

# BLACKFOOT CHALLENGE

## WEEKLY IRRIGATION REPORT

Friday September 16, 2022



At last, the temperatures have cooled and there have been a few raindrops spotted in the watershed this week. Next week has rain and **snow** showers in the forecast. Crop water use is dropping to near average levels and soil moisture fell about 1 inch this week. Blackfoot streamflows have started coming up for the first time in weeks and this trend should continue with the chance of rain predicted all next week. Most irrigators report average to higher-than-average production this year despite cooler early conditions and hotter later ones.

### COOLER, CLOUDIER WITH A CHANCE OF RAIN AND SNOW

Most of the watershed had little rain this week although the Ovando rain gauge reported 8/10 of an inch in the last 24 hours (thunderstorm?). Temperatures were much cooler with widespread smoke. Next week will be mostly cloudy with limited periods of sun. High temperatures will start out in the 70s but drop into the 50s later in the week. Lows will start out in the 30s and drop into the 20s. The 30-day forecast says below average rainfall and above average temperatures. The 90-day forecast says above average rainfall and average temperatures.

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

### CROP WATER USE: FINALLY NEAR AVERAGE

Crop water use finally dropped to near average levels this week for the first time in two months. Crops used as much as 1 inch of soil moisture or slightly less last week and will use even less next week (see chart below).

<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>1.0</b>	<b>0.8</b>	.11	<b>28.7</b>
<b>PASTURE</b>	<b>0.8</b>	<b>0.6</b>	.09	<b>23.7</b>
<b>SPRING GRAINS</b>	<b>0.0</b>	<b>0.0</b>	.00	<b>21.8</b>
<b>WINTER WHEAT</b>	<b>0.0</b>	<b>0.0</b>	.00	<b>15.3</b>
<b>LAWNS</b>	<b>0.9</b>	<b>0.7</b>	.10	<b>27.2</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 1 INCH UNLESS IRRIGATED

Soil moisture dropped about 1 inch this week in fields not irrigated or recently cut. Soil moisture will drop even less next week due to cooler temperatures and rain/snow showers. Those who still have water available can effectively recharge soil moisture since crops are using less and lower temperatures mean more goes into the soil and less evaporates from crop and soil surfaces. However, please continue to be mindful of low streamflows and irrigate conservatively.

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.

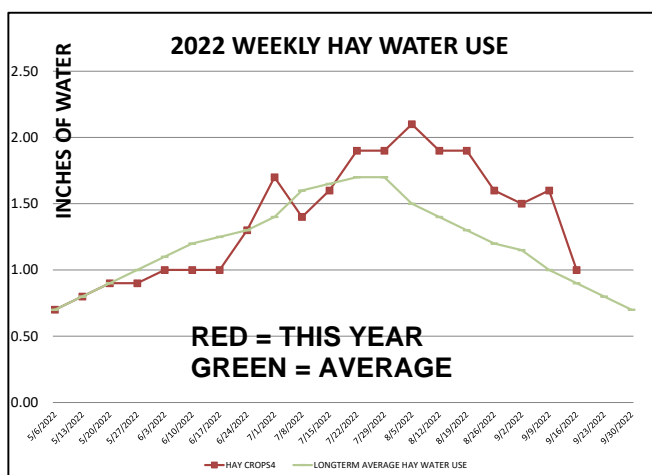
<b>BLACKFOOT 2022 GROWING SEASON WEEKLY RAINFALL &amp; CROP WATER USE</b> (INCHES OF WATER)											
WEEK ENDING	RAIN <sup>1</sup>	2022 WEEKLY POTENTIAL CROP WATER USE <sup>2</sup>						AVERAGE WEEKLY CROP WATER USE <sup>3</sup>			
	RAIN	HAY CROPS <sup>4</sup>	PASTURE	SPRING GRAINS 5-1 START	SPRING 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	0.20	1.00	0.80	0.00	0.00	0.00	0.90	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>4.29</b>	<b>28.70</b>	<b>23.70</b>	<b>21.50</b>	<b>21.80</b>	<b>15.30</b>	<b>27.20</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.

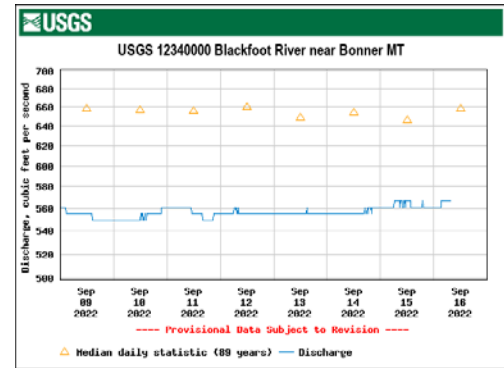
<sup>3</sup> **Longterm average** water use for each crop each week based on long-term historic data.

<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 AND NOW INCREASING SLIGHTLY

The Blackfoot river flow at Bonner continued to be fairly constant this week then began to come up slightly. Drought plan implementation by local irrigators is at least partly responsible for preventing further decreases in flows. Rainfall in portions of the watershed have helped in the past couple days. Today flow is **567 CFS** (average for this date is 659 CFS). 1965 saw the highest flow at 1,290 CFS while the lowest flow was 363 CFS in 1988. Thanks to everyone who implemented their drought plans. Your efforts have really helped in recent weeks!



## "SMART IRRIGATION" IS NO LONGER JUST YOUR "DADS OPINION"

It used to be that "smart irrigation" was what your dad told you to do and you better pay attention if you know what's good for you. And dads' historic knowledge is still an important part of irrigating your crop today. But now the term *smart irrigation* refers to a variety of new technologies providing tools to make irrigation more efficient and easier.

Irrigation scheduling using weekly irrigation reports, Agrimet Weather Stations or soil moisture sensors is a first step into this world but is just the beginning. Hooking soil moisture sensors up to cellular systems that combine crop water use predictions with moisture measurements and reporting this to your phone is a next step. This helps irrigators decide when and how much to irrigate.



Even more advanced are completely integrated pivot systems with AI (Artificial Intelligence). Lindsay Corporation, a leading global manufacturer and distributor of irrigation and infrastructure equipment and technology, and Farmers Edge, a global leader in digital agriculture, announced a plan to connect and digitize two million irrigated acres by the end of 2021. Their system delivers real-time information to control pivots and monitor crop health, along with advanced predictive models to help identify issues, including: seeding or application errors, tile drainage, weather damage, pests, disease, and more.

## IRRIGATION EXPANSION COULD FEED 800 MILLION MORE PEOPLE

A recent study cited in *Science Advances* suggests that there is enough locally available water to expand irrigation on over 350 million acres of agricultural lands. This expansion of irrigation could boost food production and feed an additional 800 million people worldwide. Most of this expansion would occur in sub-Saharan Africa, East Europe, and Central Asia.

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.