

Last Irrigation?

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One of the real management challenges with irrigation is determining when to apply the final irrigation. How to determine when the crop has enough water to grow to maturity without pumping excess groundwater or surface water is a calculated guess at best for most of us. You don't want to short the crop and hurt yield but you also don't want to spend additional money pumping water the crop won't utilize. Another goal of producers should be to leave as little moisture in the soil profile as possible and let Mother Nature replenish the soil profile during the fallow period between crops. With the exception of winter wheat behind this year's dry edible bean crop, there will be a lengthy fallow period before another crop is planted next spring.

Our local NRD districts and the University of Nebraska have guidelines for how much water each crop is using per week at the late stages of development. These guidelines don't account for moisture available in the soil for crop use. These guidelines are also based on conventional tilled soils. Residue on the soil surface reduces the water use of the crops by slowing soil moisture evaporation from the field, thus reducing the water requirements for crops planted in no till soils.

The soil moisture sensors we have in our fields help us determine this decision for water management. The centibar readings we take from these sensors are a guideline to how much moisture is in the soil based on our soil type. An example is in our Keith silt loam soils. This soil type holds 1.8-2.2 inches of available water per foot of soil for the crops when at field capacity. On our corn field planted in a Keith silt loam soil we have applied 7 inches of irrigation this growing season. Our current centibar readings are 30cb for the 1st foot, 130cb for the 2nd foot, 25cb for the 3rd foot, and 17cb for the 4th foot. The lower the centibar reading, the wetter the soil. The centibar readings range from 0 to 200. Soil type also plays an important role. A 30 centibar reading in a silt loam soil is at field capacity, while that same reading in a sand type soil is almost 60 percent below field capacity.

Using these readings and guidelines developed by the University of Nebraska for our soils, the first foot of soil is at field capacity at 30cb, so there is 1.8 inches of available water. The second foot reading of 130cb means we have depleted .9 of an inch of moisture, leaving us with another .9 of moisture available. In our soil profile on most of our soils, the 3rd and 4th foot soils are a more white calcareous type soil which has a water holding capacity of around 1 inch per foot of soil, very similar to the Valent fine sand soils we also farm. Using the guidelines for the sandy soils, we have .6 and .7 inches of available water even though the centibar readings are lower in value.

Using these readings allows us to estimate we have about 4 inches of moisture in our soil in the 4 foot soil profile. Our crop is nearing the early dent stage. We may be nearing the end of the irrigation season for this crop. We will have to determine whether we feel this is enough moisture to carry the crop to maturity. My guess is we may not

require any more irrigation, but I'll consult with some crop advisors to help make this determination.

We haven't applied any irrigation for a couple of weeks now. Thanks to some August rains we have been able to let the center pivots sit for a while. Our yearly precipitation total is 9.07 inches, still 3.4 inches below normal. Last evening we received .45" of precipitation. Unfortunately this rain was accompanied by high winds and hail.

Our total irrigation for our silt loam soils is 7 inches on the corn and 4.5 inches on the edible beans, along with 7.5 inches on the winter wheat and 1 inch on our forage/cover crop.

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