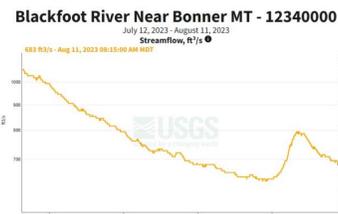


# BLACKFOOT CHALLENGE

## WEEKLY IRRIGATION REPORT

Friday August 11, 2023



Most Blackfoot watershed croplands had a weather surprise this week with an inch of rain. This week's warm temperatures will be even warmer next week but with no rain. **Crop water use was about 1 inch last week for most crops and will be about 1 ½ inches next week.** Blackfoot stream flows saw a brief increase last week but then fell sharply again. The Blackfoot River flow has again fell below the drought trigger level of 700 CFS and the drought plan remains in effect. ***Please think about what you can do to balance crop and livestock needs with fish and boating concerns.*** Send us your ideas or questions about anything you want to hear about related to irrigation, soil health, water quality, or other subjects. We will respond and share them with everyone.

### WEATHER - SUNNY AND WARMER

It seems that as soon as I send out my weekly report, the weather service changes the forecast dramatically. My *little or no rain* comment turned into an inch for most Blackfoot croplands. Temperatures were much cooler with highs in the 70s and 80s. The forecast for next week is for no rain, sunny skies and hotter temperatures (highs in the 80s and 90s, lows in the 40s and 50s). The 30-day day forecast says above average rainfall and temperatures. The 90-day forecast says average rainfall and above average temperatures.



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

### CROP WATER USE - DOWN LAST WEEK AND UP NEXT

Crop water use peaked for the season two weeks ago (well above average). It was down considerably this week due to rain and cooler temperatures. It will increase again next week to about 1½ inches for most crops as sunny skies and hotter temps return. Remember that when cutting hay, crop water use decreases by 2/3 the week after cutting and by 1/3 the second week.

<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>1.2</b>	<b>1.5</b>	<b>.27</b>	<b>17.5</b>
<b>PASTURE</b>	<b>0.9</b>	<b>1.2</b>	<b>.23</b>	<b>15.0</b>
<b>SPRING GRAINS</b>	<b>1.4</b>	<b>1.7</b>	<b>.31</b>	<b>16.7</b>
<b>WINTER WHEAT</b>	<b>0.5</b>	<b>0.2</b>	<b>.23</b>	<b>17.7</b>
<b>LAWNS</b>	<b>1.1</b>	<b>1.4</b>	<b>.26</b>	<b>17.0</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

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.

**BLACKFOOT 2023 GROWING SEASON WEEKLY RAINFALL & CROP WATER USE** (INCHES OF WATER)

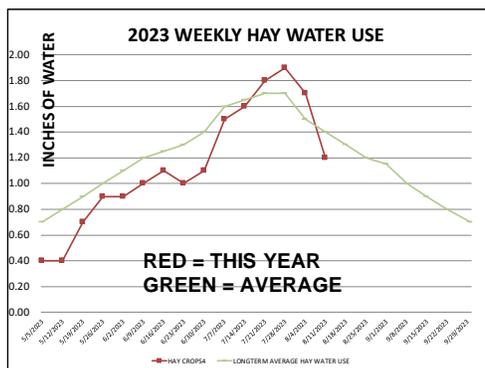
WEEK ENDING	RAIN <sup>1</sup>	2023 WEEKLY POTENTIAL CROP WATER USE <sup>2</sup>						AVERAGE WEEKLY CROP WATER USE <sup>3</sup>		
	RAIN	HAY CROPS <sup>4</sup>	PASTURE	SPRING GRAINS 5-1 START	SPRING GRAINS 5-15 START	WINTER WHEAT	LAWNS	LONGTERM AVERAGE HAY WATER USE	HOT WEEK HAY WATER USE	COOL WEEK HAY WATER USE
APRIL	0.25	0.25	0.25	0.00	0.00	0.25	0.25			
5/5/2023	0.10	0.40	0.40	0.00	0.00	0.50	0.40	0.70	1.00	0.40
5/12/2023	1.50	0.40	0.50	0.20	0.00	0.60	0.50	0.80	1.10	0.60
5/19/2023	0.25	0.70	0.70	0.30	0.00	0.80	0.80	0.90	1.20	0.70
5/26/2023	0.75	0.90	0.80	0.50	0.30	1.00	1.00	1.00	1.30	0.70
6/2/2023	0.25	0.90	0.80	0.60	0.40	1.00	0.90	1.10	1.50	0.80
6/9/2023	0.25	1.00	0.90	0.80	0.60	1.10	1.00	1.20	1.70	0.80
6/16/2023	0.40	1.10	0.90	1.00	0.80	1.20	1.00	1.25	1.90	0.90
6/23/2023	0.25	1.00	0.80	1.00	0.90	1.10	0.90	1.30	2.00	1.00
6/30/2023	0.40	1.10	0.90	1.20	1.10	1.20	1.00	1.40	2.00	1.00
7/7/2023	0.01	1.50	1.20	1.70	1.60	1.70	1.40	1.60	2.10	1.10
7/14/2023	0.01	1.60	1.30	1.70	1.60	1.70	1.50	1.65	2.20	1.10
7/21/2023	0.01	1.80	1.50	2.00	2.00	1.80	1.70	1.70	2.20	1.10
7/28/2023	0.01	1.90	1.60	2.20	2.20	2.00	1.80	1.70	2.20	1.10
8/4/2023	0.10	1.70	1.50	2.10	2.10	1.25	1.70	1.50	2.20	1.00
8/11/2023	1.00	1.20	0.90	1.40	1.40	0.50	1.10	1.40	2.20	1.00
8/18/2023								1.30	2.00	0.90
8/25/2023								1.20	1.80	0.90
9/1/2023								1.15	1.60	0.70
9/8/2023								1.00	1.40	0.60
9/15/2023								0.90	1.40	0.50
9/22/2023								0.80	1.20	0.50
9/30/2023								0.70	1.00	0.40
<b>TOTAL</b>	<b>5.29</b>	<b>17.45</b>	<b>14.95</b>	<b>16.70</b>	<b>15.00</b>	<b>17.70</b>	<b>16.95</b>	<b>26.25</b>	<b>37.20</b>	<b>17.80</b>

<sup>1</sup> Average across watershed (50-80% gets to the crop depending on irrigation method, weather, evaporation from crop and soil surfaces)

<sup>2</sup> This years potential water use by healthy crops that are well-fertilized and irrigated, disease and insect-free. Varies across watershed.

<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 from these figures approximately 2/3 the first week after cutting, 1/2 the second and 1/3 the third.



## SOIL MOISTURE FALLS $\frac{1}{2}$ - $\frac{3}{4}$ INCH LAST WEEK $1\frac{1}{2}$ INCHES NEXT

Most local croplands had about 1 inch of rain this last week but only  $\frac{1}{2}$  to  $\frac{3}{4}$  of it got into the soil while the rest evaporated from crop and soil surfaces. Crop water use was an inch or a bit more for most crops so our soils lost  $\frac{1}{2}$  to  $\frac{3}{4}$  inch of water. Next week, soils will lose more due to no rain and higher crop water use. As always, check your soil with sensors, probes or shovels to be sure you add enough water. You can reduce evaporation loss by increasing ground cover after haying so less of the soil surface is exposed to high temperatures.



<<<

Soil near 100% of its water holding forms a ball when squeezed and leaves the hand moist. Water is visible on the surface of the soil and the hand as a dark stain or shiny surface.



>>>

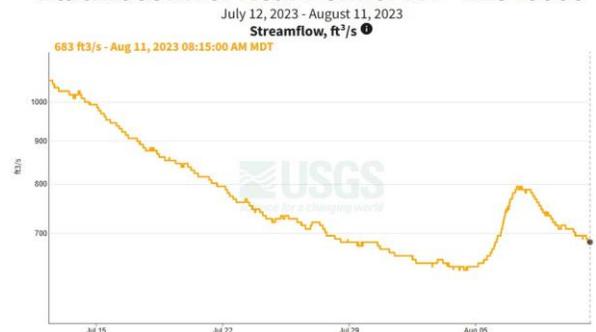
Soil near 50% of its water holding capacity may form a weak ball but leaves little moisture on the hand. Soil at 25% or less of its water holding capacity does not form a ball when squeezed. It feels and looks dry. If sandy or loamy, it crumbles easily, if high in clay it forms a hard lump. Call, text or email anytime if you have questions about evaluating your soil moisture content and irrigation options.

## WEEKLY TIPS

### STREAMFLOWS

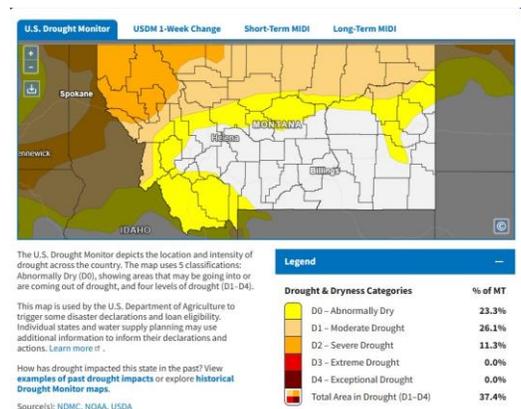
Stream flows throughout the watershed got a brief boost this week but then fell back below the drought trigger level of 700 CFS. Flow today at Bonner is **683 CFS** while the average for this date is 839 CFS. The highest flow was 2,100 CFS in 1899 and the lowest flow was 368 CFS in 1988. Flow peaked this year on May 7 at 10,400 CFS. Stream flows for the rest of the season are predicted to be below average.

### Blackfoot River Near Bonner MT - 12340000



### DROUGHT

This week the Drought Monitor lists the lower Blackfoot watershed as in *Moderate Drought* while the remainder is *Abnormally Dry*. Despite a short respite, we are back below the stream flow trigger level of 700 CFS again and the drought plan is still in effect. Please think about what you can do to balance crop and livestock needs with fish and boating concerns.



---

## Drought Options - Things You Can Do Now

- Reduce Irrigated Acreage
- Rotate Irrigation Systems During Low River Flows
- Concentrate Your Efforts on the First Cutting and Then Rest
- Apply More Water During Each Application
- Shut off during peak afternoon heat when water just evaporates from crop leaves
- Irrigate at night and early morning when possible
- Stagger start times to alternate the area irrigated during peak afternoon heat
- Irrigate a smaller area well instead of a large area poorly for best yield
- Switch to pasture which uses less water compared with hayfields since animals constantly remove part of the crop (less crop leaves = less interception = less water use)
- Harvest your grain crop and cease irrigation until water is available again.
- Harvest your hay crop and cease irrigation - it will go dormant until you irrigate again or until next season. Irrigate once after cutting if you can, especially if you have alfalfa

## BIOCHAR APPLIED TO BLACKFOOT SOILS

The Nature Conservancy, US Forest Service, Bureau of Land Management, and University of Montana teamed up on a pilot project to create, apply and research biochar. Biochar is a form of charcoal, made by intensively burning forestry waste material with very low oxygen in a process that stores carbon. The partners approached the Blackfoot Challenge about the idea of testing the application of biochar to agricultural fields. Biochar can improve soil health and biology as well as sequester carbon for thousands of years. This summer, Challenge Land Steward Brad Weltzien and Soil Scientist Barry Dutton coordinated the first applications of biochar on fields in the Blackfoot (blended with compost to "charge" the biochar's beneficial properties). Soils were tested before application and will be monitored after to gauge how biochar may improve water holding capacity, nutrient availability, and biological activity. The project will continue over the next few years with long-term monitoring to reveal the effectiveness of biochar. If you're interested in knowing more, you can contact Brad Weltzien at 406.210.9900.



## BLACKFOOT COMMUNITY BLOCK PARTY

Don't forget to bring your appetite, thirst and dancing shoes to Ovando today for the Blackfoot Community Block Party from 5 to 9 PM. There will be food trucks, live music and many of your favorite neighbors looking to share a good time and celebrate this fantastic place we call home.

---

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- IRRIGATE ONCE AFTER CUTTING IF POSSIBLE AND BE DROUGHT AWARE!

- 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 at a lower rate following 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 in drought years.**



### SEPTEMBER – APPLY AS NEEDED/AVAILABLE & GET READY FOR SPRING!

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