BLACKFOOT CHALLENGE WEEKLY IRRIGATION REPORT

Friday May 25, 2018

Floodwaters and high soil moisture levels continue to delay irrigation at many sites but it's time to start looking closely to decide when to begin. Surface soil moisture is dropping where recent rains have missed and crops are starting their growth spurt. However, some places may continue to get enough rainfall this week to further postpone irrigating. Long-range forecasts predict a change to above average temperatures and below average rainfall for the rest of the season. Our suggestions for the entire irrigation 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 – SHOWERS THEN SCATTERED SHOWERS

Rainfall was scattered over Blackfoot croplands this week with most sites getting less than ¼ inch. The chart on page 2 lists *"average"* rainfall for the drainage but you should adjust for your site. The forecast is another week of showers with temperatures in the low 70s. More rain should fall over the weekend and less during the week. The 30- and 90-day forecasts suggest above normal temperatures and below normal rainfall so anything could happen later in the season. I use a variety of weather sources each week including calls and emails from folks throughout the drainage. Let me know of the unusual (cloudburst, tornado). One great source is https://www.wrh.noaa.gov/mesowest/mwmap.php?map=mso which shows you real-time info as well as the last 7 days.

CROP WATER USE – LOW – BUT READY TO EXPLODE

Crop water use was again below normal this week but is ready to explode on the first warm sunny day. Crop water use is higher right now in fields with good drainage, sandy/rocky soils and south aspects. It remains very low in flooded and saturated fields. Consider these factors and your rainfall when deciding when and how much to irrigate. The table and chart on Page 2 summarizes the entire irrigation season and compares it with average, hot and cool conditions.

WATER USE IN INCHES	LAST 7 DAYS	NEXT 7 DAYS[1]		SEASON TOTAL[2]
HAY CROPS	**0.8**	**1.0**	(0.9 – 1.2)	2.6
PASTURE	**0.7**	**0.9**	(0.8 – 1.2)	2.1
SPRING GRAINS	**0.3**	**0.5**	(0.4 – 0.7)	0.7
WINTER WHEAT	**0.8**	**1.1**	(0.9 – 1.3)	2.6
LAWNS	**0.7**	**1.0**	(0.6 – 1.2)	2.6

[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)

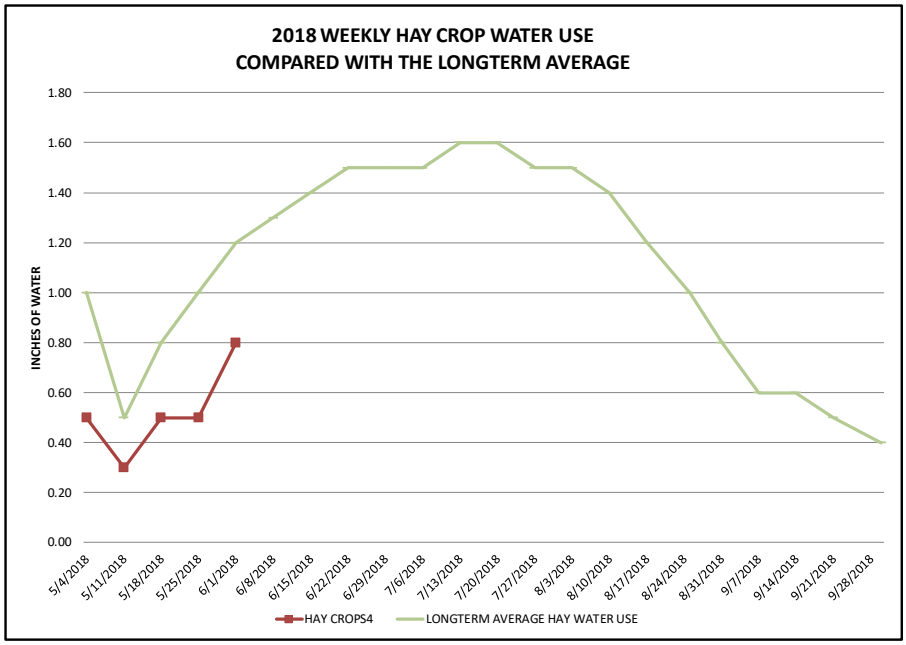
	RAIN[1]	2018 WEEKLY POTENTIAL CROP WATER USE[2]						AVERAGE POTENTIAL CROP WATER USE[3]		
WEEK ENDING	RAIN	HAY CROPS[4]	PASTURE	SPRING GRAINS 5-1 START	SPRING GRAINS 5-15 START	WINTER WHEAT	LAWNS	LONGTERM AVERAGE HAY WATER USE	HOT WEEK HAY WATER USE	COOL WEEK HAY WATER USE
APRIL	1.50	0.50	0.40	0.10	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								1.30	1.40	0.90
6/8/2018								1.40	1.50	1.00
6/15/2018								1.50	1.70	1.00
6/22/2018								1.50	1.90	1.10
6/29/2018								1.50	2.00	1.20
7/6/2018								1.60	2.10	1.30
7/13/2018								1.60	2.00	1.20
7/20/2018								1.50	2.00	1.20
7/27/2018								1.50	2.20	1.10
8/3/2018								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	**3.25**	**2.60**	**2.10**	**0.70**	**0.50**	**2.60**	**2.60**	**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 – TOO HIGH IN SOME FIELDS, DROPPING IN OTHERS

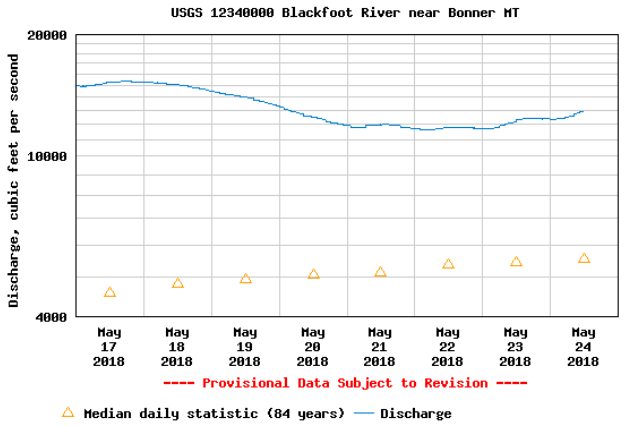
Soil moisture levels throughout the drainage this week remain the highest we've seen in the 8 years of this program. Sites in the lower drainage especially those with rocky/sandy soils saw a slight drying trend this week. Showers will continue to make up for this drying trend on some sites but irrigation will likely begin across much of the drainage. You should especially check surface soil moisture at new seedings, sandy soils and south aspects.

Soil near 100% of its water holding capacity forms a ball when squeezed and leaves the hand wet. Water is visible on both the soil surface and the hand as a shiny surface. Bouncing or striking the soil can often bring a sheen of water to the surface. At 50% of water holding capacity the soil also forms a ball (top photo). The hand 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

Flooding And Stream flows

Today the Blackfoot river flow is about 13,000 CFS at Bonner and increasing after a slight fall this week. Flow currently matches the highest level ever recorded for this date (1948) and is over twice the average. With a forecast for more rain and warmer temperatures flow could continue upwards. The lowest flow ever recorded on May 25 was 865 CFS (1941). We should appreciate our wet year! Irrigators along the Rio Grande are now getting cut off water as stretches of that river dry up completely.



Carcass Pickup Program 2018

The Blackfoot Challenge Annual Carcass Pick-up Program has ended for the year. For future carcass removals, you may deliver a carcass yourself to the MDT Composting Facility near Clearwater Junction (makes a good family outing) or call Jamie Jonkel, with MT Fish, Wildlife and Parks, at 406-544-1447.

Soil Health in the Blackfoot Drainage

Soil Health is a hot topic these days but what does it really mean for crops in the Blackfoot Drainage? Healthy soils are just as important here as anywhere but our area has its own unique opportunities and challenges. Our short growing season and limited crop choices dictate the soil health improvements we should focus on and how we can achieve them.

Soil Health in the Blackfoot Drainage will always benefit from increases in:

- Soil Organic Matter – Generally we have good levels of organic matter in local surface soils but the more the merrier (organic matter increases aeration, infiltration, microbial activity, water holding capacity and more).
- Aeration – Roots and microbes need to breath.
- Infiltration – Water needs to enter soil quickly before it runs off or evaporates.
- Microbial Activity – Microbes decompose organic matter and make nutrients available, the more microbes and the greater diversity of microbes, the better.

Much of the soil health discussion across the country is focused on cover crops which currently are rare in the Blackfoot Drainage. Cover crops don't fit into a hay and pasture landscape during most years since hay fields and pastures are infrequently replanted. Cover crops are most common in annual crop cycles where they are grown in the late summer after the main crop is harvested. Unfortunately, this corresponds to the low-flow period for local streams when fish and recreation concerns are highest and water rights most restrictive. Therefore, cover crops may only be practical for many folks in wet years with prolonged streamflows. This doesn't mean cover crops don't work in the Blackfoot drainage but that they take more planning.

Cover crops are popular because they address all the concerns listed above – organic matter, aeration, infiltration and microbes. However, there are many other ways to promote soil health. Don't feel like you are being left out of the soil health revolution just because you are not planting cover crops.

In future weekly reports we will highlight options to improve soil health that fit our local area. Let us know any special questions or interests you have. Our topics will include: organic matter, soil texture, aeration, infiltration, microbes and soil health tests.

Irrigation History

The first irrigation ditch was dug over 10,000 years ago. The first large irrigation systems were built in Egypt and Mesopotania about 6000 BC. The first lawn sprinkler was invented by J. Lesser in 1871. The impact sprinkler was invented in 1933 by Orton Englehart. The first drip system was invented in 1959 by Simcha Blass.

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.