



BLACKFOOT CHALLENGE WEEKLY IRRIGATION REPORT

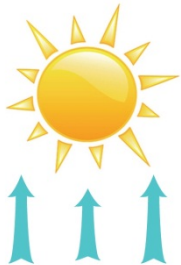
Friday June 10, 2016

It was hot this week and crops responded with a dramatic increase in crop water use. The great news is the equal increase in crop volume and early maturing crops. Showers and cloudy weather is supposed to start the next week and yield to sunnier skies midweek. Temperatures will be slightly cooler making excellent growing conditions. Crop water use was about 1 ½ inch/week for most crops and should be similar this next week. The last page of this report is a summary of recommendations for the entire irrigation season.



WEATHER - COOLER WITH SHOWERS THEN MILD WITH SUN

Hot temperatures, low humidity and occasional breezes dominated the weather last week on Blackfoot croplands. Most folks in the lower drainage had 0.1 inch of rain or so with a little more in the upper drainage. A few sites reported 0.6 inch. The coming weekend should have showers and midweek clear to sunny skies. Scattered lucky folks could get a good rain. Temperatures will be mild (70s). The 30 day forecast indicates above normal temperatures and rainfall. The 90 forecast indicates above normal temperatures and below normal rainfall.



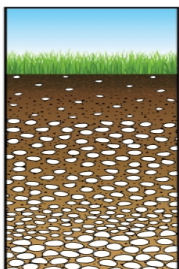
CROP WATER USE - ABOUT NORMAL

Hot, dry, breezy weather made crop water use soar last week. It will similar next week due to more normal weather conditions. Crop water use was much higher than average throughout April and early May then dropped below average for two weeks in May and now has bounced up above average (chart page 3).

WATER USE IN INCHES	LAST 7 DAYS	NEXT 7 DAYS¹	SEASON TOTAL²
HAY CROPS	1.5	1.5 (1.3 - 1.7)	7.3
PASTURE	1.4	1.4 (1.2 - 1.6)	6.5
SPRING GRAINS	1.0	1.25 (1.2 - 1.4)	4.0
WINTER WHEAT	1.6	1.6 (1.4 - 1.8)	8.3
LAWNS	1.5	1.5 (1.3 - 1.7)	6.9

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



SOIL MOISTURE - TIME TO FILL IT UP

Showers this last week contributed little or nothing to soil moisture. Soils that were not irrigated this week mostly lost about 1 ½ inches of water to crop use. New seedings lost much less.

WEEKLY TIPS

Now Is the Month for All Good Irrigators to Pour It On

June is the main growing season for all local crops and the time to pour on the water! The best thing irrigators can do for their crops and the basin-wide water supply is to irrigate well now and be prepared to cut back when streamflows fall to critical levels. Check your soil moisture with a soil probe or shovel and if it looks and feels moist – you're good. If it's dusty and dry – keep irrigating. This applies to both sprinkler and flood systems. Then give it a few days and look again - you will be surprised how much water a crop can use and how quickly soils dry out!

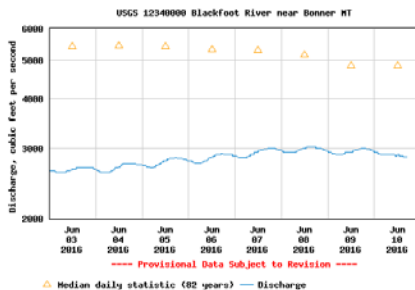
REMEMBER JUNE CROP WATER USE IS 6-8 INCHES!

Can You Hear Your Good Irrigation?

Here's another method for determining soil moisture content. You can *hear* a well-irrigated field grow on a hot day. No, I didn't bonk my old head with my soil probe, it's true. It works best in corn fields but small grains like wheat, barley and oats also produce audible sounds like a quiet popcorn popper. So if you can hear your crop growing – you likely have a good soil moisture content.

DROUGHT 2016?

The Blackfoot River at Bonner did not drop much this week but remains about half the average for this date. Today's flow is about 2,860 cfs versus an average of 5,530 cfs. The low flow for this date was 1,360 cfs in 1987 and the high was 18,000cfs in 1964. With hot dry weather in the forecast and low flows, drought remains a concern for later in the season.



We Are Some of the Luckiest Irrigators in the World!

I just spent a week in Greece, mainly on the island of Santorini - central to many of the Atlantis myths. As a soil scientist it is amazing to consider the soil history of the last 5000 years at such a place. Many of these islands and the surrounding Mediterranean countries were forested (remember the Cedars of Lebanon). Cedar, pine, cyprus and other forests were cut again and again. Goats and other herd animals were grazed to excess. Invaders burned large areas and destroyed irrigation systems to spread their hurtful impact into the future. Soils eroded from the hills and mountains to literally bury the civilizations we dig up today. The only decent soil left on hillsides seems to be contained by elaborate terrace systems. From a water view, the huge reservoir of water once contained in the forest+rangeland+riparian areas+soil hydrologic system is now gone. The entire ecosystem has dried out. Drinking water comes in a bottle for the 15,000 residents and hundreds of thousands of tourists.

We often congratulate ourselves for being great land stewards but in many ways we simply have the last best resources to work with. Let's make sure we treat them better than ancient man. For more info on this subject see: <https://www.google.com/#q=conquest+of+the+land+through+7000+years>.

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		
		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	0.80	1.60	1.50	1.40	1.50	1.00
6/17/2016								1.50	1.70	1.10
6/24/2016								1.50	1.90	1.10
7/1/2016								1.50	2.00	1.20
7/8/2016								1.60	2.10	1.30
7/15/2016								1.60	2.00	1.20
7/22/2016								1.50	1.90	1.20
7/29/2016								1.50	2.20	1.10
8/5/2016								1.40	1.70	1.00
8/12/2016								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	2.51	7.30	6.45	4.00	2.95	8.25	6.85	24.80	31.10	17.30

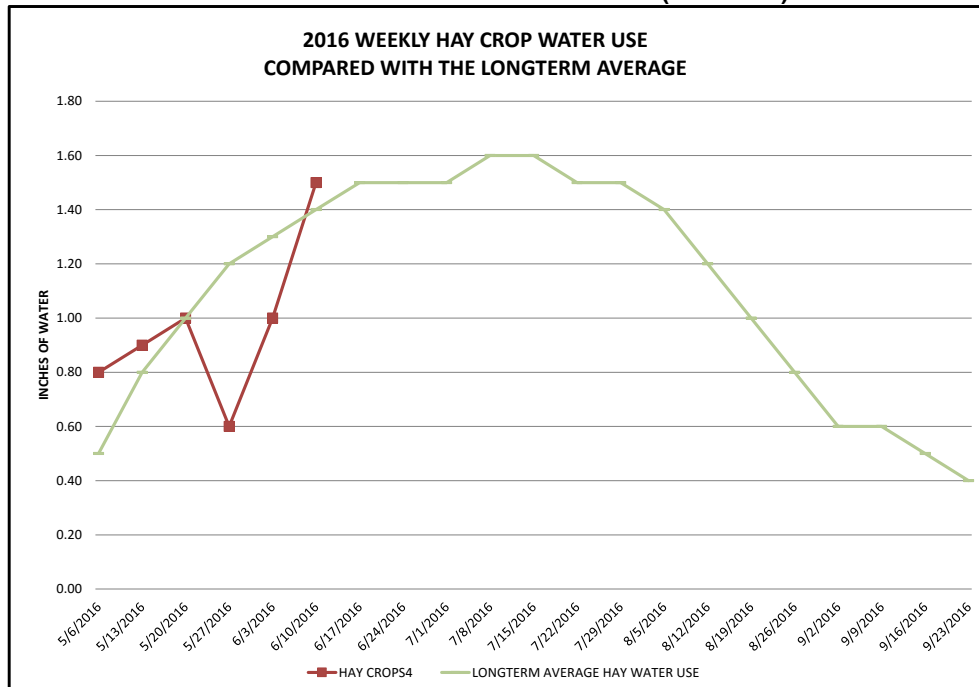
¹ Rainfall should be reduced to account for immediate evaporation from crop and soil surfaces (0.1-April,May and Sept, 0.15-June and August, 0.2-July)

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 ABOVE AVERAGE UNTIL 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. 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.