

# BLACKFOOT CHALLENGE

## WEEKLY IRRIGATION REPORT

Friday September 9, 2022



More hot weather caused crop water use to be above average for the 8<sup>th</sup> week in a row. Soil moisture fell about 1½ inches this week unless irrigated or recently cut for hay. Warm temperatures and no rain left a very dry landscape. Next week starts sunny and warm then turns cooler and cloudier with a chance of rain. Blackfoot streamflows leveled out this week following recent steep declines. **Since hot weather continued with no rain, this halt to declining streamflows is likely due in large part to drought plan implementation.** Cooler temperatures and the chance of rain should improve streamflows next week. Most irrigators report average to higher than average production this year despite cooler early conditions and hotter later ones.

### COOLER, CLOUDIER AND A CHANCE OF RAIN

The watershed had virtually no rain this week and continued warm temperatures with widespread smoke. Next week will start sunny then turn cloudy with a chance of rain. High temperatures will be cooler, in the 70s and 80s with lows in the 30s and 40s. The 30-day forecast says below average rainfall and above average temperatures. The 90-day forecast says average rainfall and above average temperatures.

*Your own rain gauge is your best source of rainfall information.*

### CROP WATER USE: CONTINUES ABOVE AVERAGE WITH HOT WEATHER

Most crops used about 1½ inches of soil moisture last week and will use slightly less next week (see chart below). Hay crops used only 1/3 this amount the first week after cutting and 2/3 this amount the second week. By the third week after cutting crop water use returns to its full potential. Peak crop water use this year has passed although it is still unusually high.

<b>WATER USE IN INCHES</b>	<b>LAST 7 DAYS</b>	<b>NEXT 7 DAYS TOTAL<sup>1</sup></b>	<b>NEXT 7 DAYS DAILY AVE<sup>2</sup></b>	<b>SEASON TOTAL<sup>3</sup></b>
<b>HAY CROPS</b>	<b>1.6</b>	<b>1.3</b>	<b>.19</b>	<b>27.7</b>
<b>PASTURE</b>	<b>1.2</b>	<b>0.9</b>	<b>.13</b>	<b>22.9</b>
<b>SPRING GRAINS</b>	<b>0.2</b>	<b>0.0</b>	<b>.00</b>	<b>21.8</b>
<b>WINTER WHEAT</b>	<b>0.0</b>	<b>0.0</b>	<b>.00</b>	<b>15.3</b>
<b>LAWNS</b>	<b>1.4</b>	<b>1.1</b>	<b>.16</b>	<b>26.3</b>

<sup>1</sup>Expected water use over the next week (range if weather becomes cooler or hotter than expected)

<sup>2</sup>Expected average daily water use over the next week (compare this with your soil moisture content)

<sup>3</sup>Beginning April 1 – note in 2010-13 we started our seasonal total on May 1 but since include April

### SOIL MOISTURE – DROPS ABOUT 1½ INCHES UNLESS IRRIGATED

Soil moisture dropped about 1½ inches this week in fields not irrigated or recently cut. Soil moisture will drop slightly less next week. Crops use soil moisture from deeper layers during these dry periods when the easy pickings in surface layers are exhausted. Congratulations to those who irrigate deeply. Most local crops simply go dormant as soil moisture is exhausted.

The table on Page 1 provides a quick summary of crop water use this last week and an estimate for next week. The table and chart below summarize the entire irrigation season and compare it with average, hot and cool conditions so you can plan ahead. This table and chart will be updated weekly all season.

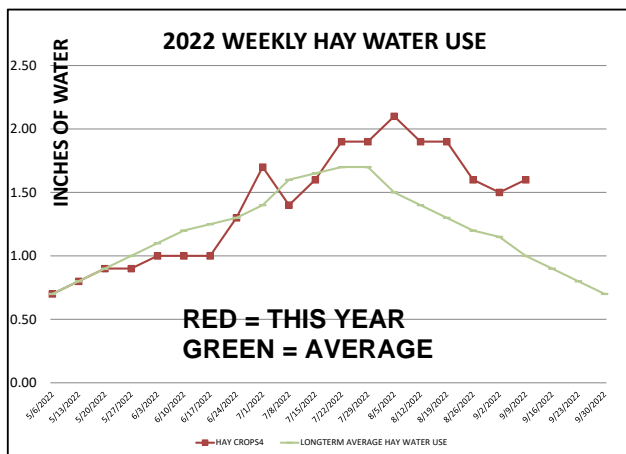
<b>BLACKFOOT 2022 GROWING SEASON WEEKLY RAINFALL &amp; CROP WATER USE</b> (INCHES OF WATER)										
WEEK ENDING	RAIN <sup>1</sup>	2022 WEEKLY POTENTIAL CROP WATER USE <sup>2</sup>						AVERAGE WEEKLY CROP WATER USE <sup>3</sup>		
	RAIN	HAY CROPS <sup>4</sup>	PASTURE	SPRING GRAINS 5-1 START	SPRING GRAINS 5-15 START	WINTER WHEAT	LAWNS	LONGTERM AVERAGE HAY WATER USE	HOT WEEK HAY WATER USE	COOL WEEK HAY WATER USE
APRIL	1.25	1.00	1.00	0.00	0.00	1.00	1.00			
5/6/2022	0.25	0.70	0.60	0.10	0.00	0.80	0.80	0.70	1.00	0.40
5/13/2022	0.01	0.80	0.70	0.20	0.00	0.90	0.90	0.80	1.10	0.60
5/20/2022	0.10	0.90	0.80	0.40	0.20	1.00	0.90	0.90	1.20	0.70
5/27/2022	0.20	0.90	0.80	0.70	0.50	1.00	0.90	1.00	1.30	0.70
6/3/2022	0.10	1.00	0.80	0.80	0.60	1.10	0.90	1.10	1.50	0.80
6/10/2022	0.50	1.00	0.80	0.90	0.70	1.10	0.90	1.20	1.70	0.80
6/17/2022	0.75	1.00	0.80	1.10	0.90	1.10	0.90	1.25	1.90	0.90
6/24/2022	1.00	1.30	1.10	1.30	1.20	1.30	1.20	1.30	2.00	1.00
7/1/2022	0.01	1.70	1.40	1.60	1.70	1.70	1.60	1.40	2.00	1.00
7/8/2022	0.75	1.40	1.20	1.60	1.60	1.50	1.30	1.60	2.10	1.10
7/15/2022	0.01	1.60	1.30	1.70	1.70	1.30	1.50	1.65	2.20	1.10
7/22/2022	0.01	1.90	1.60	2.10	2.10	1.00	1.80	1.70	2.20	1.10
7/29/2022	0.01	1.90	1.60	2.20	2.20	0.50	1.80	1.70	2.20	1.10
8/5/2022	0.01	2.10	1.70	2.40	2.40	0.00	2.00	1.50	2.20	1.00
8/12/2022	0.01	1.90	1.60	1.90	2.00	0.00	1.80	1.40	2.20	1.00
8/19/2022	0.01	1.90	1.50	1.50	1.80	0.00	1.80	1.30	2.00	0.90
8/26/2022	0.25	1.60	1.30	0.80	1.20	0.00	1.60	1.20	1.80	0.90
9/2/2022	0.10	1.50	1.10	0.20	0.80	0.00	1.30	1.15	1.60	0.70
9/9/2022	0.01	1.60	1.20	0.00	0.20	0.00	1.40	1.00	1.40	0.60
9/16/2022								0.90	1.40	0.50
9/23/2022								0.80	1.20	0.50
9/30/2022								0.70	1.00	0.40
<b>TOTAL</b>	<b>4.09</b>	<b>27.70</b>	<b>22.90</b>	<b>21.50</b>	<b>21.80</b>	<b>15.30</b>	<b>26.30</b>	<b>26.25</b>	<b>37.20</b>	<b>17.80</b>

<sup>1</sup> Rainfall should be reduced to account for immediate evaporation from crop and soil surfaces (0.1-April, May and Sept, 0.15-June and August, 0.2-July) (This rainfall figure is an average across all Blackfoot croplands - use your own rain gauge for better accuracy)

<sup>2</sup> This years maximum water use by healthy crops that are well-fertilized and irrigated, disease and insect-free. Will vary slightly across the drainage.

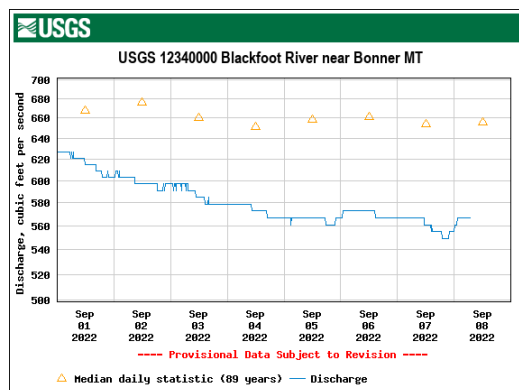
<sup>3</sup> Longterm average water use for each crop each week based on long-term historic data.

<sup>4</sup> Hay Crop water use drops approximately 2/3 the first week after cutting, 1/2 the second and 1/3 the third.



## RIVER FLOWS LEVELLED OUT SOMEWHAT THIS WEEK

The Blackfoot river flow at Bonner stopped its precipitous drop of last week and leveled out despite continued hot temps and no rain. This has to be due in large part to drought plan implementation by local irrigators. Today flow is **567 CFS** (average for this date is 662 CFS). 1899 saw the highest flow at 1,340 CFS while the lowest flow was 329 CFS in 1988. With cooler weather next week and the chance of rain we should not hit the 500 CFS drought plan trigger. We ask everyone to continue to implement their individual plans to help boost streamflows. Your efforts have really helped in recent weeks – thanks!



## DROUGHT OPTIONS - THINGS YOU CAN STILL KEEP DOING TO HELP

- Implement your individual drought plan
- Reduce Irrigated Acreage
- Rotate Irrigation Systems During Low River Flows
- Irrigate once after Cutting hay crops then wait until streamflows recover
- Irrigate at night and early morning if possible
- Stagger pivot start times to alternate the area irrigated during peak afternoon heat
- Irrigate a smaller area well instead of a large area poorly
- Switch to pasture which uses less water compared with hayfields since animals constantly remove part of the crop (less crop leaves = less interception and transpiration = less water use)

## TEMPERATURE RECORDS ARE EXCEEDED THIS YEAR!

This year is again one for the record books. We all know it's been hot but it is setting records across the world as well as here in western Montana. The weekly hay water use chart at the bottom of page 2 says it all – it's way above average and has been for the past 8 weeks. The Deer Lodge Agrimet weather station recorded the highest single day crop water use for hay ever - .44 inches on August 18.

Missoula had its hottest July and August in history, breaking records that went back to 1971. For those of you who like cool temperatures to sleep – beware. This year had the hottest low temperatures ever recorded across the US. Death Valley California reached 127F on September 1, the hottest temp recorded there in September ever. This is close to the 134F temp recorded in 1913 which still holds the record for the hottest temp ever recorded on earth.

If this continues, we may be changing crops from hay and small grains to pineapples, coconuts and sugarcane. Keep your fan and ice chest handy.



For further information contact Clancy Jandreau, Blackfoot Challenge Water Steward, 406-304-5423 or Barry Dutton, Professional Soil Scientist, 406-240-7798 [barry@landandwaterconsulting.net](mailto:barry@landandwaterconsulting.net)

## THE BLACKFOOT WATERSHED IRRIGATION SEASON IN BRIEF

This is a summary of general activities and recommendations for the whole season (more detail in the irrigation guide).

### APRIL – GET READY AND PLAN YOUR IRRIGATION STRATEGY!

- Get your irrigation system ready – perform maintenance and test system.
- Evaluate soil moisture conditions and weather predictions then plan for irrigation and drought if needed.



### MAY – CHECK SOIL MOISTURE & BE READY FOR UNUSUAL HEAT OR COLD!

- Check the soil moisture content at the start of growing season and fill up the soil to its water holding capacity during early irrigations (2-4 inches).
- Watch for dry soil conditions, especially with new plantings and apply water to ensure good germination and emergence.
- Irrigate deeply at least once early in the season to promote deep root growth.
- Apply 2-5 inches of irrigation to hay and pasture crops in May depending on weather. Apply 0-2 inches to spring grains and new plantings as needed based on weather and growth. Apply extra water to fill up the soil (2-4 in).

### JUNE – THIS IS THE TIME TO MAKE YOUR BIGGEST EFFORT SO POUR IT ON!

- Apply 6-8 inches of irrigation in June to hay and pasture crops and winter wheat depending on weather. Apply 5-8 inches to spring grains and new plantings as needed based on weather and growth.
- Consider irrigating deeply to fill up soil root zone and promote deep root growth.
- Be sure small grains are irrigated well during their critical periods of boot, bloom and early heading.



### JULY – POUR IT ON UNTIL HARVEST AND RETURN QUICKLY

- Apply 1 - 2 ½ inches of irrigation per week in July to all crops - depending on weather.
- Cutting is a critical stress period for hay crops, especially alfalfa so irrigate deeply to fill up the root zone before cutting then get back across the field quickly after cutting. Crop water use declines when hay is cut so this is a good opportunity to fill up the soil again. Irrigate at least once after cutting. Small grains harvested for seed are usually irrigated up to the milk to soft dough stage but be sure soil moisture remains to prevent kernel shriveling. Small grains for forage are often harvested earlier when plants are less dry and seeds soft.

### AUGUST- BE DROUGHT AWARE, REDUCE IRRIGATION DURING DROUGHT

- Apply 1 - 2 inches of irrigation per week in August to hay and pasture crops for full production depending on weather. Irrigate new plantings as needed.
- Many folks irrigate for pasture following their one hay cutting. Irrigate according to how much pasture you seek and with consideration for other water needs in the watershed, especially in drought years.
- Reduce river withdrawals by rotating systems and reducing the amount of irrigation at one time. Stop irrigating if you can to help streamflows.



### SEPTEMBER – APPLY AS NEEDED & AVAILABLE & PREP FOR WINTER!

- Apply ½ - 1 ½ inches of irrigation per week in September to hay and pasture crops for full production depending on weather. Continue to implement your drought plan to help low streamflows. Irrigate new plantings as needed. Prepare the system for winter and an early start next spring.