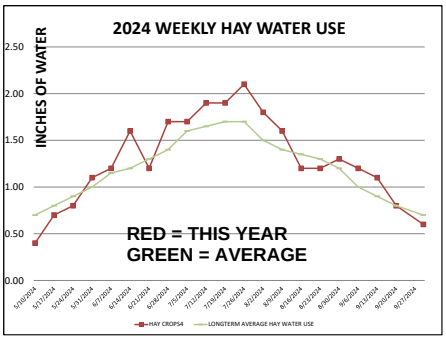
BLACKFOOT CHALLENGE LAST BEST WEEKLY IRRIGATION REPORT



Friday September 30, 2024

And so, ends the 2024 Irrigation season April 1 to September 30. The skies were clear this week with cool temperatures and no rain. Next week will have great fall weather but again with no rain. **Crops used about ½ inch of water this week as temperatures cooled.** Blackfoot River flows are at historic low levels with no significant rain in sight to change conditions. Irrigators throughout the watershed continue to sacrifice peak production by limiting irrigation. Driving throughout the watershed lately there are many less systems running than would be in a normal year - thanks to all those irrigators! I will assemble an annual report this week summarizing the irrigation events of the year. Let me know of anything you would like to see discussed.

BEAUTIFUL FALL WEATHER

It's been blue skies and changing fall colors lately without rain and with few clouds. Blackfoot watershed croplands had only a trace of rain or none this week. Next week will see highs in the 60s and 70s with lows in the 20s and 30s. Beware of the freezing temperatures some nights. There will be little or no rain. The 30-day forecast says below average rainfall and above average temperatures. The **3-Month Forecast Says Above AVERAGE RAINFALL** and 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 again this last week. **Crops used about ½ 1 inch of water this week and will use about the same next week**. This should taper down to near zero in the next few weeks.

WATER USE IN INCHES	LAST 7 DAYS	NEXT 7 DAYS TOTAL[1]	NEXT 7 DAYS DAILY AVE[2]	SEASON TOTAL[3]
HAY CROPS	**0.7**	**0.6**	.09	27.5
PASTURE	**0.5**	**0.4**	.06	23.6
SPRING GRAINS	**0.0**	**0.0**	.00	19.9
WINTER WHEAT	**0.0**	**0.0**	.00	20.1
LAWNS	**0.6**	**0.5**	.07	26.8

[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)

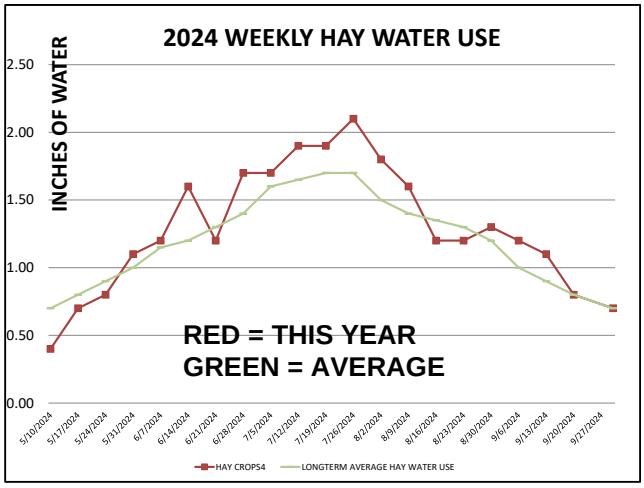
	RAIN[1]	2024 WEEKLY POTENTIAL CROP WATER USE[2]						AVERAGE WEEKLY CROP WATER USE[3]		
WEEK ENDING	RAIN	HAY CROPS[4]	PASTURE	SPRING GRAINS 5-1 START	SPRING GRAINS 5-15 START	WINTER WHEAT	LAWNS	LONGTERM AVERAGE HAY WATER USE	HOT WEEK HAY WATER USE	COOL WEEK HAY WATER USE
APRIL	0.50	0.25	0.25			0.25	0.25			
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	0.01	0.70	0.50	0.00	0.00	0.00	0.60	0.70	1.00	0.40
TOTAL	5.35	27.45	23.55	16.90	19.90	20.05	26.75	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)

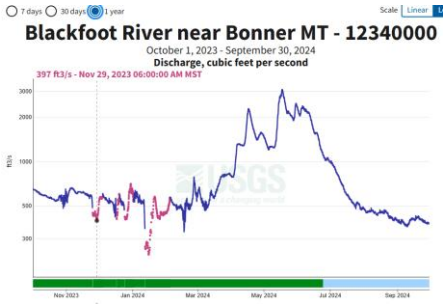
[2] **This years** potential water use by healthy crops that are well-fertilized and irrigated, disease and insect-free. Varies across watershed.

[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 STILL VERY LOW



The Blackfoot River continued to flow at historic low levels this week. A few small, scattered rainstorms recently have not boosted flows. The Drought Committee continues to express concern and encourage irrigators to reduce use as much as possible. The flow at Bonner today is 382 CFS today compared to an average for this date of 632 CFS. The highest flow on this date was about 1,200 CFS in 1965 while the lowest was about 375 CFS in 1994.

MORE STREAMFLOW MEASUREMENT INFO

Todd Blythe has provided some additional information about streamflow monitoring at Bonner. Todd is the Surface Water Section Supervisor of the Water Science Bureau at the Montana Department of Natural Resources and Conservation and a member of the Blackfoot Drought Committee.

It turns out that all water measurements are taken at the cableway just east of the Angevine rest stop. Those taken at high water use the cableway and an *Acoustic Doppler Current Profiler (ADCP)* to measure flow. This device rides on a little boat and is pulled back and forth across the river as it collects a complete depth-integrated water velocity profile as well as channel geometry from sonar beams and GPS locations. Measurements at low water are taken by wading across the river with an *Acoustic Doppler Velocimeter (ADV)* which is a handheld device that only measures the water velocity. The necessary channel dimensions like width and depth are measured usually a tape measure and rod. These measurements are used to calibrate the continuous stream gauge readings at this location. Measurements are conducted throughout the year under at different flow conditions to ensure the accuracy of the stream gauge. These measurements can be viewed at: USGS Surface Water for USA: Streamflow Measurements. The stream gauge itself only reflects the vertical height of the river. These heights are correlated with the flow measurements. You can view flows at Bonner yourself at: Blackfoot River near Bonner MT - USGS Water Data for the Nation

WINTER READING

Here are a few ideas for keeping yourself entertained through the winter months:

Cadillac Desert by Marc Reisner (and view adaptions on YouTube)
Your Water Footprint by Stephen Leahy
Dirt to Soil by Gabe Brown
Billionaire Wilderness by Justin Farell
Montana, An Uncommon Land by K. Ross Toole

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.