

BLACKFOOT CHALLENGE

WEEKLY IRRIGATION REPORT

Friday September 1, 2023



Blackfoot watershed croplands had a mix of rain and sun this week and cool to warm temperatures. Next week starts with a rainy Labor Day weekend then turns sunny and mild for the rest of the week. **Crop water use was about 1½ inches last week for most crops and will be similar next week.** Blackfoot River flows continue to fluctuate around the drought trigger level of **600 CFS.** ***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 - TYPICAL LABOR DAY RAIN

Most Blackfoot watershed croplands had ½ inch of rain this week but some up to 1 inch with a mix of sun and clouds. Temperatures were cooler, mostly in the 70s and 80s. Labor Day will see rainfall of ¼ to ½ inch with more in thunderstorms. Highs will mostly be in the 70s and 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 - MODERATE LAST WEEK AND NEXT

Crop water use remained steady this week at about 1 ½ inches for most crops due to a mix of rain, sun with warm temperatures. Next week is likely to be similar due to similar weather. The amount of water used by crops across the watershed continues to drop due to small grains reaching maturity, hay harvest where no further irrigation is planned or available and due to the lower water use inherent to pastures.

WATER USE IN INCHES	LAST 7 DAYS	NEXT 7 DAYS TOTAL¹	NEXT 7 DAYS DAILY AVE²	SEASON TOTAL³
HAY CROPS	1.5	1.6	.23	22.0
PASTURE	1.1	1.2	.17	18.6
SPRING GRAINS	0.5	0.0	.11	20.0
WINTER WHEAT	0.0	0.0	.00	18.0
LAWNS	1.4	1.5	.21	21.3

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

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

³Beginning 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)

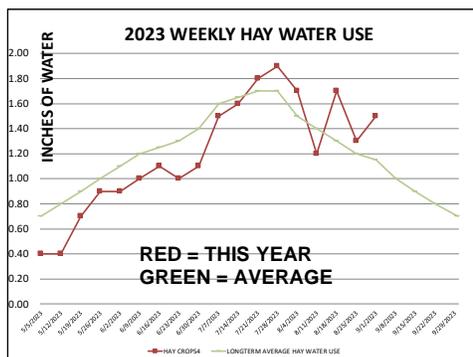
WEEK ENDING	RAIN ¹	2023 WEEKLY POTENTIAL CROP WATER USE ²						AVERAGE WEEKLY CROP WATER USE ³		
	RAIN	HAY CROPS ⁴	PASTURE	SPRING GRAINS 5-1 START	SPRING GRAINS 5-15 START	WINTER WHEAT	LAWNS	LONGTERM AVERAGE HAY WATER USE	HOT WEEK HAY WATER USE	COOL WEEK HAY WATER USE
APRIL	0.25	0.25	0.25	0.00	0.00	0.25	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	0.50	1.30	1.10	1.20	1.20	0.00	1.30	1.20	1.80	0.90
9/1/2023	0.50	1.50	1.10	0.50	0.50	0.00	1.40	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
TOTAL	6.30	21.95	18.55	19.90	18.20	17.95	21.25	26.25	37.20	17.80

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

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

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

⁴ 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 ½-1 INCH LAST WEEK, SIMILAR NEXT WEEK

Well-irrigated local croplands saw soil moisture levels fall ½ to 1 inch last week depending on crop type and how much rain fell. Next week will be similar depending on rainfall amounts. 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.



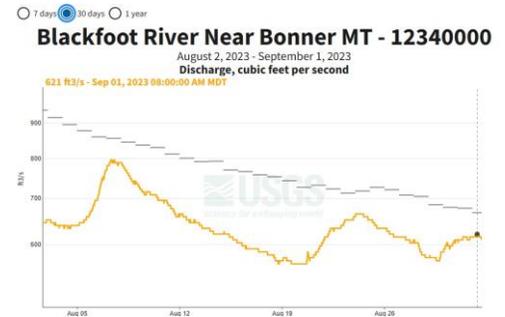
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Soil near 50% of its water holding capacity may form a weak ball but leaves little moisture on the hand. Soil at 25% or less of its water holding capacity does not form a ball when squeezed. It feels and looks dry. If sandy or loamy, it crumbles easily, 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

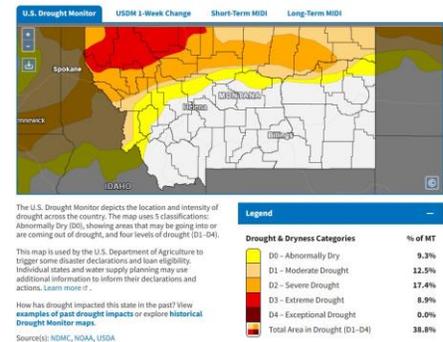
STREAM FLOWS

Stream flows throughout the watershed continue to fluctuate with days of cooler temps and rain interspersed with hot and dry conditions. Flow today at Bonner is **609 CFS** while the average for this date is 691 CFS. The highest flow was 1,380 CFS in 1899 and the lowest flow was 332 CFS in 1988. Flows are likely to drop back below the drought trigger level of 600 CFS this week. 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.



DROUGHT

The Drought Monitor this week shows southern Montana coming out of dry conditions while northwest Montana is much worse than last week. The Blackfoot watershed is about the same due to a mix of dry/warm weather and some rain with cooler temperatures. Blackfoot river stream flows continue to fluctuate around the 600 CFS trigger level and will likely drop below it again this week. Drought plan actions below 600 CFS are now in effect as listed on page 4. Please think about what you can do to balance crop and livestock needs with fish and boating concerns.



When Water Gets Scarce, The Focus Continues to Be on Irrigation

Since most of the fresh water in the world is used by agriculture, irrigation is the usual “culprit” cited by other users. Each year at this time, grumbling goes on among floaters, fishermen, guides and others. Pumps which ensure crop production and preserve an agricultural landscape are viewed in a dim light to say the least. In the Blackfoot watershed, irrigators are doing more than many across the state with our efforts around “Shared Sacrifice” where those with senior water rights are asked to voluntarily reduce their irrigation to benefits all. Most water users do not understand how irrigation works or how groups like the Blackfoot Challenge work with irrigators to help maintain stream flows. We need to keep educating all, especially the fishing and floating public about our efforts. Here are some talking points:



- Under Montana Water Law, water right holders are granted irrigation rights as a beneficial use of water which supports our family farms and ranches. Although they have the right to use this water, many in the Blackfoot watershed reduce irrigation voluntarily which represents an economic loss. We call this practice *Shared Sacrifice* and is a foundation of drought management in the Blackfoot.
- The Blackfoot Challenge coordinates a watershed-wide *Drought Plan* where irrigators with junior rights must stop irrigation when stream flows get low and those with senior rights voluntarily cut back.
- Irrigators use many practices that reduce water use such as:
 - Reducing the number of systems operating at once (you may still see a pump running on the river but it may be pumping much less than normal)
 - Ceasing irrigation on hay crops after the first cutting
 - Reducing the irrigated acreage
 - Growing small grains that mature before the driest part of the summer
 - Switching to pasture crops which use less water because of constant grazing
 - Irrigating at night or on cooler days
 - Practicing Irrigation Scheduling to apply the right amount of water at the right time
 - Installing soil moisture sensors to monitor irrigation and provide a record for comparing practices and year-to-year changes



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

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.