# BLACKFOOT CHALLENGE WEEKLY IRRIGATION REPORT

## Friday September 20, 2024

The smoke ended this week with a little rain and cooler temperatures. Next week will be great fall weather with no rain but cool nights and warm days. **Crop water use was less than 1 inch and will be similar next week.** Blackfoot River flows continue a slow upward trend due to recent rains. Flows have had help from irrigators implementing drought plans. Driving throughout the watershed lately it's obvious that irrigators are sacrificing peak crop production to help maintain streamflows - thanks to all those irrigators! Please send us any ideas or questions to include with these reports. We will respond and share them with everyone.

Note that the final irrigation report of the year will be sent out on September 30 instead of next Friday. I will then assemble an annual report summarizing the irrigation events of this year. Let me know of anything you are especially interested in.

## A WELCOME CHANGE IN WEATHER

Less smoke, cooler temperatures and a bit of rain made for a nice change this week. Most Blackfoot watershed croplands had up to ¼ inch of rain. Next week will see highs in the 60s and 70s with lows mostly in the 30s. Beware a chance of freezing temperatures early in the week. There will be little or no rain. The 30-day forecast says below average rainfall and above average temperatures. The 60-day forecast says average rainfall and above average temperatures.

*Your own rain gauge is your best source of rainfall information.*

## CROP WATER USE – AVERAGE AT LESS THAN 1 INCH

Crop water use was average for a change this last week. **Crops used less than 1 inch of water this week and will use about the same next week**.

| 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** | .11 | 26.8 |
| **PASTURE** | **0.6** | **0.6** | .09 | 23.1 |
| **SPRING GRAINS** | **0.0** | **0.0** | .00 | 19.9 |
| **WINTER WHEAT** | **0.0** | **0.0** | .00 | 20.1 |
| **LAWNS** | **0.7** | **0.7** | .10 | 26.2 |

[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 2024 GROWING SEASON WEEKLY RAINFALL & CROP WATER USE*** (INCHES OF WATER)

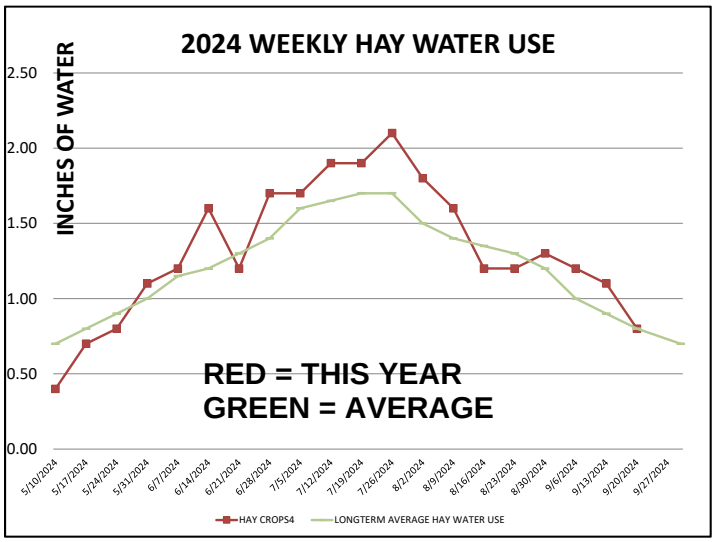
| | RAIN[1] | 2024 WEEKLY POTENTIAL CROP WATER USE[2] | | | | | | AVERAGE WEEKLY CROP WATER USE[3] | | |
|---|---|---|---|---|---|---|---|---|---|---|
| WEEK ENDING | RAIN | HAY CROPS[4] | PASTURE | SPRING GRAINS 5-1 START | SPRING GRAINS 5-15 START | WINTER WHEAT | LAWNS | LONGTERM AVERAGE HAY WATER USE | HOT WEEK HAY WATER USE | COOL WEEK HAY WATER USE |
| APRIL | 0.50 | 0.25 | 0.25 | | | 0.25 | 0.25 | | | |
| 5/10/2024 | 0.50 | 0.40 | 0.50 | | | 0.50 | 0.60 | 0.70 | 1.00 | 0.40 |
| 5/17/2024 | 0.10 | 0.70 | 0.80 | | | 1.00 | 1.00 | 0.80 | 1.10 | 0.60 |
| 5/24/2024 | 1.00 | 0.80 | 0.80 | 0.30 | 0.20 | 0.90 | 0.90 | 0.90 | 1.20 | 0.70 |
| 5/31/2024 | 0.50 | 1.10 | 0.90 | 0.50 | 0.40 | 1.20 | 1.20 | 1.00 | 1.30 | 0.70 |
| 6/7/2024 | 0.10 | 1.20 | 1.00 | 0.70 | 0.50 | 1.30 | 1.20 | 1.15 | 1.50 | 0.80 |
| 6/14/2024 | 0.01 | 1.60 | 1.40 | 1.10 | 0.90 | 1.70 | 1.50 | 1.20 | 1.70 | 0.80 |
| 6/21/2024 | 0.25 | 1.20 | 1.10 | 1.00 | 0.90 | 1.30 | 1.20 | 1.30 | 1.90 | 0.90 |
| 6/28/2024 | 0.10 | 1.70 | 1.40 | 1.60 | 1.40 | 1.80 | 1.60 | 1.40 | 2.00 | 1.00 |
| 7/5/2024 | 0.01 | 1.70 | 1.40 | 1.70 | 1.70 | 1.90 | 1.60 | 1.60 | 2.10 | 1.10 |
| 7/12/2024 | 0.01 | 1.90 | 1.60 | 2.10 | 2.10 | 2.10 | 1.80 | 1.65 | 2.20 | 1.10 |
| 7/19/2024 | 0.00 | 1.90 | 1.60 | 2.10 | 2.10 | 2.10 | 1.80 | 1.70 | 2.20 | 1.10 |
| 7/26/2024 | 0.25 | 2.10 | 1.80 | 2.50 | 2.50 | 1.80 | 2.00 | 1.70 | 2.20 | 1.10 |
| 8/2/2024 | 0.25 | 1.80 | 1.50 | 1.80 | 2.10 | 1.30 | 1.70 | 1.50 | 2.20 | 1.00 |
| 8/9/2024 | 0.50 | 1.60 | 1.30 | 1.00 | 1.60 | 0.70 | 1.50 | 1.40 | 2.20 | 1.00 |
| 8/16/2024 | 0.40 | 1.20 | 1.00 | 0.50 | 1.20 | 0.20 | 1.20 | 1.35 | 2.00 | 0.90 |
| 8/23/2024 | 0.30 | 1.20 | 1.00 | 0.00 | 1.10 | 0.00 | 1.10 | 1.30 | 2.00 | 0.90 |
| 8/30/2024 | 0.10 | 1.30 | 1.10 | 0.00 | 0.70 | 0.00 | 1.20 | 1.20 | 1.80 | 0.90 |
| 9/6/2024 | 0.01 | 1.20 | 1.00 | 0.00 | 0.50 | 0.00 | 1.10 | 1.00 | 1.40 | 0.60 |
| 9/13/2024 | 0.75 | 1.10 | 1.00 | 0.00 | 0.00 | 0.00 | 1.00 | 0.90 | 1.40 | 0.50 |
| 9/20/2024 | 0.20 | 0.80 | 0.60 | 0.00 | 0.00 | 0.00 | 0.70 | 0.80 | 1.20 | 0.50 |
| 9/30/2024 | | | | | | | | 0.70 | 1.00 | 0.40 |
| TOTAL | 5.34 | 26.75 | 23.05 | 16.90 | 19.90 | 20.05 | 26.15 | 25.25 | 35.60 | 17.00 |

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

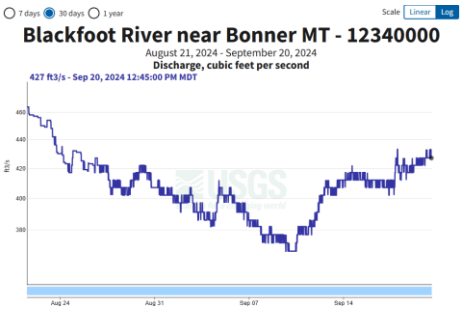
[2] **This years** potential water use by healthy crops that are well-fertilized and irrigated, disease and insect-free. Varies across watershed.

[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.




## STREAMFLOWS FINALLY INCREASING




Blackfoot River flows continued an upward trend this week which has the Drought Committee optimistic that we are heading out of this year's drought. After bottoming out at about 375 CFS last week, flows increased to 427 CFS today. The average for this date is 649 CFS. The highest flow on this date was about 1,310 CFS in 1899 while the lowest was about 377 CFS in 1987.

## STREAMFLOW MEASUREMENTS AID WATER MANAGEMENT

*Flow Meter Measurement by Hand*

Water management, drought response, irrigation planning, recreation and other activities all rely on streamflow data. Water managers throughout history have developed measurement and recordkeeping systems to support their efforts to report conditions and allocate water resources fairly. The Blackfoot watershed has a series of historic flow measurement sites with instruments to record flows and transmit the data for immediate access on the web. The Challenge also participates in basin-wide flow measurements that capture data by hand at as many locations as possible in a single day. These efforts include hydrologists and technicians from the Challenge and other agencies including Montana DNRC, the USGS and the Salish-Kootenai tribes.

Probably the most important flow measurement in the watershed is the Bonner site. It is specifically tied to enforcement of instream flow rights held by the Montana Department of Fish, Wildlife and Parks. It is also the enforcement site for rights held by the Salish and Kootenai Tribes under the recent water rights compact. The Bonner permanent calibration site is just east of the Angevine rest stop and consists of an overhead suspended trolley from which a flow meter is lowered at a series of points across the river. These are fed into a program that converts them into a total flow estimate. The measurements from this calibration site are then correlated to a gauge height at the next downstream bridge. By taking a series of measurements from low to high flows, the gauge is calibrated so we can determine flow by the gauge height alone. Periodic measurements at the calibration site are made to ensure the gauge accurately reflects flow. You can view flows at Bonner yourself at: [Blackfoot River near Bonner MT - USGS Water Data for the Nation]

*Bonner Calibration Site*

*Bonner Gauge Site Transmitter*

For further information contact Clancy Jandreau, Blackfoot Challenge Water Steward, 406-304-5423 or Barry Dutton, 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.

### 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, streamflows and drought conditions.
- 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- 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.