



# BLACKFOOT CHALLENGE

## WEEKLY IRRIGATION REPORT

Friday May 19, 2017

Welcome to the 2017 irrigation season! Please contact Jennifer Schoonen - Blackfoot River Steward (406-360-6445) for more information on this and other Challenge programs. We will provide weekly summaries of weather, crop water use and soil moisture conditions as well as tips for irrigation, soil health and crop production. These summaries are based on our weekly work throughout the drainage.

2017 is looking a lot like 2011 when cool moist weather persisted through May. As in 2011, most local cropland soils are recharged to over 75% of their water holding capacities. This year it was hard find a sprinkler operating on the first of May. For the past five years, irrigation has begun in April.

We expect fewer drought issues this year and so will provide more information about soil health and how it fits into irrigation and crop production. A condensed overview of suggestions for the entire irrigation season is presented on the last page of this report.

### WEATHER - SNOW GONE, SUN AND WARMTH RETURNS



We begin this irrigation season moist and cool with above average rainfall, including in April. Then it snows in May, just like it always used to. That is some of the most effective precipitation of the season with most of it contributing to soil moisture. It seems unlikely that drought conditions will develop this year, especially during the main crop season. Warmer, sunnier conditions are expected this week with little possibility of significant rain showers. The 30 day

forecast indicates normal temperatures and rainfall. The 90 forecast indicates above normal temperatures and normal rainfall.

### CROP WATER USE - LOW



When it snows, crop water use is low. It has been low all spring especially this last snowy week. It's going to warm up significantly and get sunny for most of the coming week so expect some dramatic crop growth from plants that have just been waiting to show their stuff. Crop water use was lower than average throughout April and this may be a cool, moist year overall. The last year like this was 2011.

<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>HAY CROPS</b>	<b>0.5</b>	<b>0.8</b> (0.6 – 1.0)	<b>3.7</b>
<b>PASTURE</b>	<b>0.4</b>	<b>0.7</b> (0.6 - 1.0)	<b>3.2</b>
<b>SPRING GRAINS</b>	<b>0.1</b>	<b>0.2</b> (0.1 - 0.3)	<b>0.0</b>
<b>WINTER WHEAT</b>	<b>0.5</b>	<b>0.9</b> (0.7 – 1.1)	<b>4.2</b>
<b>LAWNS</b>	<b>0.5</b>	<b>0.8</b> (0.6 – 1.0)	<b>3.5</b>

<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



## **SOIL MOISTURE - HIGHEST IN YEARS ON MAY 1**

Soil moisture levels throughout the drainage this week were higher than the past 5 years. Most sites that have not yet been irrigated had about 75% of their soil moisture holding capacity. That means a clay soil that usually holds 6 inches of water in the 3 foot root zone had 4.5 inches. Sandy/Rocky soils that usually holds 3 inches of water in the 3 foot root zone had 2-2.5 inches. This is similar to conditions at the start of 2011 our last wet year. Winter snowmelt, spring rains and cool conditions have boosted soil moisture just like in the old days.



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 content and irrigation options.

### **Irrigation Information Available from the Blackfoot Challenge:**

- Weekly irrigation reports for all basin irrigators – Available by email and on the Challenge website (you are reading an example now)
- Blackfoot Irrigation Guide – Available on the Challenge website
- Irrigation Information Handouts - Available on the Challenge website
- Irrigation Workshops
- Irrigation Consultant – Available by phone and email for irrigation questions
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### **Use This Info To:**

- Compare weekly crop water use with how much you irrigate
- Learn your soil water holding capacity – mostly 1 - 2 inches per foot
- Know your critical crop periods – June for most crops
- Know dry soil from moist
- Know how deeply your irrigation penetrates – 1 inch only goes  $\frac{1}{2}$  to  $\frac{3}{4}$  foot deep
- Identify options for drought years – especially irrigate early while its available
- Apply the right amount of water at the right time to achieve your goals.

## WEEKLY TIPS

### Water Supply and Streamflows

The May 1 water supply forecast has great news for irrigators. Snowpack in the Upper Clark Fork drainage (including the Blackfoot) is reported as 109% of normal and 140% of last years. Precipitation for this water year is 113% of normal. Precipitation for April is 105% of normal. Reservoir storage is 85% of normal, slightly lower than last year at this time.

Blackfoot streamflow predictions for May-July are for 120% of normal so water should be available throughout the main irrigation season. Current Blackfoot river flow is about 8000 CFS at Bonner (about twice normal).



**Time to Fill Up Your Soil and Keep Moisture Levels High.** May is the easiest time to fill up your soil moisture holding capacity, before crop water use gets high. For the next few weeks, crop water use for hay and pasture will be 1 - 1 ½ inches per week. Applying more than this amount will add to soil moisture storage. Right now most soils that have not been irrigated are almost dry so there is a lot of catching up to do.

A good soil (clay, silt, loam with few rocks) will hold 1 ½ - 2 inches of water per foot or 4 - 6 inches in a three-foot root zone (depth managed for hay and pasture crops). If you have not yet irrigated, you only have 1-2 inches so you need to add 2-5 inches to fill up your soil. Remember to also add what the crop uses while you irrigate (1-1½ inch per week) to completely fill up the soil.

A very sandy and rocky soil will hold about 1 inch of water per foot or 3 in a three-foot root zone (depth managed for hay and pasture crops). Most of these soils only showed about 1 inch of stored soil moisture this week so it would take 2 more inches to fill them up. Remember to also add what the crop uses while you irrigate (1-1½ inch per week) to completely fill up the soil.

### Not Sure How Much Water to Apply?

**JUST LOOK!** It's not rocket science, check your soil moisture with a soil probe or shovel until the soil is moist to a depth of 3 feet for hay and pasture crops or 2 feet for annual crops. If it looks and feels moist – you're good. If its dusty and dry – keep irrigating. Call for a guide to soil moisture estimating.

### Roots

Irrigate deeply at the start of the irrigation season to promote deep root growth. If you allow the soil to dry out and then only apply 1 inch at a time, you will only moisten the top 6-8 inches. This means your crop is looking for all its moisture and nutrients in this thin soil layer. Irrigate new crops deeply after they are established to moisten the entire root zone and lead your roots to deeper depths.

### Drought in 2017?

It appears that drought conditions are possible if not likely this year. Here are some options for reducing water use taken from our irrigation guide which is available on the Blackfoot Challenge website and includes details for each option. Some strategies can be used immediately and others require planning ahead and can be used in future years. Some of these practices can have negative consequences for irrigators (usually lower yield or loss of alfalfa plants).

For further information contact [Jennifer Schoonen](mailto:Jennifer.Schoonen@blackfootchallenge.com), Blackfoot Challenge Water Steward, 406-360-6445 or [Barry Dutton](mailto:Barry.Dutton@landandwaterconsulting.net), 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)**

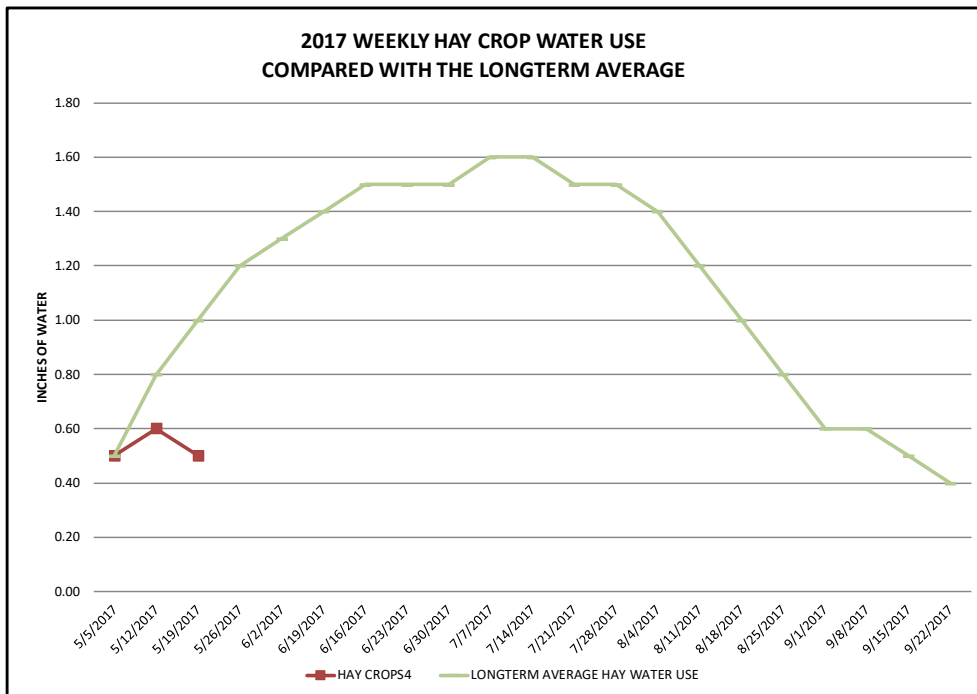
	RAIN <sup>1</sup>	2017 WEEKLY POTENTIAL CROP WATER USE <sup>2</sup>						AVERAGE POTENTIAL CROP WATER USE <sup>3</sup>		
	RAIN	HAY CROPS <sup>4</sup>	PASTURE	SPRING GRAINS 5-1 START	SPRING GRAINS 5-15 START	WINTER WHEAT	LAWNS	LONGTERM AVERAGE HAY WATER USE	HOT WEEK HAY WATER USE	COOL WEEK HAY WATER USE
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								1.20	1.20	0.80
6/2/2017								1.30	1.30	0.90
6/9/2017								1.40	1.50	1.00
6/16/2017								1.50	1.70	1.10
6/23/2017								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
<b>TOTAL</b>	<b>2.77</b>	<b>2.30</b>	<b>2.30</b>	<b>0.40</b>	<b>0.40</b>	<b>2.90</b>	<b>2.50</b>	<b>24.80</b>	<b>31.10</b>	<b>17.20</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 is reduced by 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.