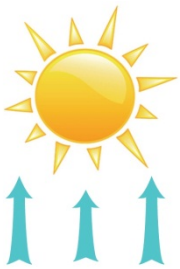
# BLACKFOOT CHALLENGE
# WEEKLY IRRIGATION REPORT
## Friday August 12, 2016

It's been unsettled weather with cooler temperatures, thunderstorms and hail. Next week looks sunny and warm. Weekly crop water use was near average this last week at about 1¼ inches for crops not yet harvested. Low river flows continue to prompt drought response and drought management plans are being implemented – call Jennifer with questions. The last page of this report is a summary of recommendations for the entire irrigation season.

## WEATHER – TURNING HOT+DRY

Cooler temperatures dominated this last week mixed with thunderstorms and scattered rain. Over a foot of hail was reported south of Helmsville and smaller amounts elsewhere. Hot, dry weather is forecast for next week. The 30 day forecast predicts normal temperatures and below normal rainfall. The 90 day forecast says above normal temperatures and normal rainfall.

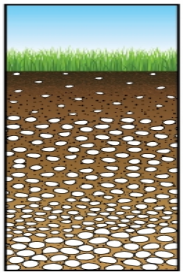


## CROP WATER USE – NORMAL NEXT WEEK

Crop water use will be near the seasonal normal next week with warm temperatures and no rainfall. Crop water use was above average throughout April, below average in May, bounced around average in June and stayed above average for most of July (chart page 3).

| WATER USE IN INCHES | LAST 7 DAYS | NEXT 7 DAYS[1] | | SEASON TOTAL[2] |
|---|---|---|---|---|
| **HAY CROPS** | **1.3** | **1.3** | (1.2 - 1.5) | 21.0 |
| **PASTURE** | **1.1** | **1.1** | (1.0 - 1.3) | 18.6 |
| **SPRING GRAINS** | **1.2** | **0.9** | (0.7 - 1.0) | 18.5 |
| **WINTER WHEAT** | **0.1** (Harvested) | **0.1** | (0.0 - 0.1) | 13.3 |
| **LAWNS** | **1.2** | **1.2** | (1.0 - 1.5) | 19.8 |

[1]Expected water use (range if weather becomes cooler or hotter than expected)
[2]Beginning April 1 – note in 2010-13 we started our seasonal total on May 1 but now include April

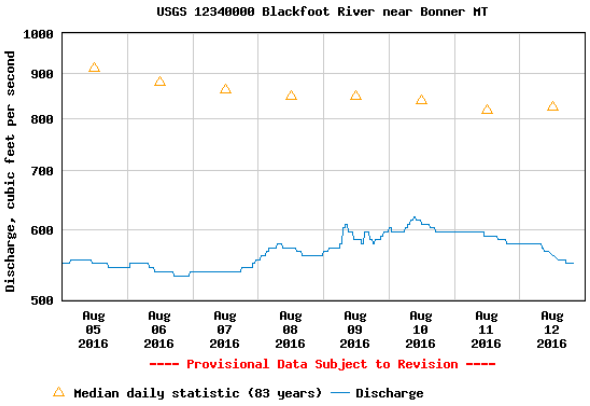


## SOIL MOISTURE – LOW UNLESS IRRIGATED

Most folks are letting soil moisture fall after cutting. Some are applying one irrigation after cutting or even filling up the soil moisture holding capacity before shutting down for the season. Those with available water are irrigating less frequently with smaller amounts which penetrate only into the surface soil. Irrigation is less efficient during this hot part of the summer - less of the applied irrigation water actually gets into the soil for crop use.

# WEEKLY TIPS

## DROUGHT 2016




The Blackfoot River flow at Bonner had a brief rise this week from rain falling in a scattered pattern across the drainage. The river is now at slightly more than half of its average flow. Todays flow is near 550 cfs compared with an average of 836 cfs. The low flow for this date was 364 cfs in 1988 and the high was 2,040 cfs in 1899.

Low flows and predictions of hot dry weather in the 30 day weather forecast suggest that drought conditions will continue.

## DO IRRIGATE AFTER CUTTING

- If you have alfalfa you want to preserve in the stand
- If you have new seedings you need to irrigate up (but consider a planting delay until fall)
- If you do, reduce irrigated acreage and irrigate that well
- If you do, only apply a fraction (25-50%) of the potential crop water use each week
- If you do, rotate systems to reduce your total river withdrawal rate
- If you do, reduce the number of heads running at once

## DON'T IRRIGATE AFTER CUTTING

- If you don't need fall pasture
- If you are reseeding in the fall
- If you are out of water

## SOIL HEALTH INFORMATION SOURCES

There are many sources of information on soil health. Here are a few to start with. Send me your favorites and I will spread them around. We will discuss soil health issues related to irrigation in future weekly reports. The Challenge also has a soil health committee looking into how to spread the word on local options for improving soil health. Tell us your interests and we will try to provide help.

**NRCS SOIL HEALTH WEBSITES**

http://www.nrcs.usda.gov/wps/portal/nrcs/main/mt/soils/health/
http://www.nrcs.usda.gov/wps/portal/nrcs/main/soils/health/
http://www.nrcs.usda.gov/wps/portal/nrcs/main/national/soils/health/

**SOIL HEALTH ORGANIZATIONS**

| | |
|---|---|
| Soil Health Institute | http://soilhealthinstitute.org/ |
| Soil Health Partnership | http://soilhealthpartnership.org/ |
| Soil Health.com | http://www.soilhealth.com/ |
| National Sustainable Agriculture Coalition | http://sustainableagriculture.net/ |

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 2016 GROWING SEASON WEEKLY RAINFALL & CROP WATER USE (INCHES OF WATER)*

| | RAIN[1] | 2016 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 |
| **5/6/2016** | 0.20 | 0.80 | 0.70 | 0.25 | 0.25 | 0.90 | 0.70 | 0.50 | 0.80 | 0.20 |
| **5/13/2016** | 0.30 | 0.90 | 0.80 | 0.25 | 0.25 | 1.10 | 0.80 | 0.80 | 1.00 | 0.50 |
| **5/20/2016** | 0.01 | 1.00 | 0.90 | 0.50 | 0.25 | 1.10 | 1.00 | 1.00 | 1.10 | 0.70 |
| **5/27/2016** | 1.00 | 0.60 | 0.50 | 0.30 | 0.25 | 0.70 | 0.60 | 1.20 | 1.20 | 0.80 |
| **6/3/2016** | 0.20 | 1.00 | 0.90 | 0.70 | 0.40 | 1.10 | 1.00 | 1.30 | 1.30 | 0.90 |
| **6/10/2016** | 0.10 | 1.50 | 1.40 | 1.25 | 0.70 | 1.60 | 1.50 | 1.40 | 1.50 | 1.00 |
| **6/17/2016** | 0.20 | 1.25 | 1.20 | 1.30 | 0.70 | 1.40 | 1.20 | 1.50 | 1.70 | 1.10 |
| **6/24/2016** | 0.10 | 1.50 | 1.40 | 1.60 | 1.20 | 1.50 | 1.50 | 1.50 | 1.90 | 1.10 |
| **7/1/2016** | 0.01 | 1.70 | 1.50 | 1.80 | 1.80 | 1.10 | 1.60 | 1.50 | 2.00 | 1.20 |
| **7/8/2016** | 0.01 | 1.70 | 1.60 | 1.80 | 1.80 | 0.50 | 1.50 | 1.60 | 2.10 | 1.30 |
| **7/15/2016** | 1.25 | 1.20 | 1.00 | 1.30 | 1.30 | 0.10 | 1.20 | 1.60 | 2.00 | 1.20 |
| **7/22/2016** | 0.10 | 1.60 | 1.40 | 1.90 | 2.00 | 0.10 | 1.50 | 1.50 | 1.90 | 1.20 |
| **7/29/2016** | 0.00 | 1.70 | 1.50 | 1.90 | 1.90 | 0.10 | 1.60 | 1.50 | 2.20 | 1.10 |
| **8/5/2016** | 0.00 | 1.70 | 1.50 | 1.90 | 1.90 | 0.10 | 1.60 | 1.40 | 1.70 | 1.00 |
| **8/12/2016** | 0.25 | 1.30 | 1.00 | 1.00 | 1.20 | 0.10 | 1.20 | 1.20 | 1.50 | 0.90 |
| **8/19/2016** | | | | | | | | 1.00 | 1.30 | 0.70 |
| **8/26/2016** | | | | | | | | 0.80 | 1.00 | 0.50 |
| **9/2/2016** | | | | | | | | 0.60 | 0.80 | 0.40 |
| **9/9/2016** | | | | | | | | 0.60 | 0.70 | 0.30 |
| **9/16/2016** | | | | | | | | 0.50 | 0.70 | 0.30 |
| **9/23/2016** | | | | | | | | 0.40 | 0.60 | 0.20 |
| **9/30/2016** | | | | | | | | 0.40 | 0.60 | 0.20 |
| **TOTAL** | **4.43** | **20.95** | **18.55** | **18.50** | **16.65** | **13.25** | **19.75** | **24.80** | **31.10** | **17.30** |

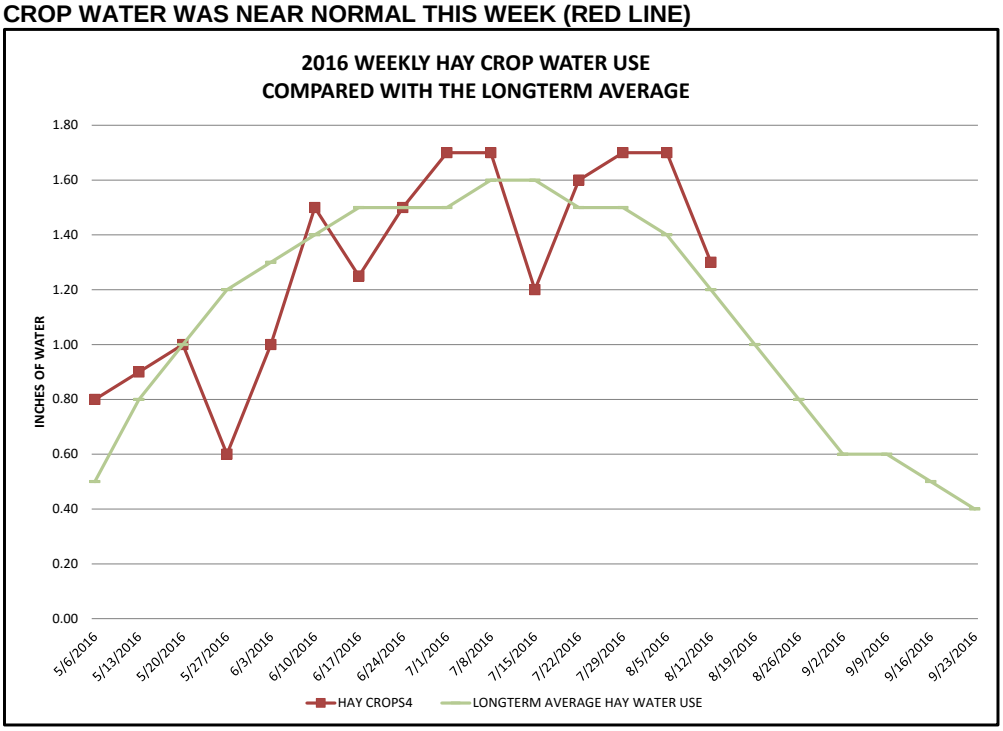
[1] Rainfall should be reduced to account for immediate evaporation from crop and soil surfaces (0.1-April,May and Sept, 0.15-June and August, 0.2-July)

[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 is reduced by approximately 2/3 the first week after cutting, 1/2 the second and 1/3 the third.

**CROP WATER WAS NEAR NORMAL THIS WEEK (RED LINE)**



## 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 and water availability. Irrigate new plantings as needed.
- Some folks irrigate for pasture following their one hay cutting. Irrigate according to pasture needs and with consideration for other water users.
- Reduce river withdrawals by rotating systems, reducing the amount area irrigated at one time and by delaying irrigation until streamflows recover.

### 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 and water availability. Irrigate new plantings as needed. Plan for higher temperatures, earlier springs and less water. Next year put some acres in lower water use crops including annual crops, alter rotations, reseed/inter-seed or come up with your own ideas to reduce overall ranch water use.