

BLACKFOOT CHALLENGE

WEEKLY IRRIGATION REPORT

Friday June 18, 2021



Most Blackfoot croplands had a couple tenths of an inch of rain this week and warm temperatures. Next week looks warmer and just as sunny and dry. Crop water use this week reduced soil moisture levels by about 1 ½ inches unless irrigated. The snowpack dropped from 90% of average to 85%. Blackfoot River streamflows fell below average for the first time this season and this trend will likely continue. There is still water for irrigation but the predicted hot, dry weather ahead is making drought a growing concern. The NOAA US Drought Monitor Map of the western United States (page 4) shows the Blackfoot as one of the only spots not in drought at this time!

WEATHER - WARM AND DRY LAST WEEK, WARMER AND DRY NEXT WEEK



Warm, dry weather last week made for some great growing conditions and crops responded across the drainage. A high of 92 in Helmsville brought out the bikinis and speedos I'm sure. There is a chance of rain this weekend but by Tuesday the highs will be in the 80s again with sunny skies. Lows will be in the 40s and 50s. Both the 30-day and 90-



day forecasts now say **below average rainfall and above average temperatures.**

I don't have to tell you that your own rain gauge is your best source of rainfall information.

CROP WATER USE - ABOVE AVERAGE FOR THE THIRD WEEK

Warm temperatures and sunny skies kept crop water use above average again this last week. **Hay crops used about 1.5 inches of water and this will increase next week to about 1.7 inches.** Note that in these early season reports, we list a range of crop water use for spring grains planted at different dates. Crop water use will then even out as spring grains mature. The table below provides a quick summary of crop water use this last week and an estimate for next week.

WATER USE IN INCHES	LAST 7 DAYS	NEXT 7 DAYS TOTAL¹	NEXT 7 DAYS DAILY AVE²	SEASON TOTAL³
HAY CROPS	1.5	1.7	.24	6.3
PASTURE	1.3	1.5	.21	5.6
SPRING GRAINS	1.1 – 1.4	1.3 – 1.8	.19 -.23	4.4
WINTER WHEAT	1.6	1.8	.26	7.2
LAWNS	1.4	1.6	.23	6.6



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 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.

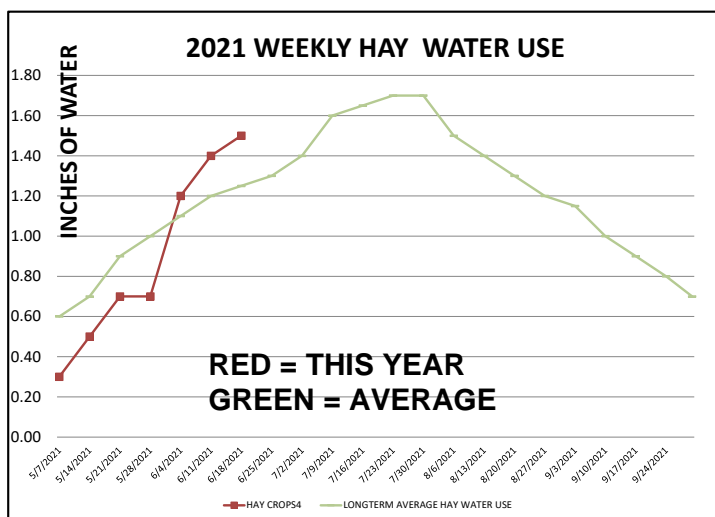
BLACKFOOT 2021 GROWING SEASON WEEKLY RAINFALL & CROP WATER USE (INCHES OF WATER)										
WEEK ENDING	RAIN ¹	2021 WEEKLY POTENTIAL CROP WATER USE ²						AVERAGE WEEKLY CROP WATER USE ³		
	RAIN	HAY CROPS ⁴	PASTURE	SPRING GRAINS 5-1 START	SPRING GRAINS 5-15 START	WINTER WHEAT	LAWNS	LONGTERM AVERAGE HAY WATER USE	HOT WEEK HAY WATER USE	COOL WEEK HAY WATER USE
5/7/2021	0.40	0.30	0.40	0.00	0.00	0.50	0.50	0.60	1.00	0.30
5/14/2021	0.20	0.50	0.50	0.10	0.00	0.70	0.70	0.70	1.10	0.40
5/21/2021	0.50	0.70	0.60	0.30	0.10	0.80	0.80	0.90	1.20	0.50
5/28/2021	2.00	0.70	0.60	0.60	0.20	0.80	0.70	1.00	1.30	0.50
6/4/2021	0.10	1.20	1.00	0.90	0.60	1.30	1.20	1.10	1.50	0.60
6/11/2021	0.10	1.40	1.20	1.10	0.80	1.50	1.30	1.20	1.70	0.70
6/18/2021	0.20	1.50	1.30	1.40	1.10	1.60	1.40	1.25	1.90	0.70
6/25/2021								1.30	2.00	0.80
7/2/2021								1.40	2.00	0.90
7/9/2021								1.60	2.10	1.00
7/16/2021								1.65	2.20	1.00
7/23/2021								1.70	2.20	1.00
7/30/2021								1.70	2.00	1.00
8/6/2021								1.50	1.80	0.90
8/13/2021								1.40	1.70	0.80
8/20/2021								1.30	1.60	0.80
8/27/2021								1.20	1.40	0.70
9/3/2021								1.15	1.40	0.70
9/10/2021								1.00	1.30	0.60
9/17/2021								0.90	1.20	0.50
9/24/2021								0.80	1.10	0.50
9/30/2021								0.70	1.00	0.40
TOTAL	3.50	6.30	5.60	4.40	2.80	7.20	6.60	26.05	34.70	15.30

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) (This rainfall figure is an average across all Blackfoot croplands - use your own rain gauge for better accuracy)

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.



SOIL MOISTURE: DROPPED ABOUT 1½ INCHES IF NOT IRRIGATED

Soil moisture dropped about 1 ½ inches this week in fields not irrigated due to higher crop water use and almost no rain. This dried out surface soils unless irrigated. **Now is the time to pour on the irrigation** – June is the most effective time to irrigate for maximum crop production. Hay crops yields are highest for the first cutting and local small grain crops produce most of their growth in June. Check soil moisture and keep it above 50% of Water Holding Capacity to get the best yields. Remember that Silty, Clayey and Loamy soils with good organic matter content can hold 2 inches of water per foot of soil. Sandy and rocky soils can hold up to 1.5 inches of water per foot but many only hold ¾ to 1 inch per foot.



Soil near 100% of its water holding forms a ball when squeezed and leaves the hand visibly moist. Water is visible on the surface of the soil and the hand is moistened. Soil near 50% of its water holding capacity also forms a ball but leaves little moisture on the hand. Call or email us if you have questions about evaluating your soil moisture content and irrigation options.



WEEKLY TIPS

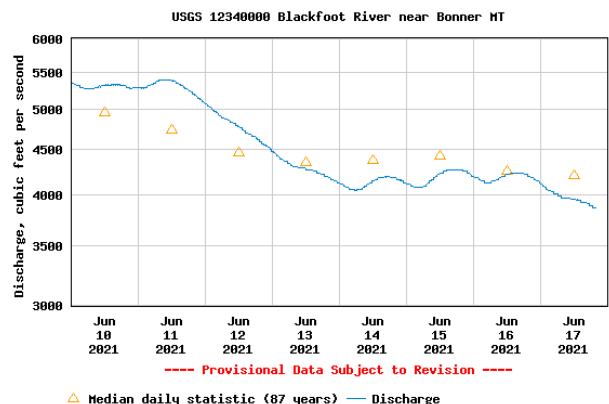
Water Supply - Snowpack Drops Further Below Average!



The Blackfoot drainage snowpack dropped from 90% of average last week to 85% this week. Warm temperatures this week caused a significant melt-off and Blackfoot River streamflows dropped below average for the first time this season. Even warmer weather next week will continue to melt the little remaining snowpack. Right now 89% of Montana is listed in drought condition. Over 44% of the state is listed in severe or extreme drought, mainly in the northeast portion. We remain the envy of drought managers everywhere.

Streamflows - Dropped Below Average

The Blackfoot river flow at Bonner dropped to **3,870 CFS today** which is below average for this date (4,800 CFS). The highest flow was 13,600 CFS in 1899 while the lowest flow was 991 CFS in 1987. Streamflows will continue to drop this week with the end of snowpack and little predicted rain.



Where is the Drought This Year and in the Past?

I continue to be amazed at how lucky we are in the Blackfoot Drainage. This year drought is another reason to smile. The maps below show drought across the west this month and in June throughout recent history. Notice the white area in western Montana this June which indicates **NO DROUGHT – THAT’S US!** While most of the western United States is hot and dry, we have had mostly cool to moderate temperatures and an abundance of water. Enjoy it while it lasts!

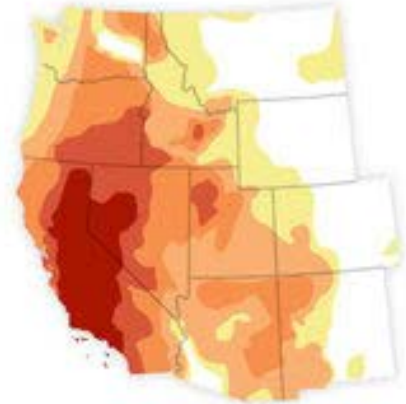
June 2021



June 2018



June 2015



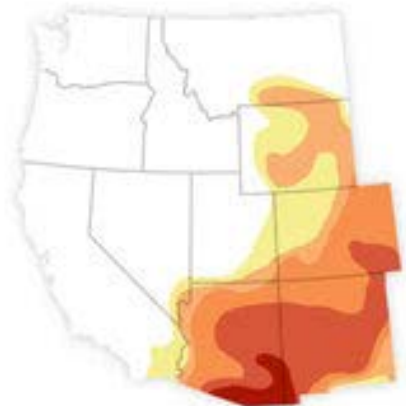
June 2012



June 2009



June 2006



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.



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. 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.