News Column
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CROP WATER NEEDS

My social media friends spent a lot of time during the month of June speculating about the weather, mostly lamenting about the fact that the clouds had parted and left their piece of the world dry again. Some of them washed their cars, left the windows down, and even hung laundry out to dry and still couldn't catch a rain.

One of my friends/acquaintances wrote that they were 8 inches behind the normal rainfall for the year. Thinking that sounded like a lot – but maybe believable – I checked the numbers for the Manhattan area and found that Manhattan's rainfall was 5.32 inches below normal through the end of May. So, 8 inches below normal was probably accurate by the third week in June.

I didn't think 5.32 inches below normal sounded too bad,.....until I realized normal for the first five months of the year is just 11.84 inches. With 6.51 inches through May, we had a little over half of the normal average rainfall going into June.

My mind travels strange paths, with every answer seemingly leading to a new question. The new question I had once I saw how much rain we had received up to this point in the year was, "How much rain do we actually need to produce a crop?"

To produce the first bushel of yield, corn needs about 10.9 inches of water. Soybeans need just 7.8 inches of water to produce the first bushel, and grain sorghum needs just 6.9 inches of water to produce a yield. Wheat needs 10 inches and sunflowers need just 5.4 inches of water to produce a minimal yield.

There are a couple of things to note when looking at these numbers. First, these aren't rainfall numbers. Instead, they are inches of water that the plant takes up. Some water that comes from the sky, or from irrigation, will run off and some will drain through the soil before the plant can use it. Not all rain that lands on a farm will be useable by the growing crop.

The second thing to note is that these are amounts of water needed to produce just the first bushel or pound of yield. More water will be needed to produce a profitable crop.

You might wonder why corn is so popular if it needs the most amount of water to begin producing a yield. The answer is that corn pretty efficient beyond the first bushel, producing 16.9 bushels of yield per inch of water after the first bushel is produced.

Grain sorghum produces the first bushel with less water, but produces just 12.2 bushels of yield per inch of water after the first bushel is produced. Soybeans produce about 4.6 bushels of yield per inch of water after the first bushel, and wheat produces 6 bushels per inch of water after the 10 inch minimum.

We don't grow many sunflowers here, but if you're curious, sunflowers produce about 218 pounds per inch of water after the first pound of yield is produced.

There is a limit to how much water plants can use, with corn maxing out at about 25 inches, soybeans at 24 inches, wheat at 24, sunflowers at 22, and grain sorghum at 21 inches.

Some quick math using the numbers just provided suggests we should get a 238 bushel per acre corn yield with 25 inches of water. Twenty-four inches of water could produce 74 bushel per acre soybeans, and 21 inches of water could produce 172 bushel per acre grain sorghum.

Wouldn't it be great if it actually worked that way?

In the real world, yield reducing factors such as hail, freeze damage, insects, diseases, and

lodging reduce the long-term average yields by 20-25%. Therefore, we are more likely to produce 190 bushel per acre corn, 60 bushel per acre soybeans, 137 bushel per acre grain sorghum in years where rainfall is plentiful.

In good years and in bad years, the most important time to receive rainfall (and cooler temperatures) is during flowering. Most of our earlier planted corn will tassel in early July. Therefore, a rain around July 4 will normally make a corn crop.

With grain sorghum, flowering usually occurs in late July, so a rain around July 25 will make a good sorghum crop. Soybean begin flowering in July, but the bulk of the yield results from flowers produced in late July and early August. A rain August 15 will usually make a soybean crop.

If you have questions, you can reach me at the Riley County Extension Office at 785/537-6350. Or, you can send e-mail to gmcclure@ksu.edu.

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