BLACKFOOT CHALLENGE
WEEKLY IRRIGATION REPORT

Friday September 20, 2019

See Page 3 for Soil Moisture Sensors

Local croplands had cool temperatures and a little rain this week. Blackfoot River flows fell briefly below 700 CFS but rain increased flows again. Sediment flows in burned areas continued to turn the river brown. Next week will start cool with showers then become mostly sunny. Crop water use remained above average this week at just over ½ inch for most crops and should be similar next week.

Drought Restrictions Lifted!

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 – POTENTIAL SHOWERS AND COOL AND THEN SUNNY

Croplands throughout the drainage had little rain early in the week but ¼ to ½ inch Wednesday through Thursday. There is a slight chance for rain this weekend followed by mostly sunny conditions the rest of the week. The remainder of the irrigation season is predicted to have above average temperatures and average rainfall.

CROP WATER USE – STILL ABOVE AVERAGE

Crop water use remained above average this week with hay crops, pasture and lawns using between ½ and 1 inch. Most annual crops including small grains have been harvested and water use has ended. Crop water use will remain similar this coming 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.

WATER USE IN INCHES	LAST 7 DAYS	NEXT 7 DAYS TOTAL[1]	NEXT 7 DAYS DAILY AVE[2]	SEASON TOTAL[3]
HAY CROPS	**0.8**	**0.8** (0.7 - 1.0)	.11	25.3
PASTURE	**0.6**	**0.6** (0.5 - 0.8)	.09	21.3
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	24.0

[1]Expected water use over the next week (range if weather becomes cooler or hotter than expected)
[2]Expected average daily water use over the next week (compare this with your soil moisture content)
[3]Beginning April 1

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

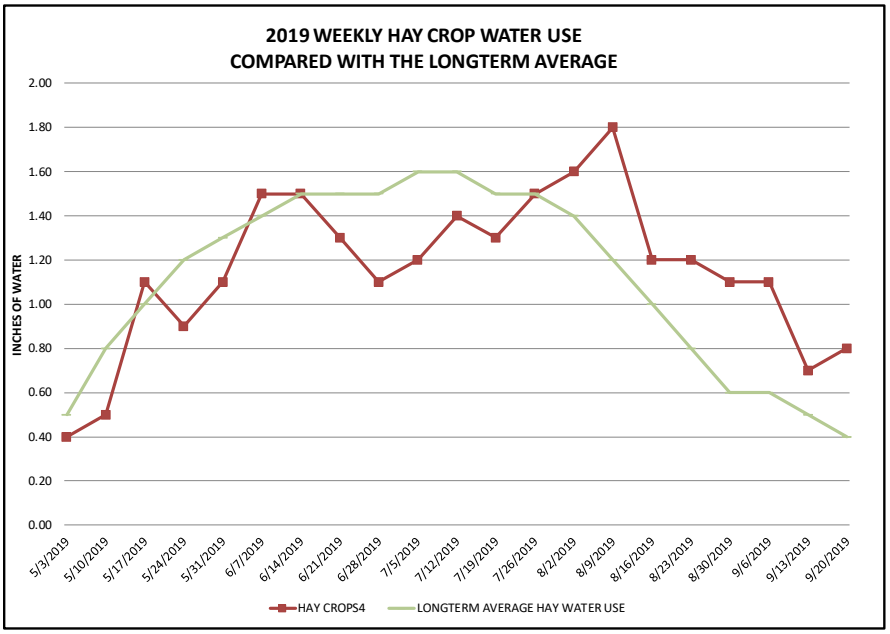
	RAIN[1]	2019 WEEKLY POTENTIAL CROP WATER USE[2]						AVERAGE POTENTIAL CROP WATER USE[3]		
WEEK ENDING	RAIN	HAY CROPS[4]	PASTURE	SPRING GRAINS 5-1 START	SPRING GRAINS 5-15 START	WINTER WHEAT	LAWNS	LONGTERM AVERAGE HAY WATER USE	HOT WEEK HAY WATER USE	COOL WEEK HAY WATER USE
5/3/2019	0.30	0.40	0.50	0.10	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	0.25	0.80	0.60	0.00	0.00	0.00	0.70	0.40	0.60	0.20
9/30/2019								0.40	0.60	0.20
TOTAL	**9.17**	**25.30**	**21.30**	**17.00**	**16.15**	**16.45**	**24.00**	**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)

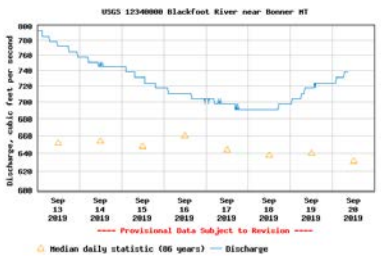
[2] **This years** maximum water use by healthy crops that are well-fertilized and irrigated, disease and insect-free. Will vary slightly across the drainage.

[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!

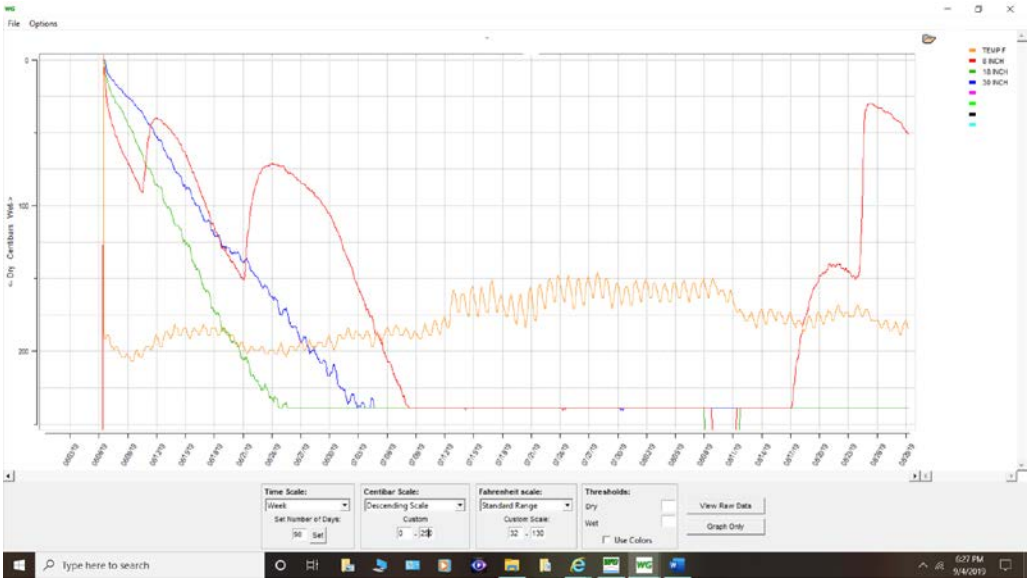


A lack of rain early in the week caused the Blackfoot River flow at Bonner to dip briefly below 700 CFS then recover with rain. Todays flow is at 738 CFS compared with an average for this date of 652 CFS. The Highest flow on this date was 1,310 (1899) and the lowest was 377 CFS (1987). Debris flows in burned tributaries caused sediment plumes that turned the river chocolate brown following recent rains.

COULD YOU USE SOIL MOISTURE SENSORS?

Soil Moisture Sensors can determine soil moisture content instantly and document changes over time. Sensors placed in the upper root zone show the immediate boost in moisture with irrigation and the decline as crops use water. Deeper sensors reveal when irrigation has penetrated the entire root zone and filled up the soil to its full water holding capacity. Sensors have had mixed reviews in the past but recent improvements are making them more user-friendly. Most important is proper installation and calibration. Irrigators must know what the sensor reads when the soil is dry, when the soil is full and how much water the full root zone contains (in inches – not gibberish). Many past sensor programs have failed to assist irrigators with this essential information.

A simple monitoring installation includes 2-3 soil moisture sensors throughout the root zone and a data recorder that allows instant readings and also captures trends over time. Costs are about $800 per field for equipment. Data recorders are located for convenience in the field, at the pivot control or field access.



The Blackfoot Challenge is considering a new and improved soil moisture sensor program for interested irrigators. This program could assist with equipment costs, installation and proper calibration of sensors as well as training in how to interpret and use results. Let us know if you might be interested. Our goal is to provide irrigators with a permanent useful option for soil moisture monitoring that doesn't require a shovel and could be upgraded as cell service improves. Eventually you will have sensors connected to your irrigation system and it will irrigate by itself. Contact Jennifer or Barry if you are interested in installing sensors.

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.