BLACKFOOT CHALLENGE WEEKLY IRRIGATION REPORT

Friday September 15, 2023

Blackfoot watershed croplands were sunny and rainless this week. Next week looks similar with lots of sun and maybe a shower late in the week. **Crop water use was 1 inch or less last week for all crops and will be similar next week.** The watershed is still listed as *Abnormally Dry* and Blackfoot River flows continue to fluctuate around the drought trigger level of **600 CFS.** It will only take one good rainstorm to end drought concerns this year. Send us your ideas or questions about anything you want to hear about related to irrigation, soil health, water quality, or other subjects. We will respond and share them with everyone.

WEATHER – SUNNY AND WARM NEXT WEEK

Blackfoot watershed croplands had no rain this week with mild temperatures and sun. Next week is going to be similar with a chance of rain late in the week but mostly sunny skies. Highs will be in the 60s and 70s and lows in the 30s and 40s. The 30-day day forecast says above average rainfall and below average temperatures. The 90-day forecast says average rainfall and temperatures.

Your own rain gauge is always your best source of rainfall information!

CROP WATER USE – ABOUTAVERAGE

Crop water use dropped this week to an inch or less for all crops, about average for this time of year. Next week crops will use a similar amount. Water use by crops across the watershed continues to drop due to small grains reaching maturity, hay harvest where no further irrigation is planned or available and due to the lower water use inherent to pasture (less dense vegetation due to grazing removal).

WATER USE IN INCHES	LAST 7 DAYS	NEXT 7 DAYS TOTAL[1]	NEXT 7 DAYS DAILY AVE[2]	SEASON TOTAL[3]
HAY CROPS	**1.0**	**1.0**	.14	24.0
PASTURE	**0.7**	**0.7**	.10	20.2
SPRING GRAINS	**0.0**	**0.0**	.00	20.0
WINTER WHEAT	**0.0**	**0.0**	.00	18.0
LAWNS	**0.9**	**0.9**	.13	23.2

[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 – note in 2010-13 we started our seasonal total on May 1 but since include April

The table on Page 1 provides a quick summary of crop water use this last week and an estimate for next week. The table and chart below summarize the entire irrigation season and compare it with average, hot and cool conditions so you can plan ahead. This table and chart will be updated weekly all season.

BLACKFOOT 2023 GROWING SEASON WEEKLY RAINFALL & CROP WATER USE (INCHES OF WATER)

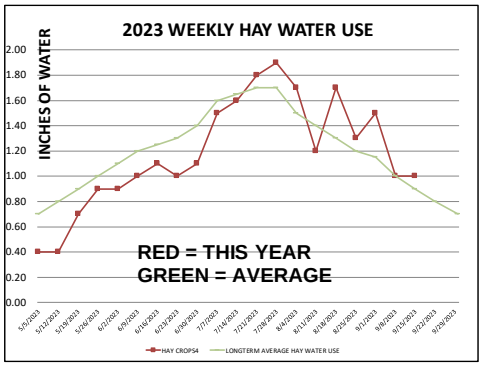
	RAIN[1]	2023 WEEKLY POTENTIAL CROP WATER USE[2]						AVERAGE WEEKLY CROP WATER USE[3]		
WEEK ENDING	RAIN	HAY CROPS[4]	PASTURE	SPRING GRAINS 5-1 START	SPRING GRAINS 5-15 START	WINTER WHEAT	LAWNS	LONGTERM AVERAGE HAY WATER USE	HOT WEEK HAY WATER USE	COOL WEEK HAY WATER USE
APRIL	0.25	0.25	0.25	0.00	0.00	0.25	0.25			
5/5/2023	0.10	0.40	0.40	0.00	0.00	0.50	0.40	0.70	1.00	0.40
5/12/2023	1.50	0.40	0.50	0.20	0.00	0.60	0.50	0.80	1.10	0.60
5/19/2023	0.25	0.70	0.70	0.30	0.00	0.80	0.80	0.90	1.20	0.70
5/26/2023	0.75	0.90	0.80	0.50	0.30	1.00	1.00	1.00	1.30	0.70
6/2/2023	0.25	0.90	0.80	0.60	0.40	1.00	0.90	1.10	1.50	0.80
6/9/2023	0.25	1.00	0.90	0.80	0.60	1.10	1.00	1.20	1.70	0.80
6/16/2023	0.40	1.10	0.90	1.00	0.80	1.20	1.00	1.25	1.90	0.90
6/23/2023	0.25	1.00	0.80	1.00	0.90	1.10	0.90	1.30	2.00	1.00
6/30/2023	0.40	1.10	0.90	1.20	1.10	1.20	1.00	1.40	2.00	1.00
7/7/2023	0.01	1.50	1.20	1.70	1.60	1.70	1.40	1.60	2.10	1.10
7/14/2023	0.01	1.60	1.30	1.70	1.60	1.70	1.50	1.65	2.20	1.10
7/21/2023	0.01	1.80	1.50	2.00	2.00	1.80	1.70	1.70	2.20	1.10
7/28/2023	0.01	1.90	1.60	2.20	2.20	2.00	1.80	1.70	2.20	1.10
8/4/2023	0.10	1.70	1.50	2.10	2.10	1.25	1.70	1.50	2.20	1.00
8/11/2023	1.00	1.20	0.90	1.40	1.40	0.50	1.10	1.40	2.20	1.00
8/18/2023	0.01	1.70	1.40	1.50	1.50	0.25	1.60	1.30	2.00	0.90
8/25/2023	0.50	1.30	1.10	1.20	1.20	0.00	1.30	1.20	1.80	0.90
9/1/2023	0.50	1.50	1.10	0.50	0.50	0.00	1.40	1.15	1.60	0.70
9/8/2023	0.35	1.00	0.90	0.00	0.00	0.00	1.00	1.00	1.40	0.60
9/15/2023	0.00	1.00	0.70	0.00	0.00	0.00	0.90	0.90	1.40	0.50
9/22/2023								0.80	1.20	0.50
9/30/2023								0.70	1.00	0.40
TOTAL	6.65	23.95	20.15	19.90	18.20	17.95	23.15	26.25	37.20	17.80

[1] **Average across watershed** (50-80% gets to the crop depending on irrigation method, weather, evaporation from crop and soil surfaces)

[2] **This years** potential water use by healthy crops that are well-fertilized and irrigated, disease and insect-free. Varies across watershed.

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

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



SOIL MOISTURE FELL 1 INCH LAST WEEK, SIMILAR NEXT WEEK

Well-irrigated local croplands saw soil moisture levels fall 1 inch or a little less last week depending on crop type. Next week will be similar. As always, check your soil with sensors, probes or shovels to be sure you add enough water. It looks like the hot weather and highest crop water use is past so enjoy the rest of the season and use less water.

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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 dark stain or shiny surface.

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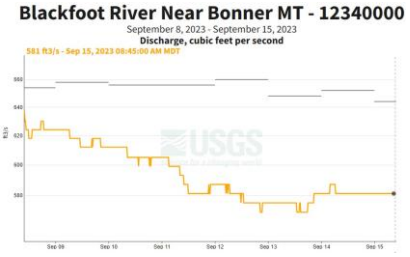
Soil near 50% of its water holding capacity may form a weak ball but leaves little moisture on the hand. Soil at 25% or less of its water holding capacity does not form a ball when squeezed. It feels and looks dry. If sandy or loamy, it crumbles easily, if high in clay it forms a hard lump. Call, text or email anytime if you have questions about evaluating your soil moisture content and irrigation options.

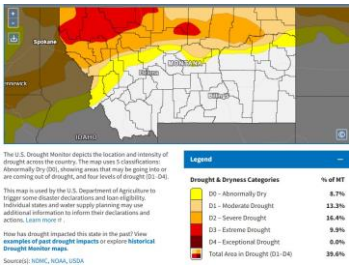
WEEKLY TIPS

STREAM FLOWS



Stream flows at Bonner dropped this week with days of cooler temps and rain interspersed with warmer and drier conditions. Irrigation has ended in some fields as small grains mature, hay is cut and pastures slow their water use. Flow today at Bonner is **581 CFS** while the average for this date is 654 CFS. The highest flow was 1,310 CFS in 1899 and the lowest flow was 370 CFS in 1987. Flow peaked this year on May 7 at 10,400 CFS.

DROUGHT



The Drought Monitor hasn't changed much this week with 39% of the state in drought conditions. Most of the Blackfoot watershed is still listed as *Abnormally Dry*. Blackfoot river stream flows continue to fluctuate around the 600 CFS trigger level and the Drought Committee does not anticipate any additional drought restrictions this year. We are one good rainstorm from lifting all restrictions.

IRRIGATION CANALS AND SOLAR PANELS

World-wide, more irrigation canals are being covered to reduce evaporation loss and produce electricity. The photo at right is from Romania where they expect to get 20 MW from a new project. A California study says this could save 63 billion gallons of water each year and produce 13 GW of energy (enough to power Los Angeles for most of the year). Could we see this on Montana's 250 miles of canals? Are solar panels on reservoirs next?

For further information contact Clancy Jandreau, Blackfoot Challenge Water Steward, 406-304-5423 or Barry Dutton, Professional Soil Scientist, 406-240-7798 barry@landandwaterconsulting.net

THE BLACKFOOT WATERSHED 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- IRRIGATE ONCE AFTER CUTTING IF POSSIBLE AND 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 at a lower rate following hay cutting. Irrigate according to how much pasture you seek and with consideration for other water needs in the watershed, especially in drought years.
- Reduce river withdrawals by rotating systems and reducing the amount of irrigation at one time. **Stop irrigating if you can in drought years.**

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.
- Apply fall irrigations where appropriate after stream flows recover.