



BLACKFOOT CHALLENGE WEEKLY IRRIGATION REPORT

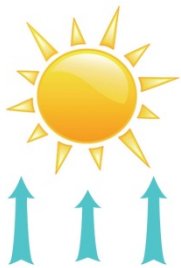
Friday August 5, 2016

It's been good for haying and your suntan but hot, dry weather will turn cooler with thunderstorms next week. Weekly crop water use was high again this last week at 1½ to 2 inches for crops not yet harvested. Remember that crop water use drops by about 2/3 the first week after cutting, 1/2 the second week and 1/3 the third 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 - HOT+DRY TURNING COOLER+THUNDER

Hot, dry weather dominated this last week but will give way by Sunday to cooler temperatures with scattered thunderstorms. Sunday through Tuesday may have the most rainfall. The 30 day forecast says continue to predict above normal temperatures. The 30 day forecast predicts normal temperatures and above normal rainfall. The 90 day forecast says above normal temperatures and normal rainfall.



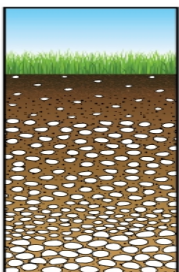
CROP WATER USE - SLIGHTLY LOWER NEXT WEEK

Crop water use will be slightly lower next week with cooler temperatures and further harvest. 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	1.6 (1.4 - 1.8)	19.7
PASTURE	1.4	1.3 (1.1 - 1.5)	17.6
SPRING GRAINS	1.9	1.7 (1.5 - 1.9)	17.5
WINTER WHEAT	0.1 (Harvested)	0.1 (0.0 - 0.1)	13.2
LAWNS	1.6	1.5 (1.3 - 1.7)	18.6

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

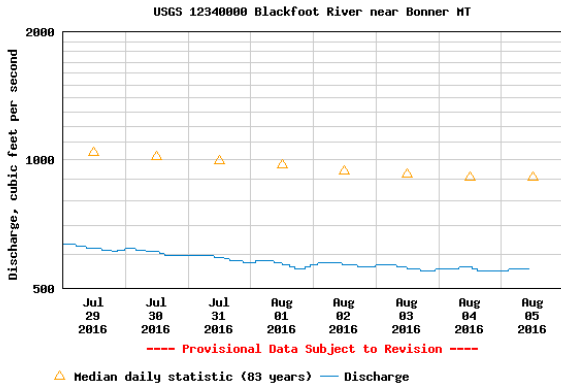


SOIL MOISTURE - LOWER FOR HAYING

Most folks are letting soil moisture fall after cutting. Some are applying one irrigation after cutting or even filling up the soil moisture holding capacity before shutting down for the season. Those with available water are irrigating less frequently with smaller amounts which penetrate only into the surface soil. During this hot part of the summer, less of the applied irrigation water actually gets into the soil for crop use.

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 550 cfs compared with an average of 940 cfs. The low flow for this date was 379 cfs in 1988 and the high was 2,360 cfs in 1899.

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

DO IRRIGATE AFTER CUTTING

- If you have alfalfa you want to preserve in the stand
- If you have new seedings you need to irrigate up (but consider a planting delay until fall)
- If you do, reduce irrigated acreage and irrigate that well
- If you do, only apply a fraction (25-50%) of the potential crop water use each week
- If you do, rotate systems to reduce your total river withdrawal rate
- If you do, reduce the number of heads running at once

DON'T IRRIGATE AFTER CUTTING

- If you don't need fall pasture
- If you are reseeding in the fall
- If you are out of water

PRODUCTION ACROSS THE DRAINAGE

The July 1 weekly report described a method for measuring crop production. With the help of Joe Zimbric and Josh Mannix, I tested this method at 12 sites across the drainage. It seems like a reasonably accurate method, especially for those who can't count and weigh bales or for comparing small test plots. Let me know if you're interested in production measurements and I may coordinate a larger effort next year.

<u>CROP</u>	<u>AVERAGE</u> (TONS/ACRE)	<u>RANGE</u> (TONS/ACRE)	<u>STANDARD DEVIATION</u> (TONS/ACRE)	<u>NUMBER OF SITES</u>
Flood Irrigated Grass	1.1	0.9 – 1.3	0.2 – 0.5	5
Pivot Irrigated Grass/Clover/Alfalfa	1.7	1.0 – 1.9	0.3 – 0.4	5
Pivot Irrigated Pea/Barley/Oat	5.7	5.7	1.6	1
Pivot Irrigated Feed Winter Wheat	2.7	2.7		1

I was also interested in the moisture content of baled hay. Three samples revealed moisture contents of 10, 11 and 12%.

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		
		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	0.00	1.70	1.50	1.90	1.90	0.10	1.60	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	19.65	17.55	17.50	15.45	13.15	18.55	24.80	31.10	17.30

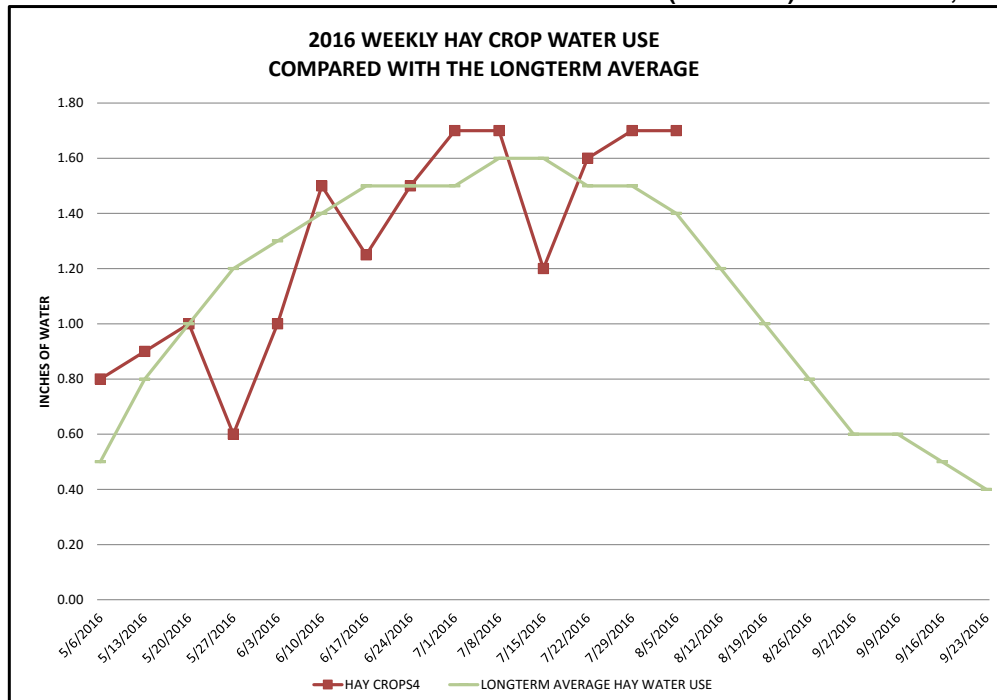
¹ Rainfall should be reduced to account for immediate evaporation from crop and soil surfaces (0.1-April,May and Sept, 0.15-June and August, 0.2-July)

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.