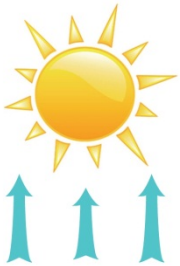
BLACKFOOT CHALLENGE WEEKLY IRRIGATION REPORT

Friday September 23, 2016

This last week saw some significant rain and cool temperatures. Most local croplands had ¼ to ½ inch of rain. Next week looks slightly warmer and drier. Weekly potential crop water use remained above average last week at about ¾ inch and will be slightly higher next week. River flows are still low and drought management plans are still in effect – call Jennifer with questions. The last page of this report is a summary of recommendations for the entire irrigation season.

WEATHER – WARM AND DRY

Cool temperatures and rain dominated this last week with most croplands getting ¼ to ½ inch but some a little more. Warmer, drier weather is forecast for next week with high temperatures in the 70s. The 30 day forecast predicts normal temperatures and rainfall. The 90 day forecast says above normal temperatures and rainfall. This year is the hottest on record worldwide since reliable records started in the 1880s.

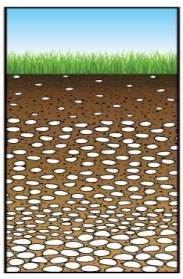


CROP WATER USE – SLOWING NEXT WEEK WITH COOL TEMPS

Potential crop water use will increase slightly next week with warmer temperatures and little rain. Crop water use was above average throughout April, below average in May, bounced around average in June and stayed above average for most of the time since June (chart page 3).

WATER USE IN INCHES	LAST 7 DAYS	NEXT 7 DAYS[1]		SEASON TOTAL[2]
HAY CROPS	**0.8**	**0.9**	(0.8 - 1.1)	28.3
PASTURE	**0.6**	**0.7**	(0.6 - 0.9)	23.5
SPRING GRAINS	**0.1**(Harvested)	**0.1**	(0.0 - 0.2)	20.3
WINTER WHEAT	**0.1** (Harvested)	**0.1**	(0.0 - 0.2)	13.9
LAWNS	**0.8**	**0.8**	(0.7 - 1.0)	25.7

[1]Expected water use (range if weather becomes cooler or hotter than expected)
[2]Beginning April 1 – note in 2010-13 we started our seasonal total on May 1 but now include April

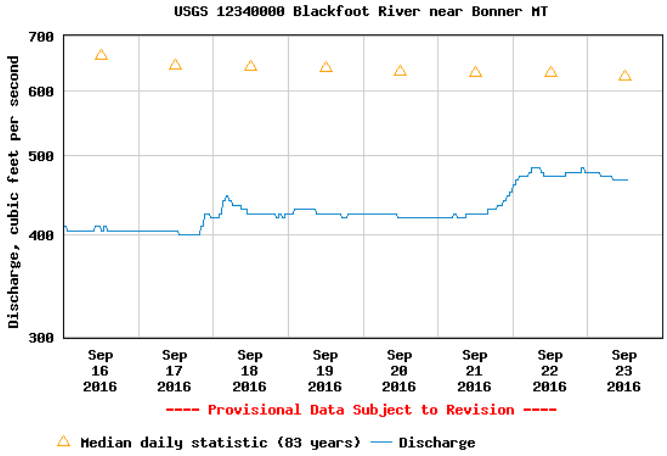


SOIL MOISTURE – LOW UNLESS IRRIGATED

Soil moisture increased slightly with recent rainfall but crop use has still been higher than rainfall for those crops still growing. Plants are growing very slowly or going into dormancy. Most folks are done irrigating or are not irrigating much until water levels come up some more.

WEEKLY TIPS

DROUGHT 2016



The Blackfoot River flow at Bonner has continued to increase this week to 467 today. It is still below 500 cfs - the main flow trigger in Blackfoot drought management but at least is going the right way. Todays flow is near 467 cfs compared with an average of about 647 cfs. The low flow for this date was 365 cfs (1905) and the high was near 1230 cfs in 1965.

Predictions of normal temperatures and rainfall in the 30 day weather forecast suggests that drought conditions may continue to improve. But right now the river is looking pretty small and I still wouldn't want to be a fish.

SOIL HEALTH

With continuing interest in soil health, there are more opportunities to hear about the basics, the experience of farmers and ranchers and the wide array of products, analyses and services available. You can study up on the web and go with some good questions.

SOIL HEALTH WORKSHOPS: All day event which in Missoula focuses on intensive grazing, pasture management, and plant-soil-animal interactions.
Sponsored By: Montana Association of Conservation Districts, NRCS, Montana Soil Conservation Society. Missoula workshop is on October 25
http://swcdmi.org/programs/soil-health-workshops/

SOIL SUMMIT: Vitalizing Montana's Soil and Agriculture
All day event about soil health, carbon sequestration, monitoring, resources for farm and rangeland management. Sponsored By: Northern Plains Resource Council. Saturday October 15. Billings Conference Center
https://www.northernplains.org/soil-summit-2016/

FREEZE ALERT! DON'T GET CAUGHT WITH ICE IN THE WRONG PLACES

An excellent local irrigator reminded me of the drain valves that stick and the nozzles that plug and the various other parts that can cause expensive damage from ice. Don't get caught by the first hard freeze of the season. Winterize. Decide what improvements make sense this year and plan/order/install/test as much as possible this year before spring madness is back. Think about the entire system from *diversion* to inlet to *fish screen* to *ditch* to *pipe* to *pump* to *sprinklers* to *runoff*. Also - low summer stream flows may make work on diversions easier and less disruptive.

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	0.00	1.70	1.50	1.90	1.90	0.10	1.60	1.40	1.70	1.00
8/12/2016	0.25	1.30	1.00	1.00	1.20	0.10	1.20	1.20	1.50	0.90
8/19/2016	0.01	1.30	1.00	0.75	0.50	0.10	1.20	1.00	1.30	0.70
8/26/2016	0.10	1.20	1.00	0.50	0.25	0.10	1.10	0.80	1.00	0.50
9/2/2016	0.25	1.30	1.00	0.25	0.10	0.10	1.20	0.60	0.80	0.40
9/9/2016	0.30	0.70	0.60	0.10	0.10	0.10	0.70	0.60	0.70	0.30
9/16/2016	0.20	1.00	0.70	0.10	0.10	0.10	0.90	0.50	0.70	0.30
9/23/2016	0.40	0.80	0.60	0.10	0.10	0.10	0.80	0.40	0.60	0.20
9/30/2016								0.40	0.60	0.20
TOTAL	**5.69**	**27.25**	**23.45**	**20.30**	**17.80**	**13.85**	**25.65**	**24.80**	**31.10**	**17.30**

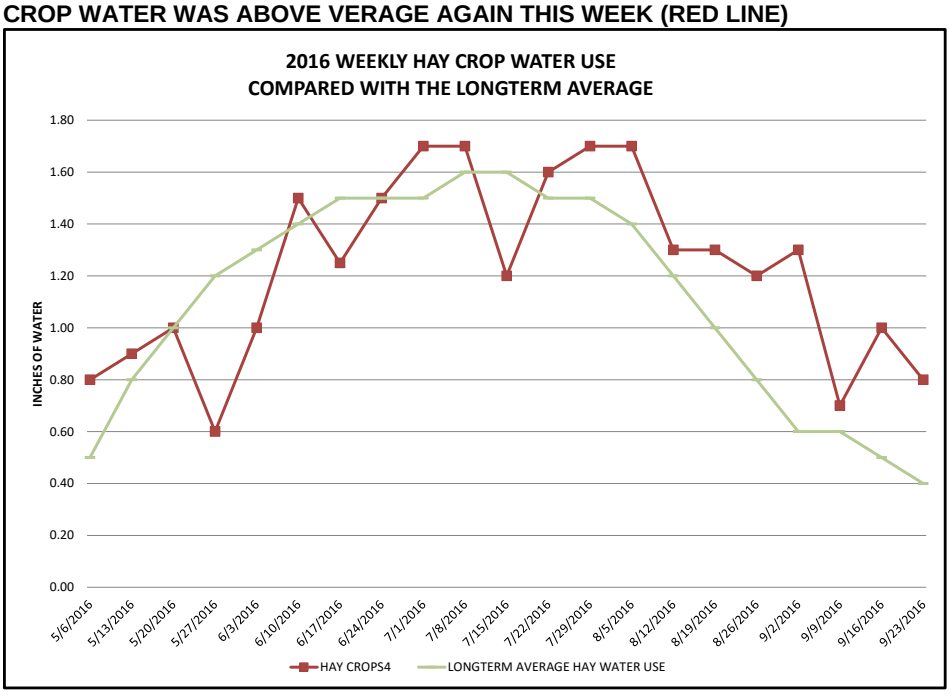
[1] Rainfall should be reduced to account for immediate evaporation from crop and soil surfaces (0.1-April,May and Sept, 0.15-June and August, 0.2-July)

[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 VERAGE AGAIN THIS WEEK (RED LINE)



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.