

# BLACKFOOT CHALLENGE

## WEEKLY IRRIGATION REPORT

Friday August 18, 2023



Blackfoot watershed croplands had no rain this week and temperatures reached 100F at many locations. Next week will be much cooler and there's a good chance of showers and smoke. **Crop water use was over 1½ inches last week for most crops and will be less than 1½ inches next week.** The Blackfoot River flows fell below the drought trigger level of **600 CFS** and additional drought restrictions have been implemented. ***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 - COOLER WITH SHOWERS

There was little or no rain this last week and temperatures were much hotter with highs that approached or exceeded 100F across local croplands. The forecast next week is for showers, rain, cloudy skies, and much cooler temperatures (highs in the 70s to low 80s, lows in the 40s). 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 - HIGH LAST WEEK AND LOWER NEXT

Crop water use peaked for the season three weeks ago (well above average). It was high again this week due to very hot temperatures and no rain. It was not quite as high as the peak since most crops are past their maximum growth period. Next week most crops will use less water (1 to 1½ inches) due to much cooler and wetter weather.

<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>
HAY CROPS	1.7	1.4	.20	19.2
PASTURE	1.4	1.1	.16	16.4
SPRING GRAINS	1.5	1.3	.19	18.2
WINTER WHEAT	0.25	0.0	.00	18.0
LAWNS	1.6	1.3	.19	18.6

<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.

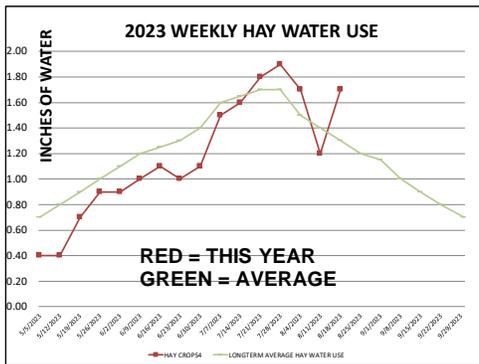
<b>BLACKFOOT 2023 GROWING SEASON WEEKLY RAINFALL &amp; CROP WATER USE</b> (INCHES OF WATER)											
WEEK ENDING	RAIN <sup>1</sup>	2023 WEEKLY POTENTIAL CROP WATER USE <sup>2</sup>						AVERAGE WEEKLY CROP WATER USE <sup>3</sup>			
	RAIN	HAY CROPS <sup>4</sup>	PASTURE	SPRING GRAINS 5-1 START	SPRING 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	0.01	1.70	1.40	1.50	1.50	0.25	1.60	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>5.30</b>	<b>19.15</b>	<b>16.35</b>	<b>18.20</b>	<b>16.50</b>	<b>17.95</b>	<b>18.55</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 1½ INCHES LAST WEEK, LESS NEXT WEEK

Well-irrigated local croplands saw soil moisture levels fall 1½ inches or more last week due to hot, dry weather. Next week, soils will lose less as crops use less water due to lower temperatures, higher humidity, and rain. Soils lose less moisture where crops are stressed by low water content and where crops are maturing (small grains) or where recently cut or grazed. 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.



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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.



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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

### STREAM FLOWS

Stream flows throughout the watershed fell rapidly this week, dropping below the drought trigger level of 600 CFS at Bonner. Flow today at Bonner is **562 CFS** while the average for this date is 767 CFS. The highest flow was 1,720 CFS in 1899 and the lowest flow was 365 CFS in 1941. 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

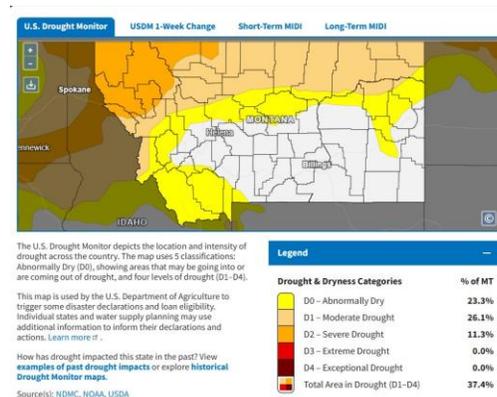
August 11, 2023 - August 18, 2023

Streamflow, ft<sup>3</sup>/s



### DROUGHT

This week the Drought Monitor again lists the lower Blackfoot watershed as in *Moderate Drought* while the remainder is *Abnormally Dry*. There has been little change to the map since last week. The Blackfoot stream flow trigger level of 600 CFS has been passed and the next set of drought plan restrictions are now in effect (see page 4 for details). Please think about what you can do to balance crop and livestock needs with fish and boating concerns.



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## 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

## DROUGHT PLAN ACTIONS WHEN FLOW FALLS BELOW 600 CFS

As flows at Bonner approach 600 cfs, the Committee will:

- Contact the roster of anglers and angling businesses to alert them of the potential need for angling restrictions if not already in place or of the need for additional angling restrictions.
- Implement outreach activities necessary to inform water users and the general public of drought conditions and the need for participation in the Drought Response.
- Re-confirm that junior water users are participating through response cards, email, personal communication and/or field checks, including notice to ALL juniors with an accepted drought plan that FWP is likely to make call if river conditions reach 500 cfs. If flows in the Blackfoot River at Bonner fall below 600 cfs and/or maximum daily water temperatures in the North Fork Blackfoot River below the falls and Monture Creek reach or exceed 65° F for three consecutive days:
  - MT FWP will issue partial (2:00 pm – midnight) or all day fishing restrictions on all critical bull trout streams. These may include Gold Creek, Belmont Creek, Cottonwood Creek, Monture Creek, North Fork Blackfoot River below the falls, Copper Creek, Landers Fork, and Morrell Creek.



As flows at Bonner approach 500 cfs, "all water users whose individual drought response involves a water trade in which there is less than a 1-to-1 exchange of senior water rights for junior water rights, that FWP will make call on their junior rights."

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For further information contact [Clancy Jandreau](mailto:Clancy.Jandreau@mt.gov), Blackfoot Challenge Water Steward, 406-304-5423 or [Barry Dutton](mailto:Barry.Dutton@landandwaterconsulting.net), 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.
- Apply fall irrigations where appropriate after stream flows recover.