

BLACKFOOT CHALLENGE

WEEKLY IRRIGATION REPORT

Friday September 13, 2019



[See Page 3 for Soil Moisture Sensors](#)

A monsoon last weekend left 2-3 inches of rain Friday-Monday across local croplands. This boosted river flows above 700 CFS but a sediment plume continues to turn the river brown and flows decreased throughout the week. Next week will be cool with showers. Crop water dropped to near average this week at just over ½ inch for most crops and should be similar next week.

Drought Restrictions Lifted!

Blackfoot River flows at Bonner have risen above 700 CFS and temperatures have cooled.

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 - RAIN, SHOWERS, COOL AND THEN SUN LATE IN THE WEEK



Croplands throughout the drainage had a virtual monsoon with most sites reporting 2-3 inches of rain last weekend (Friday-Monday). The forecast is for cool weather with showers most of next week. The 30-day prediction is for above average temperatures and rainfall while the 90-day prediction predict is above average temperatures and average rainfall.

CROP WATER USE - STILL ABOVE AVERAGE BUT DROPPING NEXT WEEK

Crop water use dropped to near – normal levels this week with hay crops, pasture and lawns using a just over ½ inch. Most annual crops including small grains have been harvested and water use has ended. Crop water use will continue low this coming week with cool temperatures and showers expected. 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.



WATER USE IN INCHES	LAST 7 DAYS	NEXT 7 DAYS TOTAL¹	NEXT 7 DAYS DAILY AVE²	SEASON TOTAL³
HAY CROPS	0.7	0.8 (0.7 - 1.0)	.11	24.5
PASTURE	0.6	0.6 (0.5 - 0.8)	.09	20.7
SPRING GRAINS	0.0	0.0 (0.0 - 0.0)	.00	17.0
WINTER WHEAT	0.0	0.0 (0.0 - 0.0)	.00	16.5
LAWNS	0.7	0.7 (0.6 - 0.9)	.10	23.3

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

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

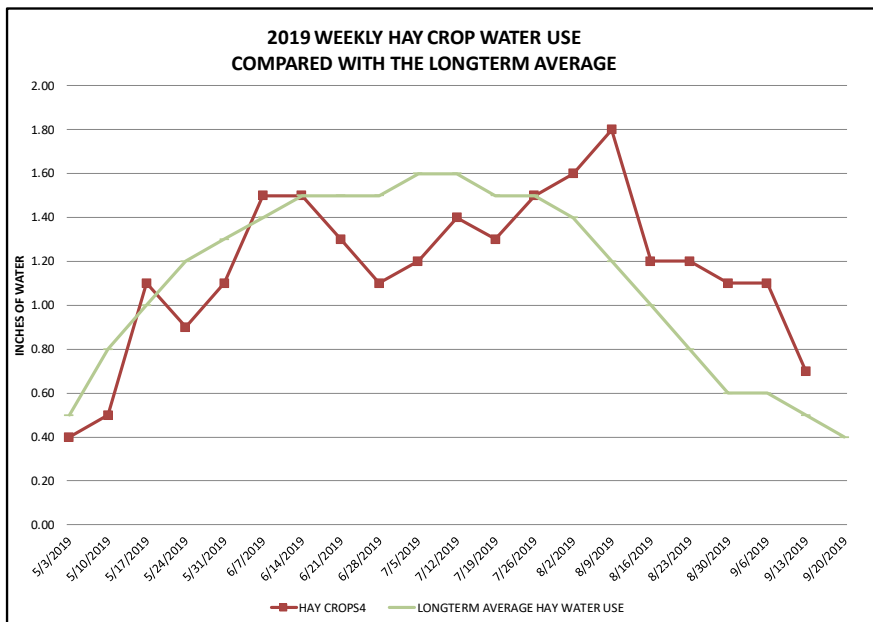
WEEK ENDING	RAIN ¹	2019 WEEKLY POTENTIAL CROP WATER USE ²						AVERAGE POTENTIAL CROP WATER USE ³		
	RAIN	HAY CROPS ⁴	PASTURE	SPRING GRAINS 5-1 START	SPRING GRAINS 5-15 START	WINTER WHEAT	LAWNS	LONGTERM AVERAGE HAY WATER USE	HOT WEEK HAY WATER USE	COOL WEEK HAY WATER USE
5/3/2019	0.30	0.40	0.50	0.10	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	0.00	1.10	1.00	1.30	0.70
8/23/2019	0.20	1.20	1.00	0.50	0.50	0.00	1.10	0.80	1.00	0.50
8/30/2019	0.20	1.10	0.90	0.10	0.10	0.00	1.00	0.60	0.80	0.40
9/6/2019	1.00	1.10	0.90	0.00	0.00	0.00	1.00	0.60	0.70	0.30
9/13/2019	1.50	0.70	0.60	0.00	0.00	0.00	0.70	0.50	0.70	0.30
9/20/2019								0.40	0.60	0.20
9/30/2019								0.40	0.60	0.20
TOTAL	8.92	24.50	20.70	17.00	16.15	16.45	23.30	24.80	31.40	17.10

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)

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.

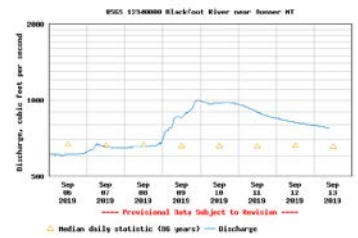
³ **Longterm average** water use for each crop each week based on long-term historic data.

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



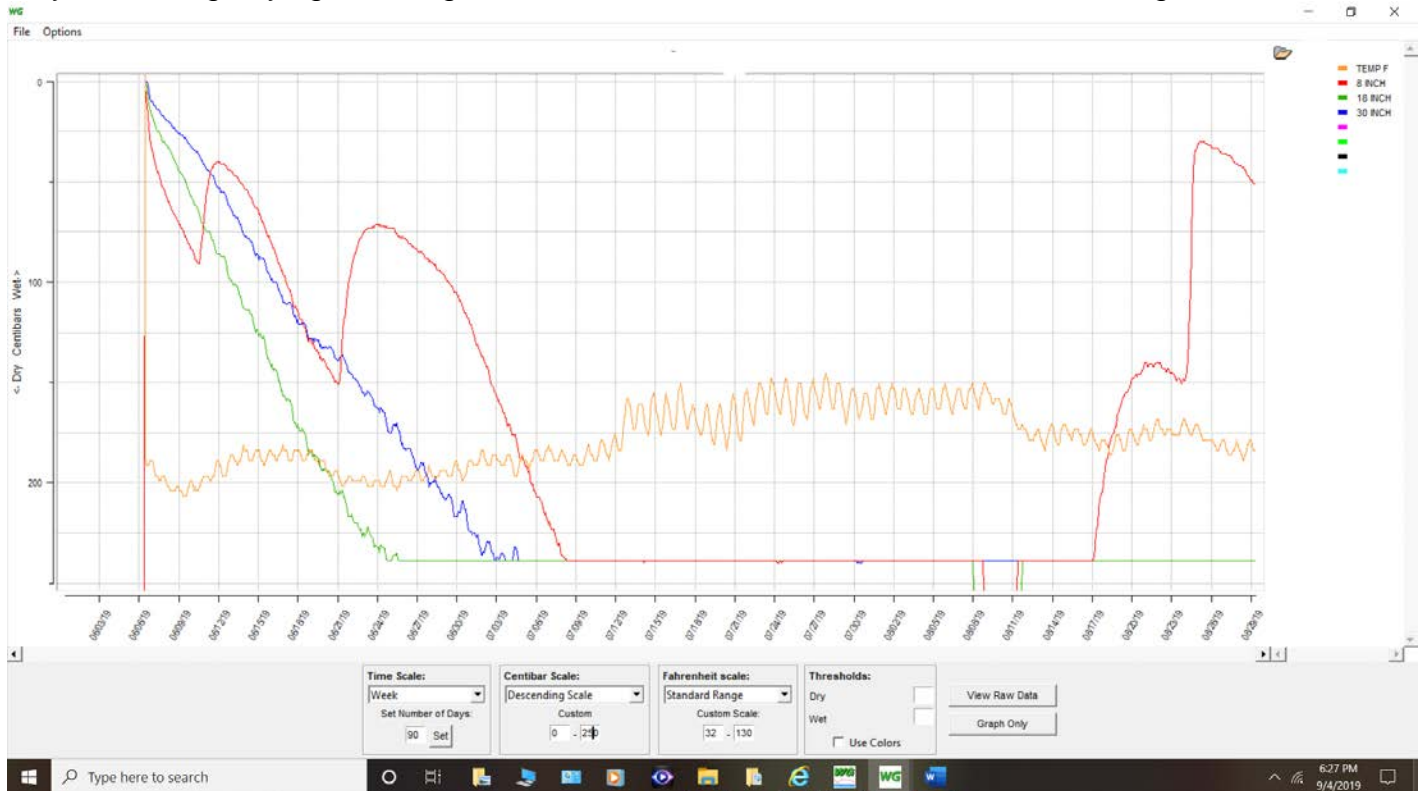
STREAMFLOWS - REVIVED WITH RAIN!

Last weekend's monsoon sent Blackfoot river flows up above average for the first time in weeks. Today's flow is at 779 CFS compared with an average for this date of 656 CFS. The Highest flow on this date was 1,280 (1899) and the lowest was 381 CFS (1987). Hopefully showers and cooler temperatures this week will keep flows up above the 700 CFS critical level.



DO YOU NEED SOIL MOISTURE SENSORS?

This summer the Challenge helped install and calibrate soil moisture sensors at 5 pivots and 1 wheel line irrigation system to provide instant soil moisture and temperature readouts at each field location. Data recorders take readings each hour to provide a detailed record of the entire irrigation season. These charts show the effects of individual irrigations including the depth of water penetration and how long before its depleted by crop use. The chart below shows soil moisture boosted in the surface foot several times by irrigation and then depleted by the crop. Moisture levels drop very low during haying then irrigation increases soil moisture in the surface foot again. Soil moisture



in the second (18 inch) and third foot (30 inch) decrease slowly throughout the period until exhausted and are not boosted by irrigation.

Let us know if you might be interested in getting soil moisture sensors installed and calibrated. Our goal is to provide irrigators with a permanent useful option for soil moisture monitoring that doesn't require a shovel. Eventually you will have sensors connected to your irrigation system and it will irrigate by itself.

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. 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.



SEPTEMBER – APPLY AS NEEDED/AVAILABLE & GET READY FOR SPRING!

- Stop irrigating if you can during drought periods
- 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.