

BLACKFOOT CHALLENGE

WEEKLY IRRIGATION REPORT

Friday May 26, 2023



Most croplands throughout the watershed had ½ to 1 inch of rain this week with a few areas getting a little more. This kept up with crop water use on some sites which was about **1 inch for most crops**. Most soils still have significant subsoil moisture. Surface moisture has decreased unless irrigated but with the predicted weather you can go off for Memorial Day celebrations with a clean irrigation conscience. Crops are growing well but still set back slightly by the late start of the growing season. Please send us your ideas or questions about these reports and anything you would like to hear about related to irrigation, soil health, water quality, or other subjects. We will respond and share them with everyone.

WEATHER - WARMER NEXT WEEK, VARIABLE RAIN

Most croplands in the watershed had ½ to 1 inch of rain this week with some folks getting a little more! Since it is Memorial Weekend, it will be cool and rainy with ¼ to 1 inch of rain across the watershed. More rain may come throughout the week but in small amounts except in scattered thunderstorms. Temperatures will warm throughout the week starting with highs in the 60s and finishing the week in the 80s. Lows will start in the low 40s and climb to the high 40s. The 30-day and 90 day forecasts predict **average rainfall and above average temperatures**.



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

CROP WATER USE - HIGHER NEXT WEEK AS CROPS GET TALLER

Crop water use was again slightly below average this last week due to cool, rainy weather and a slow start to the season. **It was about 1 inch for most crops** and will increase slightly next week with warming temperatures predicted following a cool, rainy weekend.

WATER USE IN INCHES	LAST 7 DAYS	NEXT 7 DAYS TOTAL¹	NEXT 7 DAYS DAILY AVE²	SEASON TOTAL³
HAY CROPS	0.9	1.0	.14	2.7
PASTURE	0.8	0.9	.13	2.7
SPRING GRAINS	0.3-0.5	0.4-0.6	.06-.07	1.0
WINTER WHEAT	1.0	1.2	.17	3.2
LAWNS	1.0	1.1	.16	3.0

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 – 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)

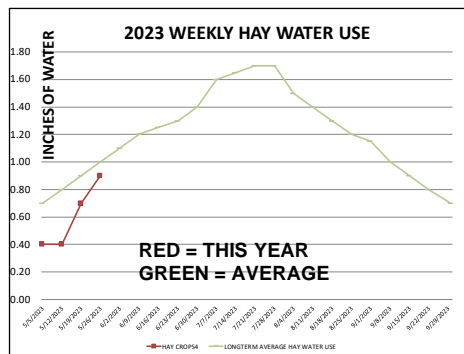
WEEK ENDING	RAIN ¹	2023 WEEKLY POTENTIAL CROP WATER USE ²						AVERAGE WEEKLY CROP WATER USE ³		
	RAIN	HAY CROPS ⁴	PASTURE	SPRING GRAINS 5-1 START	SPRING GRAINS 5-15 START	WINTER WHEAT	LAWNS	LONGTERM AVERAGE HAY WATER USE	HOT WEEK HAY WATER USE	COOL WEEK HAY WATER USE
5/5/2023	0.10	0.40	0.40	0.00	0.00	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								1.10	1.50	0.80
6/9/2023								1.20	1.70	0.80
6/16/2023								1.25	1.90	0.90
6/23/2023								1.30	2.00	1.00
6/30/2023								1.40	2.00	1.00
7/7/2023								1.60	2.10	1.10
7/14/2023								1.65	2.20	1.10
7/21/2023								1.70	2.20	1.10
7/28/2023								1.70	2.20	1.10
8/4/2023								1.50	2.20	1.00
8/11/2023								1.40	2.20	1.00
8/18/2023								1.30	2.00	0.90
8/25/2023								1.20	1.80	0.90
9/1/2023								1.15	1.60	0.70
9/8/2023								1.00	1.40	0.60
9/15/2023								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	2.60	2.65	2.65	1.00	0.30	3.15	2.95	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.



SURFACE SOIL MOISTURE VARIABLE WITH WEATHER & IRRIGATION

While subsoil moisture has remained high, surface soils have dried significantly on warmer days then been replenished on many sites with rainfall and irrigation. Most sites did not have enough rain this week to completely replenish crop water use (unless they had more than 1 inch). Only 50-80% of rain actually gets into the soil and small rain amounts (less than 2/10) completely evaporate from soil and crop surfaces. The rain predicted this weekend may satisfy crop water use this week in some fields but irrigation will help maintain optimum moisture contents. On the other hand, irrigation may not be your biggest fire to put out this week.



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.

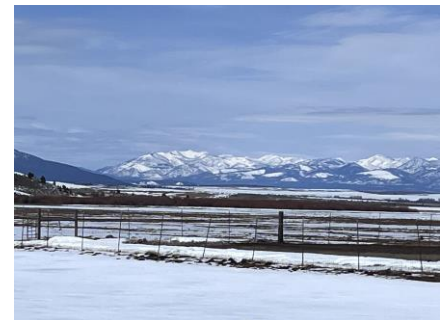


Soil near 50% of its water holding capacity may form a weak ball but leaves little moisture on the hand. Soil at 25% or less of its water holding capacity does not form a ball when squeezed. It feels and looks dry. If sandy or loamy, it crumbles easily, if high in clay it forms a hard lump. Call, text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

WEEKLY TIPS

SNOWPACK AND WATER SUPPLY

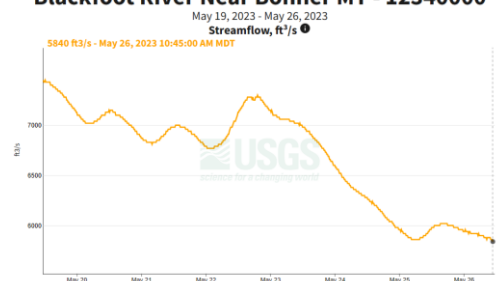
Our Blackfoot watershed snowpack dropped again this week from 62% last Friday to only 45% of average today. Warm temperatures and rain continue to cause rapid melting and bank-full streams. The good news is that rainfall was 105% of normal in the last 30 days which is great for crops. Reservoir storage is still good. Blackfoot river flows are predicted to be slightly above average this season and hopefully some of that will come in late summer.



STREAMFLOW

The Blackfoot river flow at Bonner dropped quickly this week and is now below average for the first time this season at **5,840 CFS**. The average for this date is 5,920 CFS. 2018 set the highest flow record on this date at 13,600 CFS while the lowest flow on this date was 1060 CFS in 1941. Weather predictions for the next 90 days are for above average temperatures and average rainfall so flows will likely continue to fall below average.

Blackfoot River Near Bonner MT - 12340000



USE GOOGLE EARTH PRO TO MAP YOUR RANCH OR FARM

Google Earth Pro is now available to anyone as a free download. It is an incredible tool for all kinds of uses on ranches and farms. Early in my career I used outdated black and white air photos to map soil, vegetation and other natural resources and dreamed of having such a tool. The early versions charged thousands of dollars a year to use and were clunky to say the least. I can't believe it even works on ipads and smart phones. The pro version works on computers (Microsoft or Macs) and allows you to create custom maps of your property and easily measure distances and acreages. Since they provide new images almost each year, you can save copies of your fields as screenshots each year for comparison. They also have historical photos and you can change the time scale to go back in time. When clients call I can immediately look at their property and discuss precise locations while looking at them.

Download Google Earth Pro or regular Google Earth for ipad and smartphones at: [Earth Versions – Google Earth](#) or at your app store.

Current View with label and acreage



1985 Historic View



Kleinschmidt Flat in 3D



GE can project landscapes in 3D from any angle. GE has many other uses such as finding remote campsites, viewing your remote relatives new house or even seeing what Chinese irrigated fields look like. A great guide for using Google Earth on your ranch or farm is in this article:

[Using Google Earth Pro to Create a Map for Your Agricultural Operation – Soil for Water](#)

Yuanhui District China



OGALALA AQUIFER DROPPING 2 FEET PER DAY

In Kansas, the Ogalala aquifer is the water source for irrigation and is dropping by 2 feet a day on average but by up to 7 feet per day in some areas of the state due to overuse. This aquifer holds as much water as great lake Huron but is rapidly drying up. Imagine if lake Huron dropped by 2-7 feet per day! Agriculture and irrigation remain the biggest user of the aquifer. Some counties in Kansas have already lost 80% of their access to Ogalala water as it completely dries up around the fringes. We are very lucky to be at the top of the Columbia river watershed with access to surface water that should never dry up completely.

For further information contact [Clancy Jandreau, Blackfoot Challenge Water Steward, 406-304-5423](#) or [Barry Dutton, Professional Soil Scientist, 406-240-7798 \[barry@landandwaterconsulting.net\]\(mailto:barry@landandwaterconsulting.net\)](#)

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- 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 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.



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.

