



BLACKFOOT CHALLENGE WEEKLY IRRIGATION REPORT

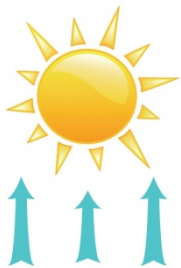
Friday June 3, 2016

It was cool and rainy for Memorial Day weekend (as usual) then the heat came on and crops are taking off like the Fourth of July! Hot dry weather will continue into next week. Crop water use was about 1 inch/week and should increase to a more seasonal 1 ¼ inch this next week. The last page of this report is a summary of recommendations for the entire irrigation season.



WEATHER - HEATING UP

We had a little more rain and cool temperatures with ¼ to ½ inch of rain on local croplands. Then it turned hot and sunny for ideal growing conditions which will continue next week. The 30 day forecast indicates above normal temperatures and rainfall. The 90 forecast indicates above normal temperatures and below normal rainfall.



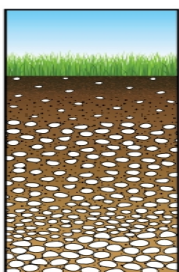
CROP WATER USE - BELOW NORMAL BUT INCREASING FAST

Crop water use was still below normal this last week due to cool temperatures and a little moisture. It will increase next week to near-normal levels due to warming temperatures and little or no rain. Crop water use was much higher than average throughout April and early May then dropped below average for the last two weeks (chart page 3).

WATER USE IN INCHES	LAST 7 DAYS	NEXT 7 DAYS¹	SEASON TOTAL²
HAY CROPS	1.0	1.1 (0.9 - 1.2)	5.8
PASTURE	0.9	1.0 (0.7 - 1.1)	5.1
SPRING GRAINS	0.5	0.7 (0.4 - 0.7)	2.8
WINTER WHEAT	1.1	1.2 (0.9 - 1.3)	6.7
LAWNS	1.0	1.1 (0.8 - 1.2)	5.4

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 week contributed slightly to soil moisture but have not kept up with crop water use. However, this was a good week for irrigating with cool temps early on. Cool and moist conditions allow most irrigation water to enter the soil with little evaporation. Many irrigated soils observed recently have been filled up and are ready to take advantage of the hot weather ahead.

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!

Critical Crop Periods

We talk about *Critical Crop Periods* as those time when irrigation is most important. Sometimes we are shooting for high yield and sometimes for quality concerns. We manipulate soil moisture to manipulate protein in alfalfa, sugar in beets and oil in mint. For most crops, we pour on water to get more production.

Crop Establishment

The most critical period for all crops is germination, emergence and early growth. If the crop does not get established well with a good, dense, even cover it can never produce fully. Spring rains used to be dependable but now it is essential to watch closely and irrigate with small amounts as needed.

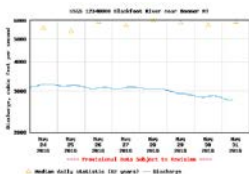
Hay

In the Blackfoot Drainage the main crop is hay with one cutting and maybe some pasture. The time of greatest stress for crop plants is at cutting (see how you like having your head cut off). This is especially true for alfalfa. To reduce stress, irrigate as close to cutting as possible - BUT - leave time for the surface to dry out before you cut. Even more important is to get the water back on as soon after cutting as possible. Irrigate once after cutting even if you will not use the pasture or try for a second cutting. Stress indicators for alfalfa include a bluish-green color followed by wilted leaves. However, alfalfa may not always show obvious stress but will simply stop growing until additional water is supplied.

Small Grains

The most critical periods for small grains includes the Boot, Bloom and Early Heading stages. Stop irrigating at the milk to soft dough stage but watch late season soil and plant tissue moisture levels closely to be sure there is sufficient water to keep kernels from shriveling. If the soil is dry and the kernels are not plump then consider irrigating again especially if hot weather is predicted. Since small grains are grasses, they show fewer signs of stress and may simply stop growing during dry periods with little harm. Stress indicators for small grains include a dark green color followed by reddish, yellowish and brownish colors on lower leaves.

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 2,750 cfs versus an average of 5,960 cfs. The low flow for this date was 1,060 cfs in 1941 and the high was 13,000cfs in 1899. With hot dry weather in the forecast and low flows, drought remains a concern for later in the season.

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								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	2.41	5.80	5.05	2.75	2.15	6.65	5.35	24.80	31.10	17.30

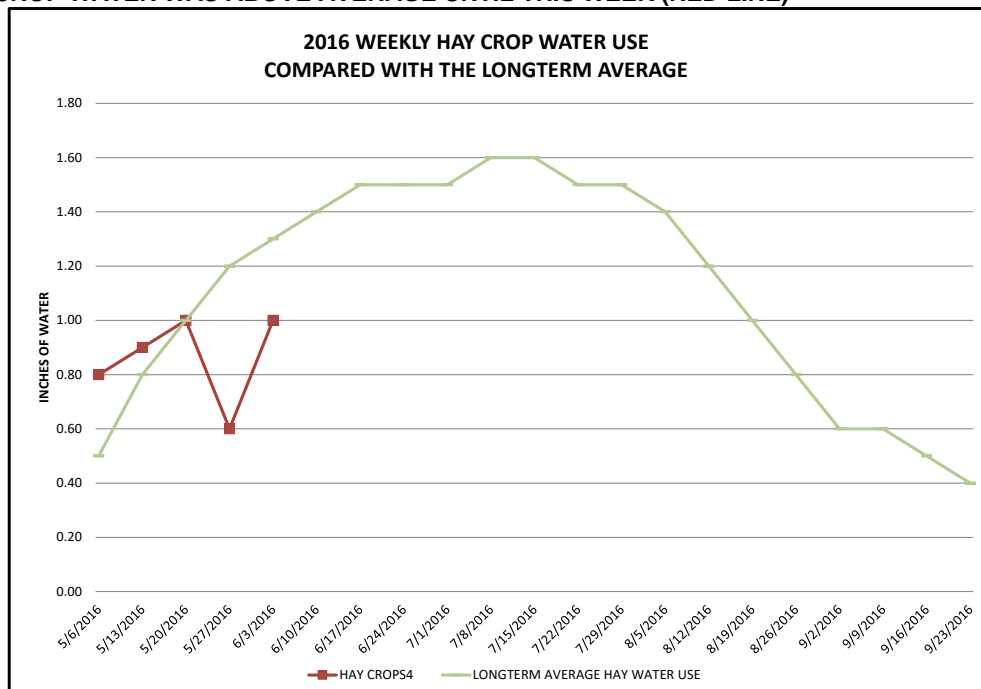
¹ Rainfall should be reduced to account for immediate evaporation from crop and soil surfaces (0.1-April,May and Sept, 0.15-June and August, 0.2-July)

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.