



BLACKFOOT CHALLENGE

WEEKLY IRRIGATION REPORT

Friday June 23, 2017

It was another good week for crops and irrigation in the Blackfoot drainage. Little or no rain fell across most areas but abundant soil moisture and warm temperatures provided good growing conditions. Local snowpack and streamflow predictions remain good throughout the summer although northeast Montana is experiencing extreme drought. A condensed overview of the whole irrigation season is on the last page of this report. Please contact Jennifer Schoonen - Blackfoot River Steward (406-360-6445) for more information on this and other Challenge programs.



WEATHER - WARM, SUNNY, THUNDERSTORMS

Last week saw little or no rain on most croplands in the drainage but sunny conditions and moderate temperatures produced significant crop growth. The coming week starts out hot (high 80s) then temperatures moderate and there's a chance of thunderstorms – fine growing conditions. The 30-day forecast indicates normal temperatures and rainfall. The 90-day forecast indicates above normal temperatures and rainfall.



CROP WATER USE - BELOW NORMAL BUT RISING

Crop water use was below average again last week (table and chart page 3). Remember that these figures represent water amounts needed to maximize production when nothing else is limiting. Your goals and situation may be met using less water. Crop water use should increase to near normal by next week unless the predicted thunderstorms are more robust than expected.

WATER USE IN INCHES	LAST 7 DAYS	NEXT 7 DAYS¹	SEASON TOTAL²	DAILY FORECAST³
HAY CROPS	1.3	1.5 (1.3 - 1.6)	8.7	.21
PASTURE	1.2	1.4 (1.2 - 1.5)	8.1	.20
SPRING GRAINS	0.8 - 1.4	0.9 - 1.7 (0.8 - 1.8)	4.8	.15 - .23
WINTER WHEAT	1.4	1.7 (1.5 - 1.8)	9.7	.23
LAWNS	1.3	1.5 (1.3 - 1.6)	8.8	.21

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 now include April

³Predicted average daily crop water use over the next week.



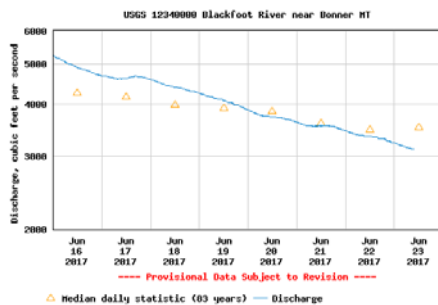
SOIL MOISTURE - KEEP IT UP!

Recent rainfall has allowed many irrigators to fill up their crop root zones and they now only need to keep it up to produce a great crop. Hot temperatures over the weekend may dry out the surface so folks with new plantings will want to consider light irrigations to promote good establishment.



When is your soil full? Soil near 50% of its water holding capacity soil forms a ball when squeezed but leaves only a little moisture on the hand (top photo). Soil near 100% of its water holding capacity forms a ball and leaves your hand moist (bottom photo). Call anytime if you have questions about evaluating your soil moisture or other irrigation topics.

WEEKLY TIPS



Water Supply and Streamflow

The Blackfoot River finally dropped from above average flows to below average for the first time this growing season (graph at left). Blackfoot streamflow predictions for June-July are 109% of normal so water should be available throughout the main irrigation season. Current flow at Bonner is about 3,100 CFS while the average for this date is 4040 CFS. The lowest flow on June 16 was 865 CFS in 1941 and the highest 13,200 CFS in 1899.

A Quick Look Back

The last cool, above-average moisture year we had was in 2011. By the third week of June that year, there were many local irrigators who had not yet started irrigating due to weather. May and June had frequent rainfall and even snowstorms. Others had put on 3 inches by then. Crop water use for hay in 2011 totaled 19 inches compared with a high of 27 inches in 2013 and 28 inches in 2016. So far 2017 is looking a lot like 2011.

How Does Your New Crop Grow?

Are you experimenting with a new crop, species mix or practice? Are you planting mixes with more species? Are you including Daikon radishes or other soil building plants in your cover crop, hay or pasture mix? Did your no-till pasture improvement work out? Which aerator did the best job? We would like to hear about your new crops, new practices and new ideas? If you have a success story (or failure) to share we want to hear from you! We will keep your identity secret to protect the sensitive.

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

BLACKFOOT 2017 GROWING SEASON WEEKLY RAINFALL & CROP WATER USE (INCHES OF WATER)

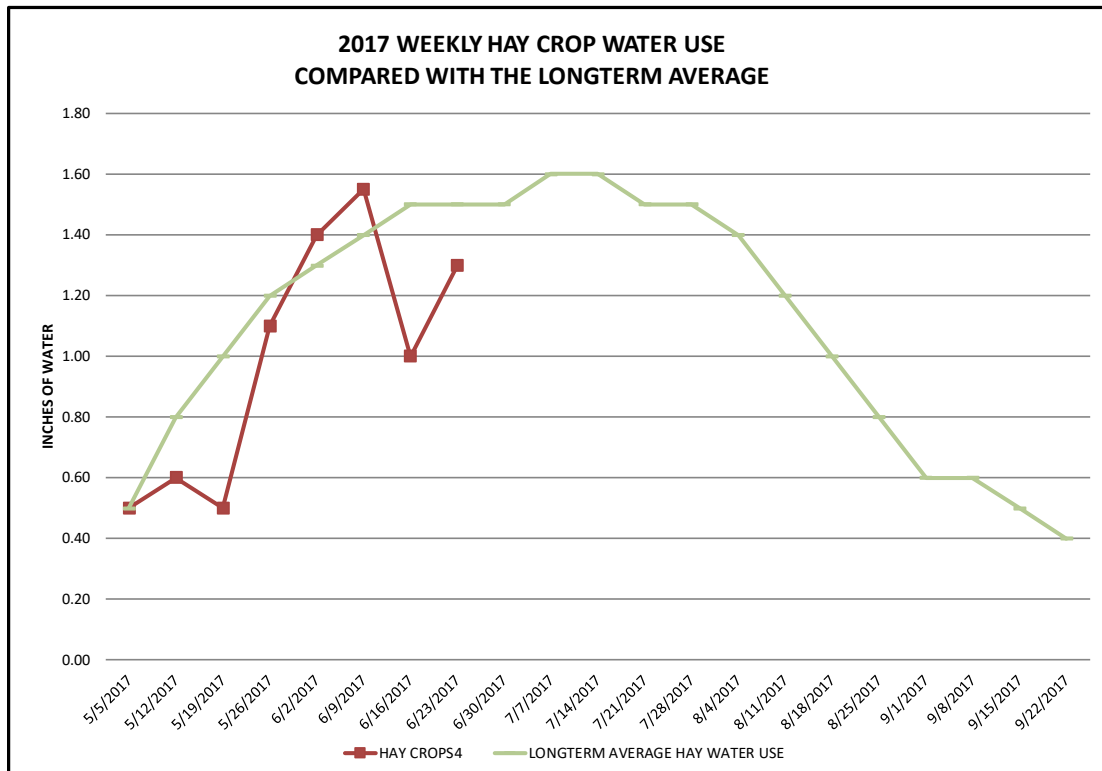
	RAIN ¹	2017 WEEKLY POTENTIAL CROP WATER USE ²						AVERAGE POTENTIAL CROP WATER USE ³		
	RAIN	HAY CROPS ⁴	PASTURE	SPRING GRAINS 5-1 START	SPRING GRAINS 5-15 START	WINTER WHEAT	LAWNS	LONGTERM AVERAGE HAY WATER USE	HOT WEEK HAY WATER USE	COOL WEEK HAY WATER USE
5/5/2017	0.02	0.50	0.40	0.10	0.10	0.50	0.50	0.50	0.80	0.20
5/12/2017	0.25	0.60	0.70	0.10	0.10	0.90	0.70	0.80	1.00	0.50
5/19/2017	1.00	0.50	0.60	0.10	0.10	0.60	0.50	1.00	1.10	0.60
5/26/2017	0.00	1.10	1.00	0.20	0.10	1.10	1.10	1.20	1.30	0.80
6/2/2017	0.25	1.40	1.30	0.60	0.20	1.50	1.40	1.30	1.40	0.90
6/9/2017	0.50	1.55	1.35	1.00	0.30	1.60	1.45	1.40	1.50	1.00
6/16/2017	1.50	1.00	0.90	1.20	0.60	1.20	1.00	1.50	1.70	1.00
6/23/2017	0.00	1.30	1.20	1.40	0.80	1.40	1.30	1.50	1.90	1.10
6/30/2017								1.50	2.00	1.20
7/7/2017								1.60	2.10	1.30
7/14/2017								1.60	2.00	1.20
7/21/2017								1.50	1.90	1.20
7/28/2017								1.50	2.20	1.10
8/4/2017								1.40	1.70	1.00
8/11/2017								1.20	1.50	0.90
8/18/2017								1.00	1.30	0.70
8/25/2017								0.80	1.00	0.50
9/1/2017								0.60	0.80	0.40
9/8/2017								0.60	0.70	0.30
9/15/2017								0.50	0.70	0.30
9/22/2017								0.40	0.60	0.20
9/29/2017								0.40	0.60	0.20
TOTAL	5.02	8.65	8.05	4.80	2.40	9.70	8.75	24.80	31.30	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.



THE BLACKFOOT DRAINAGE IRRIGATION SEASON IN BRIEF

This is a summary of general activities and recommendations with more detail provided throughout our 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.
- Stop irrigating small grains at the milk to soft dough stage but be sure there are 1- 2 inches of soil moisture left at this stage to prevent kernels from shrinking.

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.



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.