

BLACKFOOT CHALLENGE

WEEKLY IRRIGATION REPORT

Friday September 3, 2021



It was another week of sunny weather with a little rain and smoke. Next week looks like more of the same with pleasant temperatures in the 80s. Mild weather this last week resulted in about 1 inch of crop water use and it will be similar next week. This is about average for this time of year. Soil moisture dropped by about 1 inch unless irrigated.

Blackfoot River low flows have triggered the Challenge Drought Response Plan. Participating irrigators are now asked to initiate their individual Drought Response Plans and reduce their water use. Using its Murphy Rights (see page 4) FWP is now making call on junior water right users throughout the drainage who do not have a Drought Response Plan. Junior water rights cannot be used again until river flows rebound (lots of rain).



WEATHER - SUNNY, MILD (AND SMOKY?)

It was another pleasant week. Rain was variable across the drainage with some croplands getting over ¼ inch and others only a trace. Next week looks like sun and mixed smoke with high temperatures in the low 80s and lows in the 40s. The 30-day forecast says average rainfall and above average temperatures. The 90-day forecast says average rainfall and above average temperatures. The main California/Oregon fire smoke plume has been shifting in and out of the Blackfoot area and it will again next week. You can check smoke and air quality conditions anytime at: airnow.gov. The *Smoke and Fire Map* (at left) shows the fires, smoke plumes and air quality in green, yellow and red.

CROP WATER USE - AVERAGE AT ABOUT 1 INCH PER WEEK

This past week crop water use was about average due moderate temperatures and sunny skies. **Most crops used about 1 inch of water and will use about the same next week.** The last of the spring wheat is maturing and using less water. The table below provides a quick summary of crop water use this last week and an estimate for next week. We also list season totals and compare them with past years in our annual reports available on the Challenge website.

WATER USE IN INCHES	LAST 7 DAYS	NEXT 7 DAYS TOTAL¹	NEXT 7 DAYS DAILY AVE²	SEASON TOTAL³
HAY CROPS	1.1	1.1	.16	23.8
PASTURE	0.8	0.8	.11	20.0
SPRING GRAINS	0.9	0.6	.09	21.6
WINTER WHEAT	0.0	0.0	.00	16.0
LAWNS	1.0	1.0	.14	23.2



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 conten

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

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.

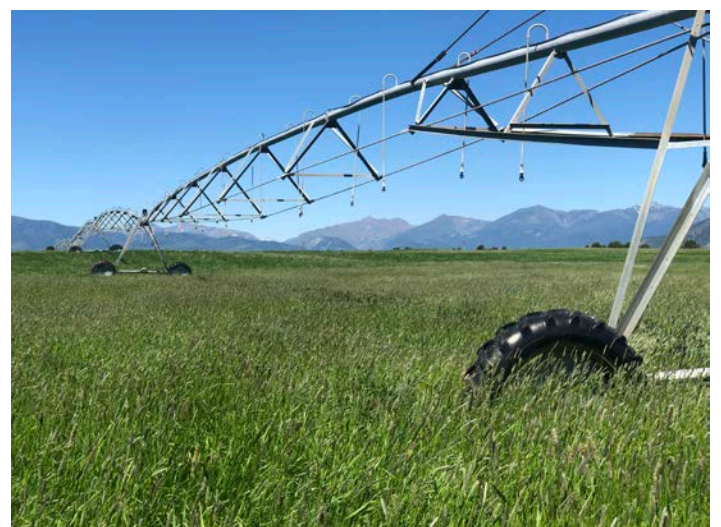
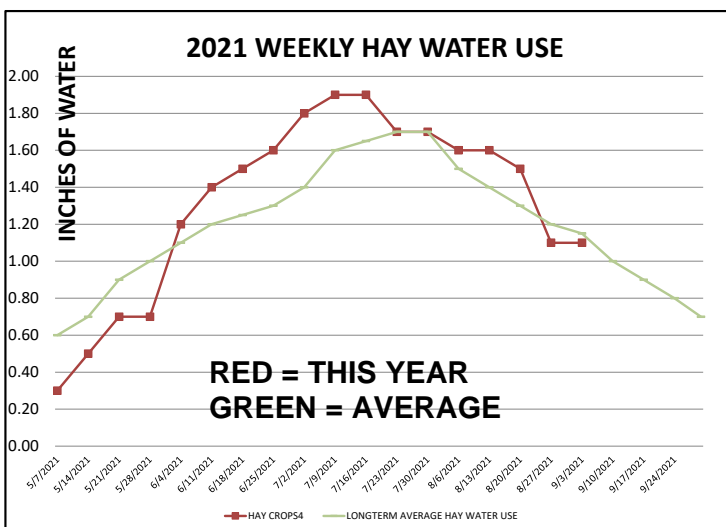
BLACKFOOT 2021 GROWING SEASON WEEKLY RAINFALL & CROP WATER USE (INCHES OF WATER)										
WEEK ENDING	RAIN ¹	2021 WEEKLY POTENTIAL CROP WATER USE ²						AVERAGE WEEKLY CROP WATER USE ³		
	RAIN	HAY CROPS ⁴	PASTURE	SPRING GRAINS 5-1 START	SPRING GRAINS 5-15 START	WINTER WHEAT	LAWNS	LONGTERM AVERAGE HAY WATER USE	HOT WEEK HAY WATER USE	COOL WEEK HAY WATER USE
5/7/2021	0.40	0.30	0.40	0.00	0.00	0.50	0.50	0.60	1.00	0.30
5/14/2021	0.20	0.50	0.50	0.10	0.00	0.70	0.70	0.70	1.10	0.40
5/21/2021	0.50	0.70	0.60	0.30	0.10	0.80	0.80	0.90	1.20	0.50
5/28/2021	2.00	0.70	0.60	0.60	0.20	0.80	0.70	1.00	1.30	0.50
6/4/2021	0.10	1.20	1.00	0.90	0.60	1.30	1.20	1.10	1.50	0.60
6/11/2021	0.10	1.40	1.20	1.10	0.80	1.50	1.30	1.20	1.70	0.70
6/18/2021	0.20	1.50	1.30	1.40	1.10	1.60	1.40	1.25	1.90	0.70
6/25/2021	0.20	1.60	1.40	1.60	1.40	1.70	1.50	1.30	2.00	0.80
7/2/2021	0.10	1.80	1.50	1.90	1.70	1.90	1.70	1.40	2.00	0.90
7/9/2021	0.01	1.90	1.60	2.00	2.00	2.00	1.90	1.60	2.10	1.00
7/16/2021	0.01	1.90	1.60	2.00	2.00	1.50	1.90	1.65	2.20	1.00
7/23/2021	0.25	1.70	1.40	1.80	1.80	1.00	1.60	1.70	2.20	1.00
7/30/2021	0.01	1.70	1.40	1.90	1.90	0.50	1.60	1.70	2.00	1.00
8/6/2021	0.25	1.60	1.30	1.80	1.80	0.20	1.50	1.50	1.80	0.90
8/13/2021	0.25	1.60	1.30	1.80	1.80	0.00	1.50	1.40	1.70	0.80
8/20/2021	0.25	1.50	1.20	1.50	1.70	0.00	1.40	1.30	1.60	0.80
8/27/2021	0.50	1.10	0.90	0.90	1.20	0.00	1.00	1.20	1.40	0.70
9/3/2021	0.25	1.10	0.80	0.80	1.00	0.00	1.00	1.15	1.40	0.70
9/10/2021								1.00	1.30	0.60
9/17/2021								0.90	1.20	0.50
9/24/2021								0.80	1.10	0.50
9/30/2021								0.70	1.00	0.40
TOTAL	5.58	23.80	20.00	22.40	21.10	16.00	23.20	26.05	34.70	15.30

¹ 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)

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

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

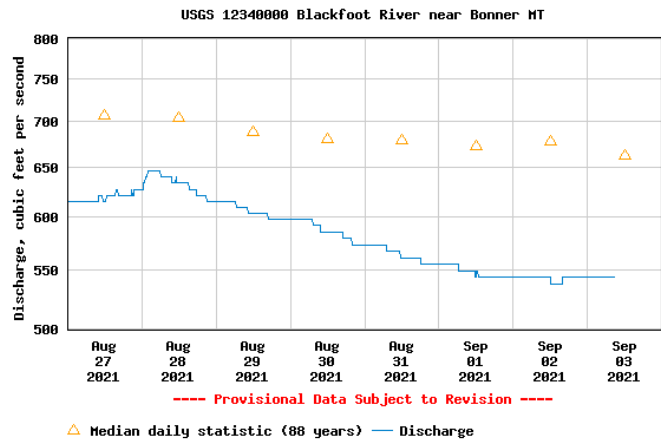
⁴ Hay Crop water use drops approximately 2/3 the first week after cutting, 1/2 the second and 1/3 the third.



WEEKLY TIPS

Blackfoot Stream Flow Below 550 CFS

Today's flow was 544 CFS compared with an average of 686 CFS. The highest flow recorded on this date was 1,420 CFS in 1899 while the lowest flow was 326 CFS in 1988. With no rain in the forecast and sunny skies flows will likely drop further this week below 600 CFS which is another drought plan trigger level. The good news is that water temperatures fell to the 50s and 60s making life easier for fish.



Drought Plans Should Be Implemented NOW!

The Blackfoot Challenge works with individual irrigators to create **Drought Response Plans** that include practices such as those listed below under *Drought Options*. FWP has agreed that it will not make Murphy Right calls on junior water right holders that follow a Blackfoot Challenge Drought Response Plan. FWP has now made call on junior water right holders that do not have a plan and those folks will have to stop using water.



The Drought Committee is asking all plan participants to make water cutbacks according to their drought plan. They invite everyone who diverts water throughout the Blackfoot Drainage to put together a Drought Response Plan with the Blackfoot Challenge so we can all work together more effectively. Call Jennifer Schoonen for details 406-360-6445.

Drought Options - Things You Can Do Now

- Rotate Irrigation Systems During Low River Flows
- Reduce Irrigated Acreage
- 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 if possible
- Stagger start times to alternate the area irrigated during peak afternoon heat
- Reduce or eliminate tailwater in flood systems
- 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)

For further information contact Jennifer Schoonen, Blackfoot Challenge Water Steward, 406-360-6445 or Barry Dutton, Professional Soil Scientist, 406-240-7798 barry@landandwaterconsulting.net

Keeping Water in Montana Streams

The allocation of water in Montana has traditionally focused on the need to satisfy off-stream uses for agriculture, industry, and domestic uses. However, Montana's rivers are well known for their outdoor recreational opportunities and world-class fisheries. Water rights, reservations and leases to keep water in streams to protect fisheries, wildlife, and recreational uses are now common in the state.

Murphy Rights

In 1969, Jim Murphy of Kalispell sponsored legislation to provide instream flow protection for specified rivers in Montana. Murphy Rights were approved by the Legislature for 12 of Montana's Blue Ribbon trout streams. These rights have a December 1970 priority date and provide instream flow protection on the following rivers: Madison, Gallatin, Missouri, Smith, Big Spring Creek, Blackfoot, Flathead, West Gallatin, Rock Creek, Yellowstone, Middle Fork Flathead, and South Fork Flathead.

The Blackfoot River has a Murphy Right to maintain flows at Bonner at 700 CFS as a minimal instream flow needed to protect its "Blue Ribbon" fisheries. This right currently has a 1971 priority date. The Flathead Reserved Water Right Compact will change this priority date to 1904 as of 2025. FWP has decided to enforce its Murphy Right on the Blackfoot River this year and uphold its end of the bargain with Blackfoot Irrigators who voluntarily reduce water use according to their Drought Management Plans. Earlier this year FWP in consultation with the Governor decided not to enforce Murphy Rights elsewhere in Montana.

Recreational Water Rights

Recreational Water Rights Recreational water rights are held by the Montana Fish Wildlife and Parks (FWP) to maintain instream flows necessary for public recreational uses. In the Clark Fork and Kootenai Basins, these rights are limited to the Bitterroot River and **several lakes in the Clearwater and Blackfoot drainages**. In the Upper Missouri River Basin, FWP holds a public recreation claim for 200 cubic feet per second (cfs) in the Beaverhead River from Grasshopper Creek to Clark Canyon Dam, as well as a fish and wildlife claim for 25 cfs from Clark Canyon downstream to the confluence with the Big Hole River. These claims are relatively junior, with priority dates of August 29, 1964, and February 28, 1962, respectively. The FWP also holds a year-round public recreation claim for 1,946,624 acre feet in Canyon Ferry Reservoir with a priority date of May 24, 1949.



Instream Flow Leasing

In 1989, following a summer that saw record low flows across the state, FWP received limited authority to temporarily lease or convert a water right to instream flow. In 1995, the Legislature extended authority to a water right owner to convert their right to instream flow, or lease the water right to a private third party for instream flow. A lease for instream flow may be entered for a term lasting up to 10 years. All leases may be renewed an indefinite number of times, but not for more than 10 years for each term. A lease up to 30 years is allowed if the leased water is made available from the development of a water conservation or storage project. **Trout Unlimited and other organizations have leased water rights in the Blackfoot Drainage and elsewhere in western Montana. This can be an excellent option for some folks to maintain their rights.**

THE BLACKFOOT DRAINAGE 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 - IN DROUGHT CONSIDER REDUCING OR ENDING IRRIGATION

- Apply 1 - 2 inches of irrigation per week in August to hay and pasture crops for full production depending on weather and water availability.
- 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 drainage, especially in drought years.
- Reduce river withdrawals by rotating systems and reducing the amount of irrigation at one time. Stop irrigating if you can. **Make a BC Drought Plan.**



SEPTEMBER – APPLY AS NEEDED IF AVAILABLE & PREPARE FOR WINTER!

- Apply ½ - 1 ½ inches of irrigation per week in September to hay and pasture crops depending on weather but continue cutbacks according to your Drought Plan if necessary. Irrigate new plantings as needed. Prepare the system for winter and an early start next spring.