

SOUTHEAST ARIZONA CROP WATER USE REPORT Sep 28, 2019

Paul W. Brown
University of Arizona

Weather Update

Last week's wet weather was accompanied by much cooler temperatures (Fig. 1) and greatly reduced levels of evaporative demand (Fig. 2). Precipitation was widespread and heavy in selected areas with weekly totals of 0.65", 0.07", 0.95" and 1.21" at Bonita, Bowie, San Simon and Willcox Bench, respectively. Annual precipitation now stands at 7.08", 6.82", 5.09" and 6.57" for Bonita, Bowie, San Simon and Willcox Bench, respectively. Precipitation at Bonita is running 16% below normal (Fig. 3). Dry conditions Monday will be followed by a new surge of tropical moisture that will produce scattered thunderstorms beginning mid-week and continuing through Friday. Whether this tropical system (Narda) produces widespread precipitation is still in question and depends on Narda's path and how it interacts with an approaching trough of low pressure dropping south from the Pacific Northwest.

This will be the final report for the 2019 growing season!

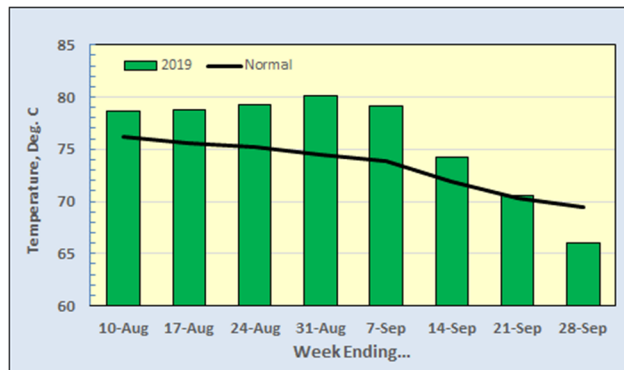


Figure 1. Average weekly air temperature for the period 10 August through 28 September 2019. The black line provides the long-term average value for each period.

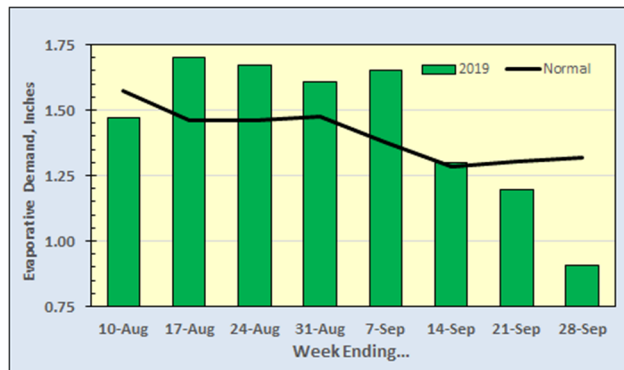


Figure 2. Total weekly evaporative demand for the period 10 August through 28 September 2019. The black line provides the long-term average value for each period.

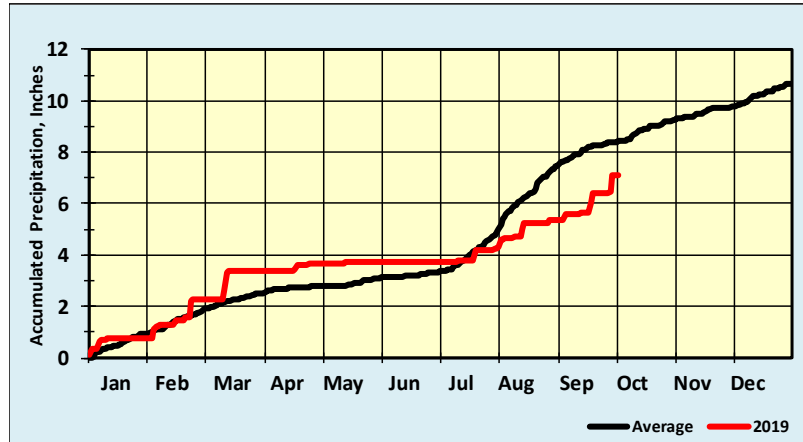


Figure 3. Cumulative precipitation for Bonita since 1 January 2019 (red line). The black line shows the average cumulative precipitation trend for Bonita.

Crop Water Use Update

The tables below provide estimates of crop water use for the past and upcoming week for selected crops in southeast Arizona. Water use was estimated by applying crop-specific coefficients (K_c) to values of reference evapotranspiration (ET_o) generated by local AZMET weather stations. Estimates for the upcoming week were computed using historical averages of ET_o for this time of year. See table at the end of this report to translate inches of water into pivot run times.

NUTS & APPLES

Location	Pecan		Pistachio		Apples	
	Last Wk	This Wk	Last Wk	This Wk	Last Wk	This Wk
Bonita	1.0"	1.3"	0.9"	1.1"	0.8"	1.0"
Bowie	1.1"	1.6"	0.9"	1.2"	0.7"	1.0"
Willcox Ben.	1.2"	1.3"	0.9"	1.1"	0.8"	1.0"
San Simon	1.1"	1.6"	0.9"	1.3"	0.7"	1.1"



CORN

Bonita	Last Week: Corn Water Use By Planting Date, Inches				This Week: Corn Water By Planting Date, Inches			
Pivot Speed	Apr 1	Apr 15	May 1	May 15	Apr 1	Apr 15	May 1	May 15
1-Day, B	M	M	M	M	M	M	M	M
1 Day, C	M	M	M	M	M	M	M	M
2 Day, B	M	M	M	M	M	M	M	M
2 Day, C	M	M	M	M	M	M	M	M
3 Day, B	M	M	M	M	M	M	M	M
3 Day, C	M	M	M	M	M	M	M	M
Willcox Bench	Last Week: Corn Water Use By Planting Date, Inches				This Week: Corn Water By Planting Date, Inches			
Pivot Speed	Apr 1	Apr 15	May 1	May 15	Apr 1	Apr 15	May 1	May 15
1-Day, B	M	M	M	M	M	M	M	M
1 Day, C	M	M	M	M	M	M	M	M
2 Day, B	M	M	M	M	M	M	M	M
2 Day, C	M	M	M	M	M	M	M	M
3 Day, B	M	M	M	M	M	M	M	M
3 Day, C	M	M	M	M	M	M	M	M

M: Mature

CHILE

Bonita	Last Week: Chile Water Use By Planting Date, Inches				This Week: Chile Water By Planting Date, Inches			
Pivot Speed	Apr 1	Apr 15	May 1	May 15	Apr 1	Apr 15	May 1	May 15
1-Day, B	0.9	1.0	1.1	1.1	1.2	1.3	1.5	1.6
1 Day, C	0.9	1.0	1.1	1.1	1.2	1.3	1.5	1.6
2 Day, B	0.9	1.0	1.1	1.1	1.2	1.3	1.5	1.6
2 Day, C	0.9	1.0	1.1	1.1	1.2	1.3	1.5	1.6
3 Day, B	0.9	1.0	1.1	1.1	1.2	1.3	1.5	1.6
3 Day, C	0.9	1.0	1.1	1.1	1.2	1.3	1.5	1.6
Willcox Bench	Last Week: Chile Water Use By Planting Date, Inches				This Week: Chile Water By Planting Date, Inches			
Pivot Speed	Apr 1	Apr 15	May 1	May 15	Apr 1	Apr 15	May 1	May 15
1-Day, B	0.9	1.0	1.1	1.2	1.1	1.2	1.4	1.5
1 Day, C	0.9	1.0	1.1	1.2	1.1	1.2	1.4	1.5
2 Day, B	0.9	1.0	1.1	1.2	1.1	1.2	1.4	1.5
2 Day, C	0.9	1.0	1.1	1.2	1.1	1.2	1.4	1.5
3 Day, B	0.9	1.0	1.1	1.2	1.1	1.2	1.4	1.5
3 Day, C	0.9	1.0	1.1	1.2	1.1	1.2	1.4	1.5

B: Bare Soil Surface

C: Planted into Cover Crop



ALFALFA

Alfalfa Water Use By Cutting Date								
Cut On >>	Water Use Last Week, Inches				Water Use This Week, Inches			
	Sep 2	Sep 9	Sep 16	Sep 23	Sep 9	Sep 16	Sep 23	Sep 30
Bonita	1.1	1.1	0.7	0.5	1.6	1.6	1.0	0.7
Bowie	1.1	1.1	0.7	0.5	1.6	1.6	1.1	0.7
Willcox Ben.	1.2	1.2	0.8	0.6	1.6	1.5	1.0	0.7
San Simon	1.1	1.1	0.7	0.5	1.8	1.7	1.2	0.8

WINE GRAPES

Location	6' Trellis Spacing		8' Trellis Spacing		10' Trellis Spacing	
	Last Wk	This Wk	Last Wk	This Wk	Last Wk	This Wk
Bonita	0.8"	1.1"	0.6"	0.8"	0.5"	0.7"
Bowie	0.8"	1.1"	0.6"	0.8"	0.5"	0.7"
Willcox Ben.	0.9"	1.1"	0.6"	0.8"	0.5"	0.7"
San Simon	0.8"	1.2"	0.6"	0.9"	0.5"	0.7"

PIVOT RUN TIMES (Days/Week) FOR VARIOUS RATES OF CROP WATER USE

Crop Use Inches/Week	Pumping Days Per Week				
	500 GPM	600 GPM	700 GPM	800 GPM	900 GPM
0.35	1.9	1.6	1.3	1.2	1.0
0.70	3.7	3.1	2.7	2.3	2.1
1.05	5.6	4.7	4.0	3.5	3.1
1.40	<i>7.0</i>	6.2	5.3	4.7	4.1
1.75	<i>7.0</i>	<i>7.0</i>	6.7	5.8	5.2
2.10	<i>7.0</i>	<i>7.0</i>	<i>7.0</i>	7.0	6.2
2.45	<i>7.0</i>	<i>7.0</i>	<i>7.0</i>	<i>7.0</i>	<i>7.0</i>
2.80	<i>7.0</i>	<i>7.0</i>	<i>7.0</i>	<i>7.0</i>	<i>7.0</i>

Example: assume crop water use is 1.4"/week and your well supplies 900 GPM. Pivot would need to run 4.1 days during the week. Numbers in italics indicate system capacity is insufficient to offset crop water use and the crop must make up the deficit by using stored soil moisture.