

Truths about Water Use, Corn and Ethanol



Getting to the truth about corn and ethanol's use of water reveals some interesting facts that many consumers may not be aware of. For example, people who need to water their lawns in the summer can logically assume that corn (like all crops) requires a good deal of moisture. Or they assume that the water goes into the corn and ... that's it. The water disappears in helping the corn grow.

The truth is out there ... but the truth is not always what one thinks it to be.

First of all, for example, is how much water corn needs to grow – nearly 600,000 gallons per acre for each growing season, or 4,000 gallons per bushel of harvested corn. This amounts to between 20 and 25 inches of water.

Fortunately, corn is grown mostly in the “Corn Belt” and surrounding states, a swath of land curving down from the Dakotas through Ohio. The top four states for corn production are Iowa, Illinois, Nebraska and Minnesota. These states and their neighbors get so much rain in the summer that irrigation is often not necessary.

Truth No. 1:

Nationally, nearly nine out of 10 acres of corn require no water other than naturally occurring rain.

When it comes to water, however, there is something else to remember. The world always has a constant supply of water in the water cycle. And while corn takes in water, it also gives it off in a combined process called evapotranspiration. In an acre of corn, water evaporates from the soil to the air and transpires from the plant itself.

Truth No. 2:

An acre of corn gives off 4,000 gallons of water a day in evapotranspiration – about 1 million to 1.5 million gallons of moisture per acre annually.

In aggregate, corn returns more moisture to the atmosphere than it withdraws from ground and surface water for irrigation.

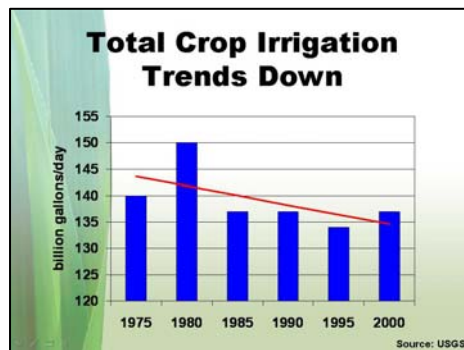
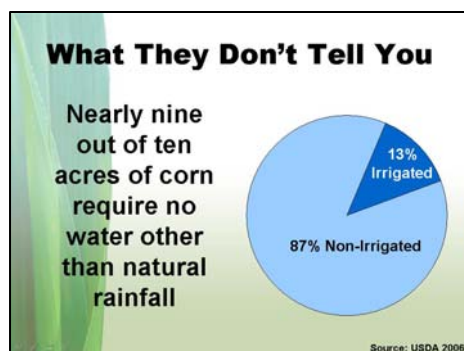
Further, corn is not as thirsty a plant as others. While it takes about 4,000 gallons of water to produce one bushel of corn, just compare this to the 11,000 gallons it takes to grow a bushel of wheat or the 15,000 gallons to grow a similar amount (56 pounds) of alfalfa.

Ethanol and Water

But what about water use at an ethanol plant? According to the Renewable Fuels Association, on average it takes three gallons of water to process a gallon of ethanol. This number has come down from four or five gallons as technology has improved in the relatively new ethanol industry. Projections are that there are savings still to come and that the number may soon drop to around two gallons.

According to the *St. Petersburg Times*, a typical 40-million-gallon-a-year ethanol plant uses almost exactly the same amount of water per as an average 18-hole municipal golf course. It also uses about 1 percent of the daily water use of a municipality of 180,000.

In addition, in most cases, an ethanol plant's process water is not discharged from the facility. Most of the water is recycled and reused. Water may also leave the plant as a component of one of the plant's coproducts: distillers wet grains, which are fed to beef and dairy cows.



But let's put water use and ethanol into perspective. If we did not have biofuels such as corn ethanol, we would need more petroleum for more gasoline. And it takes 1,851 gallons of water to refine a barrel of oil, according to the U.S. Environmental Protection Agency, or more than 44 gallons of water per gallon of crude.

Other Points for Perspective

- According to the U.S. Geological Survey (USGS), Corn and other crops are seeing a reduction in irrigated water needs.
- Water is used heavily in manufacturing and food processing. It takes 62,600 gallons to produce a ton of steel and 39,090 gallons are needed to manufacture a new car, including tires. (U.S. EPA)
- It takes 28,100 gallons to process a ton of beet sugar to make processed sugar and 1,500 gallons to process a barrel of beer. (USGS)
- The average home uses 107,000 gallons of water per year. (USGS)
- It takes 24 gallons of water to produce one pound of plastic and 101 gallons to produce one pound of cotton. (USGS)
- 300 million gallons are needed to produce a single day's supply of U.S. newsprint and it takes 150 gallons to produce the average size Sunday newspaper. (USGS, U.S. EPA)