



BLACKFOOT CHALLENGE WEEKLY IRRIGATION REPORT

Friday July 29, 2016

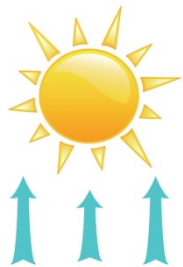
Hot, dry weather continues. It's been good for haying and your suntan. A few scattered thunderstorms are possible with a little rain or hail. Weekly crop water use was high again this last week at 1½ to 2 inches and will remain high for crops not yet harvested. Remember that crop water use drops by about 2/3 the first week after cutting and 1/3 the second week. Drought conditions have arrived and drought management plans are being implemented – call Jennifer with questions. The last page of this report is a summary of recommendations for the entire irrigation season.



WEATHER - CONTINUED HOT AND DRY, ISOLATED THUNDER

Hot, dry weather dominated this last week and will continue. Scattered thunderstorms may bring isolated small amounts of rain or hail but no significant accumulations. The 30 and 90 forecasts continue to predict above normal temperatures. The 30 day forecast predicts below normal rainfall while the 90 day forecast says normal rainfall.

For the first time in history, the entire country including Alaska is under a heat advisory predicting that in the next 30 days *EVERYONE* will have above average temperatures.



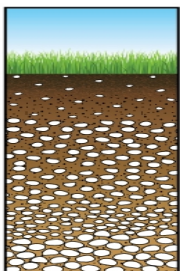
CROP WATER USE - CONTINUED HIGH NEXT WEEK

Crop water use will continue to be high next week as hot weather continues. Crop water use decreases with cutting by approximately 2/3 the first week after cutting, 1/2 the second and 1/3 the third. Crop water use was above average throughout April, below average in May, bounced around average in June and stayed above average for most of July (chart page 3).

WATER USE IN INCHES	LAST 7 DAYS	NEXT 7 DAYS¹	SEASON TOTAL²
HAY CROPS	1.7	1.7 (1.4 - 1.8)	18.0
PASTURE	1.4	1.4 (1.2 - 1.6)	16.1
SPRING GRAINS	1.9	1.9 (1.7 - 1.9)	15.6
WINTER WHEAT	0.1 (Harvested)	0.1 (0.0 - 0.1)	13.1
LAWNS	1.6	1.6 (1.4 - 1.7)	17.0

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

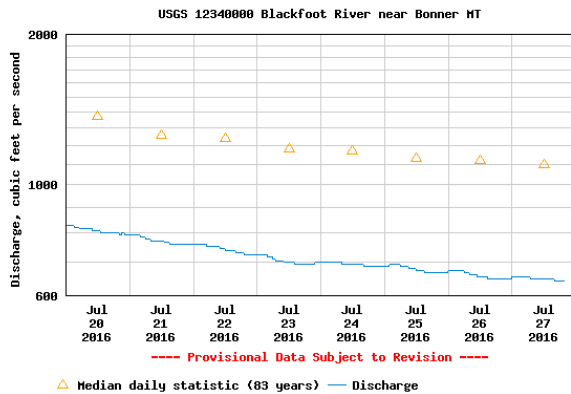


SOIL MOISTURE - LOWER FOR HAYING

Most folks are letting soil moisture fall, especially in the surface layer to help the newly cut hay dry and avoid getting the machinery stuck. Those who have water will irrigate once after haying and then stop or much reduce irrigation. Hopefully you have some moisture stored up because there is little left in the river. One great thing about growing hay and pasture is that it is mostly grass which is adapted to drought and just waits for more rain.

WEEKLY TIPS

DROUGHT 2016



The Blackfoot River flow at Bonner has fallen steadily this week and is at about half of its average flow. Today's flow is near 640 cfs compared with an average of 1,140 cfs. The low flow for this date was 435 cfs in 1988 and the high was 3,050 cfs in 1899.

Low flows and predictions of hot dry weather in the 30 and 90 day weather forecasts suggest that drought conditions will worsen before improving.

DROUGHT PLANNING - NOW AND IN THE FUTURE

With each year now being the warmest on record, maybe we should start some serious planning for a future with lower water levels and higher crop water use. Some things you can do to prepare for drought conditions are:

- Pour the water on in May and June when it's available;
- Fill up your soil to its' water holding capacity before critical stream flow periods;
- Improve soil health, especially organic matter content;
- Apply more water during each application so more goes into the soil;
- Save water for critical growth periods;
- Reduce irrigated acreage and irrigate that well;
- Concentrate your efforts on the first cutting and then relax;
- Plant crops that use less water on at least a portion of your acreage;
- Grow your crop during the cooler early season and reduce or stop irrigation during the highest crop water use period which coincides with the lowest stream flow period;

INCLUDE ANNUAL CROPS IN FUTURE DROUGHT PLANNING

You can reduce your overall annual ranch water use by planting part of your acreage to annual crops. These crops use less water and require irrigation for a relatively short portion of the growing season. They also can be grown at the start of the season when crop water use is lower due to cooler temperatures and when water is available before stream levels drop.

Winter wheat is a great crop, especially the new hay varieties. Several growers in the Potomac and Clearwater Areas have recently grown excellent stands with good yields. Winter wheat irrigation can end by late June in most years while still getting a good crop. Winter wheat grows throughout mild winters and is ready to take off whenever the growing season begins in spring.

Other small grains like oats and barley (especially feed barley) are also good choices. Oats can be grown in the shortest period with the least water. Local growers have produced some of the heaviest local hay crops with mixes that include peas. Peas add nitrogen to the soil for its own use and future crops. Planting annual crops has many other benefits such as reducing grass sod, breaking up disease cycles, adding soil organic matter and nitrogen to the soil.

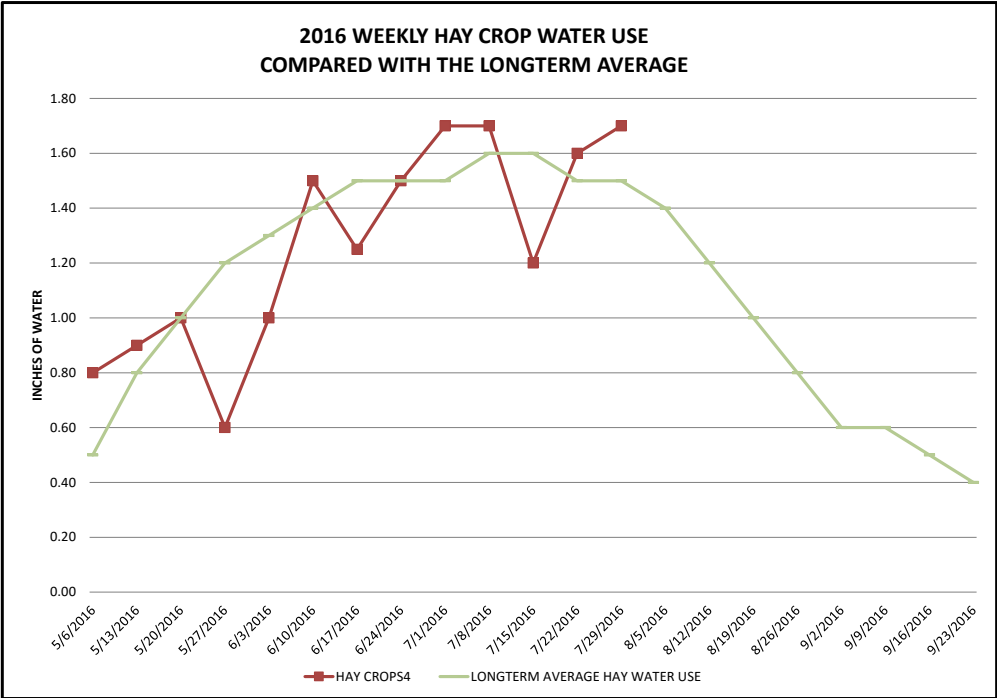
For further information contact Jennifer Schoonen, Blackfoot Challenge Water Steward, 406-360-6445 or Barry Dutton, Professional Soil Scientist, 406-240-7798 barry@landandwaterconsulting.net

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	0.10	1.50	1.40	1.25	0.70	1.60	1.50	1.40	1.50	1.00
6/17/2016	0.20	1.25	1.20	1.30	0.70	1.40	1.20	1.50	1.70	1.10
6/24/2016	0.10	1.50	1.40	1.60	1.20	1.50	1.50	1.50	1.90	1.10
7/1/2016	0.01	1.70	1.50	1.80	1.80	1.10	1.60	1.50	2.00	1.20
7/8/2016	0.01	1.70	1.60	1.80	1.80	0.50	1.50	1.60	2.10	1.30
7/15/2016	1.25	1.20	1.00	1.30	1.30	0.10	1.20	1.60	2.00	1.20
7/22/2016	0.10	1.60	1.40	1.90	2.00	0.10	1.50	1.50	1.90	1.20
7/29/2016	0.00	1.70	1.50	1.90	1.90	0.10	1.60	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	4.18	17.95	16.05	15.60	13.55	13.05	16.95	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 AGAIN THIS WEEK (RED LINE) DUE TO HOT, DRY WEATHER



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 and water availability. Irrigate new plantings as needed.
- Some folks irrigate for pasture following their one hay cutting. Irrigate according to pasture needs and with consideration for other water users.
- Reduce river withdrawals by rotating systems, reducing the amount area irrigated at one time and by delaying irrigation until streamflows recover.



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 and water availability. Irrigate new plantings as needed. Plan for higher temperatures, earlier springs and less water. Next year put some acres in lower water use crops including annual crops, alter rotations, reseed/inter-seed or come up with your own ideas to reduce overall ranch water use.