

# BLACKFOOT CHALLENGE

## WEEKLY IRRIGATION REPORT

Friday August 2, 2019



Scattered clouds and thunderstorms left little rain this week which was dominated by hot temperatures and sunny skies. Next week will be similar but even warmer. Crop water use rose above average for the first time since May to about 1 ¾ inches this week. All crops (except cut hay) should use slightly more water next week with hot, sunny weather. If you don't plan on pasture or another cutting, water alfalfa crops once after harvest and put away your irrigating boots.

**Blackfoot River flows at Bonner have now fallen to the 700 CFS trigger level and drought plans are being implemented throughout the drainage (see page 3). For drought options – see page 4.**

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



Last week had warm temperatures and a few scattered thunderstorms but little or no rain. Next week will again be sunny with very warm temperatures in the upper 80s and low 90s. The 30-day and 90-day predictions are for above average temperatures and average rainfall. Remember that average rainfall for August is very little.



### CROP WATER USE - ABOVE AVERAGE - CUT 2/3 BY HAYING

Crop water use rose above average for the first time since May. Hay crops, spring grains and lawns used over 1 ½ inches and pasture slightly less. Water use will increase again next week with hot temperatures to about ¼ inch per day (1 ¾ inches per week). 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>1.6</b>	<b>1.7</b> (1.5 - 1.9)	<b>.25</b>	<b>17.4</b>
<b>PASTURE</b>	<b>1.3</b>	<b>1.4</b> (1.3 - 1.6)	<b>.20</b>	<b>15.0</b>
<b>SPRING GRAINS</b>	<b>1.8</b>	<b>1.9</b> (1.7 - 2.0)	<b>.27</b>	<b>13.9</b>
<b>WINTER WHEAT</b>	<b>0.5</b>	<b>0.2</b> (0.1 - 0.3)	<b>.03</b>	<b>16.4</b>
<b>LAWNS</b>	<b>1.5</b>	<b>1.6</b> (1.5 - 1.8)	<b>.23</b>	<b>16.7</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)

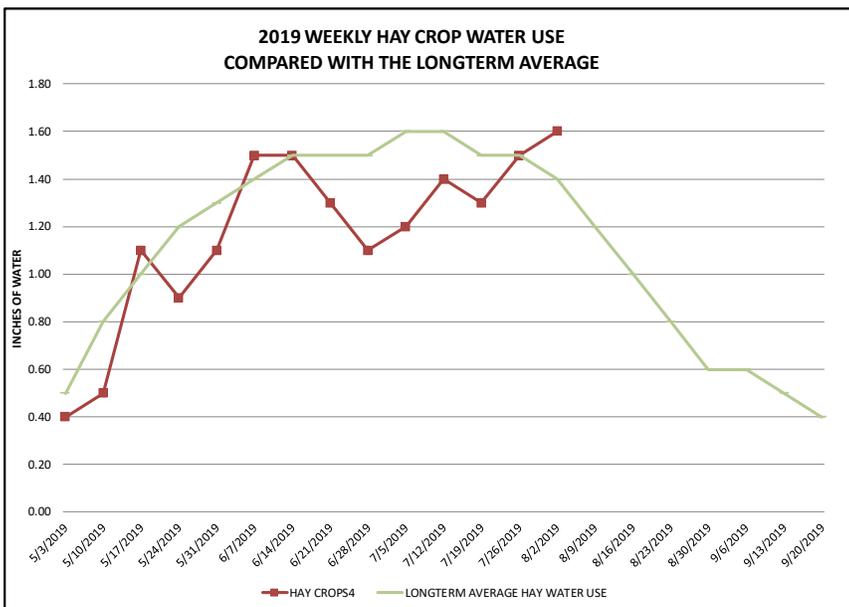
WEEK ENDING	RAIN <sup>1</sup>	2019 WEEKLY POTENTIAL CROP WATER USE <sup>2</sup>						AVERAGE POTENTIAL CROP WATER USE <sup>3</sup>		
	RAIN	HAY CROPS <sup>4</sup>	PASTURE	5-1 START	5-15 START	WINTER WHEAT	LAWNS	LONGTERM AVERAGE HAY WATER USE	HOT WEEK HAY WATER USE	COOL WEEK HAY WATER USE
5/3/2019	0.30	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								1.20	1.50	0.90
8/16/2019								1.00	1.30	0.70
8/23/2019								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>5.52</b>	<b>17.40</b>	<b>15.00</b>	<b>13.90</b>	<b>12.30</b>	<b>16.35</b>	<b>16.70</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.



25% SOIL MOISTURE



## SOIL MOISTURE - BOOST IT AFTER CUTTING IF YOU CAN

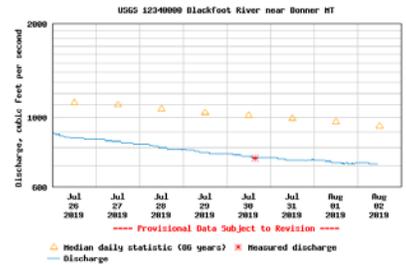
Soil moisture levels in well-irrigated fields dropped around 1 ½ inches this week due to crop water use. Crop water use drops when you cut, then recovers fully in about three weeks as new leaf area develops.

75% SOIL MOISTURE



## STREAMFLOWS - CRITICAL

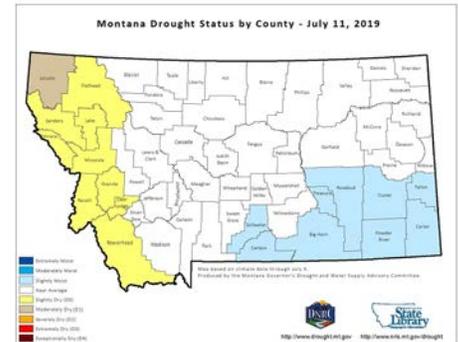
It looks like today is the day the Blackfoot river flow at Bonner declines to **700 CFS**. This is about **70% of average** (1,000 CFS) and 700 CFS is the trigger level for drought restrictions. The Highest flow on this date was 2,580 (1899) and the lowest was 381 CFS (1988). Despite an average snowpack and cool spring/summer temperatures, streamflows have declined dramatically throughout the drainage.



## DROUGHT 2019!!

The Montana Drought Status map (at right) has been updated to show the Missoula County portion of the drainage as “Slightly Dry” and the Powell County portion as “near average”. You can see on the website that the trend in weekly map updates shows the drainage getting drier by the week.

[https://mslservices.mt.gov/Geographic\\_Information/Maps/drought/](https://mslservices.mt.gov/Geographic_Information/Maps/drought/)



Blackfoot River flows at Bonner have dropped to the 700 CFS trigger level for drought restrictions. Blackfoot Challenge Water Steward Jennifer Schoonen is now working with irrigators to help implement drought plans. This comes at a bad time for local irrigators due to the delay in haying this year and the need to get water back on the crop quickly. Rainfall has continued to be scarce and stream flows have been 50-75% of normal for over a month. Predictions for the next 30 days are for average rainfall and above temperatures. The 90-day predictions are for average rainfall and above average temperatures. Remember that average rainfall is not much in August. For more info go to:

<http://dnrc.mt.gov/divisions/water/drought-management>

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)

## OPTIONS FOR A DROUGHT YEAR?

- CONCENTRATE YOUR EFFORTS ON THE FIRST CUTTING
- IRRIGATE ALFALFA ONCE AFTER CUTTING AND THEN REDUCE OR CEASE IRRIGATION.
- CEASE IRRIGATION OF GRASS HAY AND GRASS PASTURES, GRASSES ARE DROUGHT-TOLERANT AND WILL SURVIVE UNTIL FALL RAINS



- IRRIGATE IMMEDIATELY AFTER CUTTING WHEN CROP WATER USE IS MUCH-REDUCED AND MORE GOES INTO THE SOIL
- IRRIGATE AT NIGHT SO MORE GOES INTO THE SOIL
- IF YOU HAVE MULTIPLE IRRIGATION SYSTEMS – RUN ONLY A LIMITED NUMBER AT ONCE TO REDUCE THE AMOUNT WITHDRAWN AND MAINTAIN STREAM FLOWS

- APPLY MORE WATER DURING EACH APPLICATION TO INCREASE SOIL MOISTURE STORAGE – EVERY TIME YOU IRRIGATE YOU LOSE A PORTION TO EVAPORATION ESPECIALLY IN HOT WEATHER
- REDUCE YOUR IRRIGATED ACREAGE AND DO A GOOD JOB IRRIGATING ON A SMALLER ACREAGE



- PLANT CROPS THAT USE LESS WATER (SMALL GRAINS)
- PRACTICE IRRIGATION SCHEDULING

- MONITOR IRRIGATION SYSTEM PERFORMANCE SO YOU PUT ON THE RIGHT AMOUNT UNIFORMLY



## 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.