

BLACKFOOT CHALLENGE

WEEKLY IRRIGATION REPORT

Friday August 31, 2018



Small storms this week left almost ¼ inch of rain which helped maintain streamflows and reduced crop water use. Next week will be mild and sunny with less smoke. Crop water use has dropped back to near average - about 1 inch per week. Long-range forecasts predict mostly above average temperatures and below average rainfall for the rest of the growing 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 -SUNNY AND MILD

Storms this past week left slightly less than ¼ inch of rain on most local croplands. A few scattered sites had twice this amount. Next week looks very pleasant with sunny skies and mild temperatures reaching into the 70s. 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 was above average at about 1 inch this week. It should be similar next week with similar weather predicted. The table and chart on Page 2 summarize the entire irrigation season. This year started out with low crop water use then climbed above average with hot weather in July and August (100F+). It remains above average although not as high as last year when very hot weather persisted throughout September.



WATER USE IN INCHES	LAST 7 DAYS	NEXT 7 DAYS¹	SEASON TOTAL²
HAY CROPS	1.0	1.0 (0.8 – 1.2)	21.3
PASTURE	0.8	0.8 (0.7 – 1.0)	17.4
SPRING GRAINS	0.5	0.2 (0.1 – 0.5)	18.5
WINTER WHEAT	0.1	0.1 (0.0 – 0.1)	15.9
LAWNS	0.9	0.9 (0.8 – 1.2)	20.1
RAIN (Average across drainage croplands)	0	0	6.9
EFFECTIVE RAIN	0	0	5.1

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)

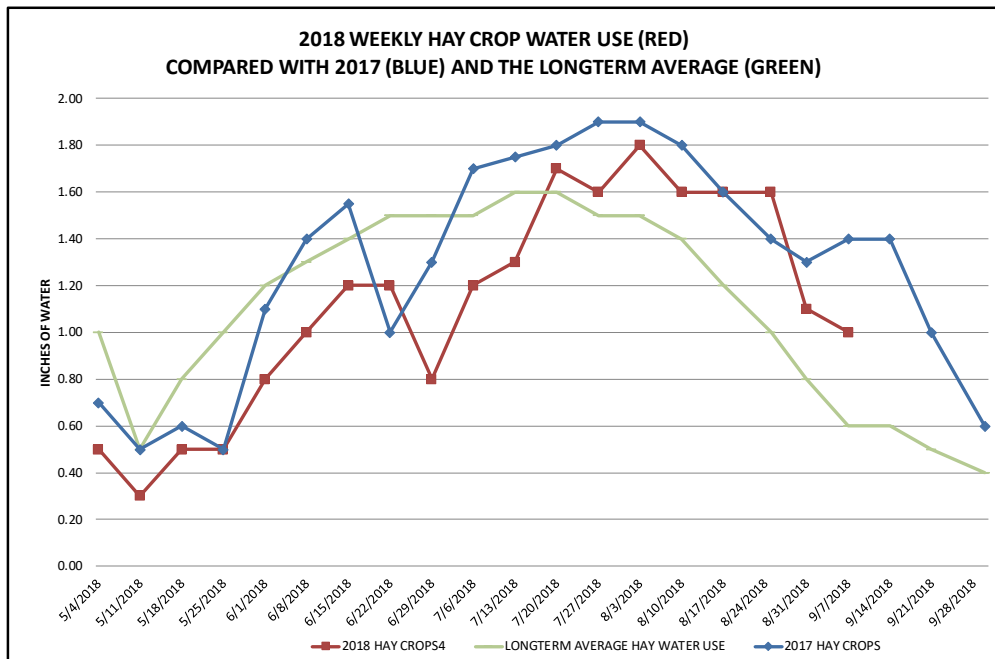
WEEK ENDING	RAIN ¹	2018 WEEKLY POTENTIAL CROP WATER USE ²						AVERAGE POTENTIAL CROP WATER USE ³		
	RAIN	HAY CROPS ⁴	PASTURE	SPRING GRAINS 5-1 START	SPRING GRAINS 5-15 START	WINTER WHEAT	LAWNS	LONGTERM AVERAGE HAY WATER USE	HOT WEEK HAY WATER USE	COOL WEEK HAY WATER USE
APRIL	1.50	0.50	0.40	0.10	0.10	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	0.10	1.50	1.00	1.30	0.70
8/24/2018	0.50	1.10	0.90	0.80	1.10	0.10	1.00	0.80	1.00	0.50
8/31/2018	0.20	1.00	0.80	0.25	0.50	0.10	0.90	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	6.97	21.30	17.40	18.05	17.30	15.85	20.10	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.





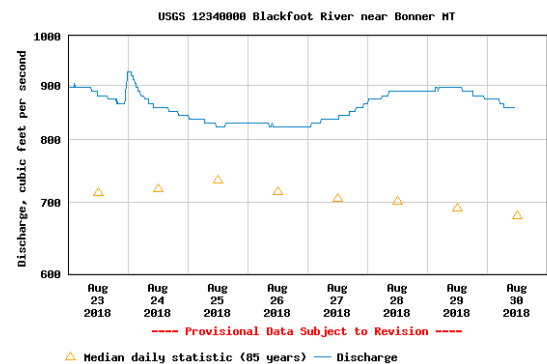
SOIL MOISTURE - WAITING FOR FALL RAINS

That ¼ inch of rain we had cooled crop and soil surfaces, raised humidity levels briefly and thereby lowered crop water use a little. What it didn't do was contribute much to soil moisture. Most soil moisture that's out there now has come from recent irrigation. Those of you who are still irrigating are likely cutting back to about what crops use each week and are not trying to boost soil moisture.

WEEKLY TIPS

Streamflows

River flows remain constant due to small rainstorms. The Blackfoot River above Bonner was flowing today at 858 CFS which is slightly above average (696 CFS) and more than last week. The highest level recorded for this date was 1,420 (1899) and the lowest 334 (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? – Cannabis

Anyone looking for a future in agriculture should at least be aware of the most lucrative crop in America. More and more farms and ranches are incorporating a greenhouse or patch of cannabis into their diverse operation. For several decades, the US cannabis crop (mostly illegal) has been estimated to exceed the dollar value of the US corn and wheat crops combined.



The legal cannabis crop is estimate to exceed \$25 billion by 2015. Montana has not caught up to production in other states and cannabis has been ranked only fourth behind wheat, hay and barley. Montana is on track to bring in over a million dollars in taxes next year from cannabis.

For this discussion I will avoid the propaganda and bias for or against cannabis and concentrate on what we know about its current and future potential in the Blackfoot drainage. As cannabis becomes widely decriminalized we will see more objective research on benefits and drawbacks from which we can make better choices about future regulation. Regardless, it's no doubt here to stay. The current literature is fascinating and goes back thousands of years.

Potential in the Blackfoot?

Cannabis has been grown across the world in a wide variety of climates and is adapted to Blackfoot Drainage conditions in all its forms from hemp to high-grade flowers. Actually, it has been grown here illegally for decades in both greenhouse and outdoor settings. The highest quality cannabis may require greenhouses at present however, new quick-maturing strains are making outdoor cultivation more practical in cooler climates.

Why is Cannabis Illegal?

In the 1930s, three forces combined to make cannabis illegal. The first US drug legislation was enacted to target black minorities and immigrants from Asia and Mexico. The new drug czar thought seizing cannabis (marijuana) would be much easier than heroin, cocaine and the other outlawed drugs so he lobbied to include it. Legislators didn't read bills back then either and most didn't realize they were also outlawing a major US and world crop – hemp. The second force was the petroleum industry which saw cannabis-derived products as competition for their new invention – plastic. The third force was William Randolph Hearst who saw hemp-derived paper as competition for his woodpulp-fueled newspaper empire (he owned vast timberlands). Since legalization, the largest forces against cannabis legalization have been pharmaceutical, tobacco and alcohol companies which all would lose profits. Their fear is a plant anyone can grow that replaces much of their products.

What is Cannabis Used For?

The list of uses is almost endless since almost all parts of the plant have been used including as food, oil, clothing, paper, rope, sails and auto parts as well as medicine. Web searches reveal thousands of current products. Mankind co-evolved with this plants for thousands of years. Cannabis has been found in the earliest archaeological sites and may have been man's first irrigated crop. The first book on medicinal use of cannabis was written 4000 years ago and lists most of the uses being re-discovered today. By comparison most "modern" drugs have only a few decades of research and experience (which is why they are constantly recalled for negative side effects). Cannabis treatments for epilepsy, glaucoma, PTSD and other conditions are currently helping patients and herald much wider use. Don't be surprised if your doctor in the future points you to a plant instead of a pill.

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.