

# BLACKFOOT CHALLENGE

## WEEKLY IRRIGATION REPORT

Friday July 31, 2020



Dry, warm weather has persisted for 3 weeks during haying and will turn slightly cooler next week. Crop water use last week was over 1 ½ inches for most crops and will decrease next week with slightly cooler temperatures. Water use is reduced by cutting (2/3 the first week and 1/3 the second). Soil moisture now drops each week by the amount crops use unless irrigated. Blackfoot River flows are close to average at about 1100 CFS (Bonner) and drought restrictions seem 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 HOT

Only isolated small areas of Blackfoot croplands had any rain last week. Next week looks dry again but slightly cooler. High temperatures will briefly drop to around 80 degrees midweek before increasing to near 90 again. Lows will be in the 40s to low 50s. The 30-day forecast says average temperatures and rainfall. The 90-day forecast says above average temperatures and rainfall.

### CROP WATER USE - PEAKS FOR THE SEASON

Monday recorded the highest potential crop water use of the season. **Hay and spring grains used 1/3 inch in one day.** Crop water use overall remained slightly above average this week due to continued hot, dry weather. Most crops used over 1 ½ inches but should decrease next week due to slightly lower temperatures. Remember, water use drops by 2/3 the week after cutting and by 1/3 the following week. Therefore, cutting during the hottest weather saves soil moisture. 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.

<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>1.6</b>	<b>1.5</b> (1.5 - 1.8)	<b>.21</b>	<b>16.4</b>
<b>PASTURE</b>	<b>1.3</b>	<b>1.3</b> (1.3 - 1.6)	<b>.18</b>	<b>13.8</b>
<b>SPRING GRAINS</b>	<b>1.8</b>	<b>1.7</b> (1.7 - 2.0)	<b>.24</b>	<b>14.0</b>
<b>WINTER WHEAT</b>	<b>0.5</b>	<b>0.2</b> (0.8 - 1.1)	<b>.01</b>	<b>15.6</b>
<b>LAWNS</b>	<b>1.5</b>	<b>1.4</b> (1.5 - 1.8)	<b>.20</b>	<b>15.5</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

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

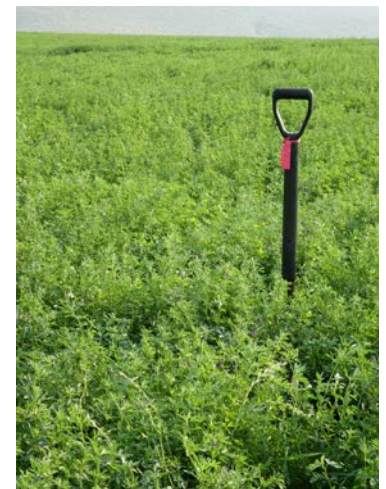
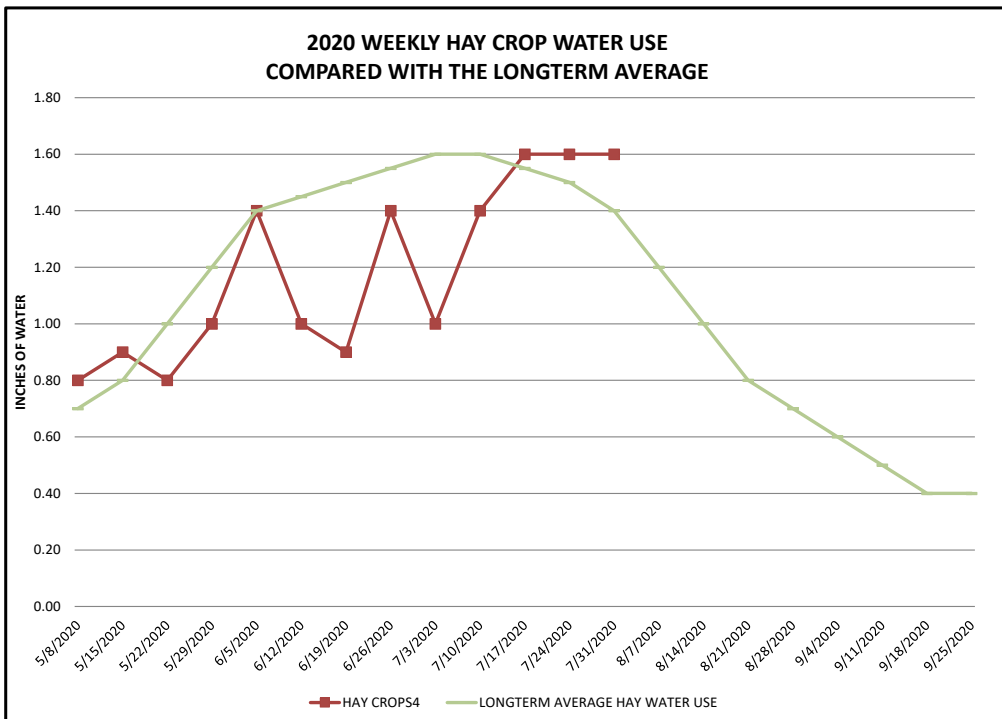
WEEK ENDING	RAIN <sup>1</sup>	2020 WEEKLY POTENTIAL CROP WATER USE <sup>2</sup>						AVERAGE WEEKLY CROP WATER USE <sup>3</sup>		
	RAIN	HAY CROPS <sup>4</sup>	PASTURE	SPRING GRAINS 5-1 START	SPRING GRAINS 5-15 START	WINTER WHEAT	LAWNS	LONGTERM AVERAGE HAY WATER USE	HOT WEEK HAY WATER USE	COOL WEEK HAY WATER USE
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	0.01	1.60	1.30	1.80	1.80	0.80	1.50	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
<b>TOTAL</b>	<b>6.45</b>	<b>16.40</b>	<b>13.80</b>	<b>14.00</b>	<b>13.20</b>	<b>15.60</b>	<b>15.50</b>	<b>22.85</b>	<b>30.60</b>	<b>16.40</b>

<sup>1</sup> 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)

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

<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 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

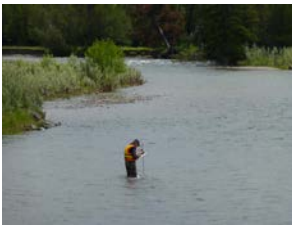
Soil moisture dropped by over 1 ½ inches this week depending on crop type and whether you just cut or not. Without irrigation it will continue to decrease next week. Crop water use decreases with cutting by 2/3 the first week and 1/3 the second week before returning to the crop's full potential in the third week after cutting. **Cutting during these high use periods saves soil moisture.**

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.



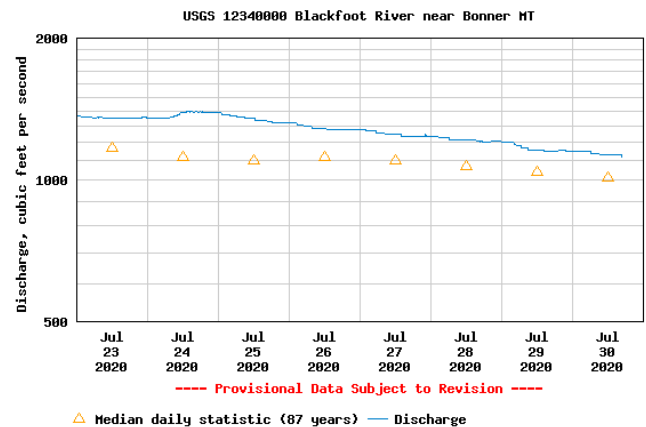
## WEEKLY TIPS

### Blackfoot River Flow About Normal



**TODAY: 1,130 CFS**  
**AVERAGE: 1,060**  
**HIGHEST: 2,890 (1899)**  
**LOWEST: 398 (1988)**

Blackfoot River flows continue to drop but are still slightly above average levels. We remain 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.



### HOW MUCH WATER DOES IT TAKE?

There are many ways to calculate water use but a recent book tries to make some comparisons. For the details see: *Your Water Footprint: The Shocking Facts About How Much Water We Use* by Stephen Leahy. He reports that 70% of fresh water use worldwide goes to irrigation (its 96% in Montana). He calculates that a vegetarian diet requires half the water use of a non-vegetarian diet. Here are some examples for specific crops:

<u>CROP</u>	<u>GALLONS OF WATER NEEDED TO PRODUCE</u>
Almond (1)	1-2
Avocado (1)	50
Melon (1)	50
Egg (1)	18
Orange (1)	20-75
Olive (1)	.75
Bread (1 slice)	3
Strawberry	.25
Apple (1)	5
Onion (1)	8
Blueberry (1)	.04

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](mailto: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- REDUCE OR CEASE IRRIGATING IF POSSIBLE DURING DROUGHTS!

- Apply 1 - 2 ½ 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.