

BLACKFOOT CHALLENGE

WEEKLY IRRIGATION REPORT

Friday July 13, 2018



It doesn't get much better than this as a record harvest begins across the drainage. A moist spring and early summer plus recent sunshine produced a hay crop that has farmers and ranchers smiling. Rain was scarce this week and temperatures warmed to normal. Sunshine and warm temperatures will continue next week – perfect haying weather. Crop water use increased dramatically last week (1 ½ - 2 inches) and will be the same next week. Long-range forecasts still predict above average temperatures and average rainfall for the rest of the season. The June 1 snowpack (150% of normal) has melted out completely and stream flows are dropping quickly. General irrigation suggestions for the entire season are presented on the last page of this report. Use these to look ahead and plan or to compare with what you're doing now. If you have questions or comment please contact Jennifer Schoonen - Blackfoot River Steward (360-6445) or Barry Dutton – Soil and Irrigation Consultant (240-7798).

WEATHER - PERFECT FOR MAKING HAY



Whether you are still growing your crop or now in the middle of haying, the weather is great. Most Blackfoot croplands had only a trace of rain this week and lots of sun. Next week will again be dominated by warm temperatures (upper 80s) and sunny skies. The 30- and 90- day forecasts still suggest above normal temperatures and normal rainfall for the remainder of the growing season.

CROP WATER USE - JUMPED TO ABOVE AVERAGE THIS WEEK AND NEXT



Crop water use climbed to above-normal levels with the first completely sunny and warm week of the season. Crop water use will remain above normal next week as warm, sunny weather continues. Harvest is showing some great crops this year. Remember that water use for hay drops by 2/3 the first week after cutting and by 1/3 the second week. Crop water use returns to normal levels by the third week after cutting. The table and chart on Page 2 summarize the entire irrigation season and compare it with average, hot and cool conditions.

WATER USE IN INCHES	LAST 7 DAYS	NEXT 7 DAYS¹	SEASON TOTAL²
HAY CROPS	1.7	1.7 (1.6 – 1.8)	11.0
PASTURE	1.3	1.3 (1.2 – 1.5)	9.0
SPRING GRAINS	2.0	2.0 (1.8 – 2.2)	8.4
WINTER WHEAT	1.8	1.8 (1.6 – 1.8)	11.9
LAWNS	1.6	1.6 (1.4 – 1.8)	10.5
RAIN (Average across drainage croplands)	T	T	6.2
EFFECTIVE RAIN	0	0	4.8

¹Expected water use (range if weather becomes cooler or hotter than expected)

²Beginning April 1 – note in 2010-13 we started our seasonal total on May 1 but since include April

BLACKFOOT 2018 GROWING SEASON WEEKLY RAINFALL & CROP WATER USE (INCHES OF WATER)

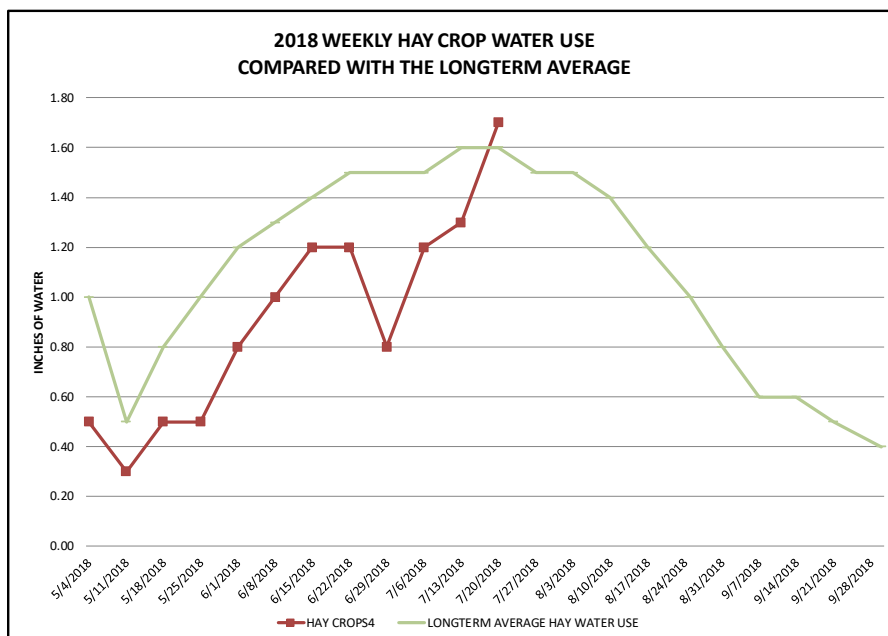
WEEK ENDING	RAIN ¹	2018 WEEKLY POTENTIAL CROP WATER USE ²						AVERAGE POTENTIAL CROP WATER USE ³		
	RAIN	HAY CROPS ⁴	PASTURE	SPRING GRAINS 5-1 START	SPRING GRAINS 5-15 START	WINTER WHEAT	LAWNS	LONGTERM AVERAGE HAY WATER USE	HOT WEEK HAY WATER USE	COOL WEEK HAY WATER USE
APRIL	1.50	0.50	0.40	0.10	0.10	0.50	0.50	1.00	1.50	0.50
5/4/2018	0.50	0.30	0.20	0.10	0.10	0.30	0.30	0.50	0.80	0.30
5/11/2018	0.50	0.50	0.40	0.10	0.10	0.50	0.50	0.80	1.00	0.50
5/18/2018	0.50	0.50	0.40	0.10	0.10	0.50	0.50	1.00	1.10	0.60
5/25/2018	0.25	0.80	0.70	0.30	0.10	0.80	0.80	1.20	1.30	0.80
6/1/2018	0.75	1.00	0.90	0.50	0.30	1.10	1.00	1.30	1.40	0.90
6/8/2018	0.20	1.20	1.00	0.80	0.50	1.30	1.10	1.40	1.50	1.00
6/15/2018	0.50	1.20	1.00	0.90	0.70	1.30	1.10	1.50	1.70	1.00
6/22/2018	1.25	0.80	0.70	0.80	0.60	1.00	0.80	1.50	1.90	1.10
6/29/2018	0.25	1.20	1.00	1.20	0.90	1.30	1.10	1.50	2.00	1.20
7/6/2018	0.01	1.30	1.00	1.50	1.20	1.50	1.20	1.60	2.10	1.30
7/13/2018	0.01	1.70	1.30	2.00	1.80	1.80	1.60	1.60	2.00	1.20
7/20/2018								1.50	2.00	1.20
7/27/2018								1.50	2.20	1.10
8/3/2018								1.40	1.70	1.00
8/10/2018								1.20	1.50	0.90
8/17/2018								1.00	1.30	0.70
8/25/2018								0.80	1.00	0.50
8/31/2018								0.60	0.80	0.40
9/7/2018								0.60	0.70	0.30
9/14/2018								0.50	0.70	0.30
9/21/2018								0.40	0.60	0.20
9/30/2018								0.40	0.60	0.20
TOTAL	6.22	11.00	9.00	8.40	6.50	11.90	10.50	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 - RECHARGE AFTER CUTTING

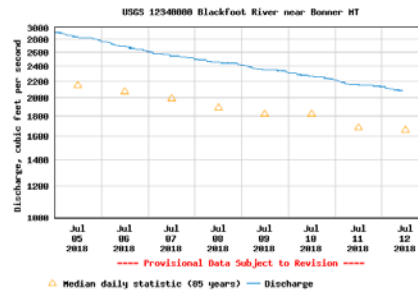
Soils are drying out quickly with warm, sunny conditions. It is unlikely we will get enough rain to increase soil moisture much for the rest of the growing season. Try to keep soil moisture levels high up until a week or so before cutting hay crops to maximize production.

It's ideal to keep your soil moisture above 50% of water holding capacity for best production. At 50% of water holding capacity the soil can be formed into a ball (top photo). The hand gets dirty and appears moist (bottom photo) but not shiny wet. Call if you have questions about your soil moisture or visit the irrigation guide on the Challenge website.

WEEKLY TIPS

Streamflows

Blackfoot river flows have dropped this week to about 2,080 CFS at Bonner which is near average (1,960 CFS). The highest level recorded for this date was 8,050 (1899) and the lowest 577 (1977). The hydrograph below shows a steady decline all week which will continue with the hot weather.



Water Supply and Drought?

Warm weather and rains in June ended our record snowpack. A snowpack that was 150% of normal in early June melted away completely by June 30. Although the NRCS water supply forecasts end the first of June, snowpack, rainfall, reservoir storage and other information is still available (google *NRCS Montana Snow Survey*). Their interactive map shows that all snow melted throughout the Blackfoot Drainage by June 30 and almost no rain fell since. It is starting to look a lot like last year when high snowfall melted quickly and turned into drought later in the summer. Enjoy the bountiful harvest and be ready for anything later this summer.

Irrigation and Hay Harvest

Hay cutting stresses plants so irrigate as close to harvest as possible and then once or twice after if you can. This is especially important for alfalfa. If you can't irrigate after harvest, don't worry, you are not a bad person. The good news is that grass is well adapted to stress and drought. Another advantage to irrigating after cutting is that the crop uses less water for about two weeks so it's easier to recharge soil moisture.

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.
- Stop irrigating small grains at the milk to soft dough stage but be sure there are 1- 2 inches of soil moisture left at this stage to prevent kernels from shrinking.

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.