

BLACKFOOT CHALLENGE

WEEKLY IRRIGATION REPORT

Friday July 24, 2020



Dry, warm weather continues and will be even warmer next week. Crop water use last week was about 1 ½ inches for most crops and will increase slightly with warmer temperature next week. Remember that water use is reduced by cutting (2/3 the first week and 1/3 the second). Soil moisture drops each week by the amount crops use unless irrigated. Blackfoot River flows are now close to average at about 1350 CFS (Bonner) and drought conditions are seeming less likely this year.

We provide weekly summaries of weather, crop water use and soil moisture conditions as well as tips for irrigation, soil health and crop production. A condensed overview of suggestions for the entire irrigation season is presented on the last page of this report. Use it to look ahead and plan or to compare what you're doing now. If you would like other information please contact Jennifer Schoonen - Blackfoot River Steward (360-6445) or Barry Dutton – Soil and Irrigation Consultant (240-7798).



WEATHER - SUNNY AND EVEN WARMER

Some Blackfoot croplands had a trace of rain last week but most had none. Next week looks dry again and even hotter which should be good for haying. Temperatures will exceed 90 degrees in the lower drainage and come close in the upper drainage with lows around 50. The 30-day forecast says average temperatures and rainfall. The 90-day forecast says above average temperatures and rainfall.

CROP WATER USE - ABOVE AVERAGE DUE TO DELAYED PEAK

Crop water use remained slightly above average this week due to warm, dry weather. Peak water use was delayed this year by cool, wet weather. Most crops used about 1 ½ inches and will use a little more next week due to higher temperatures. Remember, water use drops by 2/3 the week after cutting and by 1/3 the following week. Try to irrigate as soon as possible after cutting if you have water. The table below provides a quick summary of crop water use this last week and an estimate for next week. The table and chart on Page 2 summarize the entire irrigation season and compare it with average, hot and cool conditions so you can plan ahead.

WATER USE IN INCHES	LAST 7 DAYS	NEXT 7 DAYS TOTAL¹	NEXT 7 DAYS DAILY AVE²	SEASON TOTAL³
HAY CROPS	1.6	1.7 (1.5 - 1.8)	.24	14.8
PASTURE	1.3	1.4 (1.3 - 1.6)	.20	12.5
SPRING GRAINS	1.8	1.9 (1.7 - 2.0)	.27	12.2
WINTER WHEAT	0.8	0.5 (0.8 - 1.1)	.07	14.8
LAWNS	1.5	1.6 (1.5 - 1.8)	.23	14.0

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

BLACKFOOT 2020 GROWING SEASON WEEKLY RAINFALL & CROP WATER USE (INCHES OF WATER)

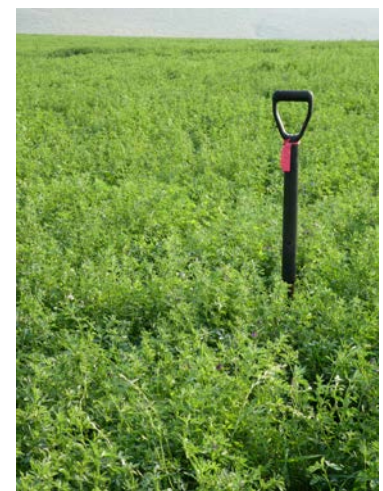
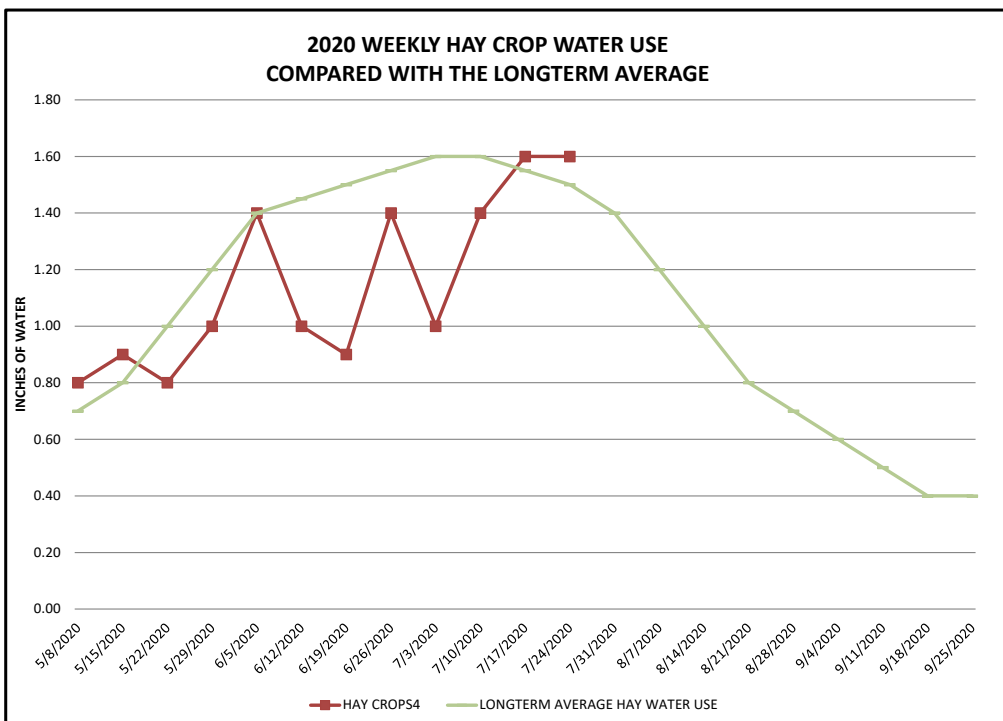
WEEK ENDING	RAIN ¹	2020 WEEKLY POTENTIAL CROP WATER USE ²						AVERAGE WEEKLY CROP WATER USE ³		
	RAIN	HAY CROPS ⁴	PASTURE	SPRING GRAINS 5-1 START	SPRING GRAINS 5-15 START	WINTER WHEAT	LAWNS	LONGTERM AVERAGE HAY WATER USE	HOT WEEK HAY WATER USE	COOL WEEK HAY WATER USE
5/8/2020	0.01	0.80	0.70	0.10	0.10	0.90	0.90	0.70	1.00	0.30
5/15/2020	0.30	0.90	0.80	0.10	0.10	0.90	0.90	0.80	1.10	0.50
5/22/2020	1.25	0.80	0.70	0.30	0.20	0.80	0.80	1.00	1.20	0.60
5/29/2020	0.10	1.00	0.80	0.70	0.40	1.20	0.90	1.20	1.30	0.80
6/5/2020	1.00	1.40	1.20	1.00	0.70	1.50	1.30	1.40	1.50	1.00
6/12/2020	1.00	1.00	0.90	1.00	0.90	1.10	1.00	1.45	1.70	1.00
6/19/2020	0.25	0.90	0.70	0.90	0.90	1.00	0.80	1.50	1.90	1.10
6/26/2020	0.25	1.40	1.20	1.70	1.70	1.70	1.30	1.55	2.00	1.10
7/3/2020	1.00	1.00	0.80	1.20	1.20	1.20	0.90	1.60	2.10	1.30
7/10/2020	0.01	1.40	1.10	1.50	1.50	1.40	1.20	1.60	2.00	1.20
7/17/2020	0.01	1.60	1.30	1.80	1.80	1.20	1.50	1.55	2.00	1.20
7/24/2020	0.01	1.60	1.30	1.80	1.80	0.80	1.50	1.50	2.20	1.10
7/31/2020								1.40	2.20	1.10
8/7/2020								1.20	1.50	0.90
8/14/2020								1.00	1.30	0.70
8/21/2020								0.80	1.20	0.60
8/28/2020								0.70	1.10	0.50
9/4/2020								0.60	1.00	0.40
9/11/2020								0.50	0.90	0.40
9/18/2020								0.40	0.70	0.30
9/25/2020								0.40	0.70	0.30
TOTAL	6.44	14.80	12.50	12.20	11.40	14.80	14.00	22.85	30.60	16.40

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.





SOIL MOISTURE - MOST CROPS USE ABOUT 1 ½ INCHES

Soil moisture dropped by about 1 ½ inches this week depending on crop type and will continue to decrease next week as warm weather continues. Crop water use decreases with cutting by 2/3 the first week and 1/3 the second week before returning to the crop's full potential in the third week after cutting.

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 shiny surface. Bouncing the soil in the hand usually brings water to the surface. Soil near 75% of its water holding capacity also forms a ball and leaves the hand moist but no actual water is visible on the hand or soil.

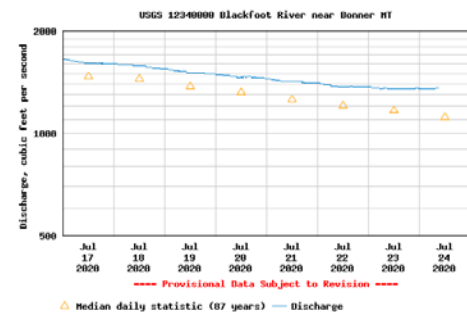


WEEKLY TIPS

Blackfoot River Flow About Normal



TODAY:	1,360 CFS
AVERAGE:	1,240
HIGHEST:	3,780 (1899)
LOWEST:	473 (1988)



Blackfoot River flows continue to drop but remain slightly above average levels. We are still far above the 700 CFS level where irrigation restrictions begin. So far it looks like we may avoid drought with normal temperatures and rainfall predicted for the next month.

Irrigation Information Sources

I know everyone is busy haying, irrigating, planting new crops and lounging in favorite chairs but here are some options for taking a break or to put on your winter list of things to do. You may feel lonely and like you are the only irrigator experiencing stress in these strange times but there is an entire world out there. A few minutes on the web can yield ideas for improving your irrigation practices or at least let you know irrigators around the country and the world are facing similar challenges.

General information about irrigation in Montana can be found by a simple Google search.

The Montana Extension Service has a wealth of publications about irrigation in Montana specific to individual crops and locations. This is a great first stop when you have questions.

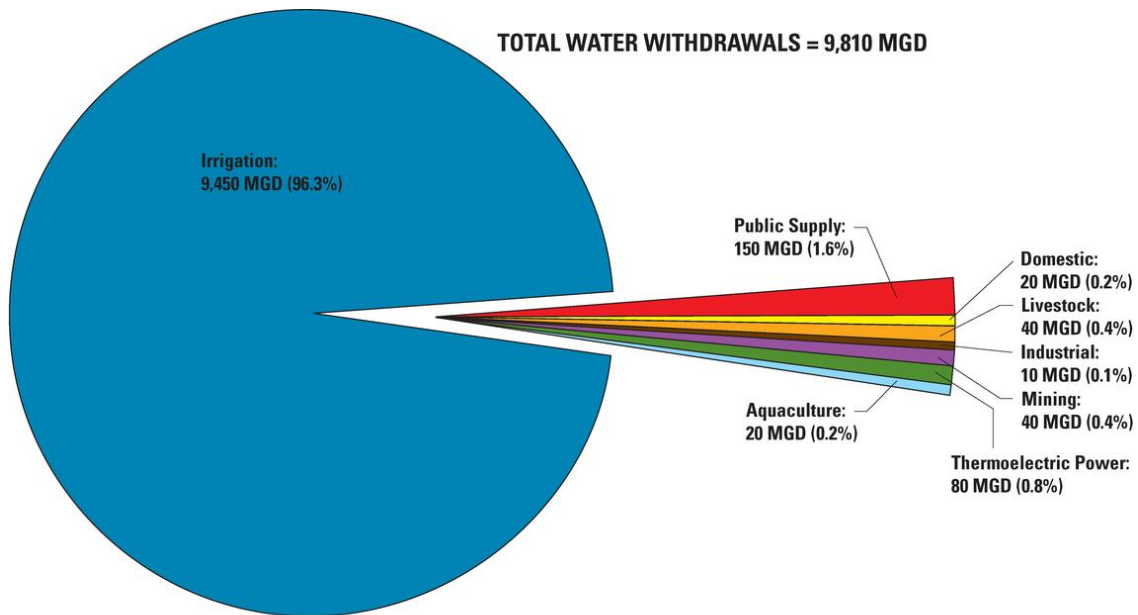
<https://waterquality.montana.edu/farm-ranch/irrigation/index.html>

The Montana NRCS website is another wealth of information on irrigation systems, irrigation scheduling, soil moisture sensors and more:

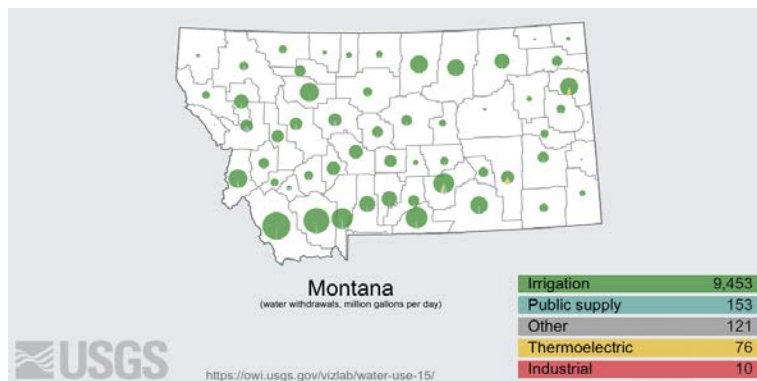
<https://www.nrcs.usda.gov/wps/portal/nrcs/mt/technical/engineering/STELPRDB1270578/>

A Google search for *Montana Irrigation* will also include the USGS website which has a variety of facts and information on how irrigators and others use water in our state:

https://www.usgs.gov/centers/wy-mt-water/science/water-use-montana?qt-science_center_objects=0#qt-science_center_objects



Total water withdrawals in Montana by category in 2015



The ***Irrigation Association*** is the largest irrigation organization in the US with a website full of news and information. You can access ***Irrigation Today*** the monthly publication presenting current articles about the latest technology and issues. <https://www.irrigation.org/>

You can find out what irrigators around the world are up to at ***The Irrigation Gazette*** which is the leading worldwide source for irrigation news. It's published in French but you can click the English icon and get the translation. Irrigators around the world are telling how Covid-19 is affecting daily operations and markets. <https://irrigazette.com/>

There are lots of things going on in irrigation and water rights that you may find somewhat interesting or which may change your life. Stan Bradshaw's article: A Buyers Guide to Montana Water Rights may give you some ideas for the future or your children's future.

https://waterquality.montana.edu/resources/files_images/A_Buyers_Guide_MontanaWaterRights.pdf

You might think you are the only one reading about irrigation even the 6 million subscribers to the New York Times are regularly presented with articles about Montana Irrigation:

<https://www.nytimes.com/2020/06/14/us/montana-water-milk-river.html>

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

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- KEEP IRRIGATING SMALL GRAINS UNTIL KERNELS MATURE, 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 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.



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.