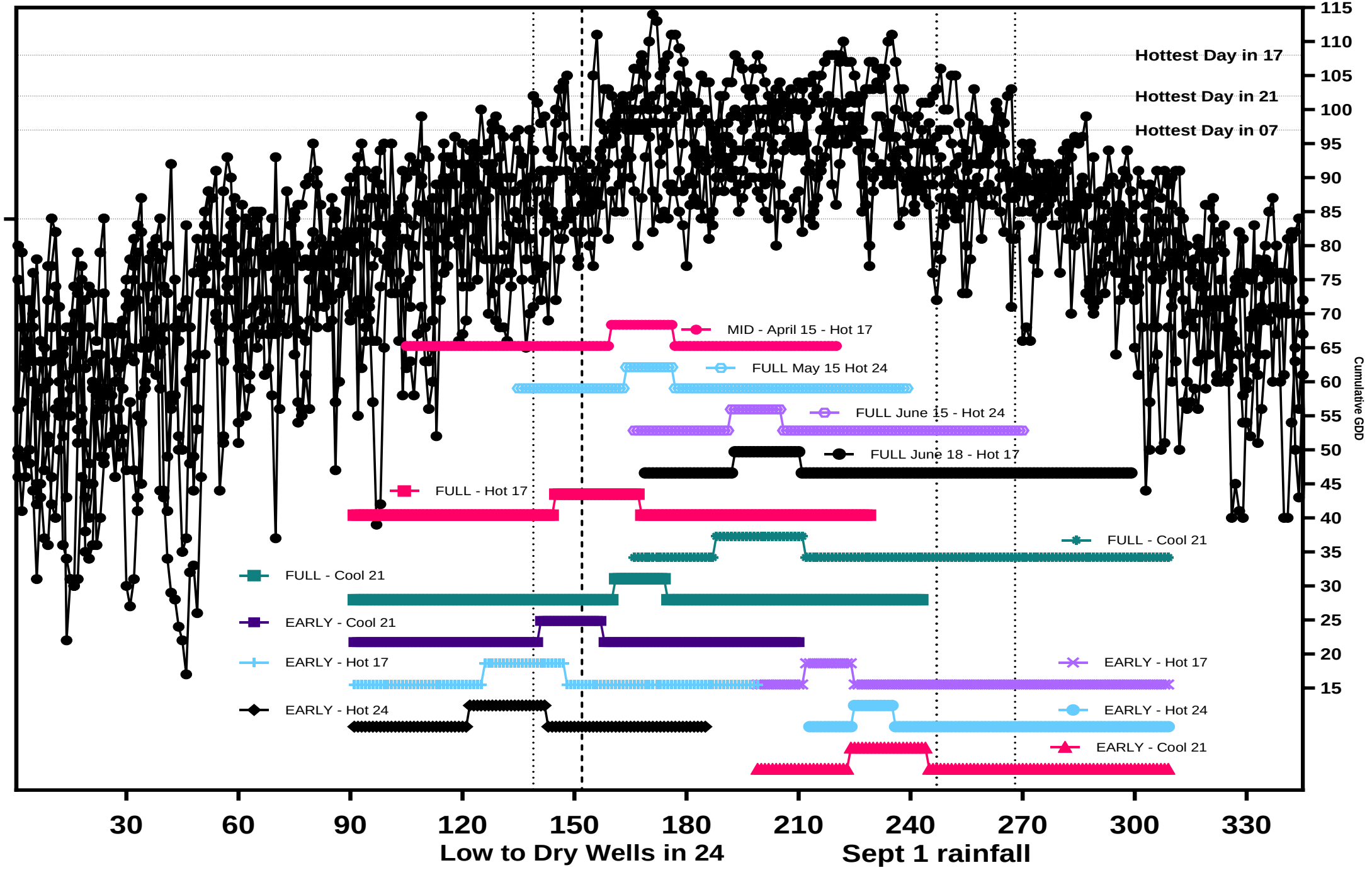
   Yes, Sometimes, Maybe, but No.

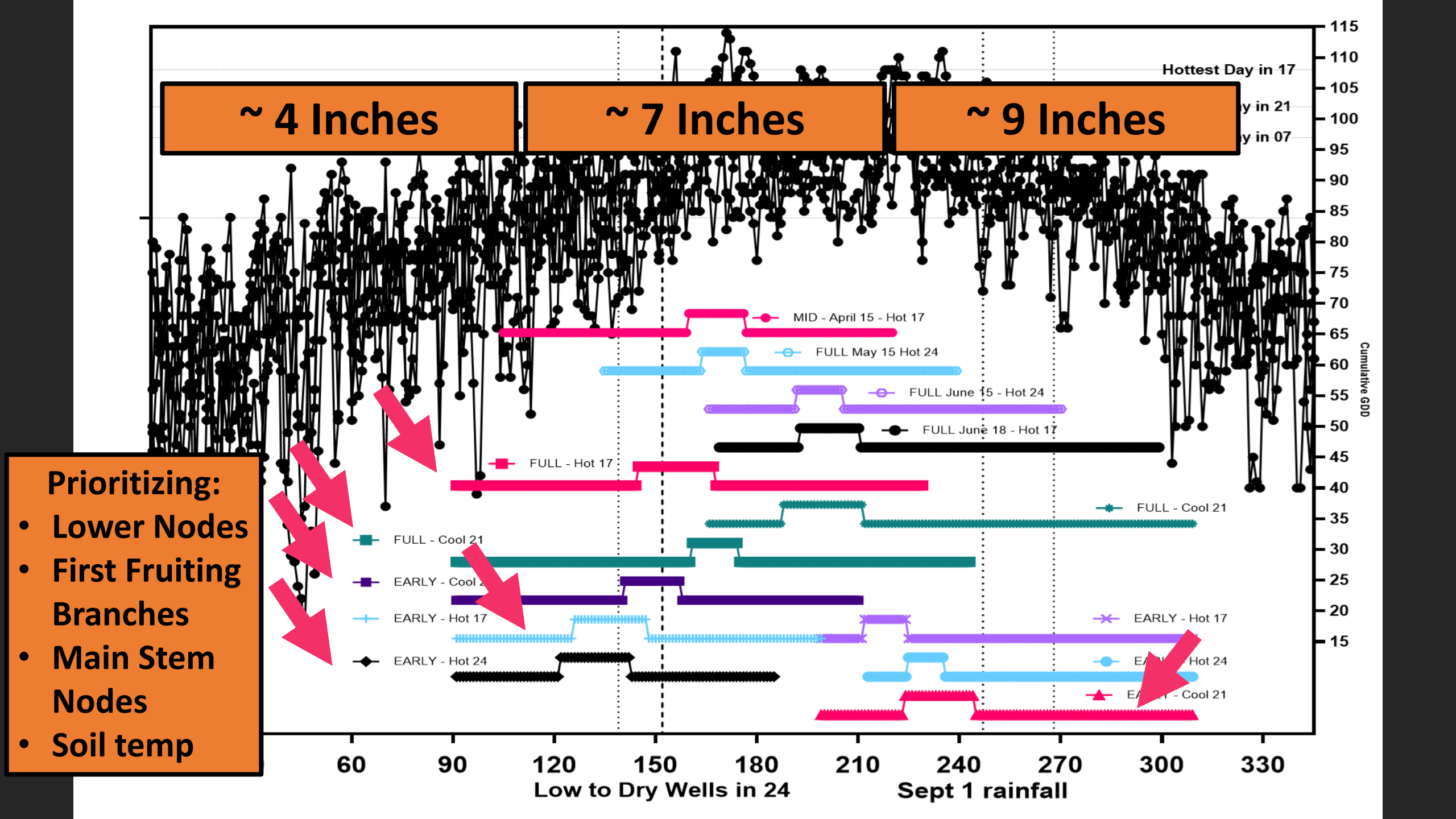
3. Should I use a seed treatment?

   That depends.


Hottest Day in 17
Hottest Day in 21
Hottest Day in 07
MID - April 15 - Hot 17
FULL May 15 Hot 24
FULL June 15 - Hot 24
FULL June 18 - Hot 17
FULL - Hot 17
FULL - Cool 21
FULL - Cool 21
EARLY - Cool 21
EARLY - Hot 17
EARLY - Hot 24
EARLY - Hot 17
EARLY - Hot 24
EARLY - Cool 21
Cumulative GDD
115
110
105
100
95
90
85
80
75
70
65
60
55
50
45
40
35
30
25
20
15
30
60
90
120
150
180
210
240
270
300
330
Low to Dry Wells in 24
Sept 1 rainfall


Combined- Max Temps 2007, 2017, 2021, 2023, 2024
Theoretical Development per actual data
Time till reproductive growth
Hottest Day in 17
Hottest Day in 21
Hottest Day in 07
MID - April 15 - Hot 17
FULL May 15 Hot 24
FULL June 15 - Hot 24
FULL June 18 - Hot 17
FULL - Hot 17
FULL - Cool 21
LL - Cool 21
RLY - Cool 21
RLY - Hot 17
RLY - Hot 24
EARLY - Hot 17
EARLY - Hot 24
EARLY - Cool 21
Cumulative GDD
115
110
105
100
95
90
85
80
75
70
65
60
55
50
45
40
35
30
25
20
15
30
60
90
120
150
180
210
240
270
300
330
Low to Dry Wells in 24
Sept 1 rainfall


Hottest Day in 17
Hottest Day in 21
Hottest Day in 07
MID - April 15 - Hot 17
FULL May 15 Hot 24
FULL June 15 - Hot 24
FULL June 18 - Hot 17
FULL - Hot 17
FULL - Cool 21
FULL - Cool 21
EARLY - Cool 21
EARLY - Hot 17
EARLY - Hot 24
EARLY - Hot 17
EARLY - Hot 24
EARLY - Cool 21
Cumulative GDD
115
110
105
100
95
90
85
80
75
70
65
60
55
50
45
40
35
30
25
20
15
30
60
90
120
150
180
210
240
270
300
330
Low to Dry Wells in 24
Sept 1 rainfall


~ 4 Inches
~ 7 Inches
~ 9 Inches
Hottest Day in 17
y in 21
y in 07
MID - April 15 - Hot 17
FULL May 15 Hot 24
FULL June 15 - Hot 24
FULL June 18 - Hot 17
FULL - Hot 17
FULL - Cool 21
FULL - Cool 21
EARLY - Cool 2
EARLY - Hot 17
EARLY - Hot 24
EARLY - Hot 17
E Hot 24
E - Cool 21
Cumulative GDD
115
110
105
100
95
90
85
80
75
70
65
60
55
50
45
40
35
30
25
20
15
60
90
120
150
180
210
240
270
300
330
Low to Dry Wells in 24
Sept 1 rainfall
Prioritizing:
• Lower Nodes
• First Fruiting Branches
• Main Stem Nodes
• Soil temp

Organophosphates (OPPs), Organochlorines (OCPs), and Carbamates:

- **Typically, complete photolysis under sunlight within 64-100 hours in top-soil.**

Pyrethroids:

- **Can degrade rapidly under sunlight, from 1 to 4 hours.**

Neonicotinoids:

- **15-60 days under sunlight in top-soil.**

Effects of sunlight on foliar pesticide & length of residual

IF UNDER EXTREME SOLAR CONDITIONS

Half-lives are shorter, especially so with wet top-soils.

Evapotranspiration is at maximum; pesticide uptake and accumulation in leaves are both very fast.

Effects of sunlight on foliar pesticide & length of residual

2007 – Cold to Warm to Cool

102 bales per GDD

25k bales / day

2017 – Warm to Hot to Cool

90 bales per GDD

20k bales / day

2024 – Cool to Hot to Hot

12 bales per GDD

2.5k bales / day

Cost - effectiveness of management

Flower thrips, from egg to adult, typically takes around

- 14 days if it is hot
- 21 days if it is cool

Cotton Fleahopper, egg to adult

- 10 days if it is hot
- 14 days if it is cool

2022-2024- Pests accounted for small fraction of total loss.

Length / intensity of pest cycle

2022-2024

Grasshoppers were probably the most damaging locally, but cryptic effects regionally.

Drought-sturdy pests were abundant but had lowered effects on the regional scale.

Stinkbugs and Leaf-footed bugs did great. Still didn’t move out of sorghum / weedy areas.

Thrips, wireworms, pillbugs, cotton fleahoppers, lygus, leaf beetles, leaf miners, and caterpillars all reduced.

Length / intensity of pest cycle

Authentic IPM Answers

1. When should I plant?

   That depends.

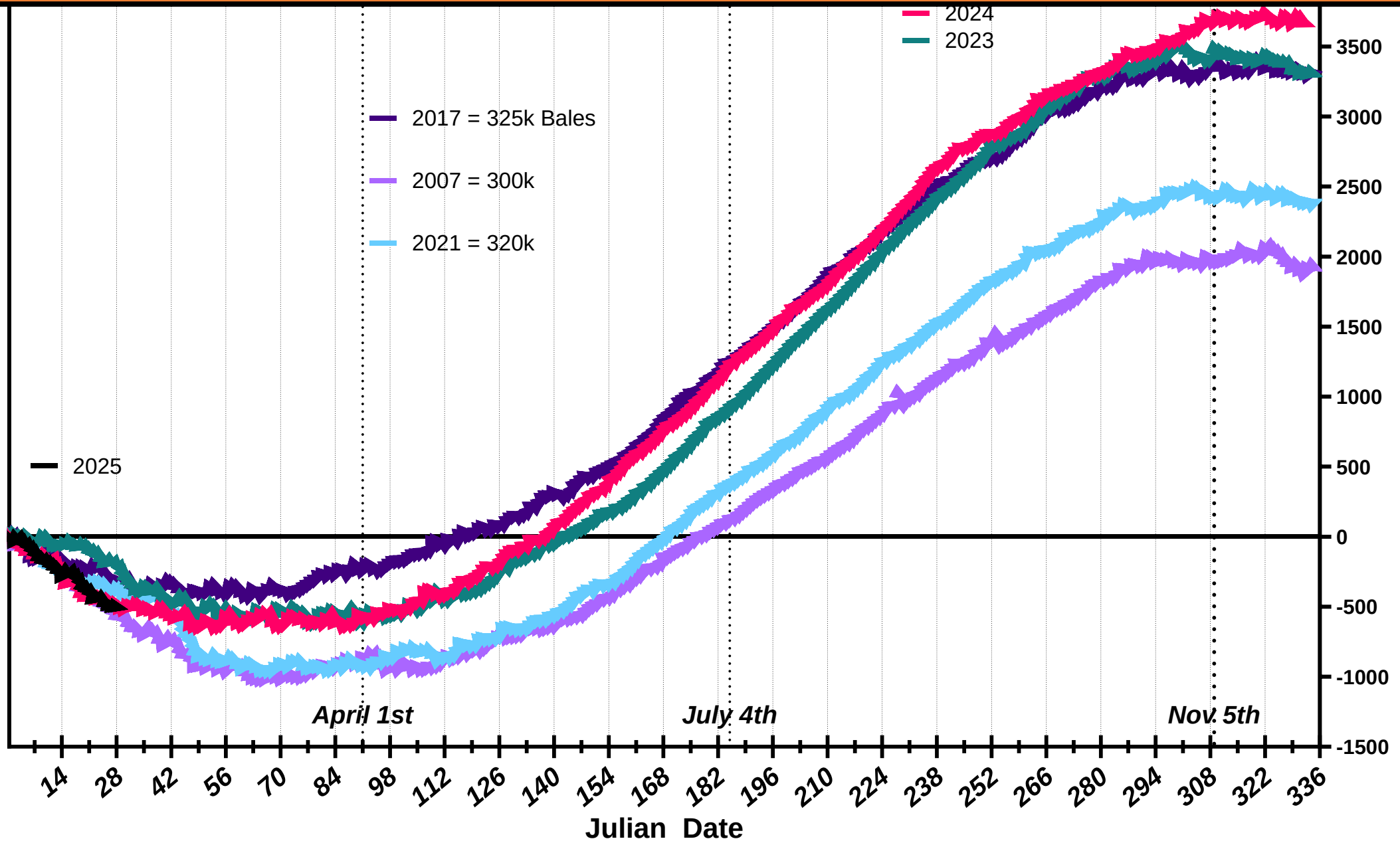
2. Can I plant on backside/frontside of the season?

   Yes, Sometimes, Maybe, but No.

3. Should I use a seed treatment?

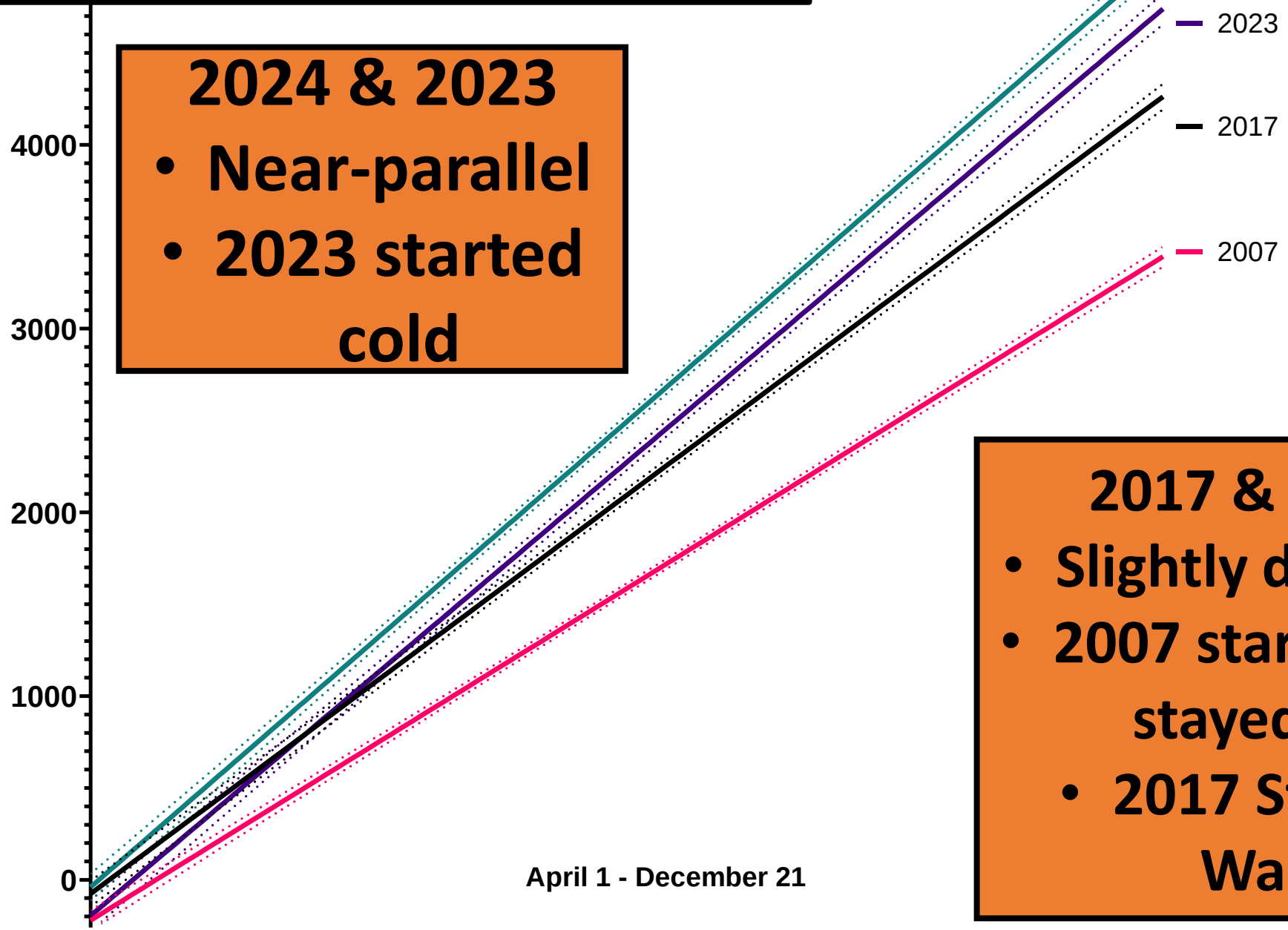
   That depends.

Depends on- What does 2025 look like so far compared to high-bale & low-bale years?



linear relationship with cumulative development

Accumulated GDD Starting April 1st



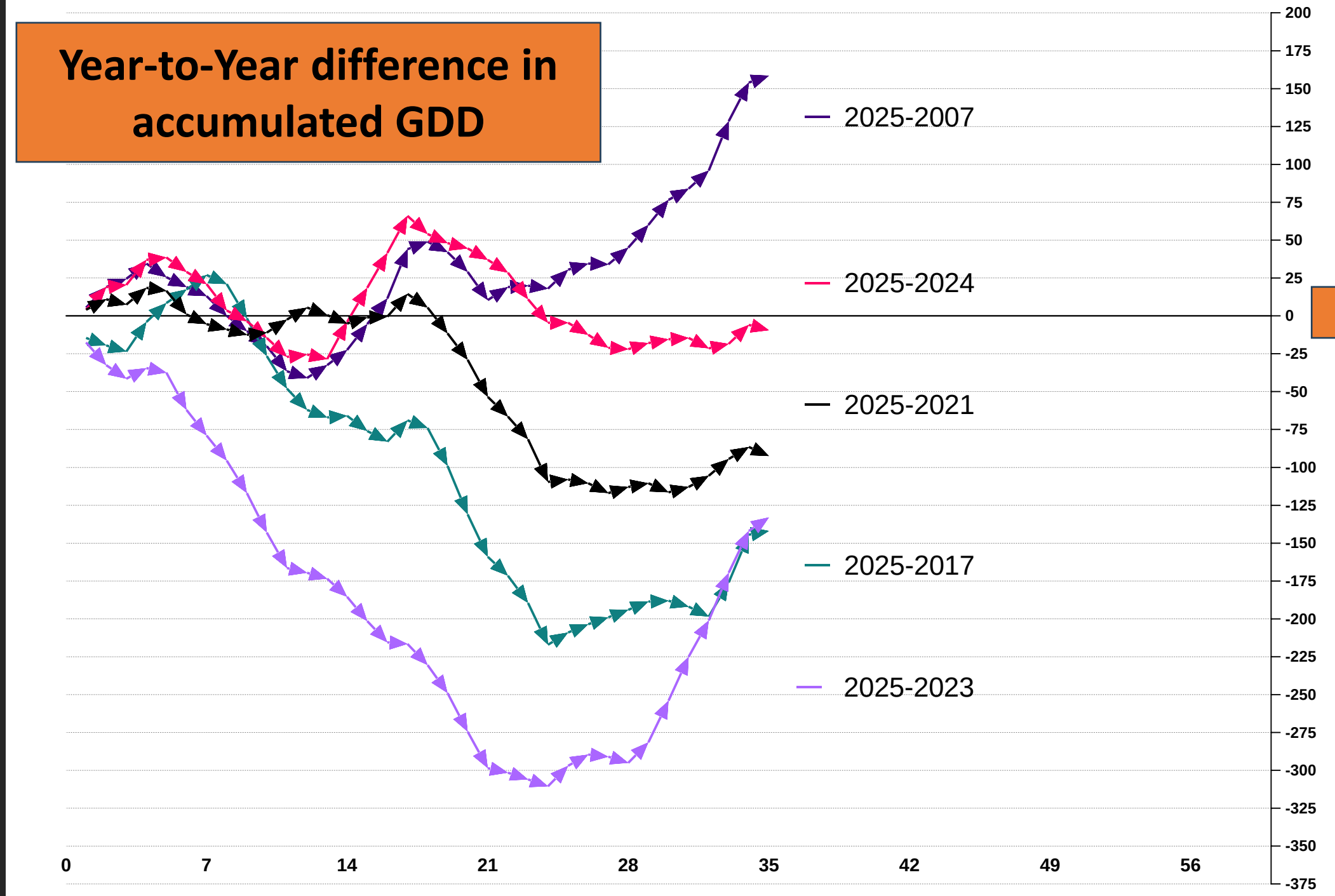
2024 & 2023

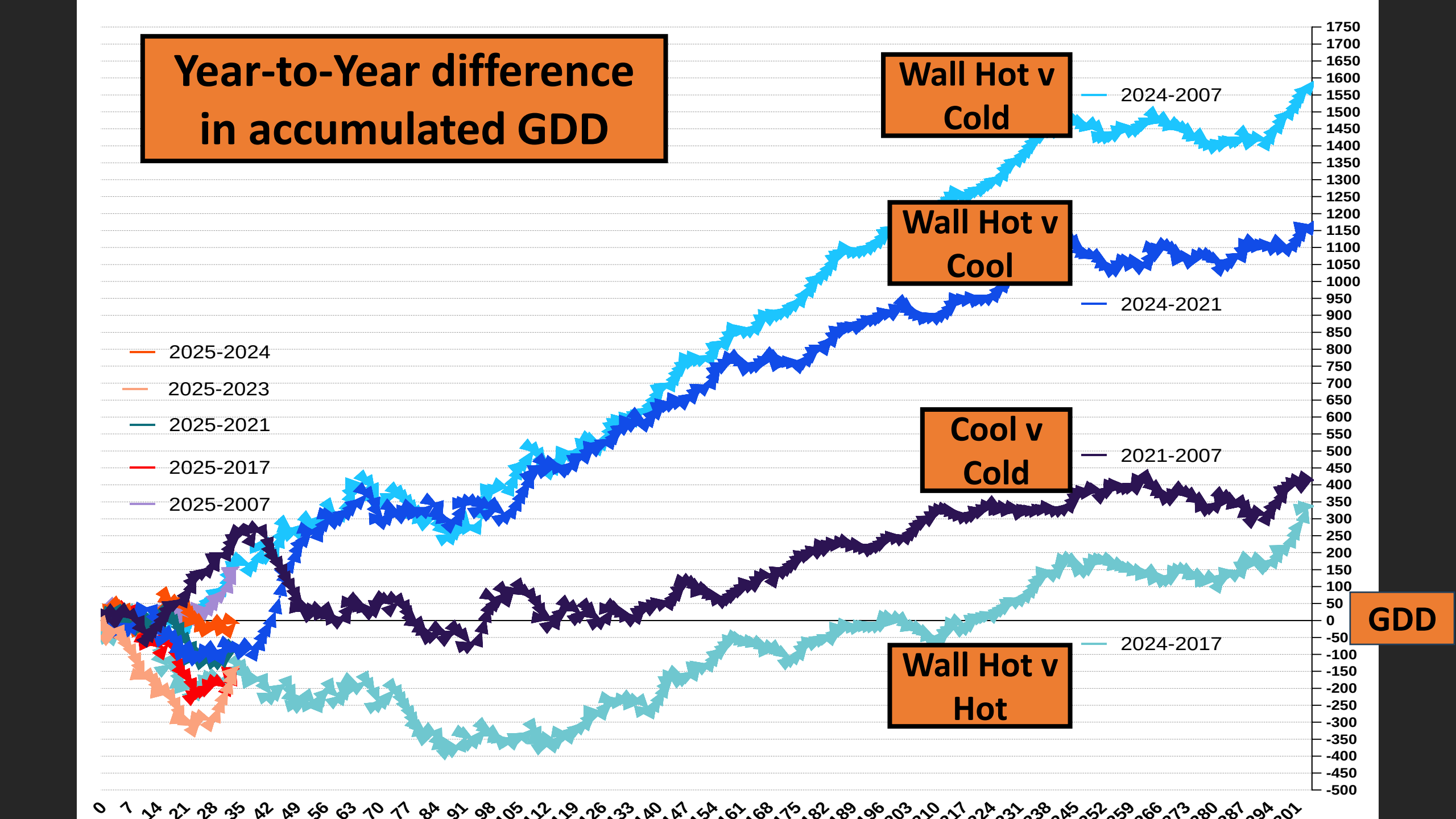
- Near-parallel
- 2023 started cold

2017 & 2007

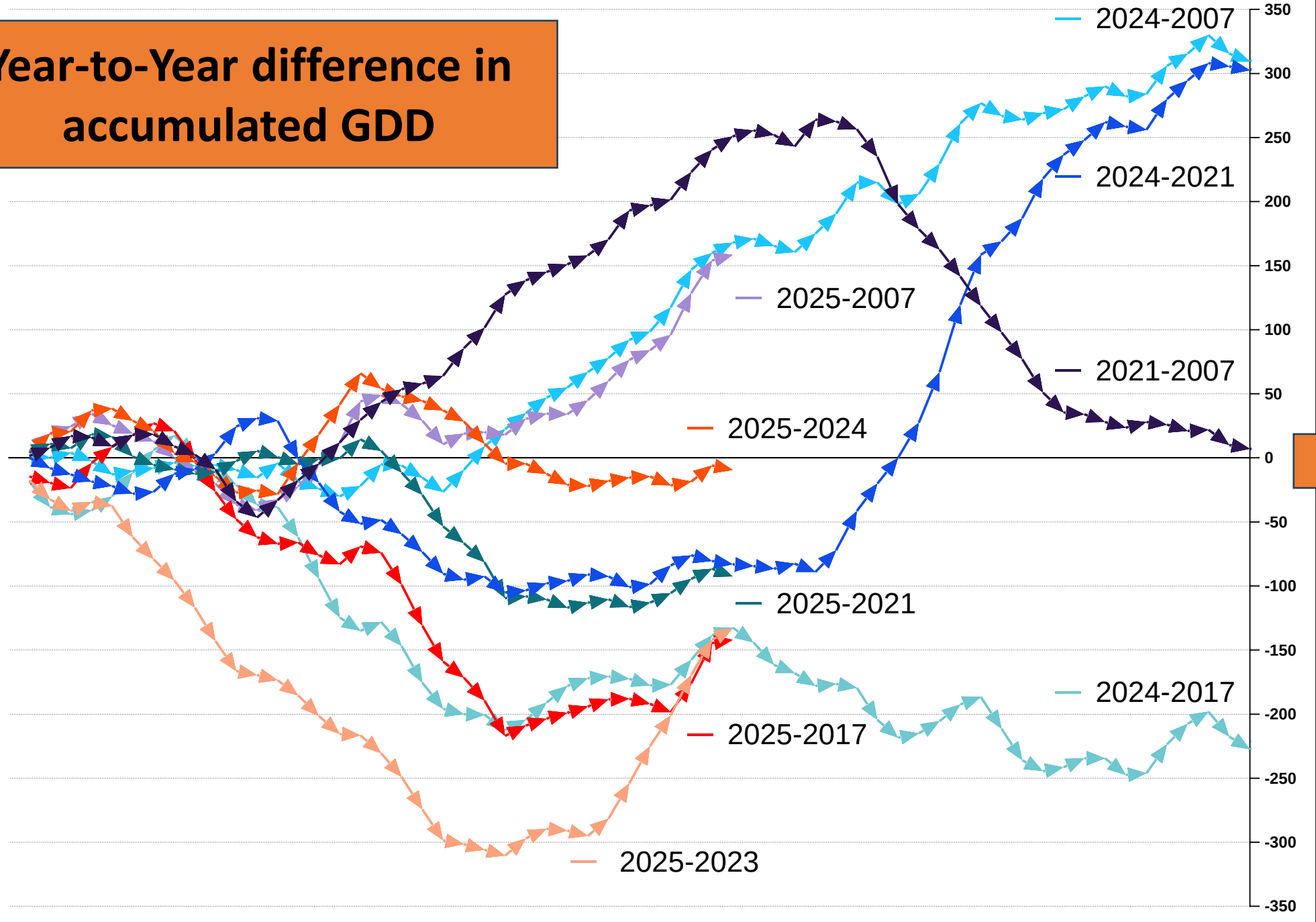
- Slightly diverging
- 2007 started cold stayed cool
- 2017 Started Warm

Year-to-Year difference in accumulated GDD




Year-to-Year difference in accumulated GDD
Wall Hot v Cold
Wall Hot v Cool
Cool v Cold
Wall Hot v Hot
2024-2007
2024-2021
2021-2007
2024-2017
2025-2024
2025-2023
2025-2021
2025-2017
2025-2007
GDD
1750
1700
1650
1600
1550
1500
1450
1400
1350
1300
1250
1200
1150
1100
1050
1000
950
900
850
800
750
700
650
600
550
500
450
400
350
300
250
200
150
100
50
0
-50
-100
-150
-200
-250
-300
-350
-400
-450
-500
0
7
14
21
28
35
42
49
56
63
70
77
84
91
98

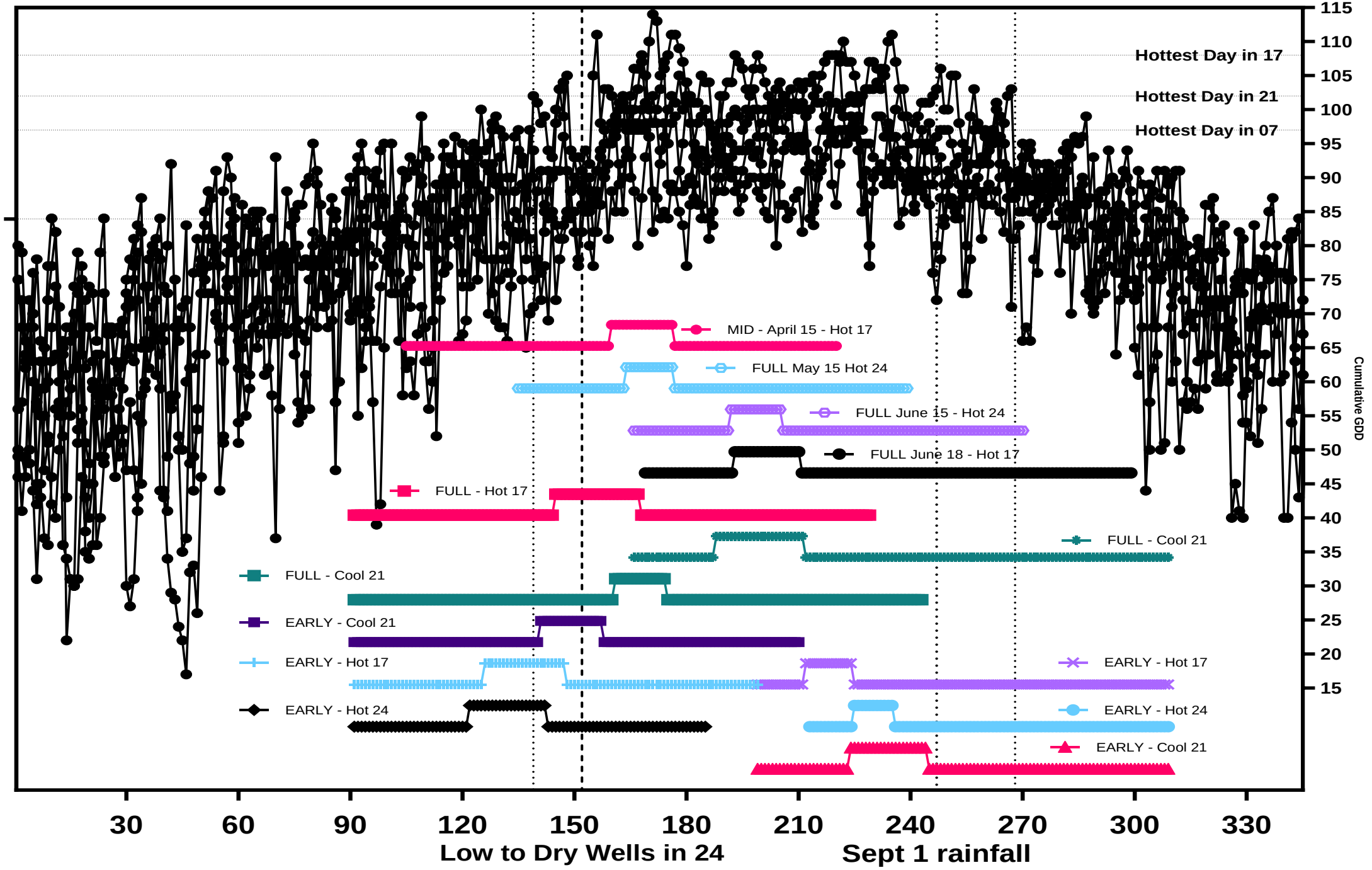
Year-to-Year difference in accumulated GDD



GDD

Questions for the audience…..

1. **When/what would you plant?**
   - ✓ **HOT YEAR – 24**
   - ✓ **WARM YEAR – 17**
   - ✓ **COOL YEAR – 21**
   - ✓ **COLD YEAR – 07**


Hottest Day in 17
Hottest Day in 21
Hottest Day in 07
MID - April 15 - Hot 17
FULL May 15 Hot 24
FULL June 15 - Hot 24
FULL June 18 - Hot 17
FULL - Hot 17
FULL - Cool 21
FULL - Cool 21
EARLY - Cool 21
EARLY - Hot 17
EARLY - Hot 24
EARLY - Hot 17
EARLY - Hot 24
EARLY - Cool 21
Cumulative GDD
115
110
105
100
95
90
85
80
75
70
65
60
55
50
45
40
35
30
25
20
15
30
60
90
120
150
180
210
240
270
300
330
Low to Dry Wells in 24
Sept 1 rainfall

Questions for the audience…..

2. Could we reduce total plant captured radiation by 50-75% (*inexpensive-foliar*---calcium carbonate, chalk, whitewash, commercial products) whenever rainfall and heating units become detrimental?
    a. Would it help?
    b. What does it cost?
    c. How long does it last?
    d. What is the name of this magical product?

Questions for the audience……

3. Which transform (like YtY / YoY) would you use to make predictive sense of energy output and production?