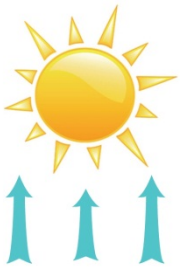
BLACKFOOT CHALLENGE
WEEKLY IRRIGATION REPORT
Friday May 13, 2016

The theme so far for 2016 is to irrigate early and well - while water supplies last and growing conditions are good. Weather has continued to be warm with below-average rainfall. Showers and cooler temperatures are forecast next week. Crop water use is higher than normal (about 1 inch/week) and crop growth is also ahead of schedule. Pay close attention to new seedings and add water to ensure good germination and early growth. Irrigators are filling up the root zone with soil moisture while water supplies last.

WEATHER – WARM WITH SHOWERS

We begin this irrigation season dry and warm with below average rainfall so far this year, including in April. Above average temperatures have once again started the growing season weeks ahead of "normal". There is a potential for drought conditions to develop later in the summer if dry conditions persist. Warm temperatures are expected next week with the possibility of scattered rain showers. The 30 day forecast indicates normal temperatures and rainfall. The 90 forecast indicates above normal temperatures and normal rainfall.

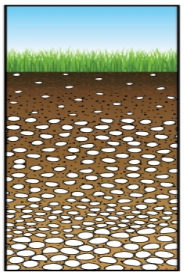


CROP WATER USE – MODERATE (HIGHER THAN NORMAL)

Crop water use was higher than normal this last week due to warm temperatures and dry conditions. It will be moderate next week with warm temperatures and possible showers. Crop water use was much higher than average throughout April.

WATER USE IN INCHES	LAST 7 DAYS	NEXT 7 DAYS[1]		SEASON TOTAL[2]
HAY CROPS	**0.9**	**1.0**	(0.8 - 1.1)	3.0
PASTURE	**0.8**	**0.9**	(0.7 - 1.1)	2.8
SPRING GRAINS	**0.25**	**0.25**	(0.25 - 0.5)	0.0
WINTER WHEAT	**1.1**	**1.2**	(0.8 - 1.3)	3.5
LAWNS	**0.8**	**0.9**	(0.8 - 1.1)	2.8

[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 – TIME TO FILL IT UP

Cropland soil moisture remains very low throughout the drainage this week where not irrigated. Most irrigators have poured on the water and crops have responded well due to above normal temperatures. Conditions this year are similar to 2013 and 2015, our last drought years. Remember what you did those years and how it worked out then plan accordingly.

WEEKLY TIPS

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.

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 about 2 inches so you need to add 2 – 4 inches to fill up your soil. Remember to also add what the crop uses while you irrigate (about 1 inch this coming week) to completely fill 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 (about 1 inch this coming week).

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 it's dusty and dry – keep irrigating. Call for a guide to soil moisture estimating.

How Much Water Are You Really Putting On?!

In over half of our irrigation system tests, less water was being applied than thought. Low pressure, worn parts, obstructions, improper computer setup and many other reasons have been identified. You can easily check your application against your chart by setting out 4-6 rain gauges or straight-walled containers under one of the middle spans of a pivot or 5-10 cans under a wheel line.

Remember - your application is further reduced by evaporation from crop and soil surfaces. This can be as little as 1/10 inch in cool weather and bare soil or more than 1/4 inch in hot, windy weather with a fully developed crop canopy. It is only the water that gets into the soil that actually grows your crop.

On-Farm Weather Monitoring Stations Come to the Blackfoot Drainage

In the future, many or most agricultural irrigation systems will likely be fully automated with weather and soil moisture monitoring. This information will be computer processed and the proper amount of water applied automatically. Cell phones (or brain implants?) will alert us to progress and problems. Golf courses have been perfecting these systems for irrigation and agriculture is coming along.

Researchers from the University of Montana and others are refining an on-farm monitoring station and installing them across the state. These stations provide weather and soil moisture information that the irrigator (or other authorized person) can access anytime by cell phone. The system is not directly connected to the irrigation system but provides up-to-date info for making decisions. The Challenge will help install and calibrate local stations then report on their operation and usefulness.

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
APRIL	0.70	1.50	1.25	0.00	0.00	1.75	1.25			
5/6/2016	0.20	0.80	0.70	0.00	0.00	0.90	0.70	0.50	0.80	0.20
5/13/2016	0.30	0.90	0.80	0.00	0.00	1.10	0.80	0.80	1.00	0.50
5/20/2016								1.00	1.10	0.70
5/27/2016								1.20	1.20	0.80
6/3/2016								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	
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	**1.20**	**3.20**	**2.75**	**0.00**	**0.00**	**3.75**	**2.75**	**23.80**	**29.60**	**15.60**

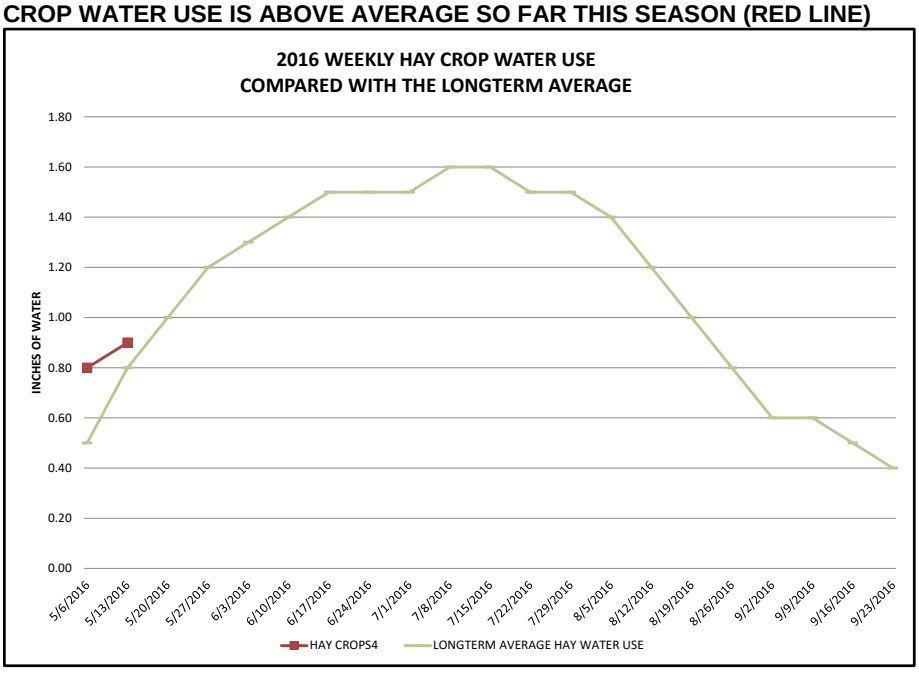
[1] Rainfall should be reduced to account for immediate evaporation from crop and soil surfaces (0.1-April,May and Sept, 0.15-June and August, 0.2-July

[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 USE IS ABOVE AVERAGE SO FAR THIS SEASON (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.