

BLACKFOOT CHALLENGE

WEEKLY IRRIGATION REPORT

Friday July 12, 2019



It was another cool week overall in the Blackfoot Drainage but ended sunny and warm. Weather changed dramatically by the day or hour. Croplands mostly had ¼ to ½ inch of rain but some had none and a lucky few had more. Next week starts again with thunderstorms but clears to sunny skies and very warm temperatures. Crop growth continues to look good and crop water use remained below average at about 1 ½ inches this week. All crops will use more next week with warmer, sunny weather. If you don't plan on pasture or another cutting, water once after harvest and put away your irrigating shoes. The Blackfoot River is dropping fast and late season drought is possible.

These reports, provide weekly summaries of weather, crop water use and soil moisture conditions plus tips for irrigation, soil health and crops. Hints for the entire irrigation season are on the last page. For other irrigation information please contact Jennifer Schoonen - Blackfoot River Steward (360-6445) or Barry Dutton – Soil and Irrigation Consultant (240-7798).

WEATHER - THUNDERSTORMS THEN SUNNY & VERY WARM



Cool, cloudy weather alternated with sunny skies and finally is got hot at the end of the week. Thunderstorms left very irregular rainfall amounts, mostly between ¼ and ½ inch total. Next week will start again with thunderstorms and end very warm and sunny with temperatures in the high 80s. The 30- day predictions are for average temperatures and rainfall while the 90-day predictions are for above average temperatures and average rainfall.



CROP WATER USE - BELOW AVERAGE FOR THE FOURTH WEEK!

Crop water use increased a bit this week to about 1 ½ inches for most crops. It remained below average for the fourth week in a row due to cool weather and cloudy skies most of the week. Water use will increase next week with warmer temperatures but will decrease by 2/3 in fields just cut. The table below provides a quick summary of crop water use 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 | 1.4 | 1.5 (1.4 - 1.7) | .21 | 13.0 |
| PASTURE | 1.1 | 1.2 (1.1 - 1.4) | .17 | 11.5 |
| SPRING GRAINS | 1.5 | 1.6 (1.5 - 1.8) | .23 | 9.0 |
| WINTER WHEAT | 1.5 | 1.4 (1.2 - 1.4) | .20 | 14.1 |
| LAWNS | 1.3 | 1.4 (1.3 - 1.6) | .20 | 12.6 |

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

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

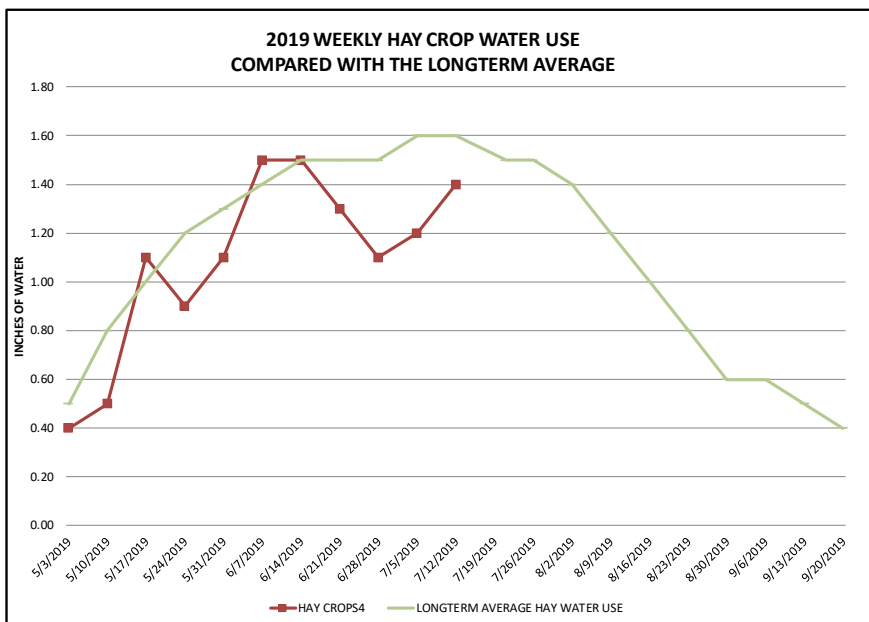
| WEEK ENDING | RAIN ¹ | 2019 WEEKLY POTENTIAL CROP WATER USE ² | | | | | | AVERAGE POTENTIAL CROP WATER USE ³ | | |
|--------------|-------------------|---------------------------------------------------|--------------|----------------------------|-----------------------------|--------------|--------------|-----------------------------------------------|------------------------|-------------------------|
| | 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 |
| 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 | 0.40 | 1.10 | 0.90 | 0.10 | 0.10 | 1.10 | 1.00 | 1.00 | 1.10 | 0.60 |
| 5/24/2019 | 0.10 | 0.90 | 0.80 | 0.20 | 0.10 | 1.00 | 0.90 | 1.20 | 1.30 | 0.80 |
| 5/31/2019 | 0.75 | 1.10 | 0.90 | 0.50 | 0.20 | 1.20 | 1.00 | 1.30 | 1.40 | 0.90 |
| 6/7/2019 | 0.30 | 1.50 | 1.30 | 1.00 | 0.60 | 1.60 | 1.40 | 1.40 | 1.50 | 1.00 |
| 6/14/2019 | 0.50 | 1.50 | 1.40 | 1.50 | 1.10 | 1.70 | 1.50 | 1.50 | 1.70 | 1.00 |
| 6/21/2019 | 0.10 | 1.30 | 1.10 | 1.40 | 1.20 | 1.50 | 1.20 | 1.50 | 1.90 | 1.10 |
| 6/28/2019 | 0.10 | 1.10 | 0.90 | 1.20 | 1.10 | 1.20 | 1.00 | 1.50 | 2.00 | 1.10 |
| 7/5/2019 | 0.40 | 1.20 | 1.00 | 1.30 | 1.20 | 1.30 | 1.10 | 1.60 | 2.10 | 1.30 |
| 7/12/2019 | 0.25 | 1.40 | 1.10 | 1.50 | 1.50 | 1.50 | 1.30 | 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 | 5.00 | 13.00 | 11.50 | 9.00 | 7.40 | 14.10 | 12.60 | 24.80 | 31.40 | 17.10 |

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 - BOOST IT AFTER CUTTING IF YOU CAN

Soil moisture levels in well-irrigated fields dropped about 1 ½ inches this week. Crop water use drops when you cut of course and recovers fully in about three weeks as new leaf area develops. Crop water use the week

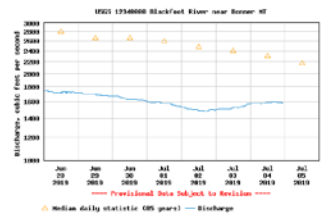
after cutting is only about 1/3 of the uncut crop potential. The second week it is about 2/3 of potential and back to normal by the third week. Soil moisture dropped by about 1 ¼ inches this week unless you had significant rain or irrigated.



STREAMFLOWS

The Blackfoot river flow at Bonner held fairly steady this week. Today it is about **1600 CFS** which is **2/3 of average** (2600 CFS). The Highest flow on this date was 10,100 (1899) and the lowest was 612 CFS (1977). Today at:

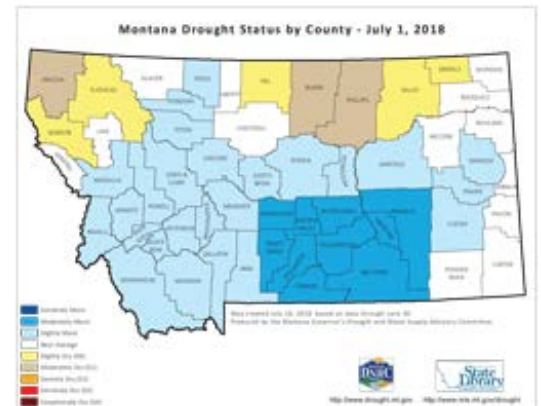
| | |
|--------------------------------|-----------|
| Yellowstone River (Livingston) | 9,000 CFS |
| Missouri River (Culbertson) | 14,000 |
| Colorado River (Lees Ferry) | 16,000 |
| Columbia River (Astoria) | 130,000 |
| Niagara Falls | 260,000 |



DROUGHT 2019?

The current Montana drought map shows us at slightly moist conditions with drier conditions to the northwest and northeast. Cool temperatures and scattered rain has made it a below-average year for crop water use. However, streamflows have been 50-60% of normal for weeks. Predictions for the next 30 days are for average rainfall and above temperatures. The 90 day predictions are for average rainfall and above average temperatures.

<http://dnrc.mt.gov/divisions/water/drought-management>



PASTURE IMPROVEMENT AND POLINATOR TOUR JULY 31 10AM!

Dryland pasture improvement including 12 grasses plus legumes and wildflowers is the topic of a tour by the Lake County Conservation District near Charlo on July 31. Information at: <https://lakecountyconservationdistrict.org/2019/07/10/nrcs-field-walk-crow-creek-ranch-dryland-pasture-improvement/>

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. Some years you better start up now.



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.