BLACKFOOT CHALLENGE WEEKLY IRRIGATION REPORT

Friday August 3, 2018

There is still plenty of hay to cut across the drainage and those finishing up are reporting good news. The week ahead may see scattered thunderstorms Sunday then be sunny and hot with little or no rain. High temperatures will range from the low to high 80s. Apply one or two irrigations after haying if you have water to help plants recover. Water use remains high for mature crops (1 ½ - 2 inches per week) but has dropped where hay was just cut and where annual crops are maturing. Water use this year is higher than average but not as high as last year (chart bottom of page 2). Long-range forecasts still predict above average temperatures and below to average rainfall for the rest of the season. General irrigation suggestions for the entire season are presented on the last page of this report. Use these to look ahead and plan or to compare with what you're doing now. If you have questions or comment please contact Jennifer Schoonen - Blackfoot River Steward (360-6445) or Barry Dutton – Soil and Irrigation Consultant (240-7798).

WEATHER – CHANCE OF THUNDERSTORMS THEN SUN

There is a chance for thunderstorms Sunday but the rest of the week looks hot weather and mostly sunny again. The 30-day forecast suggests above normal temperatures and below normal rainfall. The 90-day forecast says above average temperatures and average rainfall. Of course, 'normal' rainfall means 'not much' for August and September.

CROP WATER USE – ABOVE AVERAGE AGAIN

Crop water use remained above-normal this week due to hot, sunny weather and will continue next week as similar weather continues. Water use for winter grains has dropped off and will now drop for spring grains as crops mature. Water use for hay drops by 2/3 the first week after cutting and by 1/3 the second week then returns to normal levels by the third week. The table and chart on Page 2 summarize the entire irrigation season. So far, this year has above average crop water use but not as high as last year (2017). Potential hay water use so far this year has been 16 inches compared with 19.5 inches in 2017.

WATER USE IN INCHES	LAST 7 DAYS	NEXT 7 DAYS[1]		SEASON TOTAL[2]
HAY CROPS	**1.6**	**1.5**	(1.4 – 1.7)	14.4
PASTURE	**1.3**	**1.2**	(1.1 – 1.4)	11.8
SPRING GRAINS	**1.9**	**1.7**	(1.5 – 1.8)	12.3
WINTER WHEAT	**0.5**	**0.3**	(0.2 – 0.5)	14.8
LAWNS	**1.5**	**1.4**	(1.5 – 1.8)	13.7
RAIN (Average across drainage croplands)	**T**	**T**		6.2
EFFECTIVE RAIN	**0**	**0**		4.8

[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 since include April

BLACKFOOT 2018 GROWING SEASON WEEKLY RAINFALL & CROP WATER USE (INCHES OF WATER)

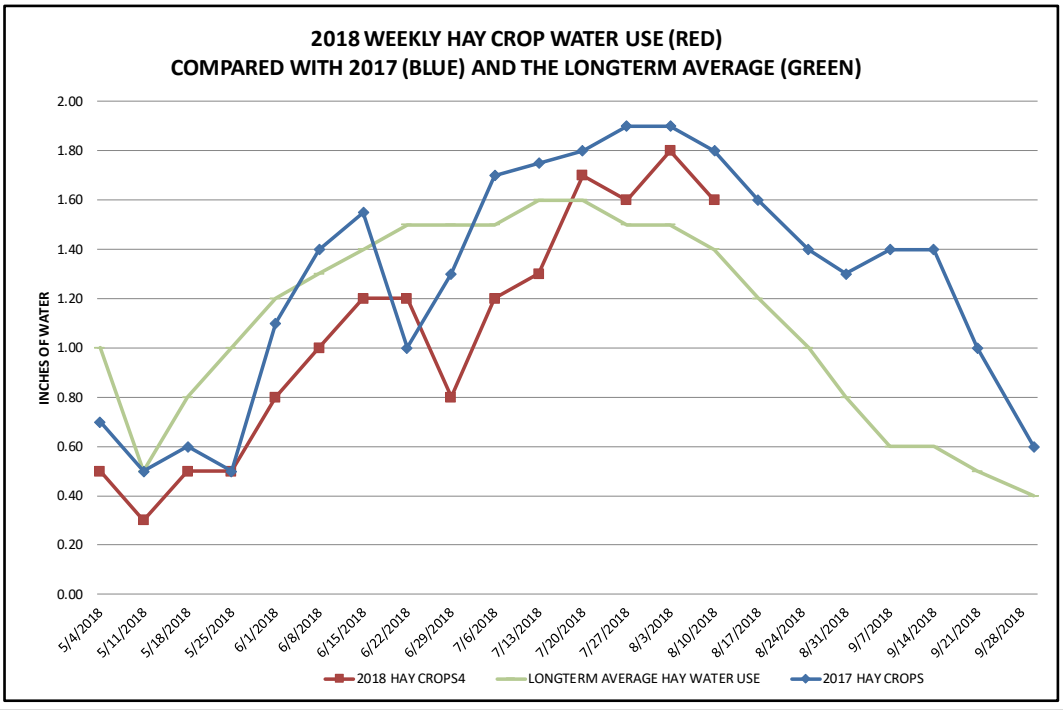
	RAIN[1]	2018 WEEKLY POTENTIAL CROP WATER USE[2]						AVERAGE POTENTIAL CROP WATER USE[3]		
WEEK ENDING	RAIN	HAY CROPS[4]	PASTURE	SPRING GRAINS 5-1 START	SPRING GRAINS 5-15 START	WINTER WHEAT	LAWNS	LONGTERM AVERAGE HAY WATER USE	HOT WEEK HAY WATER USE	COOL WEEK HAY WATER USE
APRIL	1.50	0.50	0.40	0.10	0.10	0.50	0.50	1.00	1.50	0.50
5/4/2018	0.50	0.30	0.20	0.10	0.10	0.30	0.30	0.50	0.80	0.30
5/11/2018	0.50	0.50	0.40	0.10	0.10	0.50	0.50	0.80	1.00	0.50
5/18/2018	0.50	0.50	0.40	0.10	0.10	0.50	0.50	1.00	1.10	0.60
5/25/2018	0.25	0.80	0.70	0.30	0.10	0.80	0.80	1.20	1.30	0.80
6/1/2018	0.75	1.00	0.90	0.50	0.30	1.10	1.00	1.30	1.40	0.90
6/8/2018	0.20	1.20	1.00	0.80	0.50	1.30	1.10	1.40	1.50	1.00
6/15/2018	0.50	1.20	1.00	0.90	0.70	1.30	1.10	1.50	1.70	1.00
6/22/2018	1.25	0.80	0.70	0.80	0.60	1.00	0.80	1.50	1.90	1.10
6/29/2018	0.25	1.20	1.00	1.20	0.90	1.30	1.10	1.50	2.00	1.20
7/6/2018	0.01	1.30	1.00	1.50	1.20	1.50	1.20	1.60	2.10	1.30
7/13/2018	0.01	1.70	1.30	2.00	1.80	1.80	1.60	1.60	2.00	1.20
7/20/2018	0.01	1.60	1.30	1.90	1.90	1.90	1.50	1.50	2.00	1.20
7/27/2018	0.01	1.80	1.50	2.00	2.00	1.00	1.70	1.50	2.20	1.10
8/3/2018	0.01	1.60	1.30	1.70	1.90	0.50	1.50	1.40	1.70	1.00
8/10/2018								1.20	1.50	0.90
8/17/2018								1.00	1.30	0.70
8/25/2018								0.80	1.00	0.50
8/31/2018								0.60	0.80	0.40
9/7/2018								0.60	0.70	0.30
9/14/2018								0.50	0.70	0.30
9/21/2018								0.40	0.60	0.20
9/30/2018								0.40	0.60	0.20
TOTAL	**6.25**	**16.00**	**13.10**	**14.00**	**12.30**	**15.30**	**15.20**	**24.80**	**31.40**	**17.20**

[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 drops approximately 2/3 the first week after cutting, 1/2 the second and 1/3 the third.



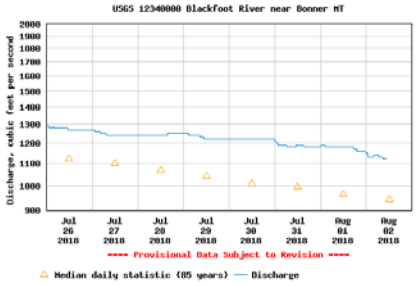
SOIL MOISTURE – RECHARGE AFTER CUTTING

Soils will now dry out fast after irrigation and more water is lost to evaporation before it can reach the soil and crop. Warm, sunny conditions and a little wind produce the highest crop water use and a challenge to boosting soil moisture. To boost soil moisture you now need to apply enough water to satisfy the crop water use (1-2 inches for mature crops) PLUS enough to account for evaporation before it reaches the soil (.25 – .50 inch) PLUS the amount you want to add to the soil (3-6 inches to fill it up). One advantage to irrigating after hay cutting is that the crop uses less water for about two weeks so it's easier to recharge soil moisture. There is also less crop to intercept irrigation and evaporate it before it gets to the soil. It's ideal to keep your soil moisture above 50% of water holding capacity for best production. At 50% of water holding capacity the soil can be formed into a ball (top photo). The hand gets dirty and appears moist (bottom photo) but not shiny wet. Call if you have questions about your soil moisture or visit the irrigation guide on the Challenge website.

WEEKLY TIPS

Streamflows and Drought (or the new normal)

Blackfoot river flows continue to slowly decline reaching about 1,120 CFS at Bonner today which is near average (941 CFS). The highest level recorded for this date was 2,580 (1899) and the lowest 381 (1988). This steady decline will continue with hot weather predicted this week. Drought restrictions do not kick in until 700 CFS. Last year on this date flows were only 760 CFS – another reason to feel good about 2018.



Maintaining Even Streamflows With Coordinated Livestock Drinking Schedules

In an effort to even-out streamflows, UNTIL FURTHER NOTICE, all livestock in the Helmville area will only drink from streams between 5:00am and 10:30am. All livestock in the Ovando area will drink from 10:30am to 2:00pm and in the Clearwater area from 2:00pm to 7:00pm. Livestock in the Potomac area will be hauled to Missoula brew pubs whenever Blackfoot flows fall below 50 CFS. Does anyone read these weekly reports? This is one attempt to find out. Simply reply to this email with a 'yes' so we know you are out there. Or make a simple comment about what you like or don't, or want (we don't have a *like* button). Thanks for your interest!

Cover Crops and Hayfield Improvement

This is the time of year that's ideal for cover crops and hayfield improvement. The main annual crop is harvested and the field lies fallow until fall or spring. The first and only cutting is over and you may or may not need fall pasture. This is the time you can do something to significantly improve soil health and provide extra forage. Cover crops can be cultivated as part of both till and no-till systems.

COVER CROPS

Cover crops are planted between other crops to improve soil health while providing forage. Why plant a crop that is not always focused on immediate profit?

- BETTER NUTRIENT CYCLING: The general rule is *"the more different plants the better"* based on the old ecological principle of *"diversity is stability"*. By planting more species, you stimulate more types of soil organisms which convert organic matter to nutrients for future crops. This larger and more diverse biology creates an overall healthier soil.

- BETTER SOIL AERATION: Cover crops that include deep rooted plants (alfalfa, clover) and tubers (radishes, beets, turnips) aerate the soil and reduce compaction. Plant roots need to breath too.

- BETTER SOIL WATER MOVEMENT AND RETENTION: More organic matter on the surface improves water infiltration and gets more irrigation into the soil before evaporation. More organic matter throughout the soil improves percolation and water holding capacity. Vertical channels created by deep rooted plants and tubers really enhance water movement as they decay.

COVER CROP PLANT SPECIES

There are lots of choices for cover crops and many have not been evaluated in the Blackfoot drainage - so you can be the pioneer! Alfalfa is great for deep-rooting even if it is not planned to be a permanent part of the new planting. Something that fixes nitrogen is ideal including alfalfa, clover, vetch, peas and other related plants. Tubers like radishes, turnips and beets are another good addition to promote aeration and eliminate compaction. Other common choices include kale, collards, sorghum, sunflowers, buckwheat, mung beans, sanfoil, teff grass, phacelia and corn.

HAYFIELD IMPROVEMENT

Cover crop species can also be used in addition to traditional grasses for hayfield and pasture improvement. This could be considered "experimental" in our area until some of the more adventurous types show everyone how. You can start by increasing the number of grasses in your mix. You can also add crop species listed above. These may not survive beyond the first frost, herbicide spray or year but can still provide long-term benefits for the main crop plants. Once again you can achieve results by replanting the entire stand, inter-seeding or no-tilling. Don't expect success every time with every choice.

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

THE BLACKFOOT DRAINAGE IRRIGATION SEASON IN BRIEF

This is a summary of general activities and recommendations for the whole season (more detail in the 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. 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. Stop irrigating if you can.

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.