

BLACKFOOT CHALLENGE

WEEKLY IRRIGATION REPORT

Friday May 10, 2019



Welcome to the 2019 irrigation season! Well, almost, I know of only one sprinkler system running so far in the entire drainage. It looks a lot like last year with cool, wet weather in April leaving good soil moisture levels to start the season. The snowpack is average this year instead of 172% of normal in 2018. Most of it has yet to run off and should provide plenty of water at least for early season irrigation. Blackfoot flows today are only one-fourth of this date last year when flooding resulted from a rapid warmup and melt. The 30-day forecast now says cool temperatures and average rainfall. The 90-day forecast says hot temperatures and above average rainfall.

Since nature has mostly recharged soil moisture, irrigators now just need to keep up with crop water use to see good crop yields (like last year). Drought seems less likely with average snowpack and reasonable weather forecast but anything can happen. We continue to suggest you concentrate your efforts on early season irrigation (May-June) when you get the best production and return on efforts.

We will 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).

CROP WATER USE - LOW - READY TO EXPLODE



April was cool and wet, just like last year. This is the most important period for recharging soil moisture – just before crops start actively growing. Crop water use was below average so far this year (about 1 inch for all of April) but should return to average this 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	0.5	0.8 (0.6 - 1.0)	.11	1.9
PASTURE	0.4	0.7 (0.6 - 1.0)	.10	2.1
SPRING GRAINS	0.1	0.2 (0.1 - 0.3)	.03	0.3
WINTER WHEAT	0.5	0.9 (0.7 - 1.1)	.13	2.0
LAWNS	0.5	0.8 (0.6 - 1.0)	.11	2.2

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 – note in 2010-13 we started our seasonal total on May 1 but since include April

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

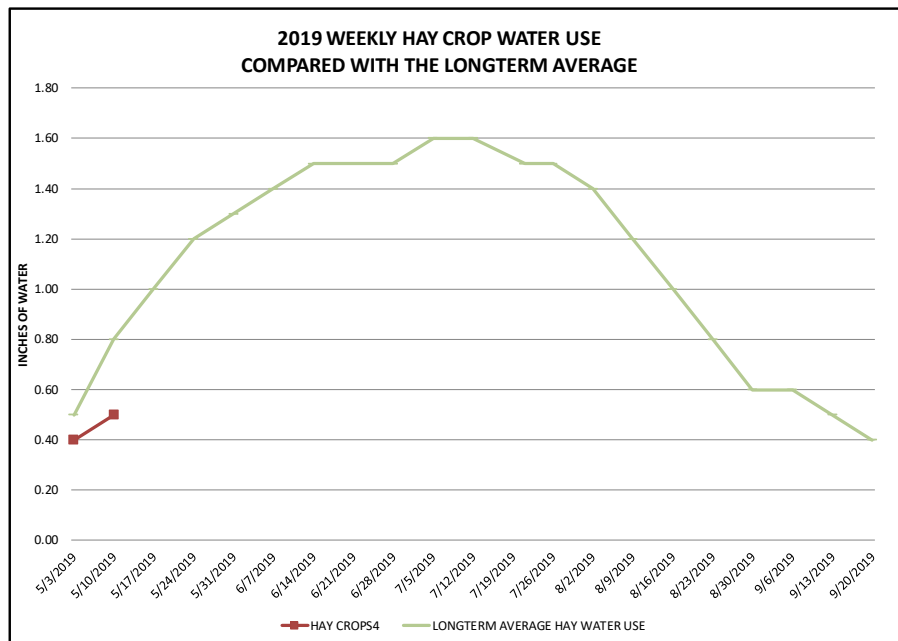
WEEK ENDING	RAIN ¹	2019 WEEKLY POTENTIAL CROP WATER USE ²						AVERAGE POTENTIAL CROP WATER USE ³		
	RAIN	HAY CROPS ⁴	PASTURE	SPRING GRAINS 5-1 START	SPRING GRAINS 5-15 START	WINTER WHEAT	LAWNS	LONGTERM AVERAGE HAY WATER USE	HOT WEEK HAY WATER USE	COOL WEEK HAY WATER USE
APRIL	1.50	1.00	1.20	0.10	0.10	1.10	1.20	1.00	1.50	0.50
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								1.00	1.10	0.60
5/24/2019								1.20	1.30	0.80
5/31/2019								1.30	1.40	0.90
6/7/2019								1.40	1.50	1.00
6/14/2019								1.50	1.70	1.00
6/21/2019								1.50	1.90	1.10
6/28/2019								1.50	2.00	1.20
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	2.10	1.90	2.10	0.30	0.30	2.00	2.20	24.80	31.40	17.20

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 - HIGH

Soil moisture levels throughout the drainage this week were almost as high as last year. Most soils are filled up to over 75% of their water holding capacity throughout the 3-foot root zone. This means most hay and pasture irrigators can still put out other fires for a week or so before irrigation gets critical. Many will start this week as temperatures rise.



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. Call anytime if you have questions about evaluating your soil moisture content and irrigation options.

WEEKLY TIPS

Water Supply



Blackfoot drainage snowpack is at 101% of average according to the May 1 water supply forecast (thank you NRCS Water Supply Forecast). Last year at this time the snowpack was at 173% of average.

April precipitation in the Blackfoot was 130% of normal which boosted both the mountain snowpack and valley soil moisture.

Reservoir storage is average at 105% of normal for the Upper Clark Fork.

Blackfoot river flows throughout May, June and July should remain slightly above normal but it depends entirely on how hot it gets and how fast. Late season flows could drop significantly if it gets hot.

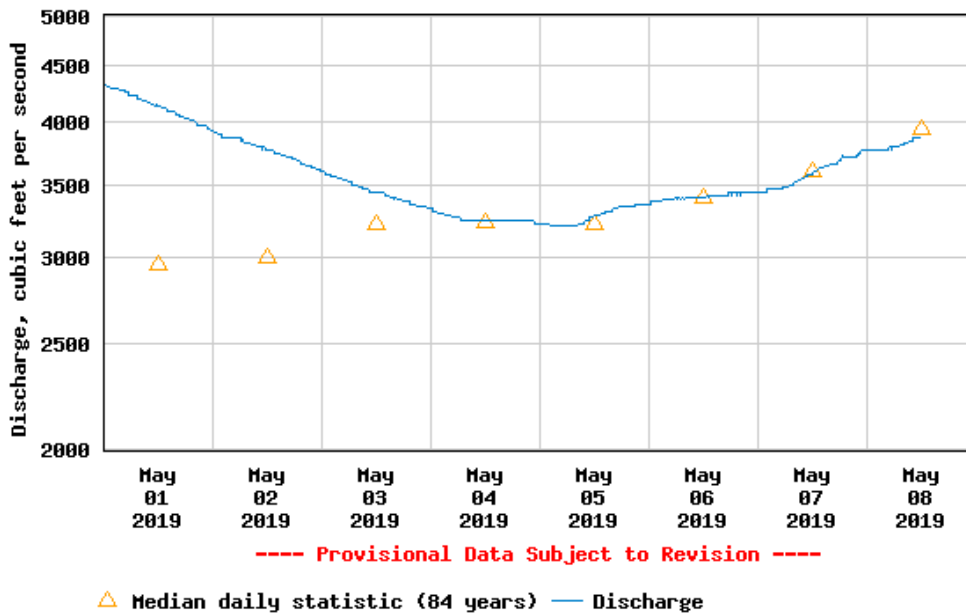


Streamflows

Today the Blackfoot river flow is about 3,870 CFS at Bonner. This is near average but only one-fourth the flow last year. Last year set a new record high flow for this date of 16,200 CFS (2018). The lowest flow on this date was 770 CFS in 1905.

We are not predicted to have serious flooding but most of the mountain snowpack has yet to melt and anything could happen. Predictions for the next 30 days are for temperatures to be cooler than average and rainfall average which should produce a nice even melt and abundant irrigation water. Predictions for the next 90 days are for temperatures to be hotter than average and rainfall above average.

USGS 12340000 Blackfoot River near Bonner MT



Time to Keep Moisture Levels High. At the start of a normal irrigation season we encourage filling up soils to their moisture holding capacities. This year nature did it for us and now we just need to keep it up. Most folks have enough stored soil moisture for 2-3 weeks of crop water use. However, production is best if you keep the soil from falling below 50% of its water holding capacity. Remember that new seedlings need monitoring to ensure the surface soil remains moist during germination.

Don't get too complacent, crops are poised to grow quickly and use up available water when it warms up this week. If it is dry, warm and breezy, crops could use over an inch this week at some sites.

Roots and Deep Irrigation



We encourage deep irrigation at least once early in the season to promote deep root growth. Roots do not grow in search of water through dry soil, they grow into moist soil. You can therefore lead your roots deeper by irrigating deeper. Even grasses which are naturally shallow-rooted will expand into lower soil layers if water is present. This is one of those principles of Soil Health that is actually as old as the hills – grow your crop in a bigger volume of soil. Overall, this bigger soil volume provides more water holding capacity, more nutrients and more biological activity (those worms, bugs, fungi, bacteria and other critters that turn organic matter into crop nutrients).

This year nature has provided a good start and many soils are moist throughout the first three feet. This is the zone where hay and pasture crops remove most of their water although even grasses will root much deeper and alfalfa to over 10 feet. Last year some the best local crops were enhanced by abundant deep moisture that just isn't there in most years.

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.