



BLACKFOOT CHALLENGE WEEKLY IRRIGATION REPORT

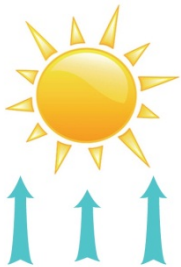
Friday July 17, 2015

Cooler weather finally came last week and lowered **potential crop water use (1-1 ½ inches)**. A few scattered showers left hopeful but very small amounts of rain. The good news is that haying is a perfect time for these dry conditions with cooler temperatures and lower crop water use. Workers are happier and plants can recover from decapitation more easily as we race to get water back on. Blackfoot River flows have dropped below 700 CFS and drought plans are getting more attention. Hoot Owl fishing restrictions are in effect from 2pm to midnight. A condensed overview of the entire irrigation season is presented on the last page of this report as a reminder to plan ahead. More information about irrigation and drought is available on the Challenge website.



WEATHER - COOLER LAST WEEK AND NEXT

It finally cooled off this last week and will continue to be cool and mostly dry with a change of showers early in the week. Temperatures will be in the 70s and 80s. The 30 and 90 day forecasts continue to suggest above normal temperatures and normal rainfall. Very low streamflows are becoming very, very low streamflows.



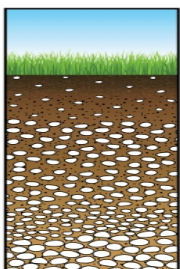
HIGH CROP WATER USE CONTINUES

Crop water use dropped with the cooler weather to below 1 ½ inches for all crops last week. This is the first time it was below normal in 6 weeks (see page 3). It will be about the same next week. It's a good time for dry, cool weather – haying. Crop water use is reduced about 2/3 the first week after cutting hay crops and about 1/3 the second week. The table and chart on Page 3 illustrate crop water use throughout the whole season.

| WATER USE IN INCHES | LAST 7 DAYS | NEXT 7 DAYS¹ | SEASON TOTAL² |
|-------------------------------------|------------------------|------------------------------------|-------------------------------------|
| HAY CROPS | 1.4 | 1.3 (1.1 - 1.5) | 16.3 |
| PASTURE | 1.1 | 1.0 (0.9 - 1.2) | 14.0 |
| SPRING GRAINS (planted May1) | 1.5 | 1.4 (1.2 – 1.6) | 11.1 |
| WINTER WHEAT | 1.0 | 0.6 (0.5 – 0.7) | 17.4 |
| LAWNS | 1.3 | 1.5 (1.3 - 1.7) | 15.8 |

¹Expected water use (range if weather becomes cooler or hotter than expected)

²Beginning April 1 – note in 2010-13 we started our seasonal total on May 1 but now include April



SOIL MOISTURE - ADD WHAT YOU CAN

Ideally you have a full soil profile and are ready for your first cutting. However, most of those in the Blackfoot Drainage on Planet Earth are struggling to boost moisture at all. Do the best you can, leave time for the surface to dry out before cutting and get back on if you can as soon as possible.

WEEKLY TIPS

Crop Water Use and Haying

Scientists have discovered that cutting your head off causes stress for plants just like it does for humans.

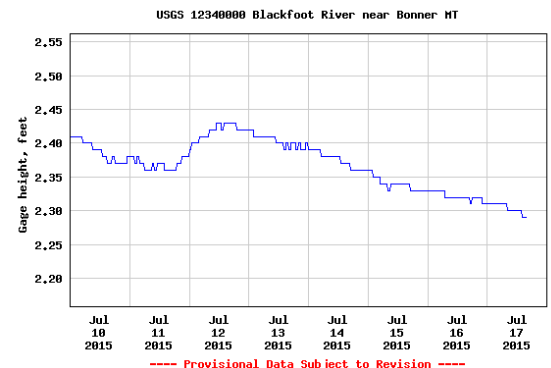
- If you plan to keep your current hay crop plants for next year you should water them once after cutting even if you don't plan a second cutting or pasture.
- If you plan to do something different next season you can turn off the pump or headgate and leave the streamflow for the fish.
- If you plan for fall pasture or a second cutting, irrigate as close to cutting as possible, leave enough time for the surface to dry, cut your hay then get back across the field as quickly as possible. Alfalfa is especially susceptible to harvest stress but grasses also recover much better with water.

Keep Irrigating While Water Supplies Last and the Weather is Great

The growing season up to first cutting is the most important period in the Blackfoot drainage so make your best effort then. Hot days are great for converting irrigation water into crop production. Check your soil moisture with a soil probe or shovel and if it looks and feels moist – you're good. If it's dusty and dry – keep irrigating. This applies to both sprinkler and flood systems. Then give it a few days and look again - you will be surprised how much water a crop can use and how quickly your soil dries out!

Drought in 2015

You don't need me to tell you it's a drought. There was little snow, no rain, the river looks like a creek, the hills are brown and who knows what the fire season will bring or what we will use to put it out. I just came back from 18 days along the west coast of British Columbia and they were having **water rationing in costal BC!** Little towns like Bella Bella and Sherwood turned us away from the spigot and pointed to bottled water when we asked to fill our boats water tank. About 30 years ago I turned down a job in Ketchikan Alaska because of the 180 inch rainfall. This year has seen almost none since May and fisherman report water temperatures up by 3 degrees when ½ degree usually affects fishing. Drought managers and irrigators from Montana to Alaska are considering options and we will keep you informed about new developments.



Drought Relief Hints

Here are some hints for reducing water use taken from our irrigation guide. The guide has more detail and is available at: <http://blackfootchallenge.org/Articles/wp-content/uploads/2013/06/BFIrrigationGuideFinalv3.0.pdf>

- Fill Up Your Soil - NOW - and Try to Keep it Near Full
- Know how much you apply – check with rain gauges or flow meter
- Apply More Water At Each Application
- Concentrate your efforts on the first cutting and then relax
- Reduce irrigated acreage and irrigate that well

For more information contact Jennifer Schoonen, Blackfoot Challenge Water Steward, 406-360-6445 or Barry Dutton, Professional Soil Scientist, 406-240-7798 barry@landandwaterconsulting.net

BLACKFOOT 2015 GROWING SEASON WEEKLY RAINFALL & CROP WATER USE (INCHES OF WATER)

| | RAIN ¹ | 2015 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 |
| April | 0.50 | 0.90 | 1.00 | 0.00 | 0.00 | 1.20 | 1.10 | | | |
| 5/1/2015 | 0.01 | 0.80 | 0.90 | 0.10 | 0.00 | 1.10 | 0.90 | 0.50 | 0.80 | 0.20 |
| 5/8/2015 | 0.01 | 1.10 | 1.00 | 0.20 | 0.00 | 1.20 | 1.10 | 0.70 | 0.90 | 0.30 |
| 5/15/2015 | 0.10 | 1.10 | 0.90 | 0.20 | 0.00 | 1.20 | 1.00 | 0.80 | 1.00 | 0.50 |
| 5/22/2015 | 0.25 | 0.80 | 0.60 | 0.25 | 0.20 | 0.90 | 0.80 | 1.00 | 1.10 | 0.70 |
| 5/29/2015 | 0.25 | 1.10 | 0.80 | 0.40 | 0.30 | 1.20 | 1.00 | 1.20 | 1.20 | 0.80 |
| 6/5/2015 | 0.50 | 0.90 | 0.80 | 0.50 | 0.40 | 1.00 | 0.90 | 1.30 | 1.30 | 0.90 |
| 6/12/2015 | 0.00 | 1.60 | 1.40 | 1.10 | 0.90 | 1.60 | 1.50 | 1.40 | 1.50 | 1.00 |
| 6/19/2015 | 0.00 | 1.60 | 1.40 | 1.50 | 1.25 | 1.70 | 1.50 | 1.50 | 1.70 | 1.10 |
| 6/26/2015 | 0.00 | 1.60 | 1.30 | 1.70 | 1.60 | 1.70 | 1.50 | 1.50 | 1.90 | 1.10 |
| 7/3/2015 | 0.00 | 1.70 | 1.40 | 1.80 | 1.80 | 1.80 | 1.60 | 1.50 | 2.00 | 1.20 |
| 7/10/2015 | 0.00 | 1.70 | 1.40 | 1.80 | 1.80 | 1.80 | 1.60 | 1.60 | 2.10 | 1.30 |
| 7/17/2015 | 0.01 | 1.40 | 1.10 | 1.50 | 1.50 | 1.00 | 1.30 | 1.60 | 2.00 | 1.20 |
| 7/24/2015 | | | | | | | | 1.50 | 1.90 | 1.10 |
| 7/31/2015 | | | | | | | | 1.50 | 2.20 | 1.10 |
| 8/7/2015 | | | | | | | | 1.40 | 1.70 | 1.00 |
| 8/14/2015 | | | | | | | | 1.20 | 1.50 | 0.90 |
| 8/21/2015 | | | | | | | | 1.00 | 1.30 | 0.70 |
| 8/28/2015 | | | | | | | | 0.80 | 1.00 | 0.50 |
| 9/4/2015 | | | | | | | | 0.60 | 0.80 | 0.40 |
| 9/11/2015 | | | | | | | | 0.50 | 0.70 | 0.30 |
| 9/18/2015 | | | | | | | | 0.50 | 0.70 | 0.30 |
| 9/25/2015 | | | | | | | | 0.40 | 0.60 | 0.20 |
| 9/30/2015 | | | | | | | | 0.40 | 0.60 | 0.20 |
| TOTAL | 1.63 | 16.30 | 14.00 | 11.05 | 9.75 | 17.40 | 15.80 | 24.40 | 30.50 | 17.00 |

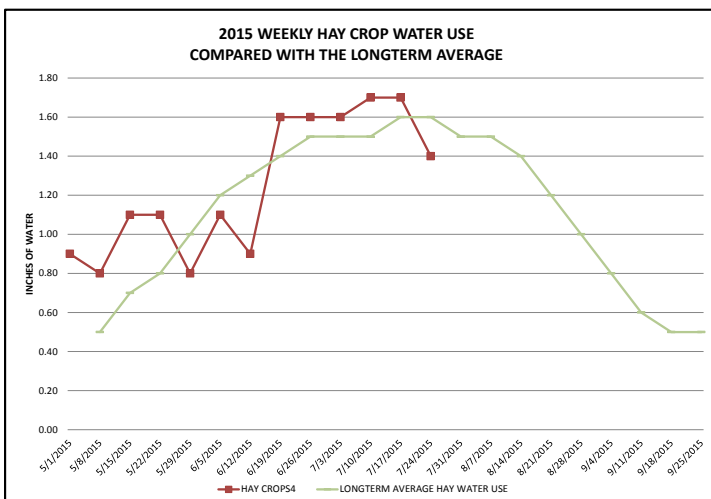
¹ Rainfall should be reduced to account for immediate evaporation from crop and soil surfaces (0.1-May and Sept, 0.15-June and August, 0.2-July)

² This years maximum water use by healthy crops that are well-fertilized and irrigated, disease and insect-free. Will vary across the drainage.

³ Average water use for each crop each week based on long-term historic data.

⁴ Hay Crop water use should be reduced by approximately 2/3 the first week after cutting, 1/2 the second and 1/3 the third.

CROP WATER USE STARTED OUT ABOVE AVERAGE, DROPPED BELOW AVERAGE FOR THREE WEEKS AND SHOT UP WITH WARMER WEATHER FOR FIVE WEEKS BUT WE NOW HAVE THE FIRST RELIEF DUE TO COOLER WEATHER (RED LINE = 2015, GREEN LINE = LONG TERM AVERAGE)



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 weather conditions and predictions then plan for 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 (May 1) 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.