

BLACKFOOT CHALLENGE

WEEKLY IRRIGATION REPORT

Friday June 28, 2019



It was another rollercoaster week of weather in the Blackfoot Drainage with sunny, warm conditions changing to cool and cloudy by the day or even hour. Next week starts sunny and warm then cools off for the 4th with potential thunderstorms especially later in the week. Crops growth and crop water use have continued to be below average at about 1 inch this week. All crops should use only a little more next week. These cool days are the best to irrigate effectively (get more water into the soil) so build up some reserve for cutting. The Blackfoot River flow is dropping fast and late season drought is possible.

NOW IS A GREAT TIME TO STORE UP WATER FOR CUTTING!

These reports, provide weekly summaries of weather, crop water use and soil moisture conditions plus tips for irrigation, soil health and crops. Hints for the entire irrigation season are on the last page. For other irrigation information please contact Jennifer Schoonen - Blackfoot River Steward (360-6445) or Barry Dutton – Soil and Irrigation Consultant (240-7798).

WEATHER - ANOTHER WEEK OF MIXED WEATHER



Warm and sunny weather alternated with cool and cloudy this week plus some scattered thunderstorms. These storms produced little rain and over limited areas of cropland. Next week will start warm and sunny with temperatures near 80 then cool to the high 60s by midweek with scattered thunderstorms. The 30- and 90-day predictions are for above average temperatures and average rainfall.

CROP WATER USE - BELOW AVERAGE FOR THE SECOND WEEK!

Crop water use continued below average due to cooler weather with most crops using only about 1 inch this week. This is the second week in a row of below average crop water use which has given irrigators a break for those who need it. Water use will be similar next week with another mix of cool and warm weather. The table below provides a quick summary of crop water use 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	1.1	1.2 (1.3 - 1.4)	.17	10.4
PASTURE	0.9	1.0 (1.0 - 1.3)	.14	9.4
SPRING GRAINS	1.1	1.2 (1.2 - 1.5)	.19	6.2
WINTER WHEAT	1.2	1.3 (1.3 - 1.6)	.18	11.3
LAWNS	1.0	1.2 (1.1 - 1.4)	.17	10.2

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

BLACKFOOT 2019 GROWING SEASON WEEKLY RAINFALL & CROP WATER USE (INCHES OF WATER)

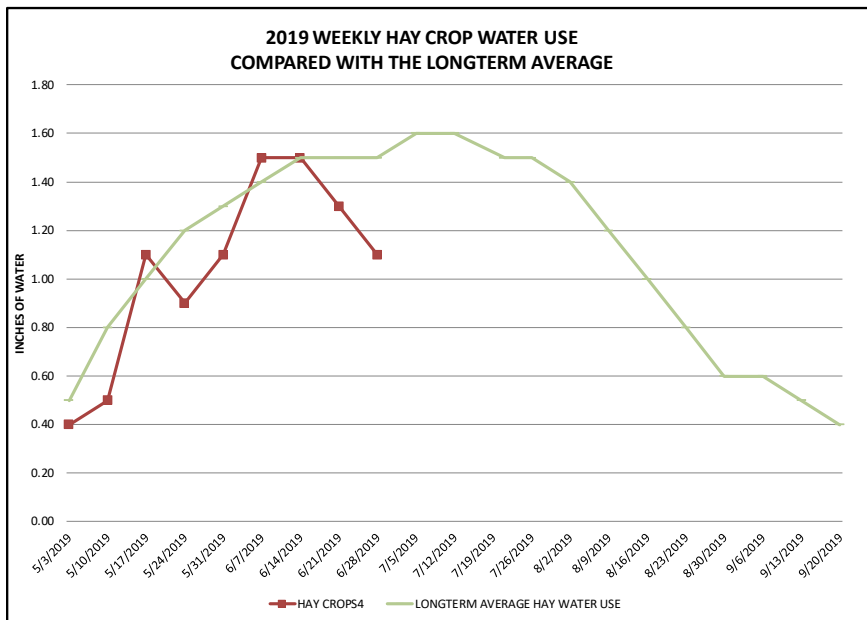
WEEK ENDING	RAIN ¹	2019 WEEKLY POTENTIAL CROP WATER USE ²						AVERAGE POTENTIAL CROP WATER USE ³		
	RAIN	HAY CROPS ⁴	PASTURE	5-1 START	5-15 START	WINTER WHEAT	LAWNS	LONGTERM AVERAGE HAY WATER USE	HOT WEEK HAY WATER USE	COOL WEEK HAY WATER USE
5/3/2019	0.30	0.40	0.50	0.10	0.10	0.40	0.50	0.50	0.80	0.30
5/10/2019	0.30	0.50	0.40	0.10	0.10	0.50	0.50	0.80	1.00	0.50
5/17/2019	0.40	1.10	0.90	0.10	0.10	1.10	1.00	1.00	1.10	0.60
5/24/2019	0.10	0.90	0.80	0.20	0.10	1.00	0.90	1.20	1.30	0.80
5/31/2019	0.75	1.10	0.90	0.50	0.20	1.20	1.00	1.30	1.40	0.90
6/7/2019	0.30	1.50	1.30	1.00	0.60	1.60	1.40	1.40	1.50	1.00
6/14/2019	0.50	1.50	1.40	1.50	1.10	1.70	1.50	1.50	1.70	1.00
6/21/2019	0.10	1.30	1.10	1.40	1.20	1.50	1.20	1.50	1.90	1.10
6/28/2019	0.10	1.10	0.90	1.20	1.10	1.20	1.00	1.50	2.00	1.10
7/5/2019								1.60	2.10	1.30
7/12/2019								1.60	2.00	1.20
7/21/2019								1.50	2.00	1.20
7/26/2019								1.50	2.20	1.10
8/2/2019								1.40	1.70	1.00
8/9/2019								1.20	1.50	0.90
8/16/2019								1.00	1.30	0.70
8/23/2019								0.80	1.00	0.50
8/30/2019								0.60	0.80	0.40
9/6/2019								0.60	0.70	0.30
9/13/2019								0.50	0.70	0.30
9/20/2019								0.40	0.60	0.20
9/30/2019								0.40	0.60	0.20
TOTAL	4.35	10.40	9.40	6.20	4.70	11.30	10.20	24.80	31.40	17.10

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)

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 - GOING FAST

Soil moisture dropped by about 1 inch this week in most fields unless you had significant rain or irrigated. These cooler days are a great time to boost soil moisture to get you through cutting. You must add more than the crop is using (1 to 1 ½ inches per week).

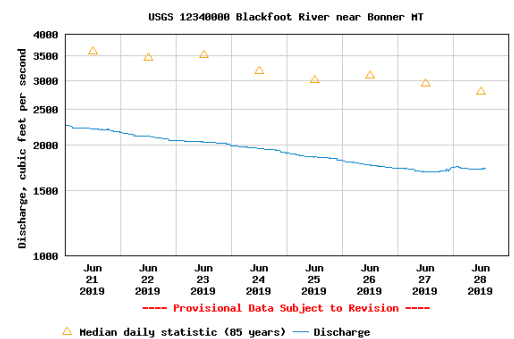


Cool days are perfect for effective irrigation that gets most of the water in the soil.

STREAMFLOWS AND DROUGHT 2019?

The Blackfoot river flow at Bonner today is **1730 CFS** which is about **50% of average** (3320 CFS). The Highest flow on this date was 12,100 (1899) and the lowest was 660 CFS (1977).

Late season drought conditions are possible but not yet expected. Predictions for the next 90 days are for average rainfall and above average temperatures. Irrigate while you can.



WILL YOUR PIVOT SOON BE YOUR BOSS?

A pivot manufacturer (Valley) and a technology company (Prospera) are teaming up to bring Artificial Intelligence to irrigated agriculture. Their goal includes 60,000 pivots covering 9.6 million acres at a cost of 40-million-dollars. Artificial intelligence and machine learning combined with inputs from the actual farmer will direct precise applications of water, fertilizer and pesticide at the exact time and place needed. The first pivot conversions will be in Nebraska and Washington state for the 2020 growing season. No word yet on a schedule for Blackfoot drainage pivots. Questions remain about whether the system will be connected to your alarm clock or designed to yank you out of bed in the morning.



<https://www.forbes.com/sites/jenniferhicks/2019/03/19/how-to-transform-60000-irrigation-pivots-into-autonomous-growing-machines/#a5659c7721da>

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. Some years you better start up now.



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.