

# BLACKFOOT CHALLENGE

## WEEKLY IRRIGATION REPORT

Friday August 23, 2019

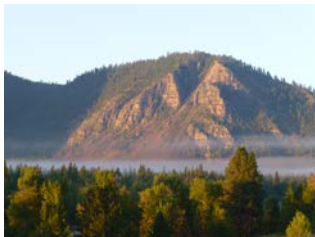


A few showers this week left ¼ to ½ inch of rain across the drainage but some locations had none. Blackfoot River flows continue to decline quickly and are at critical levels. Next week be sunny and warm with temps in the 70s. Crop water use remained above-average this week at about 1 inch for most crops. This should decrease slightly next week.

Blackfoot River flows at Bonner are below the 700 CFS trigger level and drought plans are being implemented throughout the drainage (see page 3 for drought options). Lots of sprinklers came back on last week when it rained but it will take a monsoon to overcome dropping river levels so please turn off unless you really need water for new plantings.

These reports, provide weekly summaries of weather, crop water use and soil moisture conditions plus tips for irrigation, soil health and crops. Hints for the entire irrigation season are on the last page. For other irrigation information please contact Jennifer Schoonen - Blackfoot River Steward (360-6445) or Barry Dutton – Soil and Irrigation Consultant (240-7798).

### WEATHER - SUNNY & VERY WARM AGAIN



Croplands throughout the drainage had ¼ to ½ inch of rain last week but some folks had none. Next week will have sunny skies and warm temperatures in the 70s. The 30-day and 90-day predictions still say above average temperatures and average rainfall. We continue to avoid wildfire smoke.



Curious? See Page 4

### CROP WATER USE - STILL ABOVE AVERAGE

Crop water use continued above average this week with hay crops, pasture and lawns using about 1 inch. Water use will decrease slightly next week with slightly cooler temperatures. The table below provides a quick summary of crop water use last week and an estimate for next week. The table and chart on Page 2 summarize the entire irrigation season. Crop water use the week after cutting is only about 1/3 of the uncut crop potential. The second week it is about 2/3 of potential and back to normal by the third week.



<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>1.2</b>	<b>1.1</b> (0.9 - 1.3)	<b>.16</b>	<b>21.6</b>
<b>PASTURE</b>	<b>1.0</b>	<b>0.9</b> (0.7 - 1.1)	<b>.13</b>	<b>18.3</b>
<b>SPRING GRAINS</b>	<b>0.5</b>	<b>0.3</b> (0.2 - 0.4)	<b>.04</b>	<b>16.9</b>
<b>WINTER WHEAT</b>	<b>0.1</b>	<b>0.1</b> (0.1 - 0.1)	<b>.01</b>	<b>16.7</b>
<b>LAWNS</b>	<b>1.1</b>	<b>1.0</b> (0.8 - 1.2)	<b>.14</b>	<b>20.6</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

**BLACKFOOT 2019 GROWING SEASON WEEKLY RAINFALL & CROP WATER USE (INCHES OF WATER)**

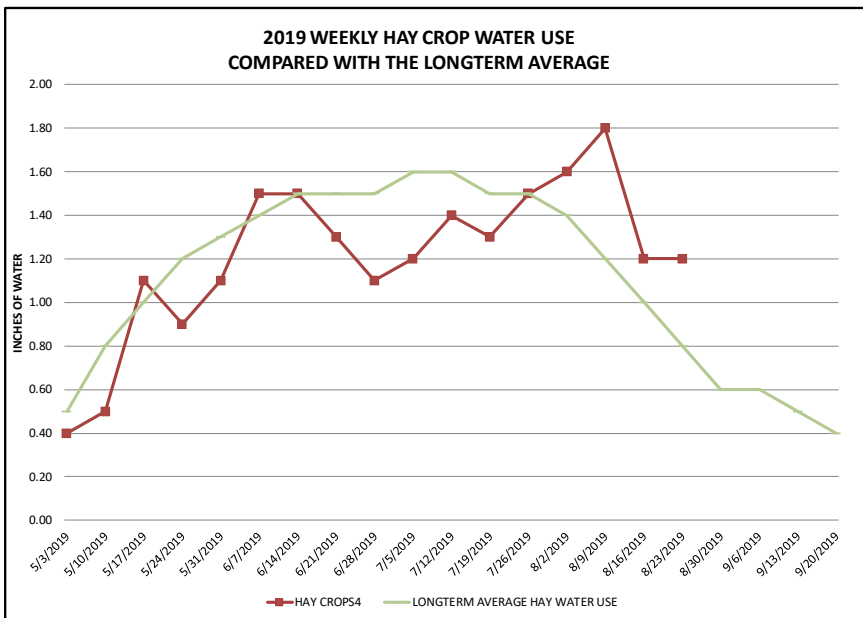
WEEK ENDING	RAIN <sup>1</sup>	2019 WEEKLY POTENTIAL CROP WATER USE <sup>2</sup>						AVERAGE POTENTIAL CROP WATER USE <sup>3</sup>		
	RAIN	HAY CROPS <sup>4</sup>	PASTURE	SPRING GRAINS 5-1 START	SPRING GRAINS 5-15 START	WINTER WHEAT	LAWNS	LONGTERM AVERAGE HAY WATER USE	HOT WEEK HAY WATER USE	COOL WEEK HAY WATER USE
5/3/2019	0.30	0.40	0.50	0.10	0.10	0.40	0.50	0.50	0.80	0.30
5/10/2019	0.30	0.50	0.40	0.10	0.10	0.50	0.50	0.80	1.00	0.50
5/17/2019	0.40	1.10	0.90	0.10	0.10	1.10	1.00	1.00	1.10	0.60
5/24/2019	0.10	0.90	0.80	0.20	0.10	1.00	0.90	1.20	1.30	0.80
5/31/2019	0.75	1.10	0.90	0.50	0.20	1.20	1.00	1.30	1.40	0.90
6/7/2019	0.30	1.50	1.30	1.00	0.60	1.60	1.40	1.40	1.50	1.00
6/14/2019	0.50	1.50	1.40	1.50	1.10	1.70	1.50	1.50	1.70	1.00
6/21/2019	0.10	1.30	1.10	1.40	1.20	1.50	1.20	1.50	1.90	1.10
6/28/2019	0.10	1.10	0.90	1.20	1.10	1.20	1.00	1.50	2.00	1.10
7/5/2019	0.40	1.20	1.00	1.30	1.20	1.30	1.10	1.60	2.10	1.30
7/12/2019	0.25	1.40	1.10	1.50	1.50	1.50	1.30	1.60	2.00	1.20
7/19/2019	0.50	1.30	1.00	1.40	1.40	1.00	1.20	1.50	2.00	1.20
7/26/2019	0.01	1.50	1.20	1.70	1.70	0.75	1.40	1.50	2.20	1.10
8/2/2019	0.01	1.60	1.30	1.80	1.80	0.50	1.50	1.40	1.70	1.00
8/9/2019	0.10	1.80	1.40	1.50	2.00	0.10	1.70	1.20	1.50	0.90
8/16/2019	0.40	1.20	0.90	1.00	1.25	0.10	1.10	1.00	1.30	0.70
8/23/2019	0.20	1.20	1.00	0.50	0.50	0.10	1.10	0.80	1.00	0.50
8/30/2019								0.60	0.80	0.40
9/6/2019								0.60	0.70	0.30
9/13/2019								0.50	0.70	0.30
9/20/2019								0.40	0.60	0.20
9/30/2019								0.40	0.60	0.20
<b>TOTAL</b>	<b>6.22</b>	<b>21.60</b>	<b>18.30</b>	<b>16.90</b>	<b>16.05</b>	<b>16.65</b>	<b>20.60</b>	<b>24.80</b>	<b>31.40</b>	<b>17.10</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)

<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.

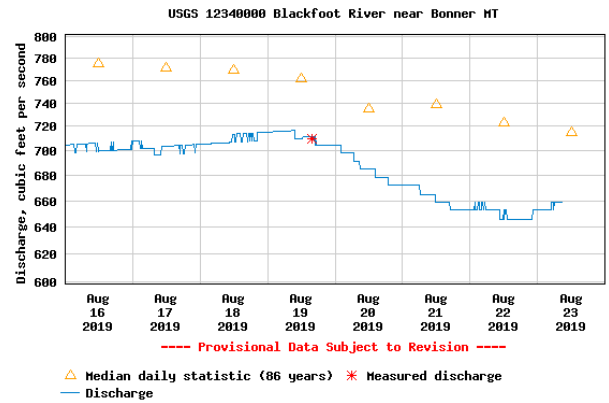
<sup>3</sup> **Longterm average** water use for each crop each week based on long-term historic data.

<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.



## STREAMFLOWS - CRITICAL

The Blackfoot river flow continued to drop this week and continues below the critical 700 CFS level which triggers irrigation restrictions. Today's flow is at **659 CFS** compared with an average for this date of 744 CFS. The Highest flow on this date was 1,880 (1899) and the lowest was 364 CFS (1988). Flow increased a very small amount with rain Thursday but is expected to continue to drop further with dry, warm weather next week.



## OPTIONS FOR A DROUGHT YEAR?

- CONCENTRATE YOUR EFFORTS ON THE FIRST CUTTING
- IRRIGATE ONCE AFTER CUTTING AND THEN CEASE IRRIGATION.
- **STOP IRRIGATING HAYFIELDS AND PASTURES, GRASSES AND ALFALFA ARE DROUGHT-TOLERANT AND WILL SURVIVE UNTIL FALL RAINS**



- IRRIGATE AT NIGHT SO MORE GOES INTO THE SOIL
- IF YOU HAVE MULTIPLE IRRIGATION SYSTEMS – RUN ONLY ONE OR SO AT ONCE TO REDUCE THE AMOUNT WITHDRAWN AND MAINTAIN STREAM FLOWS
- REDUCE YOUR IRRIGATED ACREAGE AND DO A GOOD JOB IRRIGATING ON A SMALLER ACREAGE

- PRACTICE IRRIGATION SCHEDULING
- MONITOR IRRIGATION SYSTEM PERFORMANCE TO PUT ON THE RIGHT AMOUNT UNIFORMLY



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)

# TURNIPS DISCOVERED IN THE BLACKFOOT DRAINAGE!



Scott Gordon and Bruce Menz are using a cover crop to renovate this irrigated hayfield near Clearwater Junction. The site has a very rocky and sandy soil that just hasn't produced well. This soil has very low water and nutrient holding capacities and low organic matter content.

The goal is to end irrigation and convert the field to a native + non-native dryland mix dominated by grasses. But first they decided to build up the soil with cover crops to add organic matter, nutrients, aeration and encourage a more diverse microbiology. This year all 9 plants in the cover crop seed mix came up - including the

turnips! The mix is listed below along with each plants role in the renovation. Thanks guys - for showing what cover crops can do in the Blackfoot. Scott says they had lots of good advice from the Blackfoot Challenge, Jim Stone, Brad Weitzen, the Lake County Conservation District and even myself. So spread the word – diverse cover crops are a local success and can be used to improve your soils too.

Their seed mix (suggested by NorthForty Ag) is listed below and was seeded with a no-till drill.

**Crimson Clover:** Clovers fix nitrogen and the flowers attract pollinators and some especially beneficial insects, such as pirate bugs and lady bugs.

**4010 Forage Peas:** These peas can fix 10-40 lbs/year of nitrogen. Peas have a very low C:N ratio, meaning the residue breaks down very quickly. It's a high protein forage and great in a mix with oats, spring triticale, or spring barley for added fiber.

**Diamond T Ryegrass:** Great roots for scavenging nutrients, breaking up compaction and building soil tilth (infiltration, aggregation and organic matter).

**Spring Barley:** Forage barley is a successful crop across Montana especially for hay or pasture renovation.

**Spring Oats:** Oats germinate and grow fast providing ground cover and erosion control. Their low C:N ratio means the residue breaks down quickly. The forage beats wheat or rye.

**Trophy Rapeseed:** Rape grows quick with forage value similar to alfalfa. It doesn't fix nitrogen but can scavenge up to 120 lbs/acre with its dense, fibrous roots and deep tap root. Its root exudates help turn insoluble phosphorus forms plants can use. The abundant roots increase soil organic matter.

**Purple Top Turnip:** Turnips mine nutrients from deep in the soil and bring them up where all plants can use them. The tuber provides organic matter in the surface soil, reduces compaction, and it take three days of 15 degrees to kill turnips. May cause choking (teach your cows the Heimlich Maneuver).

**Black Oil Sunflowers:** - Great as forage or silage and adapted to many soils, this plant attracts natural predator organisms to crop pests, pollinators and a variety of wildlife. Gives cows a shiny coat.

**Baldy Spineless Safflower:** Historically grown for oilseed and birdseed, its related to sunflower and provides excellent forage.

**Rapeseed**



**Sunflower**



**Safflower**



**Ryegrass**



**Peas**



## 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. Some years you better start up now.



### 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.