

BLACKFOOT CHALLENGE

WEEKLY IRRIGATION REPORT

Friday August 9, 2019

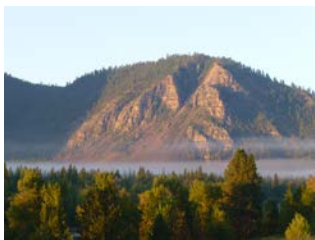


Hot, dry sunny weather dominated the week ending with scattered clouds and very little rain. Most of next week should be sunny and not quite as warm. Crop water use probably reached its highest this week with spring grains using a full 2 inches (almost 1/3 inch per day). All crops should use slightly less water next week with slightly cooler but sunny weather. Many irrigators are hanging up their boots after a good first cutting and as drought restrictions take effect.

Blackfoot River flows at Bonner have now fallen below the 700 CFS trigger level and drought plans are being implemented throughout the drainage (see page 3). For drought options – see page 4.

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 - SUNNY & VERY WARM AGAIN



Last week had very warm temperatures and sunny skies with a little rain at the end and a few scattered thunderstorms. A cloudy weekend with a little rain will turn into sunny skies and warm temperatures in the 80s. The 30-day and 90-day predictions are for above average temperatures and average rainfall.



CROP WATER USE - ABOVE AVERAGE - CUT 2/3 BY HAYING

Crop water use rose to its highest level this week. Hay crops, spring grains and lawns used up to 2 inches. Water use will decrease slightly next week with slightly cooler temperatures to about 1 ½ inches. 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. 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.



WATER USE IN INCHES	LAST 7 DAYS	NEXT 7 DAYS TOTAL¹	NEXT 7 DAYS DAILY AVE²	SEASON TOTAL³
HAY CROPS	1.8	1.6 (1.5 - 1.8)	.23	19.2
PASTURE	1.4	1.2 (1.0 - 1.4)	.17	16.4
SPRING GRAINS	2.0	1.7 (1.5 - 1.8)	.29	15.4
WINTER WHEAT	0.1	0.1 (0.1 - 0.1)	.01	16.5
LAWNS	1.7	1.5 (1.4 - 1.7)	.21	18.4

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)

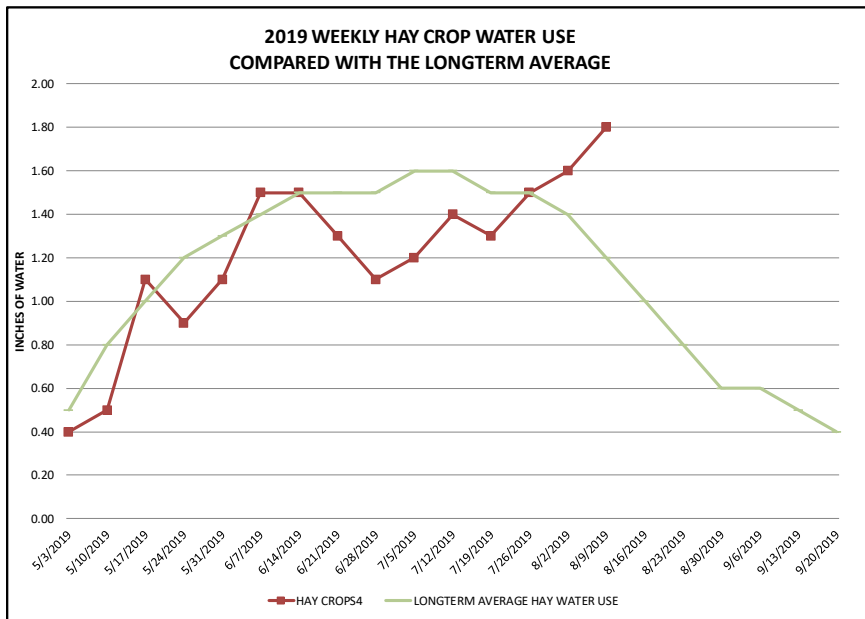
WEEK ENDING	RAIN ¹	2019 WEEKLY POTENTIAL CROP WATER USE ²						AVERAGE POTENTIAL CROP WATER USE ³		
	RAIN	HAY CROPS ⁴	PASTURE	SPRING GRAINS 5-1 START	SPRING GRAINS 5-15 START	WINTER WHEAT	LAWNS	LONGTERM AVERAGE HAY WATER USE	HOT WEEK HAY WATER USE	COOL WEEK HAY WATER USE
5/3/2019	0.30	0.40	0.50	0.10	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
7/19/2019	0.50	1.30	1.00	1.40	1.40	1.00	1.20	1.50	2.00	1.20
7/26/2019	0.01	1.50	1.20	1.70	1.70	0.75	1.40	1.50	2.20	1.10
8/2/2019	0.01	1.60	1.30	1.80	1.80	0.50	1.50	1.40	1.70	1.00
8/9/2019	0.10	1.80	1.40	1.50	2.00	0.10	1.70	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	5.62	19.20	16.40	15.40	14.30	16.45	18.40	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.

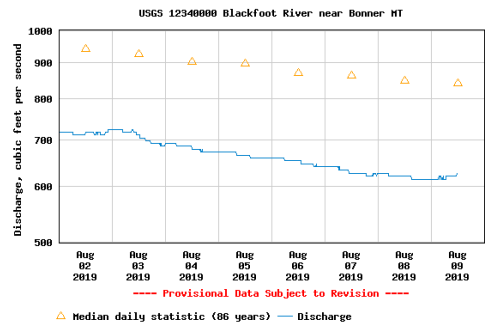
³ **Longterm average** water use for each crop each week based on long-term historic data.

⁴ Hay Crop water use drops approximately 2/3 the first week after cutting, 1/2 the second and 1/3 the third.



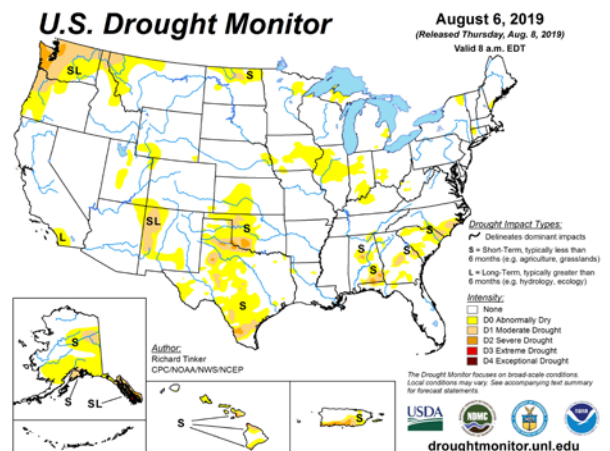
STREAMFLOWS - CRITICAL

The Blackfoot river flow rose slightly with rainfall in the past 24 hours but remains below the critical 700 CFS level where irrigation restrictions are initiated. Today's flow is at **627 CFS** compared with an average for this date of 871 CFS. The Highest flow on this date was 2,160 (1899) and the lowest was 379 CFS (1988). Despite an average snowpack and cool spring/summer temperatures, streamflows have declined dramatically throughout the drainage.



DROUGHT 2019!!

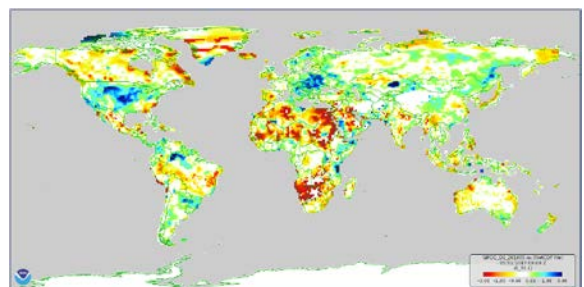
Drought Status Maps of the US and Montana continue to show dry conditions encroaching on our area. Missoula County continues in the "Slightly Dry" category while Powell County is "near average". The Montana website below shows a trend of increasing drought. Blackfoot River flows at Bonner have dropped below the 700 CFS trigger level for drought restrictions. Blackfoot Challenge Water Steward Jennifer Schoonen is now working with irrigators to help implement drought plans. Hopefully rainfall this weekend will be sufficient to slow this drying trend but it is unlikely we will get the widespread rain across the drainage needed to make a difference.



https://mslservices.mt.gov/Geographic_Information/Maps/drought/

Don't feel like we are the only ones with drought concerns. Drought is becoming widespread across the entire globe. Current estimates say 25% of the world's population now is suffering from extreme water stress. Recent reports predict that large parts of the US will experience similar water shortages within 50 years.

<https://www.sciencealert.com/17-countries-are-facing-extreme-water-stress-and-they-hold-a-quarter-of-the-world-s-population>



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

OPTIONS FOR A DROUGHT YEAR?

- CONCENTRATE YOUR EFFORTS ON THE FIRST CUTTING
- IRRIGATE ALFALFA ONCE AFTER CUTTING AND THEN CEASE IRRIGATION.
- CEASE IRRIGATION OF GRASS HAY AND GRASS PASTURES, GRASSES ARE DROUGHT-TOLERANT AND WILL SURVIVE UNTIL FALL RAINS



- IRRIGATE IMMEDIATELY AFTER CUTTING WHEN CROP WATER USE IS MUCH-REDUCED AND MORE GOES INTO THE SOIL
- IRRIGATE AT NIGHT SO MORE GOES INTO THE SOIL
- IF YOU HAVE MULTIPLE IRRIGATION SYSTEMS – RUN ONLY ONE OR SO AT ONCE TO REDUCE THE AMOUNT WITHDRAWN AND MAINTAIN STREAM FLOWS
- APPLY MORE WATER DURING EACH APPLICATION TO INCREASE SOIL MOISTURE STORAGE – EVERY TIME YOU IRRIGATE YOU LOSE A PORTION TO EVAPORATION ESPECIALLY IN HOT WEATHER

- REDUCE YOUR IRRIGATED ACREAGE AND DO A GOOD JOB IRRIGATING ON A SMALLER ACREAGE
- PLANT CROPS THAT USE LESS WATER (SMALL GRAINS)
- PRACTICE IRRIGATION SCHEDULING
- MONITOR IRRIGATION SYSTEM PERFORMANCE TO PUT ON THE RIGHT AMOUNT UNIFORMLY



MANAGING GRASS HAYFIELDS IN DROUGHT CONDITIONS

Grasses, especially most of those common in irrigated hayfields and pastures are naturally adapted to drought. However, during drought conditions, proper management is important to reduce mortality and prevent future production declines.

Grasses begin their growth during the previous years fall. Fall stubble is extremely important for the future productivity of grasses. Grasses store almost all of their sugars and carbohydrates in the stubble internodes (the few inches above and below the soil surface). The amount of stored sugars and carbs largely determines the number of tillers and general health/productivity of the plant next season.

During drought, avoid cutting or grazing grass plants below a height of 3-4 inches. This will preserve the plants sugar reserves and ensure full production the following year. This stubble also helps insulate the soil from extreme temperatures which can seriously restrict root growth and production.

Fall applications of phosphorus and potassium can help grass plants survive drought and also stimulate root and tiller growth next spring. These nutrients do not leach from the soil as readily as nitrogen so the effects of fall applications are likely to persist through to spring.

The articles below include more detailed information on hayfield/pasture management during drought.

http://cesiskiyou.ucanr.edu/newsletters/Drought_Articles_by_Steve_Orloff50156.pdf

<http://msuextension.org/magazine/articles/1335>

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.

