



BLACKFOOT CHALLENGE WEEKLY IRRIGATION REPORT

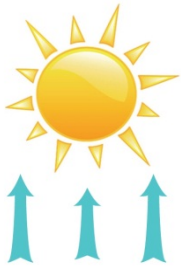
Friday July 10, 2015

Another week of warm weather with high **potential crop water use (>1 ½ inches)**. A few drops were reported but that's it for Blackfoot croplands. A lot of haying is going on and crops have responded well to warm temperatures and clear skies with impressive yeilds in some fields. A condensed overview of the entire irrigation season is presented on the last page of this report as a reminder to plan ahead. More information about irrigation is available on the Challenge website.



WEATHER - WARM LAST WEEK AND WARM NEXT

Very warm, dry weather prevailed last week and will continue. Only scattered showers are predicted. Temperatures will again be in the 80 and 90s. The 30 and 90 day forecasts continue to suggest above normal temperatures and normal rainfall. Low streamflows are becoming very low streamflows.



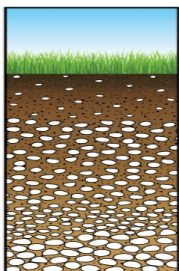
HIGH CROP WATER USE CONTINUES

Crop water use continued to be above 1 ½ inches for most crops last week – still above normal. It will continue to be high next week. Crop water use is reduced about 2/3 the first week after cutting hay crops and about 1/3 the second week. The table and chart on Page 3 illustrate crop water use throughout the whole season.

WATER USE IN INCHES	LAST 7 DAYS	NEXT 7 DAYS¹	SEASON TOTAL²
HAY CROPS	1.7	1.7 (1.5 - 1.8)	14.9
PASTURE	1.4	1.4 (1.3 - 1.6)	12.9
SPRING GRAINS (planted May1)	1.8	1.8 (1.7 – 2.1)	9.6
WINTER WHEAT	1.8	1.6 (1.7 – 2.1)	16.4
LAWNS	1.6	1.6 (1.5 - 1.8)	14.5

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 - ADD WHAT YOU CAN

Ideally you have a full soil profile and are ready for your first cutting. However, most of those in the Blackfoot Drainage on Planet Earth are struggling to boost moisture at all. Do the best you can, leave time for the surface to dry out before cutting and get back on if you can as soon as possible.

WEEKLY TIPS

Crop Water Use and Haying

Scientists have discovered that cutting your head off causes stress for plants just like it does for humans.

- If you plan to keep your current hay crop plants for next year you should water them once after cutting even if you don't plan a second cutting or pasture.
- If you plan to do something different next season you can turn off the pump or headgate and leave the streamflow for the fish.
- If you plan for fall pasture or a second cutting, irrigate as close to cutting as possible, leave enough time for the surface to dry, cut your hay then get back across the field as quickly as possible. Alfalfa is especially susceptible to harvest stress but grasses also recover much better with water.

Keep Irrigating While Water Supplies Last and the Weather is Great

The growing season up to first cutting is the most important period in the Blackfoot drainage so make your best effort then. Hot days are great for converting irrigation water into crop production. 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 your soil dries out!

Drought in 2015

Blackfoot River streamflows continue a downward trend. For the latest flow level go to: <http://waterdata.usgs.gov/usa/nwis/uv?12340000>.

Flows remains at 1/3 the normal level with this trend predicted to continue throughout the summer. *Water Supply Forecasts* are available on the website: <http://blackfootchallenge.org/Articles/?p=1589>.

Drought Relief Hints

Here are some hints for reducing water use taken from our irrigation guide. The guide has more detail and is available at: <http://blackfootchallenge.org/Articles/wp-content/uploads/2013/06/BFIrrigationGuideFinalv3.0.pdf>

- Fill Up Your Soil - NOW - and Try to Keep it Near Full
- Know how much you apply – check with rain gauges or flow meter
- Apply More Water At Each Application
- Improve Irrigation System Performance
- Concentrate your efforts on the first cutting and then relax
- Reduce irrigated acreage and irrigate that well

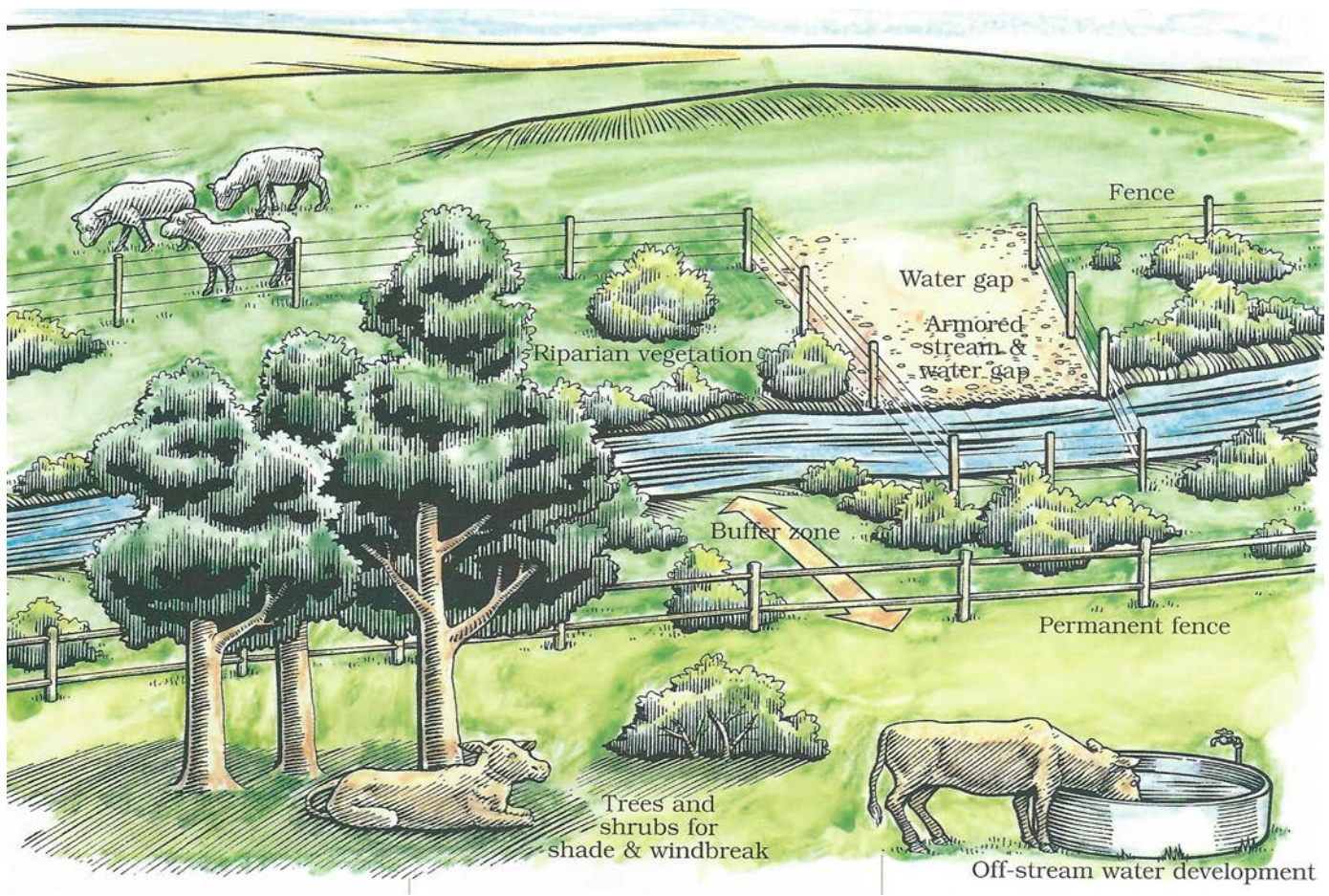
For more information contact Jennifer Schoonen, Blackfoot Challenge Water Steward, 406-360-6445 or Barry Dutton, Professional Soil Scientist, 406-240-7798 barry@landandwaterconsulting.net

Water Quality Hints - Buffer Areas

Many water quality problems in agriculture can be solved by putting a little distance between activities and waters of concern. A common approach has been to simply establish buffer zones between waters of concern and various forestry, mining, development, grazing and agricultural practices. Vegetation and soil are extremely effective at removing most pollutants including sediment, nutrients and agricultural chemicals. The more plant material and dirt between waters and wastes, the better.

Most buffer area requirements or suggestions fall between 50 and 200 feet. The largest buffer strip encountered during a past study was 12,000 feet. This turned out to be for preserving the visual quality of the Missouri River near Fort Benton and not for water quality concerns.

Although many buffer regulations and best management practices have standard widths for convenience, most buffers are better plans for the specific site. Considerations include the type and amount of potential pollutants, the distance to water, slope angle, vegetation, soil type and many others. Help with designing buffers and the related infrastructure is available from a variety of public and private sources.



BLACKFOOT 2015 GROWING SEASON WEEKLY RAINFALL & CROP WATER USE (INCHES OF WATER)

	RAIN ¹	2015 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	0.50	0.90	1.00	0.00	0.00	1.20	1.10			
5/1/2015	0.01	0.80	0.90	0.10	0.00	1.10	0.90	0.50	0.80	0.20
5/8/2015	0.01	1.10	1.00	0.20	0.00	1.20	1.10	0.70	0.90	0.30
5/15/2015	0.10	1.10	0.90	0.20	0.00	1.20	1.00	0.80	1.00	0.50
5/22/2015	0.25	0.80	0.60	0.25	0.20	0.90	0.80	1.00	1.10	0.70
5/29/2015	0.25	1.10	0.80	0.40	0.30	1.20	1.00	1.20	1.20	0.80
6/5/2015	0.50	0.90	0.80	0.50	0.40	1.00	0.90	1.30	1.30	0.90
6/12/2015	0.00	1.60	1.40	1.10	0.90	1.60	1.50	1.40	1.50	1.00
6/19/2015	0.00	1.60	1.40	1.50	1.25	1.70	1.50	1.50	1.70	1.10
6/26/2015	0.00	1.60	1.30	1.70	1.60	1.70	1.50	1.50	1.90	1.10
7/3/2015	0.00	1.70	1.40	1.80	1.80	1.80	1.60	1.50	2.00	1.20
7/10/2015	0.00	1.70	1.40	1.80	1.80	1.80	1.60	1.60	2.10	1.30
7/17/2015								1.60	2.00	1.20
7/24/2015								1.50	1.90	1.10
7/31/2015								1.50	2.20	1.10
8/7/2015								1.40	1.70	1.00
8/14/2015								1.20	1.50	0.90
8/21/2015								1.00	1.30	0.70
8/28/2015								0.80	1.00	0.50
9/4/2015								0.60	0.80	0.40
9/11/2015								0.50	0.70	0.30
9/18/2015								0.50	0.70	0.30
9/25/2015								0.40	0.60	0.20
9/30/2015								0.40	0.60	0.20
TOTAL	1.62	14.90	12.90	9.55	8.25	16.40	14.50	24.40	30.50	17.00

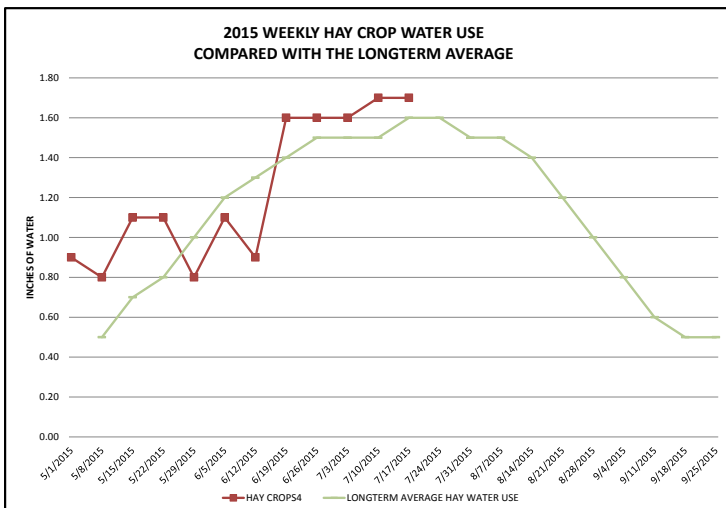
¹ Rainfall should be reduced to account for immediate evaporation from crop and soil surfaces (0.1-May and Sept, 0.15-June and August, 0.2-July)

² This years maximum water use by healthy crops that are well-fertilized and irrigated, disease and insect-free. Will vary across the drainage.

³ Average water use for each crop each week based on long-term 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.

CROP WATER USE STARTED OUT ABOVE AVERAGE, DROPPED BELOW AVERAGE FOR THREE WEEKS AND SHOT UP WITH WARMER WEATHER EVER SINCE (RED LINE = 2015, GREEN LINE = LONG TERM AVERAGE)



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.