



BLACKFOOT CHALLENGE WEEKLY IRRIGATION REPORT

Friday May 9, 2014

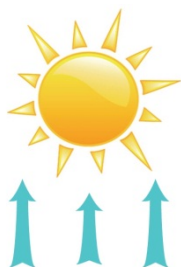
If such a thing as normal exists anymore, we are looking at a fairly normal irrigation season so far this year. Folks are getting ready in a more leisurely fashion and little irrigation has begun. Instead of the drought and heat of last May we have quite average conditions. Soils are mostly at about 50% of their water holding capacities or a little higher. Cool temperatures have kept crop water use at low to moderate levels and rainfall added almost enough moisture this week to keep up. More details on these subjects are presented below. 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 - COOL AND MOIST, NO DROUGHT IN SIGHT

Cool temperatures and scattered rain dominated this week with a couple warmer, rainless days. Most croplands had about ½ inch of rain with a bit less in parts of the lower drainage and a bit more in the upper. Cool temperatures and scattered rain are expected again next week. The 30 day forecast indicates below normal temperatures and above normal rainfall. It is during this cool, rainy weather that you can take advantage of lower crop water use to fill up your soil to its full water holding capacity.



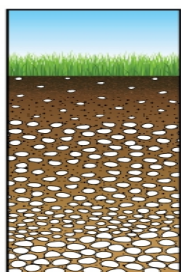
CROP WATER USE - MODERATE

Crop water use was moderate this last week due to cool temperatures and early growth conditions. Crop water use will again be moderate next week due to cool, moist weather. See the table and chart on Page 3 for more details.

| WATER USE IN INCHES | LAST 7 DAYS | NEXT 7 DAYS¹ | SEASON TOTAL² |
|----------------------------|--------------------|--------------------------------|---------------------------------|
| HAY CROPS | 0.7 | 0.8 (0.6 -0.9) | 0.9 |
| PASTURE | 0.6 | 0.7 (0.5 -0.8) | 0.8 |
| SPRING GRAINS | 0.0 | 0.0 (0.0 -0.0) | 0.0 |
| WINTER WHEAT | 0.8 | 0.9 (0.7 -0.9) | 1.0 |
| LAWNS | 0.7 | 0.8 (0.7 -0.9) | 0.9 |

¹Expected water use (range if weather becomes cooler or hotter than expected)

²Beginning May 1 - season start date



SOIL MOISTURE - ABOUT AVERAGE FOR THIS TIME OF YEAR

Soil moisture dropped slightly this week especially where less rain fell, more sun shined and more wind blew. Most sites continued to have about half of their water holding capacities in the upper foot and slightly more in the second and third foot. This adds up to 2-3 inches of stored soil moisture for most hay and pasture irrigators. Although snowpack is at high levels (150% of normal), soil moisture in the valley bottom is more affected by weather in March and April following snowmelt. This means, irrigators must add extra water in May to fill up the soil and meet crop use.

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 ¼ inches per week. Applying more than this amount will add to soil moisture storage. Soils will hold 1-2 inches per foot or 3-6 inches in a three-foot root zone. Filling up your soil gives you extra for when it get hot and dry as well as helping to develop a deep root system. Irrigate and 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. This will require adding 2-4 inches of water in addition to the amount used by the crop. Most irrigators can add 5-10 inches of water throughout May without over-irrigating. Irrigators with very sandy soils may only be able to apply 5-7 inches. The Blackfoot Challenge Irrigation Guide shows how to determine your soil moisture holding capacity and current moisture level.

Roots

Consider irrigating 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. Check for deep moisture penetration with a soil probe or shovel.

Drought in 2014?

It appears that drought is not going to be a concern this year (*had this been a true drought emergency you would have been instructed to tune into the Blackfoot Challenge Drought Emergency Network*). This means you don't need to rush to get a crop grown before river flows drop. Based on current snowpack levels and predicted weather conditions, it is likely that streamflows will remain at good levels throughout the summer. However, things can change and we will keep you informed. It is still a good practice to fill up your soil and keep it up in case of equipment failure or other problems.

You Can 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). Most local cropland soils can hold about 1 ½ inches of water in the surface foot of soil. Sandy and rocky soil hold less (1 inch/foot) and clayey soils hold more (2 inches/foot). So you only have to guess between 0 for dry and 1.5-2 inches wet. Page 4 is a guide for estimating soil moisture content. The simplest way to irrigation schedule is simply to look at your soil and keep it above 50% of its water holding capacity. Call Barry for assistance or a visit for instruction.

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)

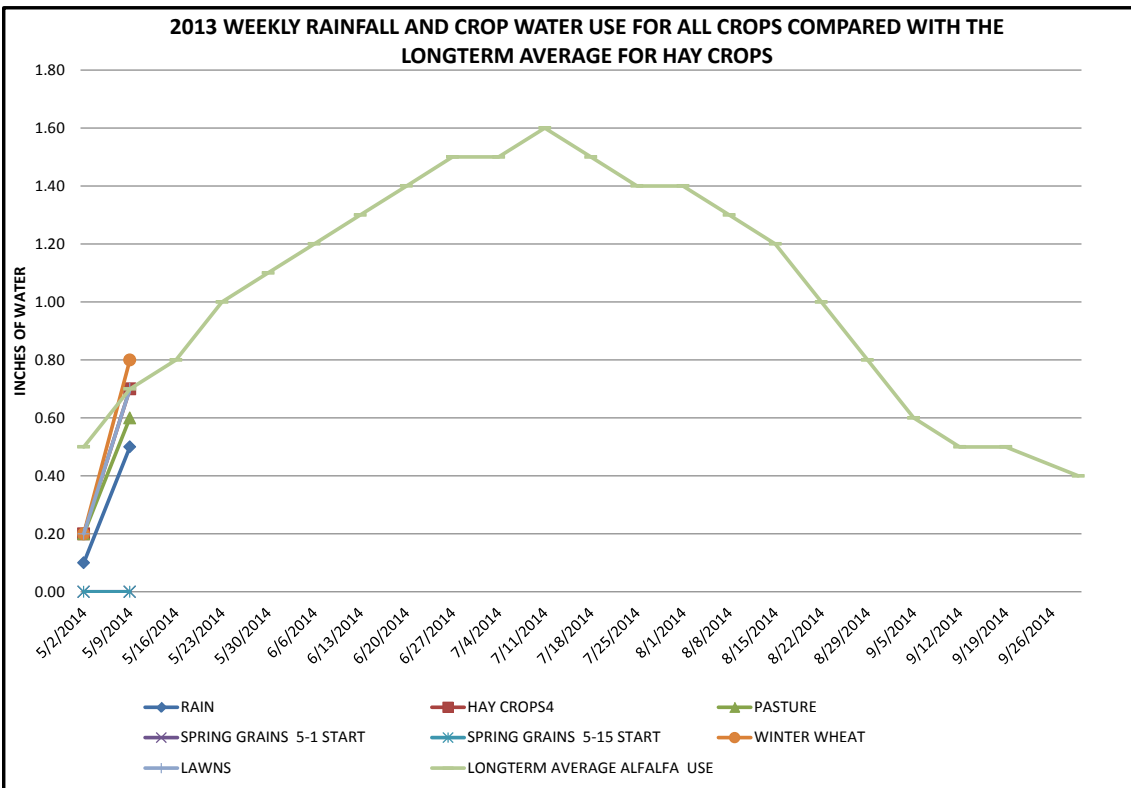
| | RAIN ¹ | 2013 WEEKLY POTENTIAL CROP WATER USE ² | | | | | | AVERAGE POTENTIAL CROP WATER USE ³ | | |
|--------------|-------------------|---|-------------|-------------------------|--------------------------|--------------|-------------|---|--------------------------------|---------------------------------|
| | RAIN | HAY CROPS ⁴ | PASTURE | SPRING GRAINS 5-1 START | SPRING GRAINS 5-15 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 | | | | | | | | 0.80 | 1.00 | 0.40 |
| 5/23/2014 | | | | | | | | 1.00 | 1.10 | 0.60 |
| 5/30/2014 | | | | | | | | 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 | 0.60 | 0.90 | 0.80 | 0.00 | 0.00 | 1.00 | 0.90 | 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.

Inches/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.