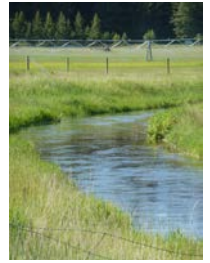


BLACKFOOT CHALLENGE

WEEKLY IRRIGATION REPORT

Friday May 14, 2021



It was another cool, dry week with little sprinkler irrigation going on throughout the Blackfoot Drainage. Most Blackfoot croplands had only a trace of rain this week and a few snowflakes with cool temperatures and some frost. Soil moisture levels at the start of this growing season are slightly below average in most fields. The drought monitor indicates the Blackfoot drainage is in a “Slightly Dry” condition, much better than most of the state.

The snowpack held steady this week at 94% of average which is similar to last year. Stream flow dipped below average this week and will continue to fluctuate with temperatures. There appears to be plenty of water for early season irrigation but predicted hot, dry weather could change that later on. The 30-day forecast says above average rainfall and average temperatures. The 90-day forecast says below average rainfall and above average temperatures.



WEATHER - WARM & SUNNY TO COOL AND MOIST?

Last week had a mix of weather and next week looks the same. It will start out sunny with highs in the 70s to low 80s then drops to the 60s and low 70s by Wednesday with some rain. Lows will be mostly in the 40s.



CROP WATER USE - LOW - INCREASING SLOWLY

Note that in these early season reports, we list a range of crop water use to account for elevation and soil differences. Crop water use will even out across the drainage when crops start actively growing everywhere. Right now, lower elevations and coarser soils are using more water. Higher elevations are cooler which reduces crop water use but the vapor pressure is lower at higher elevations which increases crop water use. Blackfoot irrigated croplands range from 3500 feet in the Potomac. 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	0.4-0.6	0.4-0.6	.06-.09	0.8
PASTURE	0.4-0.7	0.4-0.7	.06-.10	0.9
SPRING GRAINS	0.0	0.2	.03	0.0
WINTER WHEAT	0.5-0.8	0.5-0.8	.07-.11	1.2
LAWNS	0.5-0.8	0.5-0.8	.07-.11	1.2



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

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)

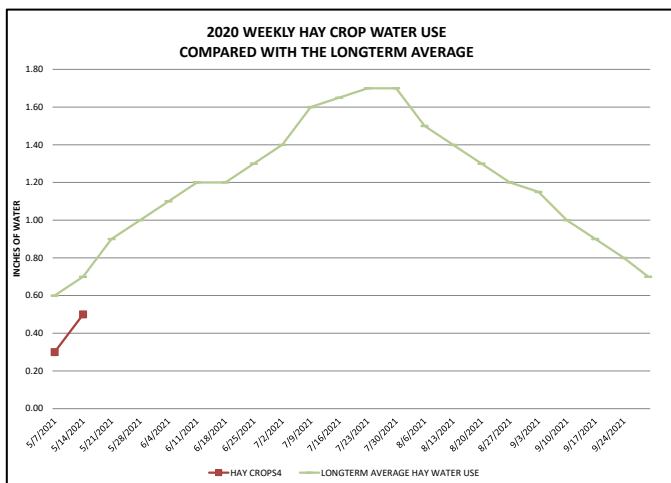
WEEK ENDING	RAIN ¹	2021 WEEKLY POTENTIAL CROP WATER USE ²						AVERAGE WEEKLY CROP WATER USE ³		
	RAIN	HAY CROPS ⁴	PASTURE	SPRING GRAINS 5-1 START	SPRING GRAINS 5-15 START	WINTER WHEAT	LAWNS	LONGTERM AVERAGE HAY WATER USE	HOT WEEK HAY WATER USE	COOL WEEK HAY WATER USE
5/7/2021	0.40	0.30	0.40	0.00	0.00	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								0.90	1.20	0.50
5/28/2021								1.00	1.30	0.50
6/4/2021								1.10	1.50	0.60
6/11/2021								1.20	1.70	0.70
6/18/2021								1.20	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	0.60	0.80	0.90	0.10	0.00	1.20	1.20	26.00	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 - A BIT LOWER THAN AVERAGE!

Soil moisture levels throughout the drainage this week were slightly lower than last year. Most surface soils are filled up to 50 to 75% of their water holding capacity throughout the 3-foot root zone. Surface soils begin to slowly lose moisture after snowmelt by evaporation alone and then by transpiration from crop plants even when they are young or remnants of cutting. The time between snowmelt and vigorous crop growth in May has been getting longer. Irrigators should plan to fill up their soils and concentrate on early season irrigation (May-mid July) when it's most effective (less immediate evaporation).



WEEKLY TIPS

Water Supply

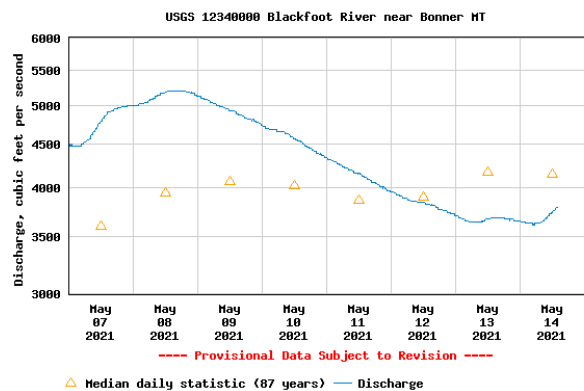


Blackfoot drainage snowpack is holding steady at 94% of average today down from 102% on May 1. Recent cool weather has slowed snowmelt and streamflow in a manner similar to last year. Blackfoot precipitation was down to 73% of normal in the last 30 days which combined with a few warm days caused a drop in stored soil moisture. Reservoir storage remains good. Blackfoot river flows are predicted to be slightly above normal this season but watch for a change if the weather should turn hot and dry.

Streamflows

The Blackfoot river flow at Bonner is about 3,790 CFS today which is below average for this date (4,920 CFS) and about the same as last year. 2018 set the highest flow record at 14,600 CFS while the lowest flow on this date was 1160 CFS in 1905.

The next 30 days should have average temperatures and above average rainfall which should produce a nice even snowmelt with abundant irrigation water. However, the 90-day forecast shows above average temperatures and below average rainfall.



Elevations of Blackfoot Croplands

As I drive from Bonner to Helmville, I sometimes feel I am climbing Mt. Everest, making large elevation jumps from the banana plantations of Potomac to the Sherpa pastures above Helmville. But most Blackfoot irrigated croplands are within a 1000-foot range between 3500 and 4500 feet.

Potomac	3500-4300
NineMile Prairie/Clearwater	3600-3800
Ovando/Kleinschmit	3900-4400
Helmville	4300-4600 (to 5000 in Douglas Cr)
Lincoln	4400-4900
Above Nevada Creek Dam	4600-5000

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.

