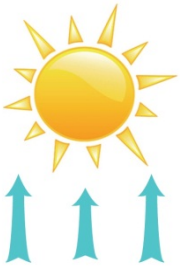
BLACKFOOT CHALLENGE WEEKLY IRRIGATION REPORT

Friday May 30, 2014

The irrigation season continues at a fairly normal pace with crop water use average for this time of year. Temperatures warmed slowly and little or no rain fell this week. Most flood irrigation systems and many sprinklers are running water throughout the drainage. Sites not yet irrigated have dry surface soils. Some moisture still remains in most subsoils but is dropping fast. Crop water use should increase to high levels this week. The last page of this report is a condensed summary of recommendations for the entire season. Work towards these goals for best results and check out our irrigation guide for more details at:
http://blackfootchallenge.org/Articles/wp-content/uploads/2013/06/BFIrrigationGuideFinalv3.0.pdf

WEATHER – WARMING BUT NORMAL

A mix of cool and warm temperatures this past week should continue next week then give way to warmer and drier conditions. Most croplands across the drainage received no rain this week. The 30 day forecast indicates below normal temperatures and above normal rainfall. The 90 day forecast indicates below normal temperatures and average rainfall.

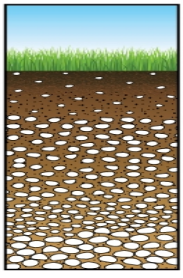


CROP WATER USE – MODERATE AND INCREASING

Crop water use continued to creep upward this last week due to slightly warmer temperatures, low humidity and intermittent wind. Crop water use will again be moderate next week. See the table and chart on Page 3 for more details. Now is the time to take advantage of lower crop water use to fill up your soil to its full water holding capacity.

WATER USE IN INCHES	LAST 7 DAYS	NEXT 7 DAYS[1]		SEASON TOTAL[2]
HAY CROPS	**1.2**	**1.3**	(1.0 - 1.5)	3.9
PASTURE	**1.1**	**1.2**	(0.9 -1.4)	3.4
SPRING GRAINS (5-15 planting)	**0.75**	**0.9**	(0.8 -1.1)	1.0
WINTER WHEAT	**1.3**	**1.5**	(1.2 -1.6)	4.3
LAWNS	**1.1**	**1.3**	(0.9 -1.4)	3.7

[1]Expected water use (range if weather becomes cooler or hotter than expected)
[2]Beginning May 1 - season start date



SOIL MOISTURE – DROPPING FAST BUT AVERAGE FOR THIS TIME OF YEAR

Soil moisture dropped significantly this week due to little rain, warmer temperatures and corresponding crop growth. Most soils in the lower drainage have ¼ or less of their water holding capacities (WHC) in the upper foot and about ¼-½ in the second and third foot. Best production is achieved by keeping the soil above ½ of its WHC. Irrigators should add extra water in May to both meet crop use and fill up the soil.

WEEKLY TIPS

You!

You are the source of ideas for our weekly tips. It is your questions and comments over the years that tell us what to talk about. We try to blend timely reminders of important irrigation subjects everyone should know with answers to the specific questions you bring up. So share your curiosity with your neighbors by telling us what you want to hear about.

Do Plants Suck?

Each year I'm asked how water moves through the soil and plant to reach the atmosphere. No, there are not little men with pumps connected to each root pushing upward. Water infiltrates the soil surface and moves mostly through the large pores until it is all absorbed into smaller pores. These small pores hold it against gravity until a root hair grows by and moves it into the plant. The force that "pumps" the water up the plant to eventually exit through a leaf stoma (opening) is actually the sucking of the atmosphere. This sucking is created by the difference in vapor pressure between the soil atmosphere (high) and the above-ground atmosphere (low). So plant don't suck, but the atmosphere does and plants are like a bunch of straws into the soil. This is similar to connecting a wire from the positive and negative poles of a battery.

Check Your Soil Moisture Yourself

It's not rocket science to determine how much moisture is in your soil. Dig up a chunk or use a soil probe and take a look. If it looks dry it has no water. If you can see shiny water it is near its moisture holding capacity (full). The simplest way to irrigation schedule is simply to look at your soil and keep it above 50% of its water holding capacity. See page 4 or call Barry for assistance.

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. This will require adding 2-4 inches of water in addition to the inch per week by the crop.

Roots

Irrigate deeply at the start of the irrigation season to moisten the entire root zone and 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. Check for deep moisture penetration with a soil probe or shovel.

NOW IS THE TIME TO POUR ON THE WATER!

Whether you practice careful irrigation scheduling all year, or have a more casual attitude towards irrigation - **now is the time to get the biggest bang for your efforts!** Now is the time to pour on the water in amounts that match the actual crop water use. For the next 4-6 weeks before cutting, alfalfa will use 1 ½ – 2 inches during hot weeks and 1 – 1 ½ inches during cool weeks. To get the best production you should apply these amounts - or as close to them as possible. These weekly reports will tell you how much each crop actually uses in the Blackfoot drainage.

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 2014 GROWING SEASON WEEKLY RAINFALL & CROP WATER USE (INCHES OF WATER)

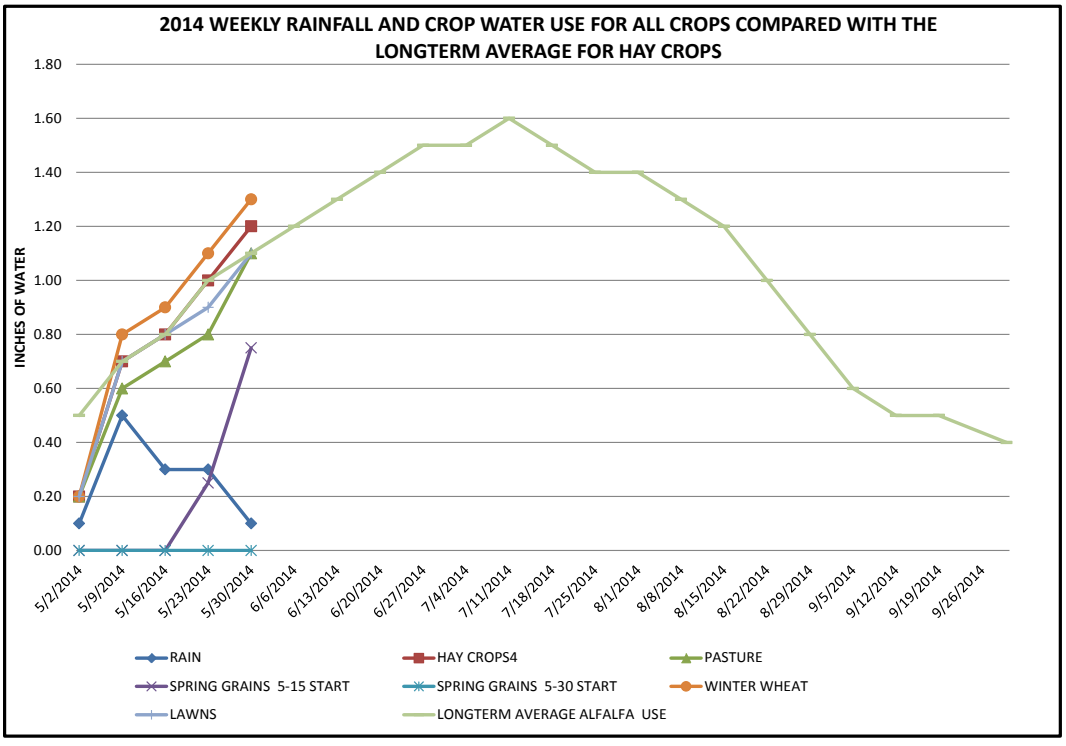
	RAIN[1]	2013 WEEKLY POTENTIAL CROP WATER USE[2]						AVERAGE POTENTIAL CROP WATER USE[3]		
	RAIN	HAY CROPS[4]	PASTURE	SPRING GRAINS 5-15 START	SPRING GRAINS 5-30 START	WINTER WHEAT	LAWNS	LONGTERM AVERAGE ALFALFA USE	HOT WEEK ALFALFA HAY WATER USE	COOL WEEK ALFALFA HAY WATER USE
5/2/2014	0.10	0.20	0.20	0.00	0.00	0.20	0.20	0.50	0.80	0.20
5/9/2014	0.50	0.70	0.60	0.00	0.00	0.80	0.70	0.70	0.90	0.30
5/16/2014	0.30	0.80	0.70	0.00	0.00	0.90	0.80	0.80	1.00	0.40
5/23/2014	0.30	1.00	0.80	0.25	0.00	1.10	0.90	1.00	1.10	0.60
5/30/2014	0.10	1.20	1.10	0.75	0.00	1.30	1.10	1.10	1.20	0.80
6/6/2014								1.20	1.30	0.90
6/13/2014								1.30	1.50	1.00
6/20/2014								1.40	1.70	1.10
6/27/2014								1.50	1.90	1.10
7/4/2014								1.50	2.00	1.20
7/11/2014								1.60	2.10	1.30
7/18/2014								1.50	2.00	1.20
7/25/2014								1.40	1.90	1.10
8/1/2014								1.40	2.20	1.10
8/8/2014								1.30	1.70	1.00
8/15/2014								1.20	1.50	0.90
8/22/2014								1.00	1.30	0.70
8/29/2014								0.80	1.00	0.50
9/5/2014								0.60	0.80	0.40
9/12/2014								0.50	0.70	0.30
9/19/2014								0.50	0.70	0.30
9/30/2014								0.40	0.60	0.20
TOTAL	**1.30**	**3.90**	**3.40**	**1.00**	**0.00**	**4.30**	**3.70**	**23.20**	**29.90**	**16.60**

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

[2] Maximum water use by healthy crops that are well-fertilized and irrigated, disease and insect-free.

[3] Average water use for each crop each week based on historic data.

[4] Hay Crop water use should be reduced by approximately 2/3 the first week after cutting, 1/2 the second and 1/3 the third.



Appearance of sandy clay loam, loam, and silt loam soils at various soil moisture conditions.

Available Water Capacity 1.5-2.1 inches/foot

Percent Available: Currently available soil moisture as a percent of available water capacity.

lnches/foot. Available: Inches of water held in a foot of soil.

0-25 percent available
0- .5 in/ft. available

Dry, soil clods break away easily, no staining on fingers, clods crumble with applied pressure. (Not pictured)

25-50 percent available
0.4-1.0 in/ft. available

Slightly moist, forms a weak ball with rough surfaces, no water staining on fingers, few aggregated soil grains break away.

50-75 percent available
.75-1.5 in/ft. available

Moist, forms a ball, very light staining on fingers, darkened color, pliable, forms a weak ribbon between the thumb and forefinger.

75-100 percent available
1.2-2.0 in/ft. available

Wet, forms a ball with well-defined finger marks, light to heavy soil/water coating on fingers, ribbons between thumb and forefinger.

100 percent available
1.5-2.0 in/ft. available (field capacity)

Wet, forms a soft ball, free water appears briefly on soil surface after squeezing or shaking, medium to heavy soil/water coating on fingers. (Not pictured)

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 weather conditions and predictions then plan for 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 (May 1) 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.