



# BLACKFOOT CHALLENGE

## WEEKLY IRRIGATION REPORT

Friday July 7, 2017

It was a hot, dry week for crops and irrigators in the Blackfoot drainage. Only a few spots had a small shower and it did not contribute to soil moisture. Temperatures were the hottest of 2017 and are expected to remain hot (80s and 90s) this coming week. There's no significant rainfall in the forecast. Crop water use is at its highest of the year so far and may be even higher next week – approaching 2 inches. Soil moisture dropped dramatically in fields not irrigated. Hay harvest has begun throughout the drainage and the crop looks good. Blackfoot River flows are dropping fast and are now far below average. A condensed overview of the entire irrigation season is on the last page of this report so you can plan ahead. Please contact Jennifer Schoonen - Blackfoot River Steward (406-360-6445) for more information on this and other Challenge programs.



### WEATHER - HOTTER, SUNNIER

Last week saw no rain on most croplands in the drainage. A few folks had scattered showers that produced less than ¼ inch. Sunny conditions and hot temperatures were great for growing irrigated crops. The coming week is looking sunny and hot again (80s-90s). The 30-day forecast indicates normal temperatures and rainfall. The 90-day forecast indicates above normal temperatures and rainfall.



### CROP WATER USE - VERY HIGH - PEAKING

Crop water reached its highest level of the year last week (1.7 inches for hay and small grains). It will likely increase even more next week. Hot temperatures, no rain and wind all combine to make crops deplete soil moisture fast. The highest potential daily crop water use this year was on June 26 (Hay and small grains used 0.45 inches in one day) and July 4 (0.35 inch) according to the Deer Lodge Agrimet station. Most days have been in the 0.25-0.30 range.

Crop water use for hay crops drops to about 1/3 of the potential the first week after cutting and to about 2/3 of the potential the second week. By the third week, crop water use has returned to its full potential. So if the crop water use for hay is 1 ½ inches a week, just cut hay will use ½ inch the first week, 1 inch the second and 1 ½ inches the third week after cutting.

<b>WATER USE IN INCHES</b>	<b>LAST 7 DAYS</b>	<b>NEXT 7 DAYS<sup>1</sup></b>	<b>SEASON TOTAL<sup>2</sup></b>	<b>DAILY FORECAST<sup>3</sup></b>
<b>HAY CROPS</b>	<b>1.7</b>	<b>1.8</b> (1.5 - 2.0)	12.1	.26
<b>PASTURE</b>	<b>1.4</b>	<b>1.6</b> (1.3 - 1.7)	11.2	.23
<b>SPRING GRAINS</b>	<b>1.2 - 1.8</b>	<b>1.2 - 2.0</b> (1.3 - 2.2)	5.1 – 8.4	.17 - .28
<b>WINTER WHEAT</b>	<b>1.8</b>	<b>1.9</b> (1.6 - 2.1)	13.3	.28
<b>LAWNS</b>	<b>1.7</b>	<b>1.8</b> (1.4 - 1.9)	12.2	.26

<sup>1</sup>Expected water use (range if weather becomes cooler or hotter than expected)

<sup>2</sup>Beginning April 1 – note in 2010-13 we started our seasonal total on May 1 but now include April

<sup>3</sup>Predicted average daily crop water use over the next week.



## SOIL MOISTURE – KEEP IT UP!

Keeping up soil moisture in this very hot weather is a real challenge, especially when you are trying to refill the soil after harvest. More irrigation water evaporates from crop and soil surfaces and less goes into the soil. High crop water use exceeds the ability of some systems to keep up.

The best time to recharge soil moisture is right after cutting when crop water use is reduced to 1/3 of normal the first week and 2/3 of normal the second week. There is also less foliage to catch water which then evaporates before ever reaching the soil. A few irrigators have the systems and flexibility to irrigate at night which is more effective.



If you had a good first cutting and don't plan on fall pasture you can just let the soil stay dry and the crop go dormant until fall rains come. Grasses are adapted to dry conditions and dormancy. However, watch new plantings

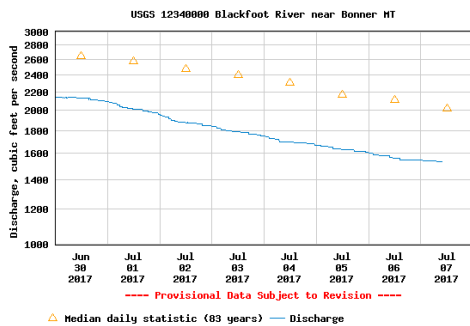
closely during hot weather when they are more vulnerable to high temperature and drought.

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

Blackfoot River flows continue to fall rapidly as the last snows melt and temperatures soar. The new monthly water supply forecast is not yet available but will likely show a substantial drop from last month which was over 100% of normal. Current flow at Bonner is 1,503 CFS which is about 1,000 CFS lower than the average for this date of 2,430 CFS. The lowest flow on July 7 was 587 CFS in 1977 and the highest 8,930 CFS in 1899.



### BUILD UP SOIL MOISTURE BEFORE CUTTING!

The highest stress period for hay crops is at harvest. Try to store up soil moisture before cutting while leaving enough time after your last irrigation to let the surface soil dry out. Get back across the cut field as soon as possible. If you want to build up your soil moisture after cutting, you will need to apply more than the 1 ½ – 2 inches crops are using each week.

### REMEMBER TO LET THE SURFACE SOIL DRY OUT BEFORE HARVEST!

Remember to stop irrigating and let the surface soil dry before harvest. The surface layer of sandy soils may dry out in a few days but clayey soils may take 5 -10 days (half these time with the recent heat we have had). Irrigate as close to harvest as possible and then get back across the field quickly. Apply at least one irrigation after cutting to help plants recover.

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](mailto:barry@landandwaterconsulting.net)

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

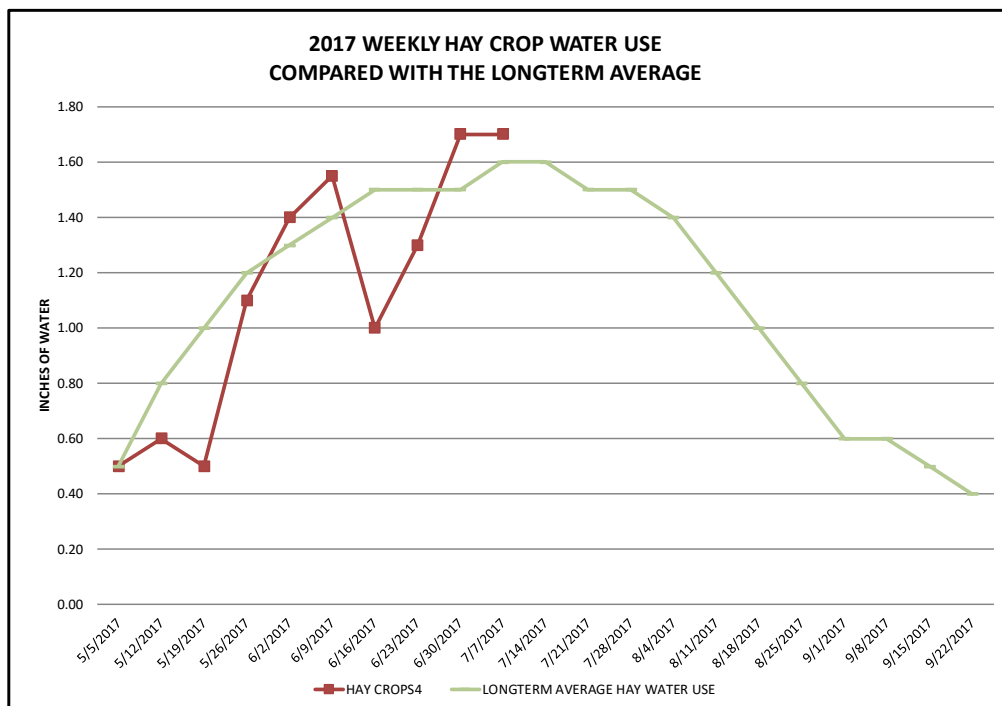
	RAIN <sup>1</sup>	2017 WEEKLY POTENTIAL CROP WATER USE <sup>2</sup>						AVERAGE POTENTIAL CROP WATER USE <sup>3</sup>		
	RAIN	HAY CROPS <sup>4</sup>	PASTURE	SPRING GRAINS 5-1 START	SPRING GRAINS 5-15 START	WINTER WHEAT	LAWNS	LONGTERM AVERAGE HAY WATER USE	HOT WEEK HAY WATER USE	COOL WEEK HAY WATER USE
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	0.25	1.70	1.60	1.80	1.20	1.80	1.70	1.50	2.00	1.20
7/7/2017	0.00	1.70	1.50	1.80	1.50	1.80	1.70	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
<b>TOTAL</b>	<b>5.27</b>	<b>12.05</b>	<b>11.15</b>	<b>8.40</b>	<b>5.10</b>	<b>13.30</b>	<b>12.15</b>	<b>24.80</b>	<b>31.30</b>	<b>17.10</b>

<sup>1</sup> 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)

<sup>2</sup> **This years** maximum water use by healthy crops that are well-fertilized and irrigated, disease and insect-free. Will vary slightly across the drainage.

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

<sup>4</sup> 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.