

BLACKFOOT CHALLENGE

WEEKLY IRRIGATION REPORT

Sunday June 7, 2020



This report was delayed a couple days due to unavoidable vacation-related activities. Most Blackfoot croplands in the lower drainage had little rain this week while those in the upper drainage had over ½ inch. Crop water use rose to about average with most crops using 1- 1 ½ inches and next week should be similar. Surface soil moisture is now mostly controlled by irrigation. Blackfoot River flows remain slightly above average while the snowpack is 136% of normal. Drought conditions and water restrictions could still happen this season due to warm/dry weather expected in July-September.

We provide weekly summaries of weather, crop water use and soil moisture conditions as well as tips for irrigation, soil health and crop production. A condensed overview of suggestions for the entire irrigation season is presented on the last page of this report. Use it to look ahead and plan or to compare what you're doing now. If you would like other information please contact Jennifer Schoonen - Blackfoot River Steward (360-6445) or Barry Dutton – Soil and Irrigation Consultant (240-7798).



WEATHER - A MIX

Last week had a mix of weather and next looks like more of the same with a general warming trend all week. Little rain fell on most croplands in the lower drainage but the upper drainage had over ½ inch. Temperatures were warmer but variable. The coming week starts cool but warms with lows starting in the 30s and 40s then rising into the high 40s and low 50s. Highs will start in the 50s and climb into the low 80s. It's another hit and miss week for rainfall

– I hope you get some where you are. The 30-day forecast says above average temperatures and rainfall. The 90-day forecast says above average temperatures and below average rainfall.

CROP WATER USE - AVERAGE FOR THIS TIME OF YEAR

Last week crop water use rose to average levels for the first time in several weeks with most hay crops using about 1.4 inches. Water use will be similar next week as temperatures start cool but warm throughout the week. The table below provides a quick summary of crop water use this last week and an estimate for next week. The table and chart on Page 2 summarize the entire irrigation season and compare it with average, hot and cool conditions so you can plan ahead.

WATER USE IN INCHES	LAST 7 DAYS	NEXT 7 DAYS TOTAL¹	NEXT 7 DAYS DAILY AVE²	SEASON TOTAL³
HAY CROPS	1.4	1.4 (1.3 - 1.6)	.20	5.9
PASTURE	1.2	1.2 (1.1 - 1.4)	.17	5.2
SPRING GRAINS	1.0	1.3 (1.2 - 1.5)	.19	2.3
WINTER WHEAT	1.5	1.5 (1.4 - 1.7)	.21	6.4
LAWNS	1.3	1.3 (1.2 - 1.5)	.19	5.8

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

BLACKFOOT 2020 GROWING SEASON WEEKLY RAINFALL & CROP WATER USE (INCHES OF WATER)

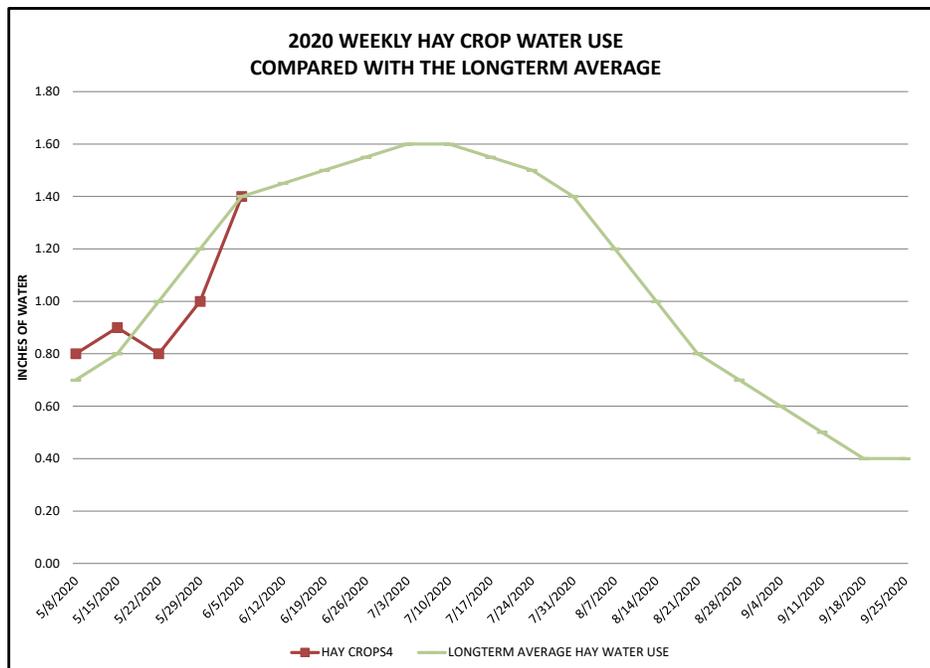
WEEK ENDING	RAIN ¹	2020 WEEKLY POTENTIAL CROP WATER USE ²						AVERAGE WEEKLY CROP WATER USE ³		
	RAIN	HAY CROPS ⁴	PASTURE	SPRING GRAINS 5-1 START	SPRING GRAINS 5-15 START	WINTER WHEAT	LAWNS	LONGTERM AVERAGE HAY WATER USE	HOT WEEK HAY WATER USE	COOL WEEK HAY WATER USE
5/8/2020	0.01	0.80	0.70	0.10	0.10	0.90	0.90	0.70	1.00	0.30
5/15/2020	0.30	0.90	0.80	0.10	0.10	0.90	0.90	0.80	1.10	0.50
5/22/2020	1.25	0.80	0.70	0.30	0.20	0.80	0.80	1.00	1.20	0.60
5/29/2020	0.10	1.00	0.80	0.70	0.40	1.20	0.90	1.20	1.30	0.80
6/5/2020	0.40	1.40	1.20	1.00	0.70	1.50	1.30	1.40	1.50	1.00
6/12/2020								1.45	1.70	1.00
6/19/2020								1.50	1.90	1.10
6/26/2020								1.55	2.00	1.10
7/3/2020								1.60	2.10	1.30
7/10/2020								1.60	2.00	1.20
7/17/2020								1.55	2.00	1.20
7/24/2020								1.50	2.20	1.10
7/31/2020								1.40	2.20	1.10
8/7/2020								1.20	1.50	0.90
8/14/2020								1.00	1.30	0.70
8/21/2020								0.80	1.20	0.60
8/28/2020								0.70	1.10	0.50
9/4/2020								0.60	1.00	0.40
9/11/2020								0.50	0.90	0.40
9/18/2020								0.40	0.70	0.30
9/25/2020								0.40	0.70	0.30
TOTAL	3.31	5.90	5.20	2.30	1.60	6.40	5.80	22.85	30.60	16.40

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 - IRRIGATION DEPENDENT

Surface soil moisture is now mostly controlled by how much you irrigate. As usual for this time of year, rainfall has not kept up with crop water use. But you can boost soil moisture by applying more than weekly crop use.



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 shiny surface. Bouncing the soil in the hand usually brings water to the surface. Soil near 75% of its water holding capacity also forms a ball and leaves the hand moist but no actual water is visible on the hand or soil when bounced.



WEEKLY TIPS

NRCS National Resource Conservation Service
 Montana
 Water Supply Outlook Report
 June 1st, 2020

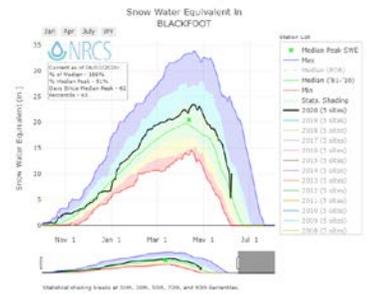


Water Supply Still Looks Good

The June 1 Water Supply Forecast lists the Blackfoot Drainage at 136% of normal snowpack. This compares with 83% at this time last year. Reservoir storage is about 110%. However, the hot/dry 90-day forecast suggests water supply shortages are likely later in the season. A considerable amount of our snowpack flowed down the river this week. The Blackfoot drainage has not shown up as a concern on the drought monitor yet.



Shown above is the West Fork of the Madison River during the last weekend of May. The unprecedented warm temperatures, which are also forecast for June 1st and 2nd at some locations (NRCS), along with the above normal flooding, resulted in some fish along bank areas. Due to the unseasonably high flows, some fish are unable to find their way upstream, which is not before being the fish. This rapid decrease means that less water will be available later in summer when demand is the highest. Snowmelt forecasts for the summer are higher than above average in downstream river basins. In such a case, water users are encouraged to read the individual basin conditions and allocations forecasts for their region to gauge the impact the high water might have on their own summer water availability. (Photo: Tom Beary - USDA NRCS Montana State Office)

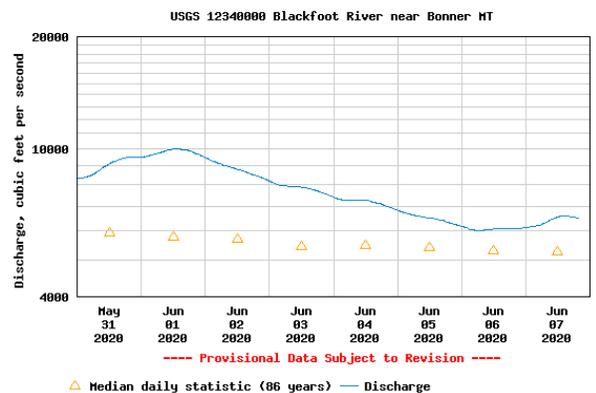


Blackfoot River Flow Dropping Towards Average Conditions



TODAY: 6,510 CFS
AVERAGE: 5,870
HIGHEST: 14,100 (2011)
LOWEST: 1,340 (1987)

River flows fell closer to average levels this week but rainfall caused slight, brief increases. Flows should remain near average through June but are likely to drop significantly later in the season.



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.