

BLACKFOOT CHALLENGE

WEEKLY IRRIGATION REPORT

Friday August 24, 2018



Cooler temperatures and ½ inch of rain was a welcome relief after more than 50 days of none. Last week and next week will be similar with thunderstorms moving through early in the week and then sunnier skies, hopefully with less smoke. Crop water use has dropped back to near average - about 1 inch per week. Long-range forecasts predict above average temperatures and below average rainfall for the rest of the season.

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 - THUNDERSTORMS THEN SUN

Thunderstorms brought cooler temperatures and ½ inch of rain last week. It should happen again early this coming week followed by sunshine later in the week. The 30-day forecast suggests above normal temperatures and normal rainfall. The 90-day forecast says above average temperatures and below average rainfall.



CROP WATER USE - FALLING TO AVERAGE

Crop water use fell to near average at about 1 inch this week. It should be similar next week with similar weather predicted. Water use for winter grains has dropped off and is now dropping fast for spring grains as crops mature. The table and chart on Page 2 summarize the entire irrigation season. This year started out with low crop water use then climbed to above average with hot weather (100F last week) and now has fallen back to normal for late August.



WATER USE IN INCHES	LAST 7 DAYS	NEXT 7 DAYS¹	SEASON TOTAL²
HAY CROPS	1.1	1.0 (0.8 – 1.2)	20.3
PASTURE	0.9	0.8 (0.7 – 0.9)	16.6
SPRING GRAINS	1.1	0.7 (0.5 – 0.7)	17.8
WINTER WHEAT	0.1	0.1 (0.0 – 0.1)	15.6
LAWNS	1.1	1.0 (0.8 – 1.2)	19.2
RAIN (Average across drainage croplands)	0	0	6.7
EFFECTIVE RAIN	0	0	5.0

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 then we include April

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

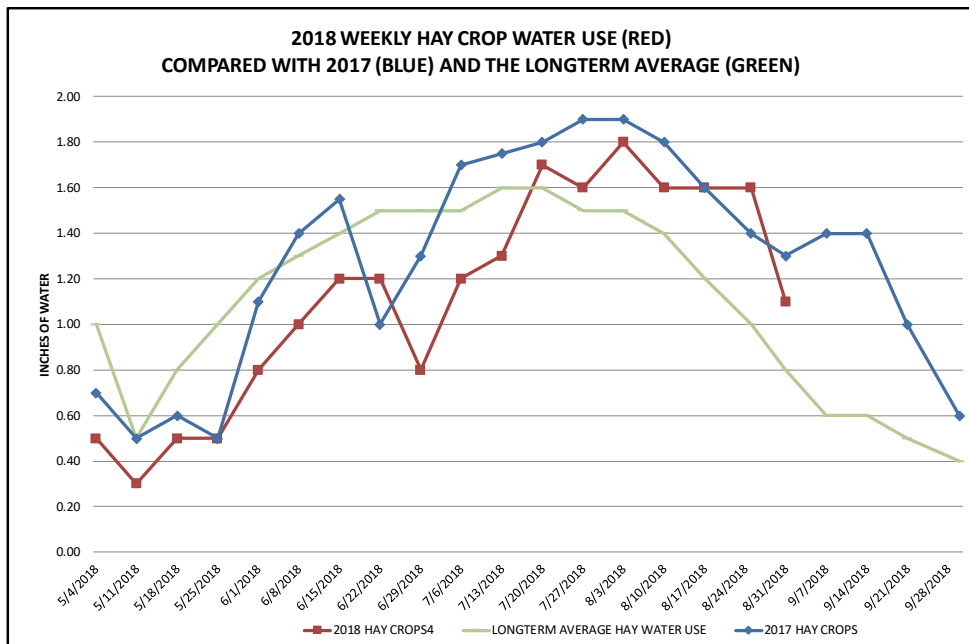
WEEK ENDING	RAIN ¹	2018 WEEKLY POTENTIAL CROP WATER USE ²						AVERAGE POTENTIAL CROP WATER USE ³		
	RAIN	HAY CROPS ⁴	PASTURE	SPRING GRAINS 5-1 START	SPRING GRAINS 5-15 START	WINTER WHEAT	LAWNS	LONGTERM AVERAGE HAY WATER USE	HOT WEEK HAY WATER USE	COOL WEEK HAY WATER USE
APRIL	1.50	0.50	0.40	0.10	0.10	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	0.01	1.60	1.30	1.90	1.90	1.90	1.50	1.50	2.00	1.20
7/27/2018	0.01	1.80	1.50	2.00	2.00	1.00	1.70	1.50	2.20	1.10
8/3/2018	0.01	1.60	1.30	1.70	1.90	0.50	1.50	1.40	1.70	1.00
8/10/2018	0.01	1.60	1.30	1.60	1.80	0.25	1.50	1.20	1.50	0.90
8/17/2018	0.01	1.60	1.30	1.40	1.60	0.01	1.50	1.00	1.30	0.70
8/25/2018	0.50	1.10	0.90	0.80	1.10	0.01	1.00	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	6.77	20.30	16.60	17.80	16.80	15.57	19.20	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.





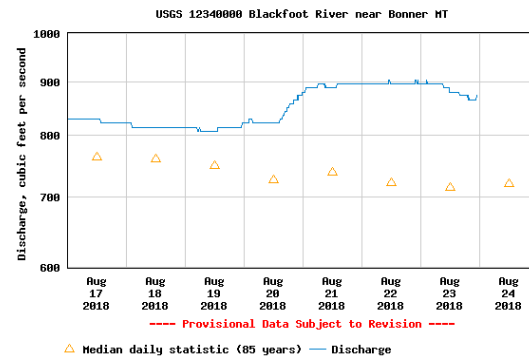
SOIL MOISTURE - NOT MUCH FROM THAT STORM

That ½ inch of rain we had cooled crop and soil surfaces, raised humidity levels briefly and thereby lowered crop water use. What it didn't do was contribute much to soil moisture unless you had just cut hayfields, just plowed or just seeded so that there was little vegetation to intercept rain. Otherwise ½ inch of rain is easily held on crop and soil surfaces until it evaporates. It is possible that we get larger amounts this coming week and it's usually the case that someone gets an extra large soaking.

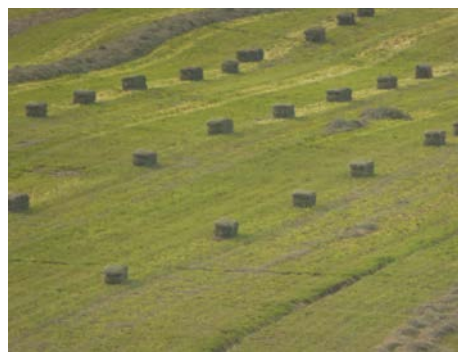
WEEKLY TIPS

Streamflows

The river flow increased for the first time since June 22 (over 60 days) after much of the drainage had more than ½ inch of rain. The Blackfoot River above Bonner was flowing today at 873 CFS which is slightly above average (737 CFS) and more than last week. The highest level recorded for this date was 1,720 (1899) and the lowest 358 (1988). Small fluctuations in flow will continue next week as scattered thunderstorms produce limited rain but welcome rain.



2018 will be remembered for great harvests so take a few photos, save your seed, fertilizer, soil test and bale count records for future reference. Great Job Folks!



New Crop Choices? - Potatoes

Potatoes, primarily seed potatoes continue to be an important crop throughout western Montana. Our isolated valleys have proved useful for reducing potato diseases at early life stages. The Deer Lodge Valley has had the additional benefit of historic heavy metal fumigation which also reduces potato disease.

A few decades ago we didn't think small grains would ever be a common crop in the Blackfoot drainage. But as the climate warms we will see other opportunities and so if you are in it for - "the long haul" - look ahead to new options. The Blackfoot drainage has been considered too cold for large potato plantings but hardy gardeners produce impressive spuds. As the climate continues to warm and potato diseases affect other areas the Blackfoot may offer a tuber bonanza. This would likely involve higher value seed potatoes and local market production.

Potatoes are great for improving soil health. They break up compacted layers and sod-bound soils. A portion of the crop is always left in the ground to increase soil organic matter, aeration, water holding capacity and water movement. Potatoes also increase the diversity of soil micro-organisms which improves nutrient availability.

New Crop Choices? - Beets

Montana has a thriving beet industry for decades with beet farms and beet plants spread across most of the states major agricultural areas. From the Flathead, Mission and Missoula valleys in the west to the Yellowstone valley in the east were thousands of acres of beets picked by migrant labor and processed in local plants. A byproduct of beet agriculture was a valuable soil amendment in the form of processed beet pulp. A thriving beet industry still exists between the Billings, MT and Powell, WY areas.

Although climate change should continue to favor the Blackfoot drainage with a longer growing season, it is unlikely a large beet industry will re-emerge. Infrastructure requirements and world market uncertainties continue to challenge the sugar trade. But if outside evil forces ever try to cut us off from our frosted flakes, we can always grow our own if we have to.

Beets are also great for improving soil health. They break up compacted layers and sod-bound soils. A portion of the crop is always left in the ground to increase soil organic matter, aeration, water holding capacity and water movement. Potatoes also increase the diversity of soil micro-organisms which improves nutrient availability.

All tubers including radishes, carrots, turnips, rutabagas have similar soil health benefits.

New Crop Choices? - Specialty Crops

Some smart entrepreneur is always looking ahead and seeing what the rest of us miss so remember that fortunes have been made with seed potatoes, mint oil, melons and lentils (well maybe not lentils). But the farm and ranch of the future is likely to be more diverse and evolve over time as crops and demands change.

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 DESIRED MATURITY, 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.