BLACKFOOT CHALLENGE WEEKLY IRRIGATION REPORT

Friday July 28, 2017

It was another hot, dry week in the Blackfoot drainage with no change looking forward. Crop water use is looking like the highest it's been for the longest period ever. The potential water use by mature hay crops and small grains was almost 2 inches again this week. Water use was reduced on just-cut hayfields and maturing small grains. Blackfoot River flows are way below average and water temperatures have soared. Plan on drought restrictions soon and the likelihood of these becoming the norm. A condensed overview of the entire irrigation season is on the last page of this report so you can plan ahead. Please contact Jennifer Schoonen - Blackfoot River Steward (406-360-6445) for more information on this and other Challenge programs.

WEATHER – ADD 'SMOKEY' TO HOT AND SUNNY

It was another week with no significant moisture. Smoke has plagued us as well as the heat. Most of the local smoke has come from the Lolo Peak Fire pictured at left. Next week is looking like more of the same – sunny, hot (80s - 90s) and smoky. The 30-day and 90-day forecasts still indicate above normal temperatures and normal rainfall.

CROP WATER USE – VERY HIGH - PEAKING

Crop water use is peaking for mature hay and spring grains. Water use drops for small grains as they mature and for hay crops when they are cut. Crop water use for hay drops to 1/3 of the potential the first week after cutting and to 2/3 of the potential the second week. By three weeks after cutting, crop water use is back up to the full potential.

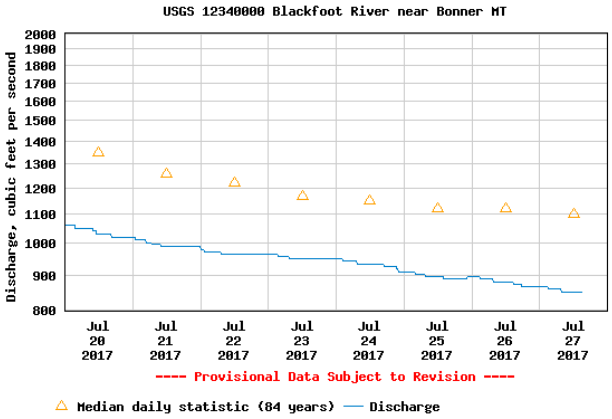
WATER USE IN INCHES[1]	LAST 7 DAYS	NEXT 7 DAYS[2]		SEASON TOTAL[3]	DAILY FORECAST[4]
HAY CROPS	**1.9**	**1.9**	(1.7 - 2.0)	17.7	.27
PASTURE	**1.6**	**1.6**	(1.4 - 1.7)	16.0	.23
SPRING GRAINS	**2.0**	**2.0**	(1.8 - 2.1)	14.3	.29
WINTER WHEAT	**1.0**	**1.0**	(0.5 - 0.7)	15.3	.14
LAWNS	**1.8**	**1.8**	(1.4 - 1.9)	17.5	.27

[1]Potential maximum water use for a well-irrigated crop without fertility, insect or disease restrictions
[2]Expected water use (range if weather becomes cooler or hotter than expected)
[3]April 1 – September 30 (note in 2010-13 we started our seasonal total on May 1 but now include April)
[4]Predicted average daily crop water use over the next week.

SOIL MOISTURE – IF IT LOOKS DRY IT IS!

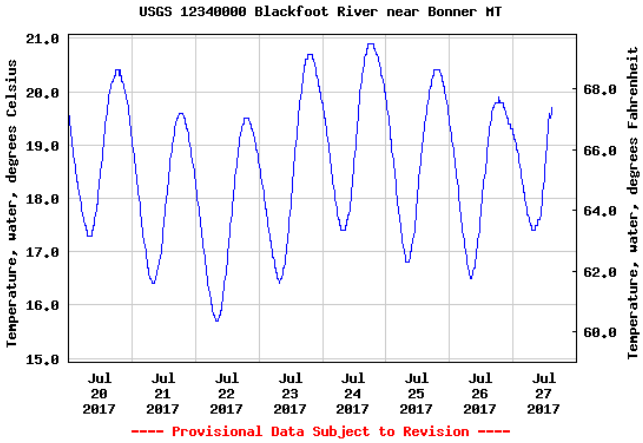
Soil moisture is now a matter of ***"When did I last irrigate?"*** You can use the daily estimate of crop water use to estimate how long your new application will last. Right now a mature hay crop will use up a 1 inch irrigation in 3-4 days. Checking you soil moisture is not rocket science. If it looks dry, if it doesn't form a ball when squeezed - then it probably has little or no moisture. Soil near 50% of its water holding capacity forms a ball when squeezed but little moisture on the hand (middle photo). Soil near 100% of its water holding capacity forms a ball and leaves your hand moist (right photo).

WEEKLY TIPS



STREAMFLOW GETTING CRITICAL

Blackfoot River flows continue to fall rapidly and water temperatures are becoming critical. Current flow at Bonner is only about **850 CFS** compared with the average for this date of **1,140 CFS**. The lowest flow on this date was 435 CFS in 1988 and the highest 3,050 CFS in 1899. It appears that drought restrictions may be implemented very soon.



WATER TEMPERATURES TOO

Temperatures in the Blackfoot River are reaching critical levels for fish and fish-lovers throughout the drainage. Soon you may be able to jump in the river to 'warm up' instead of 'cool off.' With no relief in the forecasts, expect fishing and irrigation restrictions soon.

DROUGHT INSURANCE FOR FUTURE YEARS – START PLANNING NOW!

It is looking more and more like '*drought year*' is the new norm. We may only occasionally get a slightly above normal year for snowpack, rainfall and soil moisture. But even in a year like 2017 that started out so promising with above-average snowpack, a slow melt and a large rainstorm in the early growing season, we are now looking at drought restrictions.

The good news is that many irrigators are already adapting and as a result have put up some of the best harvests ever. These irrigators have taken advantage of earlier growing season start dates combined with abundant early-season water. New crop choices and practices have also helped to increase yields. Some of the ways to reduce water use in future years include:

- Save water for critical growth periods (crop establishment, cutting, peak growth periods);
- Concentrate your hay efforts on the first cutting and then reduce or cease irrigation;
- Concentrate your efforts during the cooler periods when crop water use is lower;
- Reduce/stop irrigation during high crop water use periods which coincide with low stream flow;
- Rotate irrigation systems during low river flows to reduce the amount withdrawn;
- Reduce your irrigated acreage and do a good job irrigating on a smaller acreage;
- Plant crops that use less water and are harvested before low river flow periods (small grains);
- Wait to plant the next crop or new seeding until the hottest and driest period is past;
- Monitor irrigation system performance so you put on the right amount uniformly;
- Put more of your infrastructure into pipes instead of open ditches to reduce water loss;
- Talk with your neighbors and fellow water users and try to solve local problems locally;
- **Be more aware and more flexible of changing spring conditions**.

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

Turpin canals are constructed by digging vertical wells and then connecting them with horizontal tunnels to bring water hundreds of miles across deserts. We can convert open channel ditches to pipelines as one way to reduce evaporation losses in transit.

Avoid planting new crops during the hottest, driest period.

Improve soil health, especially organic matter content, aeration and biological activity.

BLACKFOOT 2017 GROWING SEASON WEEKLY RAINFALL & CROP WATER USE (INCHES OF WATER)

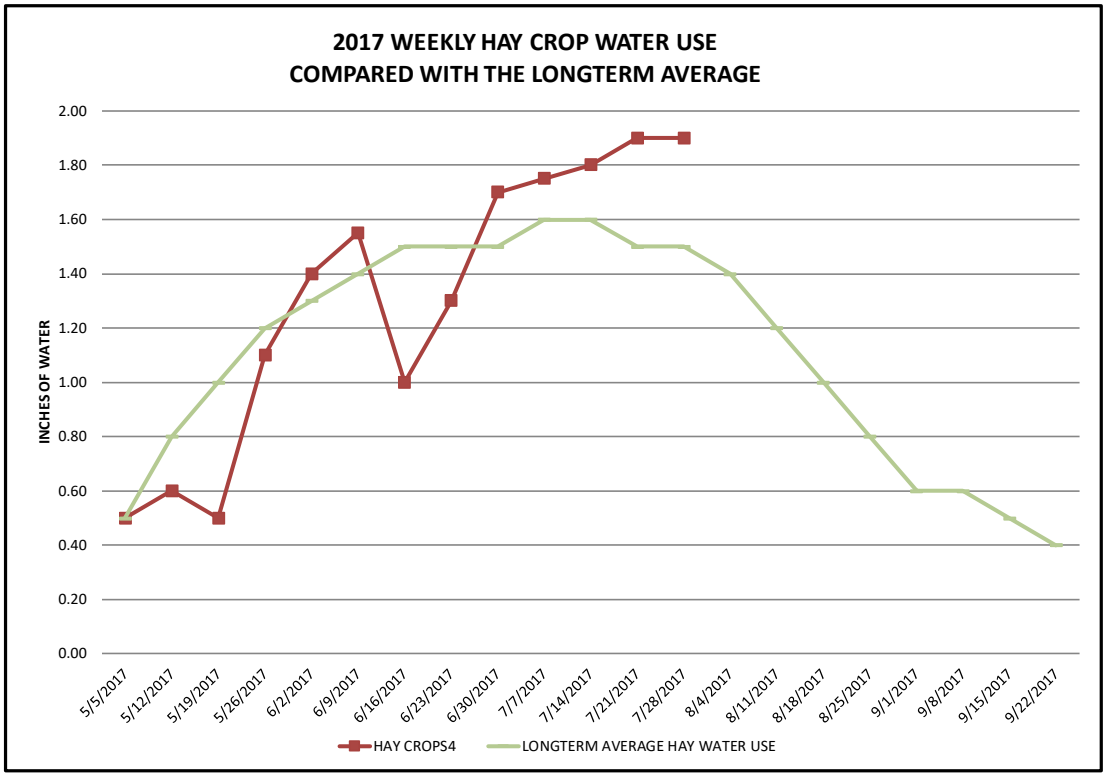
	RAIN[1]	2017 WEEKLY POTENTIAL CROP WATER USE[2]						AVERAGE POTENTIAL CROP WATER USE[3]		
	RAIN	HAY CROPS[4]	PASTURE	SPRING GRAINS 5-1 START	SPRING GRAINS 5-15 START	WINTER WHEAT	LAWNS	LONGTERM AVERAGE HAY WATER USE	HOT WEEK HAY WATER USE	COOL WEEK HAY WATER USE
5/5/2017	0.02	0.50	0.40	0.10	0.10	0.50	0.50	0.50	0.80	0.20
5/12/2017	0.25	0.60	0.70	0.10	0.10	0.90	0.70	0.80	1.00	0.50
5/19/2017	1.00	0.50	0.60	0.10	0.10	0.60	0.50	1.00	1.10	0.60
5/26/2017	0.00	1.10	1.00	0.20	0.10	1.10	1.10	1.20	1.30	0.80
6/2/2017	0.25	1.40	1.30	0.60	0.20	1.50	1.40	1.30	1.40	0.90
6/9/2017	0.50	1.55	1.35	1.00	0.30	1.60	1.45	1.40	1.50	1.00
6/16/2017	1.50	1.00	0.90	1.20	0.60	1.20	1.00	1.50	1.70	1.00
6/23/2017	0.00	1.30	1.20	1.40	0.80	1.40	1.30	1.50	1.90	1.10
6/30/2017	0.25	1.70	1.60	1.80	1.20	1.80	1.70	1.50	2.00	1.20
7/7/2017	0.00	1.75	1.55	1.80	1.80	1.25	1.70	1.60	2.10	1.30
7/14/2017	0.00	1.80	1.60	1.90	1.90	1.00	1.75	1.60	2.00	1.20
7/21/2017	0.00	1.90	1.60	2.00	2.00	1.00	1.80	1.50	1.90	1.20
7/28/2017	0.00	1.90	1.60	2.00	2.00	0.50	1.80	1.50	2.20	1.10
8/4/2017								1.40	1.70	1.00
8/11/2017								1.20	1.50	0.90
8/18/2017								1.00	1.30	0.70
8/25/2017								0.80	1.00	0.50
9/1/2017								0.60	0.80	0.40
9/8/2017								0.60	0.70	0.30
9/15/2017								0.50	0.70	0.30
9/22/2017								0.40	0.60	0.20
9/29/2017								0.40	0.60	0.20
TOTAL	**5.27**	**17.70**	**16.00**	**14.30**	**11.30**	**15.25**	**17.50**	**24.80**	**31.30**	**17.10**

[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.



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. 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.

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.