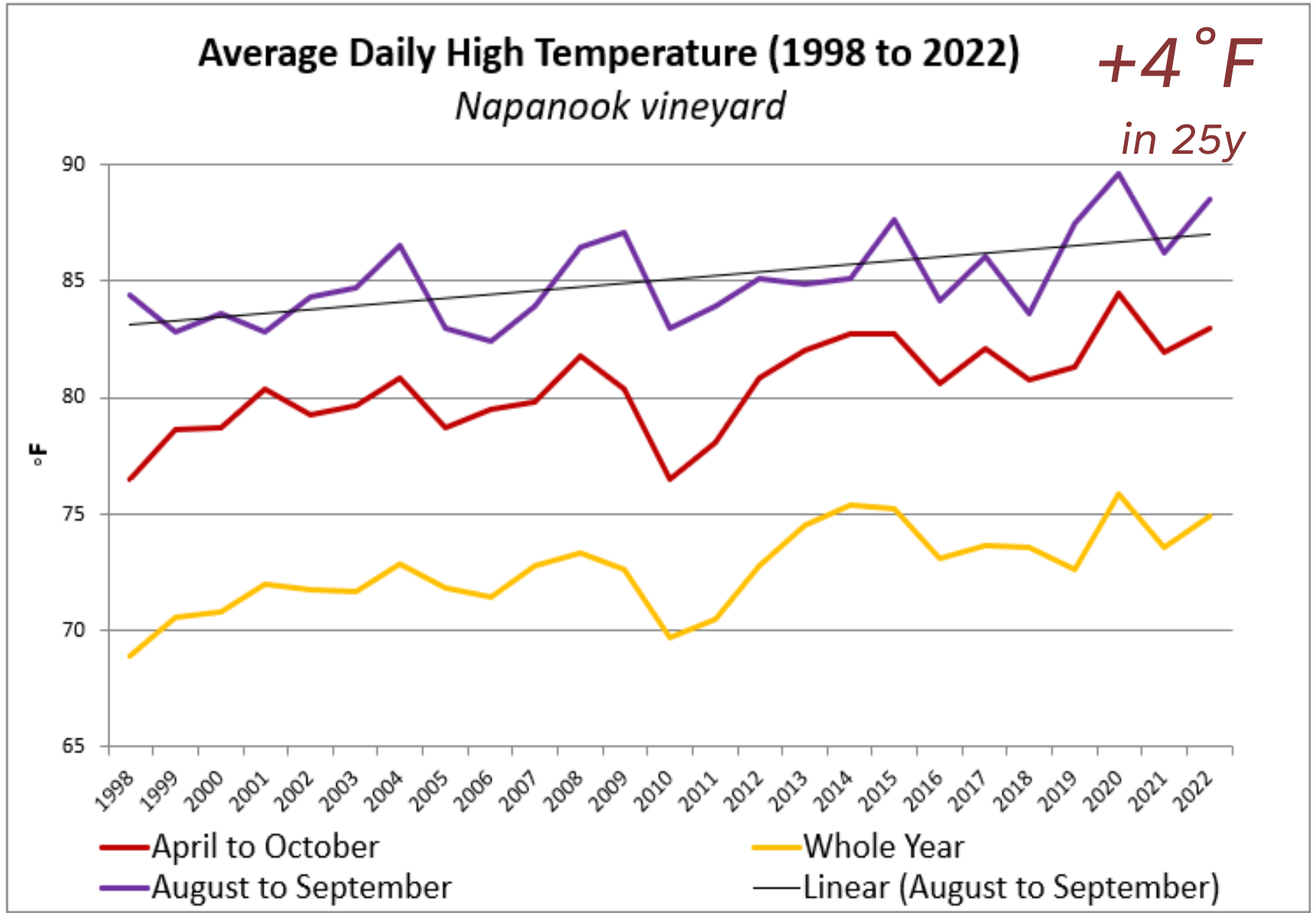
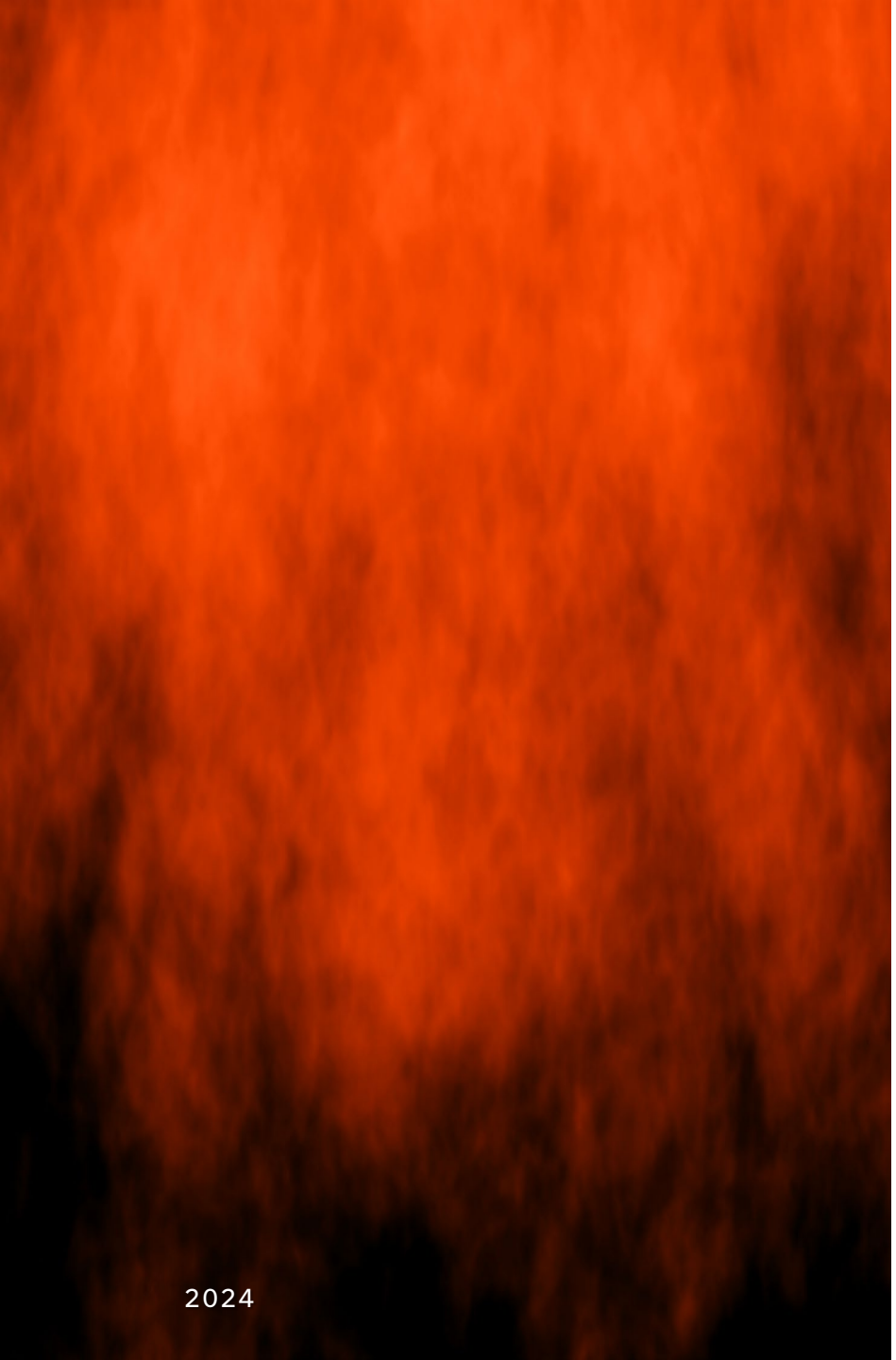

ABUELITOS

DAILY HIGHS
AUGUST - SEPT

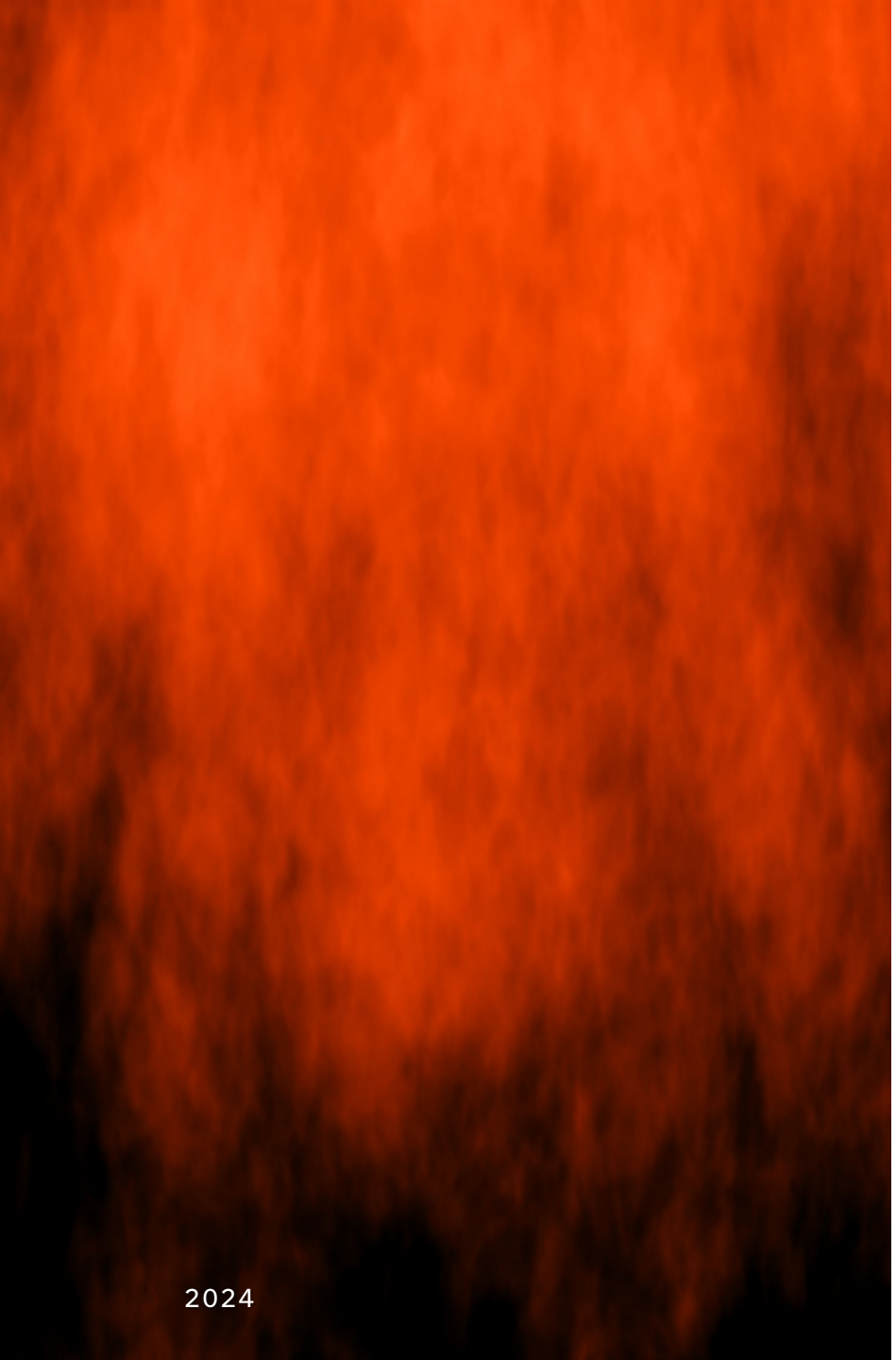




VAPOR PRESSURE DEFICIT (VPD)

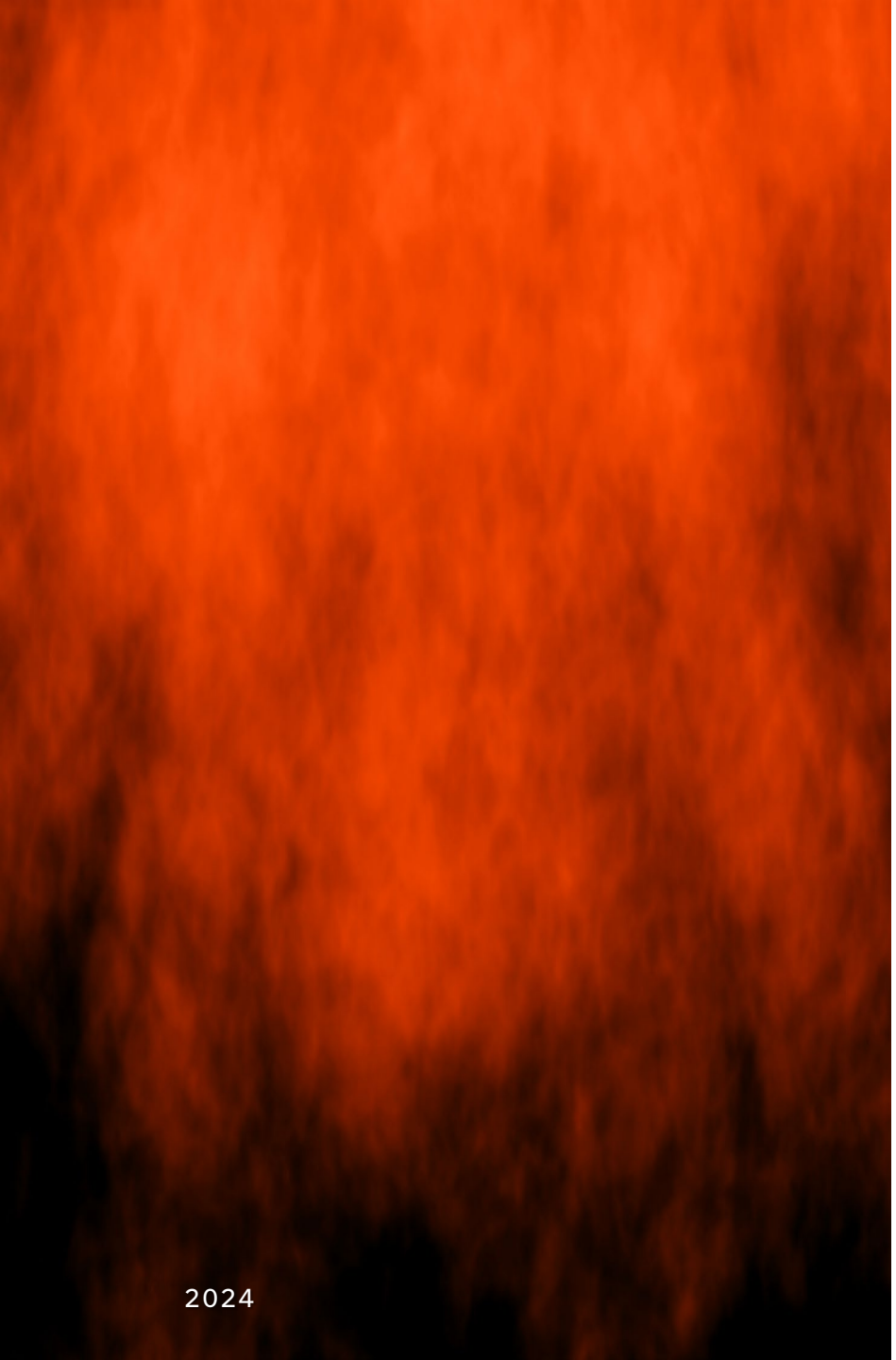
The Moisture-Sucking capacity of the air.

It gets higher when it is hotter.



VAPOR PRESSURE DEFICIT (VPD)

Temperature	Humidity	VPD	*What's it feel like?*
F	%	kPa	
60	80	0.5	*cold & damp (foggy SF)*
75	50	1.5	*comfortable (spring Napa)*
85	40	2.5	*warm & pleasant*
95	20	4.5	*hot & dry (vines "shut down")*
100	15	5.5	*very hot & very dry*
105	15	6.5	*scorching (Death Valley)*

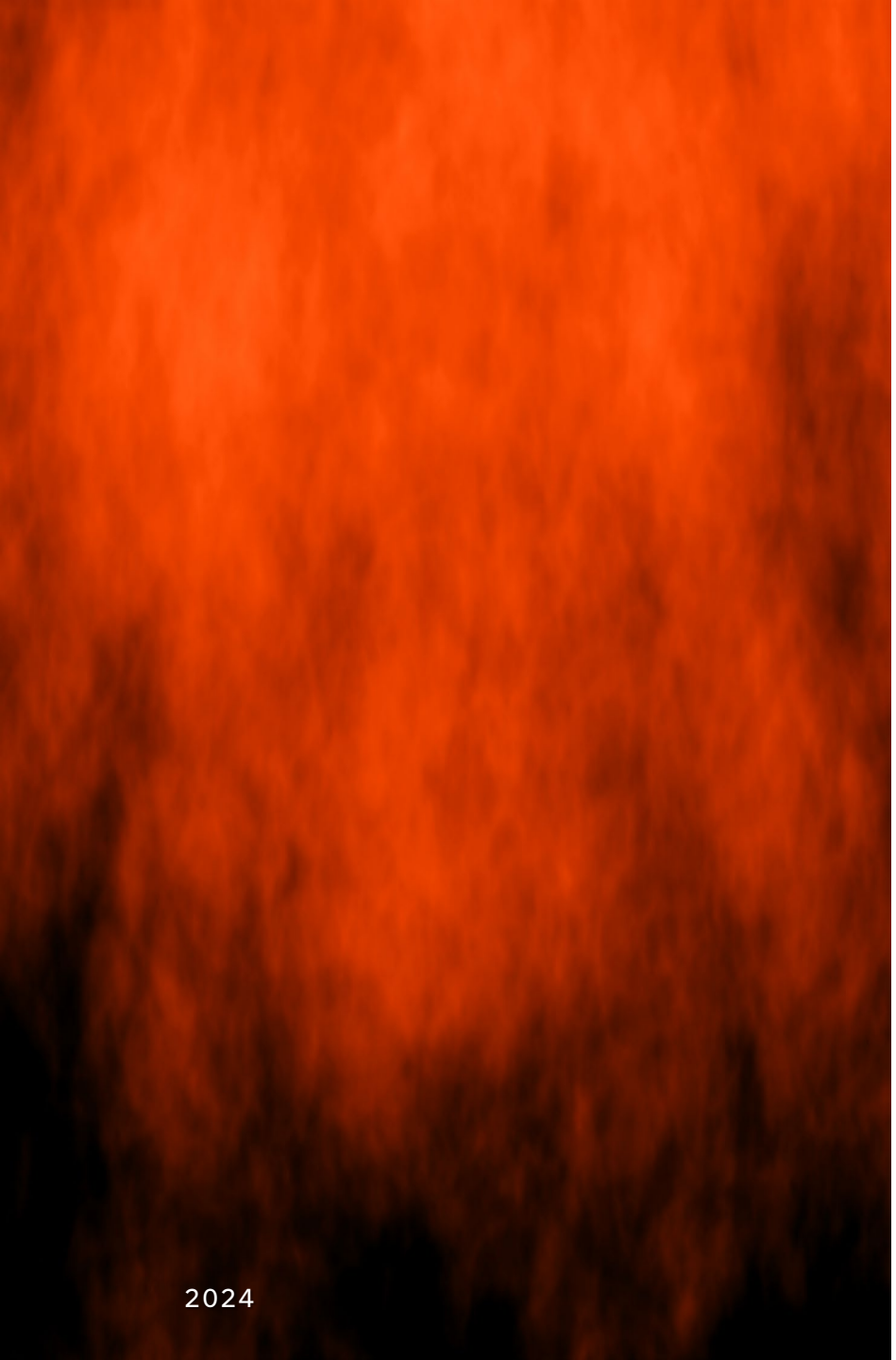


VAPOR PRESSURE DEFICIT (VPD)

Temperature F	Humidity %	VPD kPa	*What's it feel like?*
60	80	0.5	*cold & damp (foggy SF)*
75	50	1.5	*comfortable (spring Napa)*
83	***40***	***2.3***	***25 years ago***
85	40	2.5	*warm & pleasant*
87	***40***	***2.6***	***today***

Difference in VPD **+0.3**

The rise in VPD (Aug-Sept) in the last 25 years is 0.3.



VAPOR PRESSURE DEFICIT (VPD)

"Growing VPD accounted for nearly all the growth in forest fires in California from 1972-2018."

Columbia University, American Geophysical Union, Earth's Future Journal, July 2019

SHADE STRATEGIES (ADAPTIVE)

LOWER TEMPERATURES & RAISE HUMIDITY

ORIENTATION

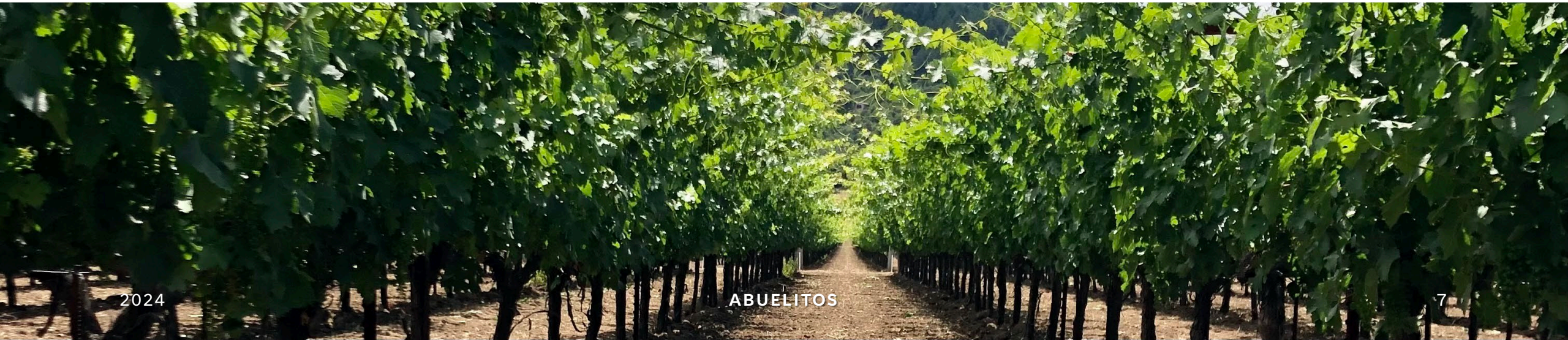
Rows parallel to the sun’s rays at the hottest time of the day.

TRELLISING

Trellises that increase overhead shading.

CANOPY

Laterals trimmed to protect clusters.



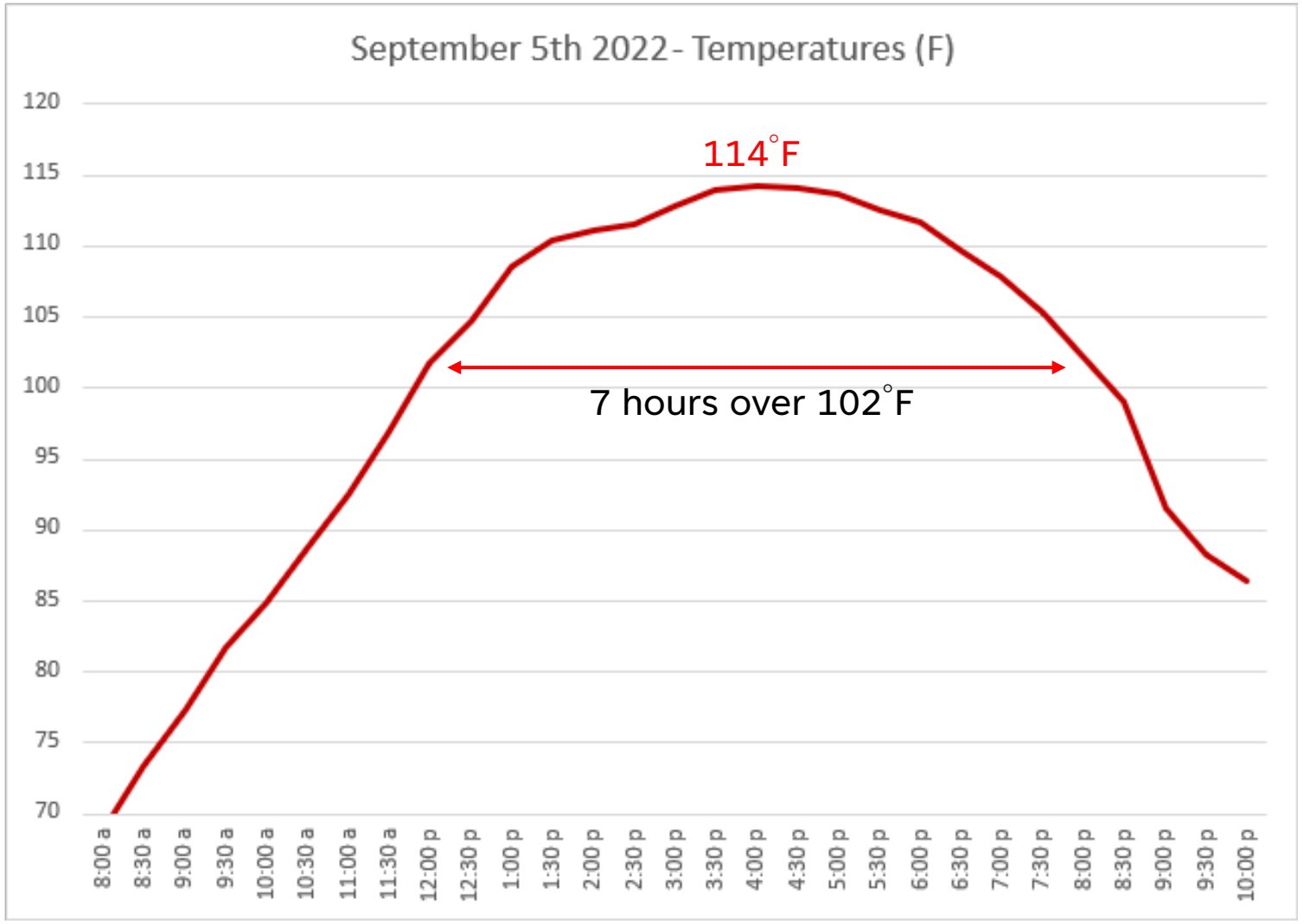
2022

ABUELITOS

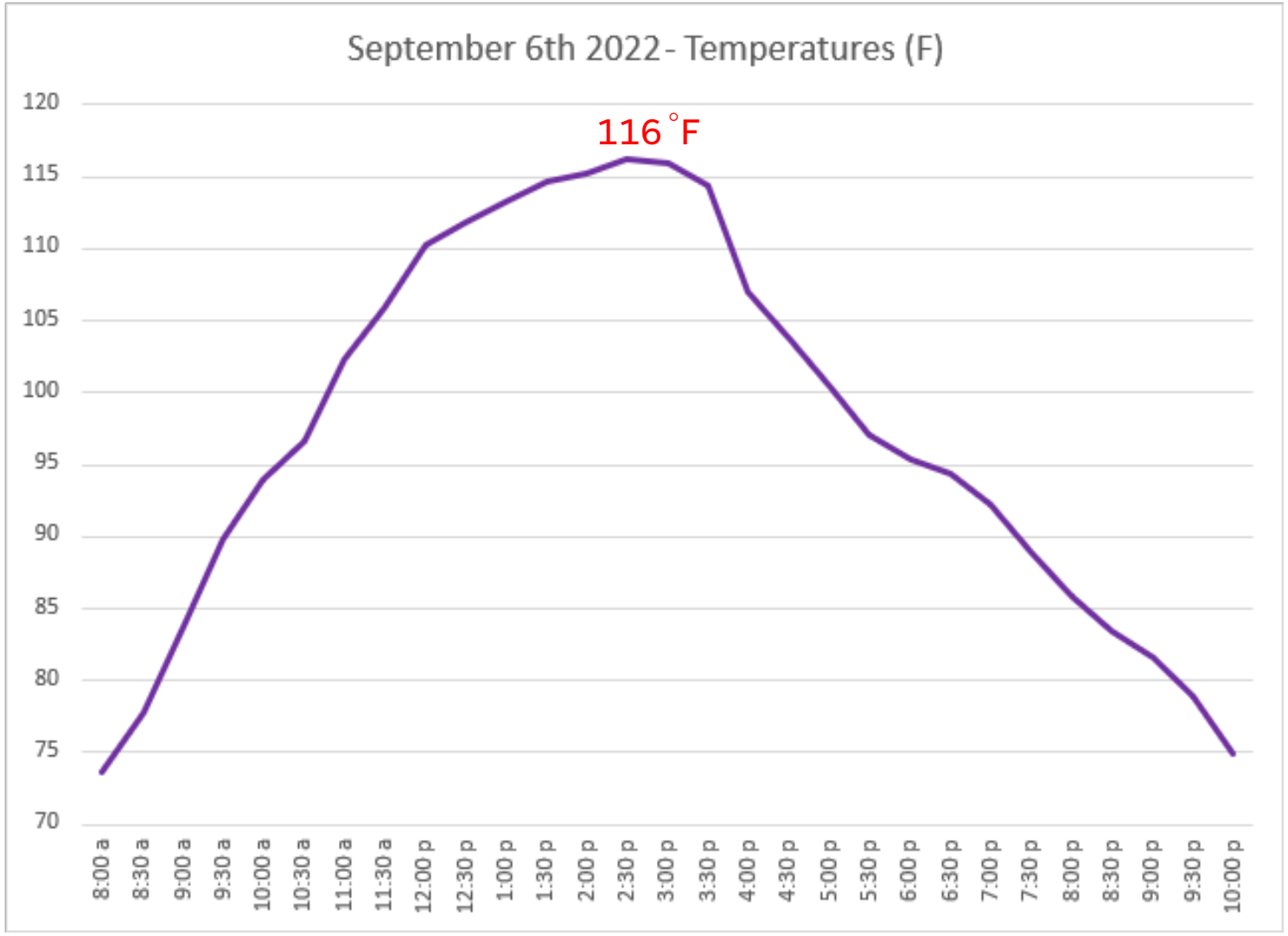
Every farm a vital ecosystem

VINTAGE 2022

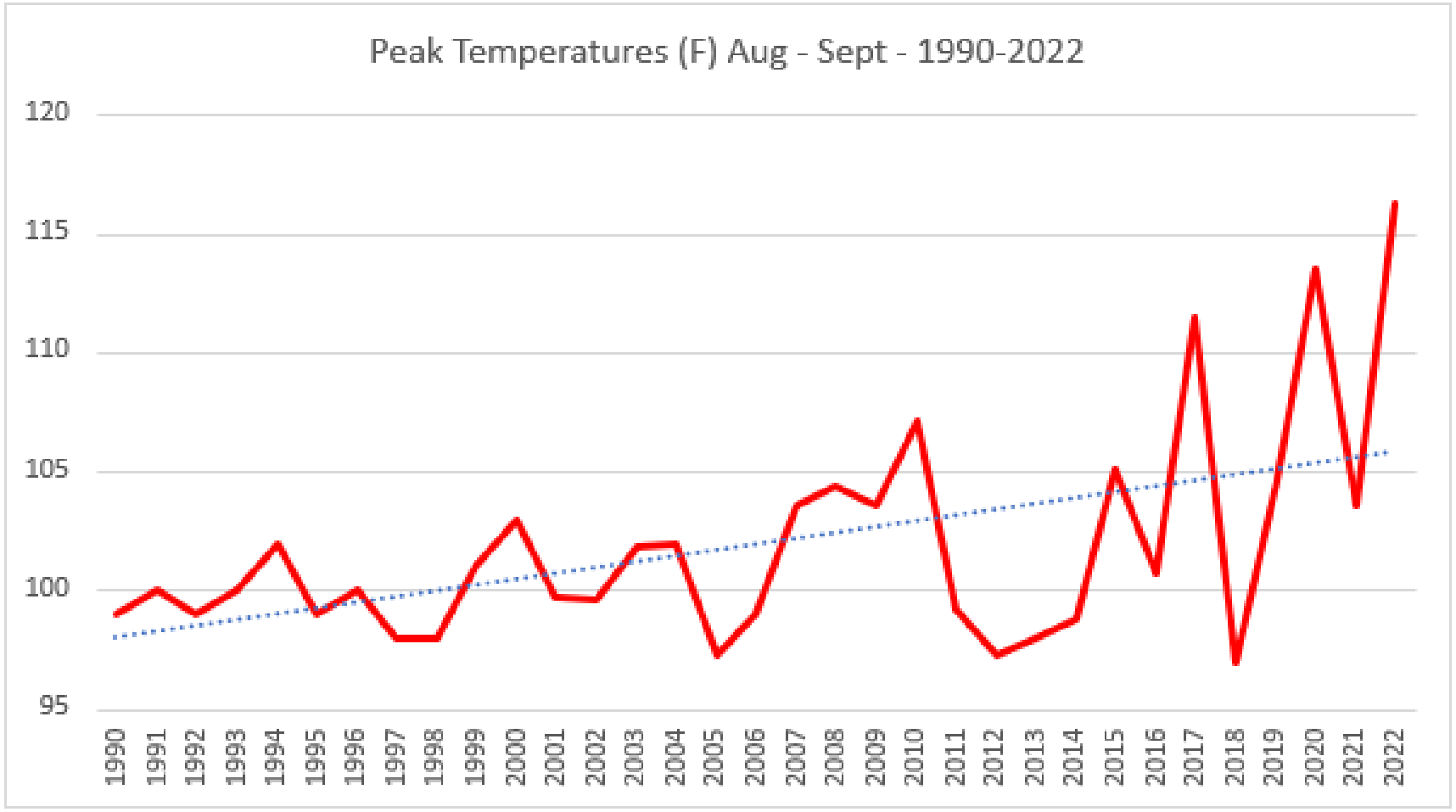
SEPTEMBER 5

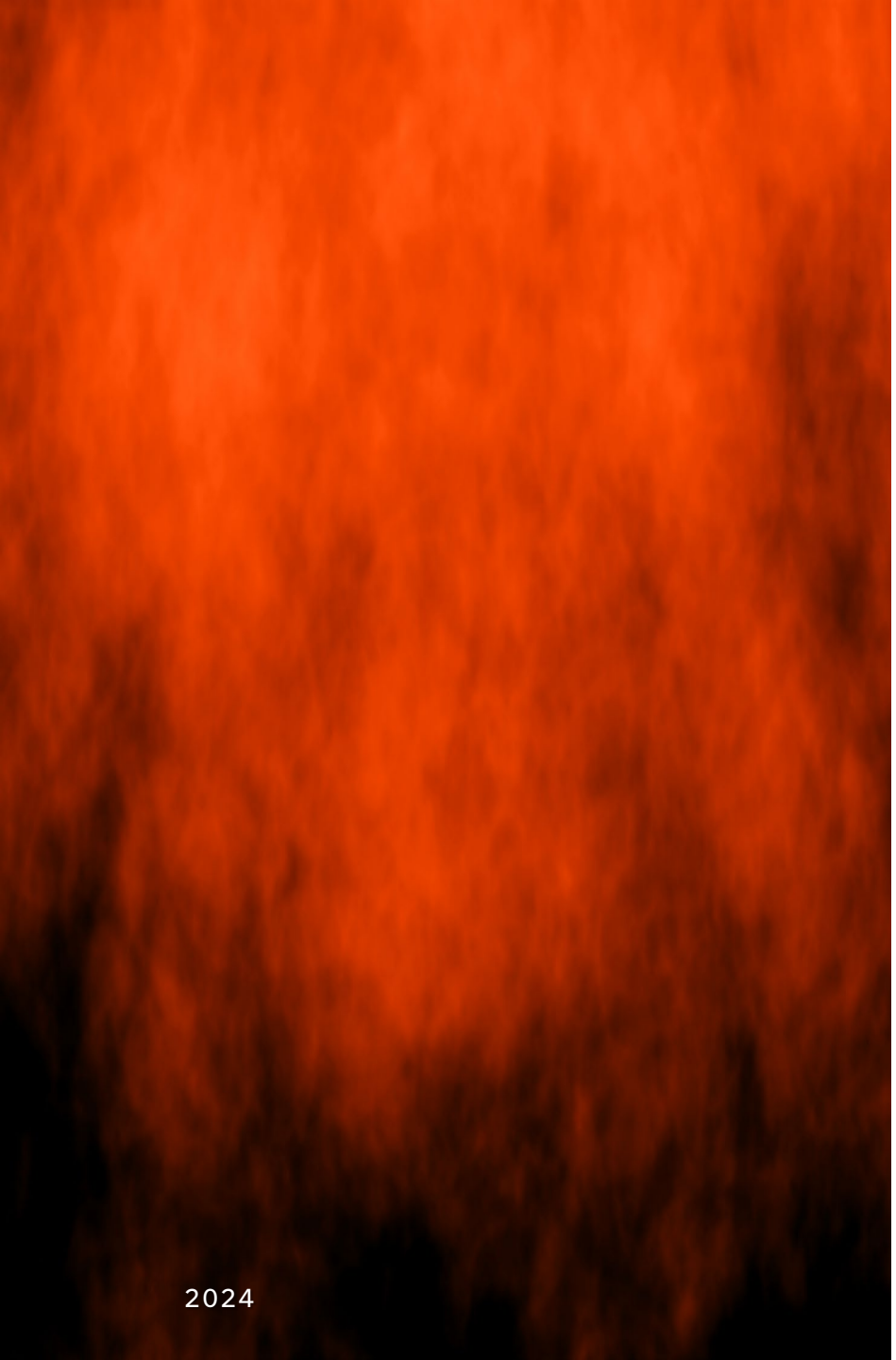

September 5th 2022- Temperatures (F)
120
115
110
105
100
95
90
85
80
75
70
114˚F
7 hours over 102˚F
8:00 a
8:30 a
9:00 a
9:30 a
10:00 a
10:30 a
11:00 a
11:30 a
12:00 p
12:30 p
1:00 p
1:30 p
2:00 p
2:30 p
3:00 p
3:30 p
4:00 p
4:30 p
5:00 p
5:30 p
6:00 p
6:30 p
7:00 p
7:30 p
8:00 p
8:30 p
9:00 p
9:30 p
10:00 p

SEPTEMBER 6


September 6th 2022 - Temperatures (F)
116 °F
120
115
110
105
100
95
90
85
80
75
70
8:00 a
8:30 a
9:00 a
9:30 a
10:00 a
10:30 a
11:00 a
11:30 a
12:00 p
12:30 p
1:00 p
1:30 p
2:00 p
2:30 p
3:00 p
3:30 p
4:00 p
4:30 p
5:00 p
5:30 p
6:00 p
6:30 p
7:00 p
7:30 p
8:00 p
8:30 p
9:00 p
9:30 p
10:00 p

PEAK TEMPS 1990-2022





VAPOR PRESSURE DEFICIT (VPD)

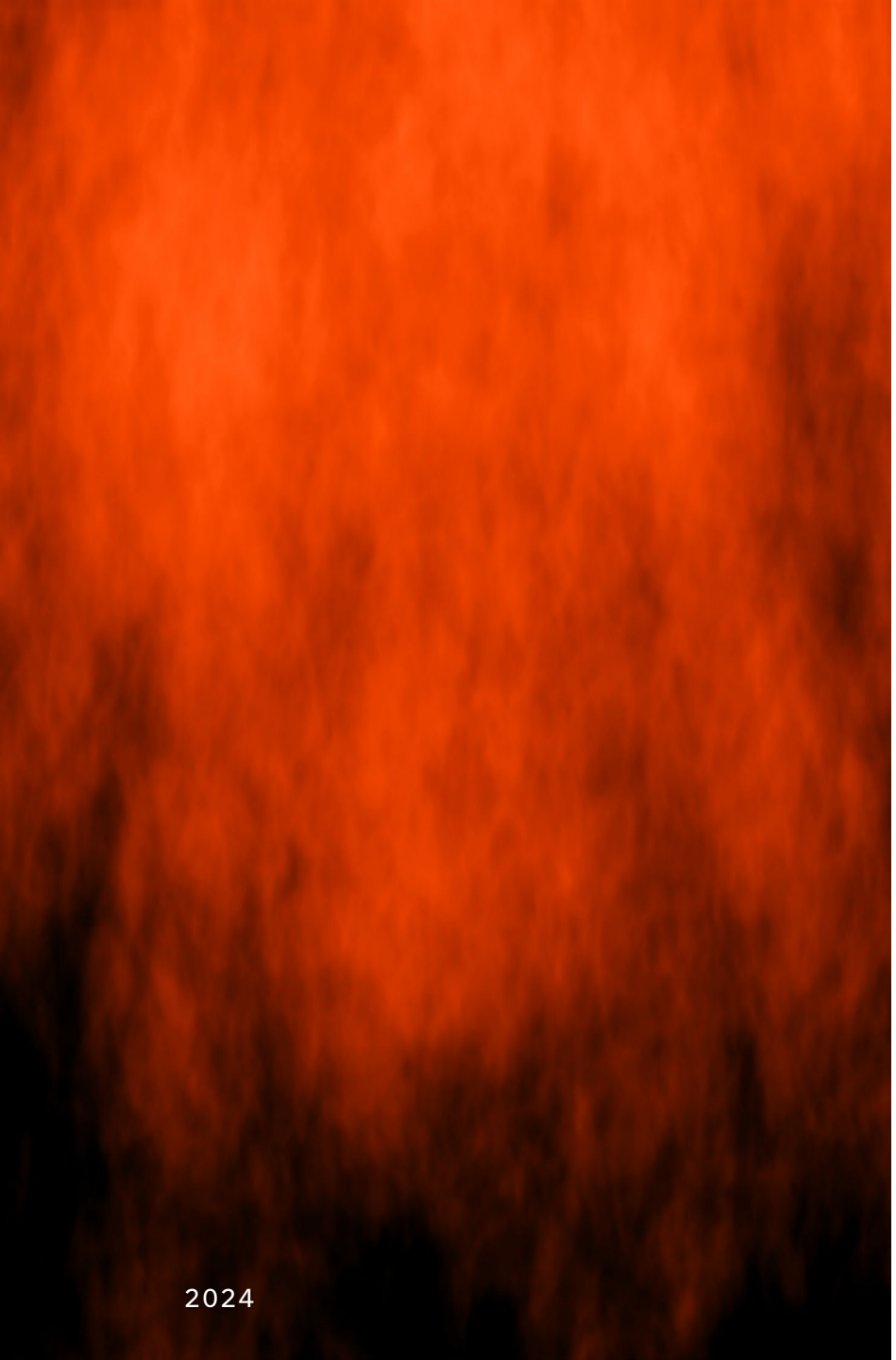
Napa Valley

Record-breaking temperature spikes

Note: Previous record in 2010 (107°F)

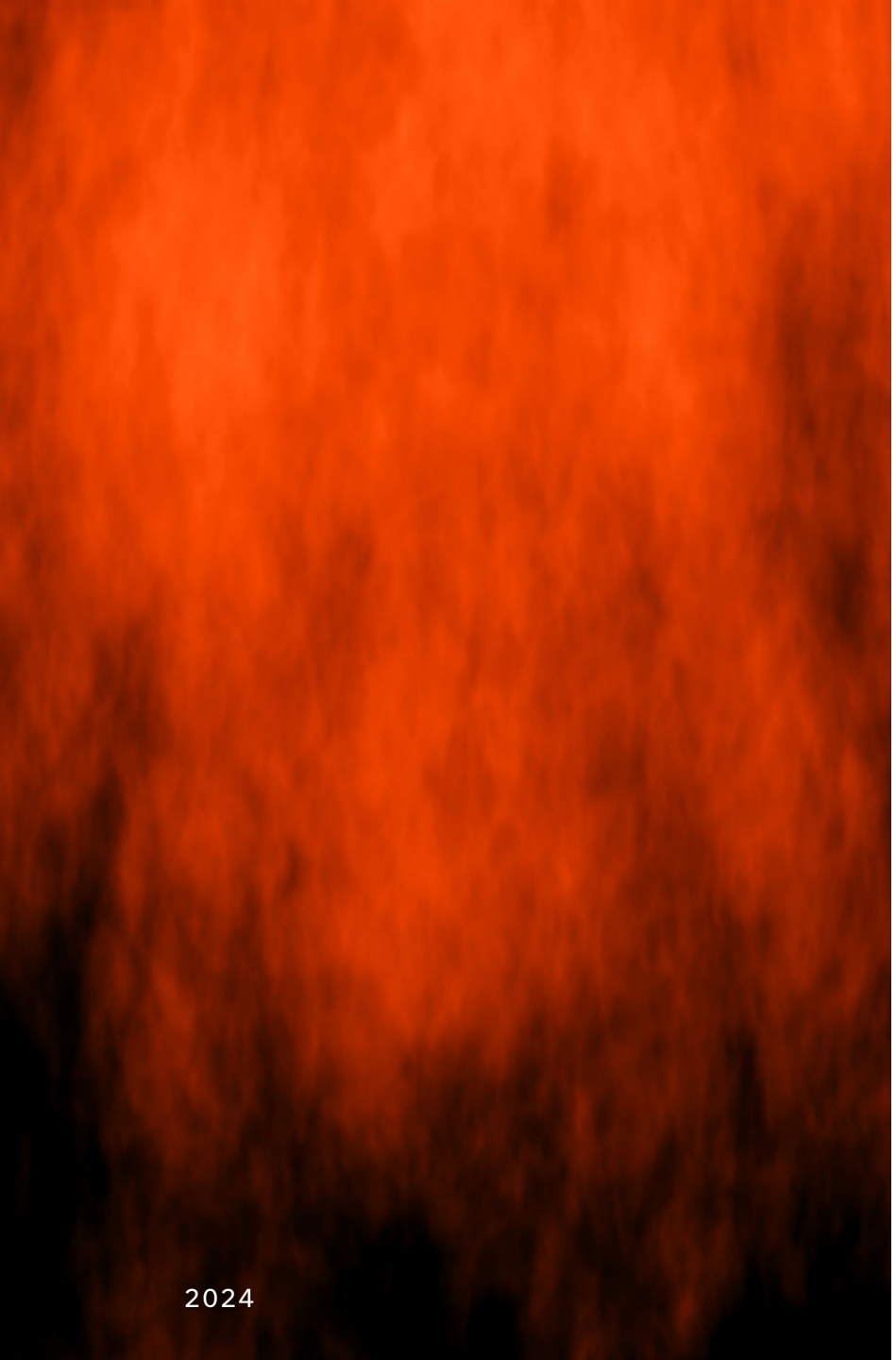
Year	Temp	Fruit Loss
2017	112°F	50%
2020	114°F	70%
2022	116°F	100%

- Dominus Estate, Napa Valley
- Temperature peaks in Aug-Sept



VAPOR PRESSURE DEFICIT (VPD)

Temperature F	Humidity %	VPD kPa	*What's it feel like?*
60	80	0.5	*cold & damp (foggy SF)*
75	50	1.5	*comfortable (spring Napa)*
83	40	2.3	***25 years ago***
85	40	2.5	*warm & pleasant*
87	40	2.6	***today***
95	20	4.5	*hot & dry (vines "shut down")*
100	15	5.5	*very hot & very dry*
105	15	6.5	*scorching (death valley)*
112	11	**8.3**	*2017 (50% crop lost)*
114	11	**8.8**	*2020 (70% crop lost)*
116	13	**9.1**	*2022 (100% loss)*



VAPOR PRESSURE DEFICIT (VPD)

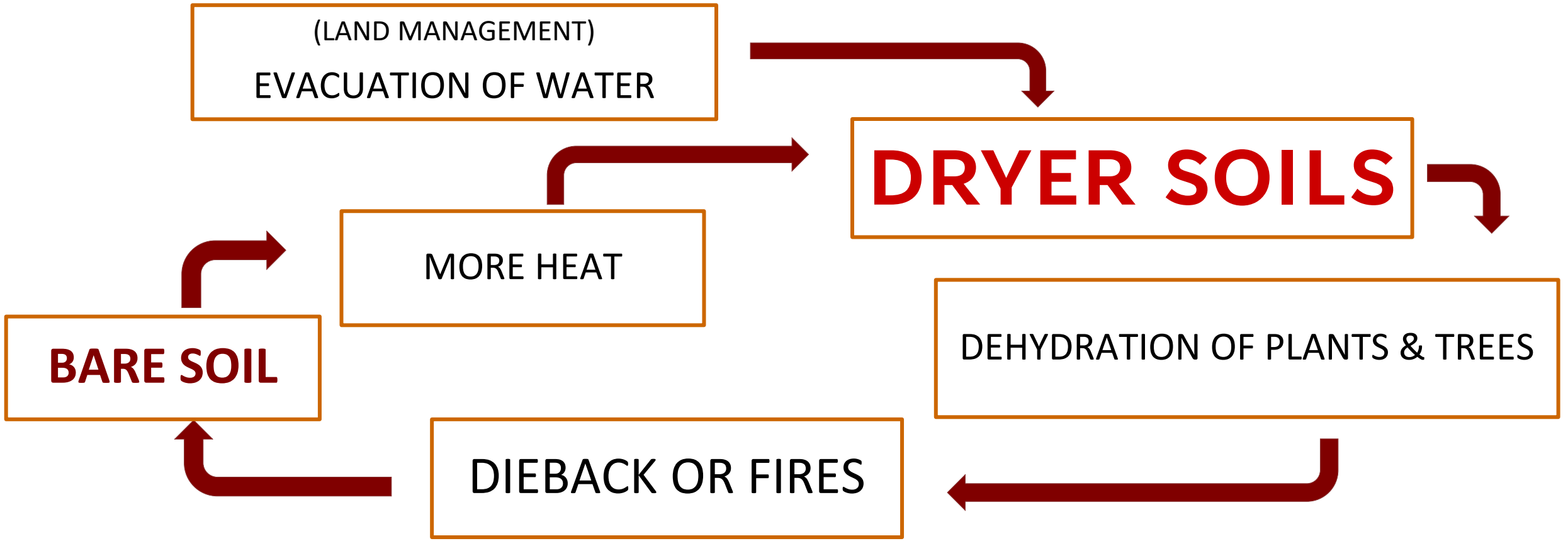
Temperature	Humidity	VPD	*What's it feel like?*	
F	%	kPa		
114	11	**8.8**	*2020*	70% loss
116	13	**9.1**	*2022*	No crop

Difference in VPD **+0.3**

The difference between a crop and no crop is a VPD of 0.3.

DESERTIFICATION

Dry soils lead to MORE HEAT, which leads to more drying.



FEEDBACK LOOP

BARE SOIL

DUSTY	HOT	DRY
Why does DUST matter?	175°F	2” of RAIN per foot

DUST

DUST ABSORBS SUNLIGHT AND HEATS AIR

DUST

Dust leads to more WATER VAPOR, which leads to more warming.

DUST ABSORBS SUNLIGHT AND HEATS AIR

HOTTER

HOT AIR INCREASES EVAPORATION (MORE WATER VAPOR)

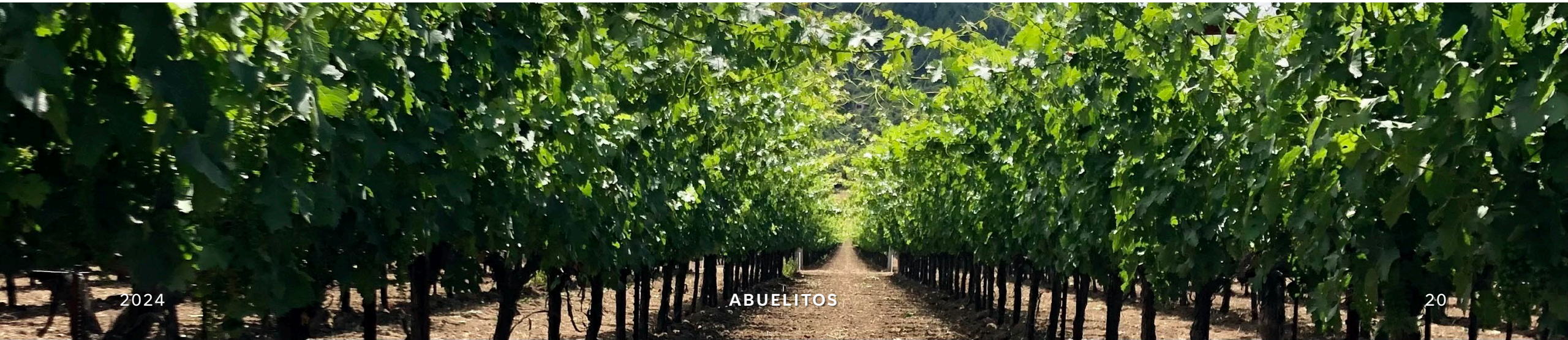
HOT AIR HOLDS MORE WATER VAPOR

(UNCONDENSED) WATER VAPOR = POWERFUL GHG

FEEDBACK LOOP

ABUELITOS

IS IT POSSIBLE TO REDUCE CLIMATE EXTREMES WITH ECOSYSTEMS?



ABUELITOS

IS IT POSSIBLE TO COOL OUR VALLEY LOCALLY?

H2O VAPOR = GHG

Uncondensed water vapor is a POWERFUL GHG.
(DUST INCREASES H20 VAPOR)

BARE SOIL IS HOT

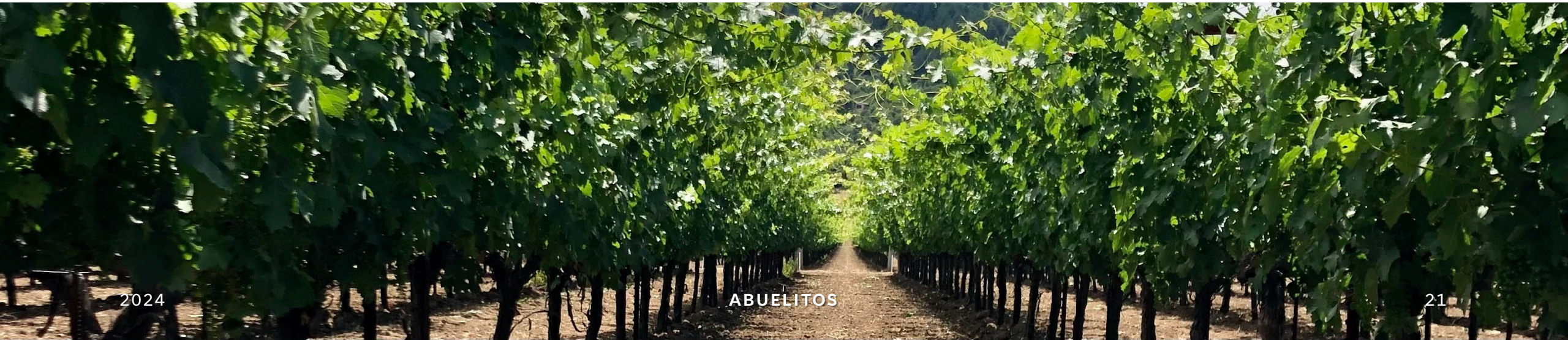
175°F

75°-100°F (with groundcover)

SOIL HOLDS 2” H2O/FT DEPTH

10’ ROOTS =

20” H2O infiltration



PLANTED

VEGETATED

Why do PLANTS matter?

COOLER

75°-100°F

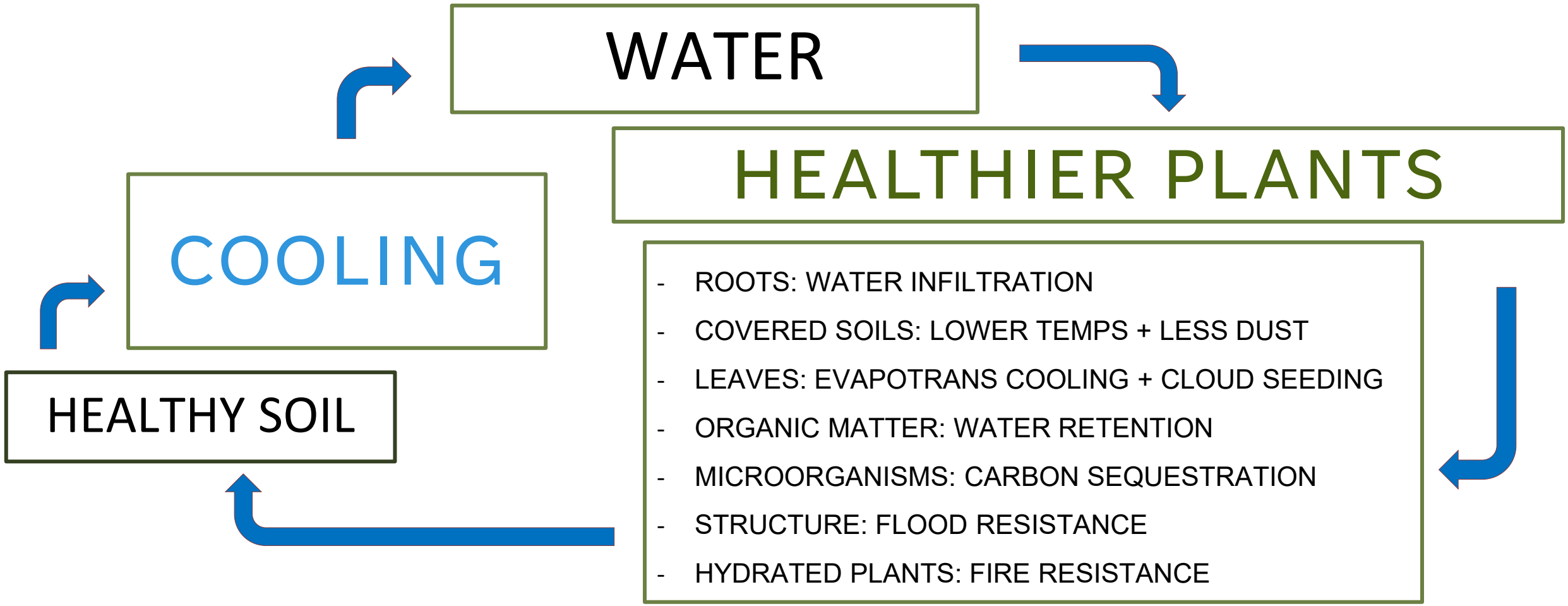
HYDRATED

20” of RAIN

With 10-foot deep roots

RESTORATION

Hydrated soils lead to LESS HEAT, which leads to more hydration.



FEEDBACK LOOP

ABUELITOS

COMPLEXITY

BALANCE

VITALITY

Ecosystems regulate the climate.

ABUELITOS

COMPLEXITY

BALANCE

VITALITY

How do we build ecosystems?

ABUELITOS

BUILDS ECOSYSTEMS

(NATIVE)
GROUNDCOVER

HABITATS
BORDERS
CORRIDORS & ISLANDS

SLOW FLOW
OF H2O

ABUELITOS

HOW WE ARE LEADING THIS WORK:

EDUCATION
COMMUNITY OUTREACH

PILOT PROJECTS
CREATING A MODEL

IMPLEMENTATION SUPPORT
WIDESPREAD ADOPTION

ABUELITOS
FOUNDATION

BOARD OF DIRECTORS

GINNA BEHARRY
VICHHEKA HANG
ERIK OLSON
NICHOLAS CARSON

EXECUTIVE DIRECTOR

GRETCHEN HAYES

ABUELITOS

NAPA WATERSHED COALITION

CORE GROUP LEADERS

MICHAEL SILACCI
MARY MAHER
MOLLY WILLIAMS
KIMBERLEE MARINELLI
ANNA BRITTAIN
MIMI CASTEEL

PARTNERS

GRAPEGROWERS
LANDOWNERS
OAKVILLE WINEGROWERS
NAPA RCD
NAPA COUNTY
GROUNDWATER SUSTAINABILITY AGENCY
LAND TRUST
REGULATORY AGENCIES
NAPA FIREWISE
NAPA GREEN
FLOWWEST
& OTHERS

CREATING ECOSYSTEMS

Step by step

GROUND-WATER RECHARGE

- Water: Conditions for Plant Life
- Hydrated Soils: Cooler Soils
- Hydrated Vegetation: Fire Resilience

PLANT LIFE

- Roots: Water Infiltration
- Covered Soils: Lower Temps + Less Dust
- Leaves: ET Cooling + Cloud Seeding

SOIL HEALTH

- Organic Matter: Water Retention
- Microorganisms: Carbon Sequestration
- Structure: Flood Resistance

CAN ECOSYSTEMS REALLY MAKE A DIFFERENCE?

ABUELITOS conducts studies

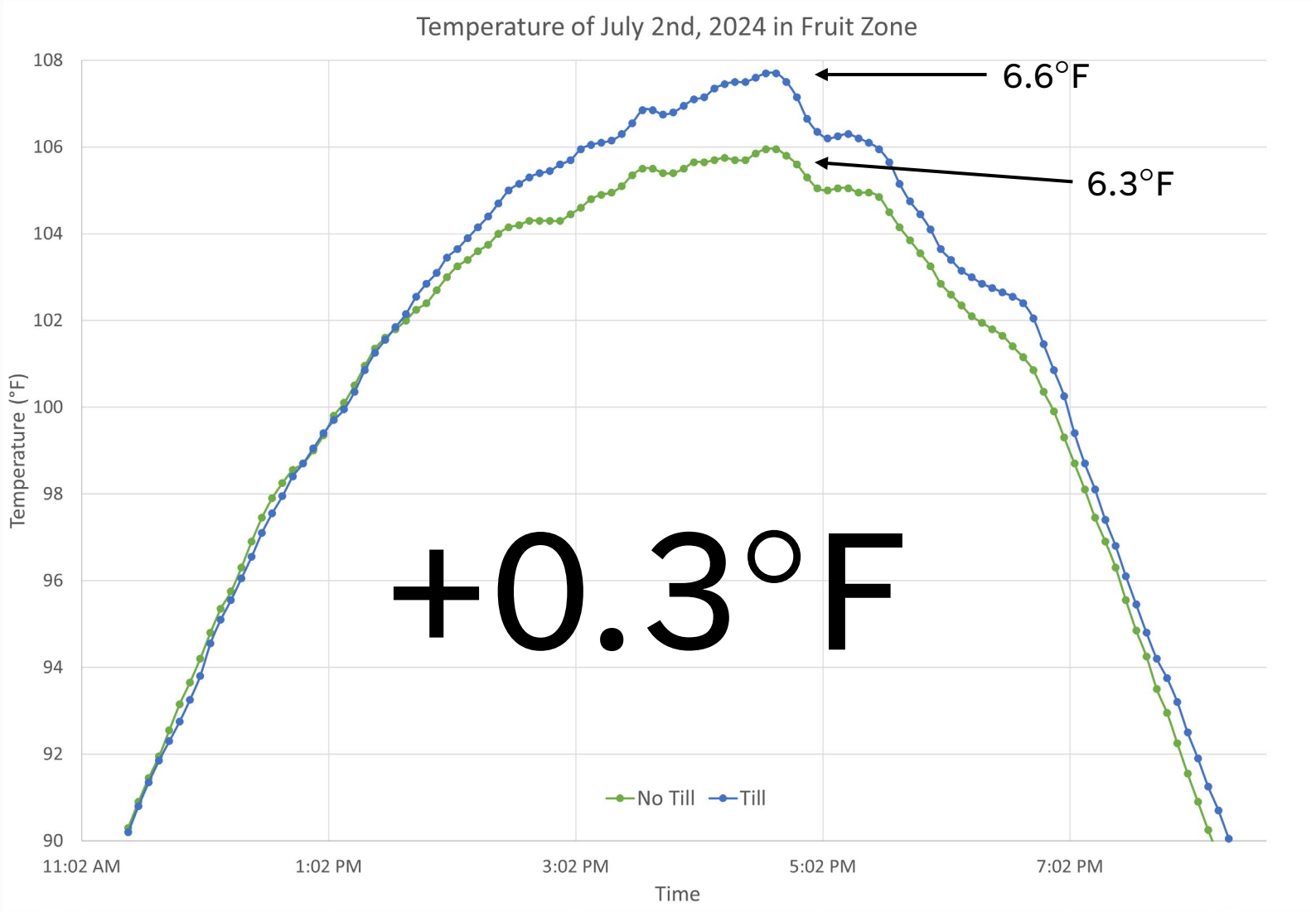
to answer this question.

BARE SOIL

vs

GROUNDCOVER

JULY 2, 2024


Temperature of July 2nd, 2024 in Fruit Zone
6.6°F
6.3°F
+0.3°F
Temperature (°F)
108
106
104
102
100
98
96
94
92
90
11:02 AM
1:02 PM
3:02 PM
5:02 PM
7:02 PM
Time
No Till
Till

PERENNIAL GROUNDCOVER

One thing anyone can do.

GROUND-WATER RECHARGE

- Water: Conditions for Plant Life
- Hydrated Soils: Cooler Soils
- Hydrated Vegetation: Fire Resilience

PLANT LIFE

- Roots: Water Infiltration
- Covered Soils: Lower Temps + Less Dust
- Leaves: ET Cooling + Cloud Seeding

SOIL HEALTH

- Organic Matter: Water Retention
- Microorganisms: Carbon Sequestration
- Structure: Flood Resistance

ABUELITOS FOUNDATION NEWS

INITIATIVES

- Summer Vegetation Study
- Hopper Creek Climate Action Plan
- Napa Watershed Coalitions

LEADERSHIP

- Gretchen Hayes, Executive Director
- Leadership Napa Valley Practicum

WEBSITE

- Coming December 2024

ABUELITOSFOUNDATION.ORG

Info@AbuelitosFoundation.org