



BLACKFOOT CHALLENGE

WEEKLY IRRIGATION REPORT

Friday August 4, 2017

Heat and smoke was the theme again this week throughout the Blackfoot drainage. The future doesn't look much different. Crop water use remains the highest it's been for the longest period since records have been kept. The potential water use by mature crops was at or near 2 inches again this week. Blackfoot River flows are expected to reach the 700 CFS level in the next few days which will trigger *drought response plans*. We may have to relabel these plans *normal operating procedures*. 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 - SMOKEY AND HOT AGAIN

It was another week with no significant moisture and there is none in the forecast. 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 has dropped 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. Pasture crop water use is lower than hay crops since it is partially "cut" by grazing animals on a regular basis.

| WATER USE IN INCHES¹ | LAST 7 DAYS | NEXT 7 DAYS² | SEASON TOTAL³ | DAILY FORECAST⁴ |
|--|------------------------|------------------------------------|-------------------------------------|---------------------------------------|
| HAY CROPS | 1.8 | 1.8 (1.7 - 2.0) | 19.5 | .27 |
| PASTURE | 1.5 | 1.5 (1.4 - 1.7) | 17.5 | .23 |
| SPRING GRAINS | 2.0 | 2.0 (1.8 - 2.1) | 15.3 | .29 |
| WINTER WHEAT | 0.0 (HARVESTED) | 0.0 (0.0 - 0.0) | 15.3 | .14 |
| LAWNS | 1.7 | 1.7 (1.4 - 1.9) | 19.2 | .27 |

¹Potential maximum water use for a well-irrigated crop without fertility, insect or disease restrictions

²Expected water use (range if weather becomes cooler or hotter than expected)

³April 1 – September 30 (note in 2010-13 we started our seasonal total on May 1 but now include April)

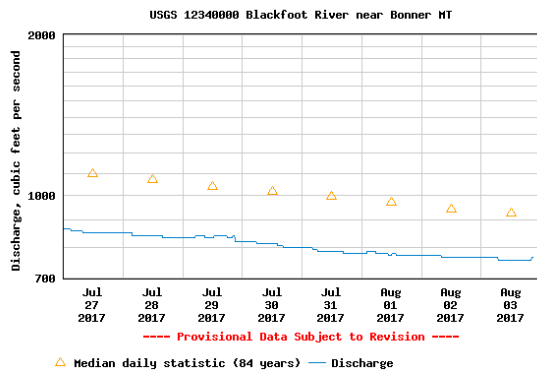
⁴Predicted average daily crop water use over the next week.

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).

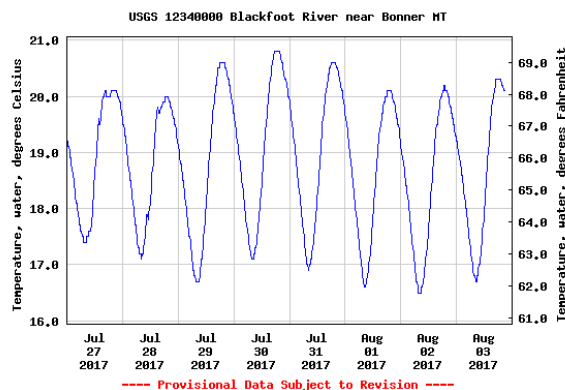


WEEKLY TIPS



STREAMFLOW GETTING CRITICAL

Blackfoot River flows continue to fall rapidly and water temperatures are becoming critical. Current flow at Bonner is only about **760 CFS** compared with the average for this date of **980 CFS**. The lowest flow on this date was 386 CFS in 1988 and the highest 1,160 CFS in 1899. It appears that flows will reach 700 CFS in the next few days and drought restrictions will be implemented.



WATER TEMPERATURES TOO

Temperatures in the Blackfoot River are near critical levels for fish and fish-lovers throughout the drainage. The action level is when temperatures exceed 70 degrees for 3 days in a row. Soon you may be able to jump in the river to 'warm up' instead of 'cool off.' There may be fishing restrictions soon.

FIRES HAVE PRIORITY FOR WATER

When fires are burning close to critical infrastructure they need priority for water use. It may be necessary to curtail irrigation if water is needed to support fire fighters and their equipment. This should only affect local areas near "diversions" where tanks, buckets and scoops are filled.

DROUGHT AROUND THE COUNTRY AND WORLD

Droughtmonitor.unl.edu says 11% of the US (lower 48) is impacted by drought including 22 million people. The Amazon basin is experiencing its third 100-year drought since 2005. NASA says the eastern Mediterranean is feeling the worst drought in 900 years.

SOIL HEALTH INFORMATON - LISTSERV

We invite everyone interested in Soil Health to join the Soil Health listserv and receive announcements about this important topic. Anyone who wants to sign up can contact (jennifer@blackfootchallenge.org) or Brad (brad@blackfootchallenge.org).

SOIL HEALTH INFORMATON - EVENTS

Soil Health Bus Tour: The Montana chapter of the Soil & Water Conservation Society (SWCS) is hosting a bus tour to Dakota Lakes Research Farm (Pierre, S.D.), Menoken Farms, and Gabe Brown's Farm/Ranch on September 12th-14th. We invite everyone interested in Soil Health to join the Soil Health listserv to keep informed or go to MTSWCS.org. The Challenge will be there!

Maughn Farm Tour: There will be a tour of the Foust Farm in the Moeise Valley of Lake County on August 29 at 2:30pm. Take the Moeise Valley Road across from the Bison Range entrance and watch for the Foust Farm sign at the 90 degree corner. The Fousts are cover-crop enthusiasts and have planted a wide variety of "alternative forage" including collard greens. More info at <http://lakecountyconservationdistrict.org/>.

DROUGHT INSURANCE FOR FUTURE YEARS - START PLANNING NOW!

Some of the ways to reduce water use in future years include:

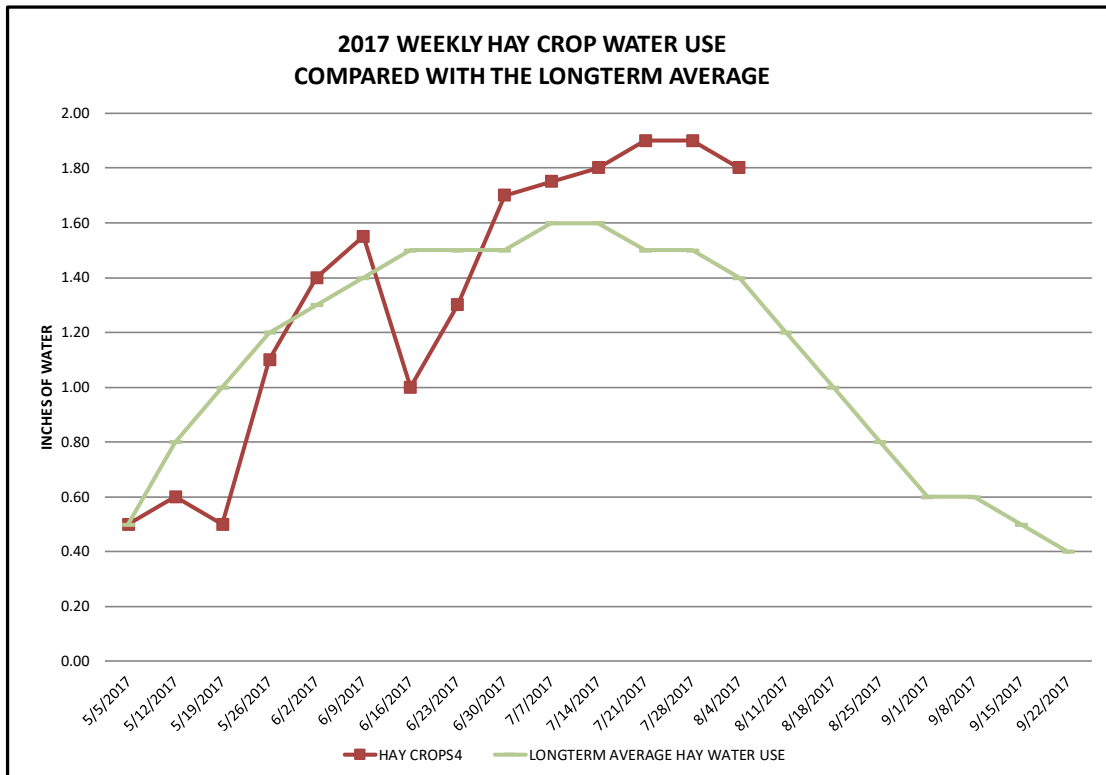
- Save water for critical growth periods (crop establishment, cutting, peak growth periods);
- Concentrate your hay efforts on the first cutting and then reduce or cease irrigation;
- Concentrate your efforts during the cooler periods when crop water use is lower;
- Reduce/stop irrigation during high 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

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 | SPRING GRAINS | WINTER WHEAT | LAWNS | LONGTERM AVERAGE HAY WATER USE | HOT WEEK HAY WATER USE | COOL WEEK HAY WATER USE |
| | | | | 5-1 START | 5-15 START | | | | | |
| 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 | 0.00 | 1.80 | 1.50 | 1.00 | 1.80 | 0.00 | 1.70 | 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 | 19.50 | 17.50 | 15.30 | 13.10 | 15.25 | 19.20 | 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.