The Biggest Biofuels Myths Demystified

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The news headlines could not be more distressing. Australia has to add another color to its weather map [1] because this year's heat is so intense. U.S. temperatures in 2012 smashed all previous records [2]. And here, in the biofuels sector, comes a *New York Times* report linking ethanol mandates to poverty and privation in Guatemala [3].

Here on Earth, things have become so bad that a company offering *one-way* tickets for Mars colonization — first landings scheduled for 2023 — received 1,000 applications for colonist selection even before the official selection program opened. [4] Is it really time to exit planet Earth? Let's look at the six biggest biofuels myths.

Myth #1: 40 percent of the U.S. corn crop is used to make biofuel.

Reality. Actually, it's more if all you are measuring is the volume of corn passing through biorefineries — including both dry grind and wet mills. But those refineries make a heck of a lot more than ethanol. They also make most of the cattle and swine feed. They make corn syrup, and CO2 for soft drinks, and whiskey, and corn meal, and all kinds of ingredients and flavoring.

Imagine alleging that China was using half the world's iron to make sewing needles. Or that 40 percent of the U.S. corn crop was being used to make sugarless gum flavoring. Just to pull the same trick using other commodities.

About 13 percent of the U.S. corn crop is used to make, specifically, fuel ethanol. But keep in mind that per-acre crop yields have grown so much in recent years that,

taken over the long term, the U.S. has not had to increase its corn acreage by a square foot to make fuel ethanol. In fact, there's less land used to grow grain today than 100 years ago in the U.S.

Myth #2: "Now that the United States is using 40 percent of its crop to make biofuel, it is not surprising that tortilla prices have doubled in Guatemala."

Reality. The confusion here is that there are two types of corn. There's the type grown in the U.S. for biorefineries and animal feed — #2 yellow corn. Then there's the type of corn used to make tortillas, in Guatemala and elsewhere. That's white corn. They have completely distinct markets — and their own independent supply-and-demand drivers.

The Renewable Fuels Association's Geoff Cooper helps with two data points. Here's one: "Very little white corn is grown in the U.S., but acres dedicated to white corn have not been reduced since passage of the renewable fuel standard (RFS)."

Here's the other: "Guatemalan farmers are harvesting more corn than in the past. Guatemala harvested 850,000 hectares of corn in 2012, the second highest level in history, according to the United States Department of Agriculture (USDA). Over the past five years, harvested corn acres have been 32 percent higher, on average, than in the preceding 10 years."

Cooper's devastating fact-check on the *New York Times'* coverage can be found here [5].

Facts such as: Guatemala's maize imports have been steady since 2000, not rising [5]. Guatemalan corn acreage is growing faster than sugarcane acreage, not the other way around [5]. Per capita consumption of maize in Guatemala is up 3 percent (2004 to 2009, last data year), not down [5].

Myth #3: The world is going to climate hell, and there's nothing anyone can do about it, except starve (if you don't die of thirst first).

Reality. The world is certainly heading for more climate stress, but industry and science is responding.

Recently, Ceres announced that field trials in China [6] have demonstrated that its portfolio of drought tolerance genes provided significant improvements in yield protection in rice, which the company routinely uses to confirm trait performance.

One of Ceres' genes produced an average of 25 percent more grain than experimental control plants and 20 percent more grain than rice plants containing a recently deregulated biotech drought trait. Biomass production was improved by 20 percent over the same controls. In addition to greater yield stability under drought conditions, some Ceres genes have also demonstrated yield benefits under normal watering conditions.

Based on these results in rice, the company believes that drought genes already in its pipeline could maintain 100 percent grain and biomass yields under water deficits up to 30 percent, with the opportunity to further enhance tolerance by combining, or stacking, drought genes together. According to published reports, the first commercial biotech drought trait, as well as drought traits developed by plant breeding alone, have provided only modest (less than 10 percent) yield protection.

Ceres will proceed with additional testing and continue to move its traits into its energy crops, as well as row crops. About 80 percent of agricultural land in the U.S. experienced drought last season, making the 2012 drought more extensive than any drought since the 1950s, according to the USDA. U.S. corn production, for instance, was down 4 billion bushels to 10.7 billion bushels from early-season projections of 14.8 billion — a loss of $25 billion based on season-average corn prices for the 2011/12 marketing year.

READ MORE: More on the Ceres story here. [6]

READ MORE: What's being done in crop R&D about drought tolerance. [7]

READ MORE: Biofuels and energy crop developments in drought tolerance [7].

Myth #4: Biofuels cause higher carbon emissions, instead of lowering them.

Reality: According to the EPA, corn ethanol reduces greenhouse gas emissions by 20 percent, compared to the use of fossil fuels, and every other biofuel in use in the United States (which require qualifying for the advanced, or non-corn, pool) results in, at least, a 50 percent reduction in greenhouse gas emissions compared to fossil fuels. Does this include both direct land-use change, and even a component for the controversial indirect land-use change? You bet it does.

Myth #5: Biofuels have lower fuel economy.

Reality: On mileage. Bio-based gasoline and renewable diesel, as identical fuel molecules, have exactly the same fuel economy as their counterparts. Due to the way that particulates found in fossil fuels behave in jet engines, bio-based aviation fuels generate 2 to 7 percent better fuel economy than their counterparts. Ethanol is generally in the 70 percent range in terms of mileage per gallon, compared to gasoline — the energy density is a little lower than that, but the impact is mitigated by some other favorable properties of ethanol, including higher octane levels.

In Brazil, flex-fuel drivers generally buy gasoline when the price of ethanol is more than 70 percent of gasoline, and buy ethanol when the comparable price is lower. In the U.S., the price of wholesale ethanol is generally right at that 70 percent mark, too. So, while fuel economy is lower on a car-for-car basis — the cost per mile is just about the same.

Myth #6. Biofuels use more energy in their production than they provide as a transport fuel.

Reality. Generally, the consensus energy return for corn ethanol is 1.3 to 1, sugarcane ethanol (primarily from Brazil) is at 8:1, biodiesel is at the 2.5:1 mark and the range for cellulosic biofuels runs from 2:1 to 36:1. Also worth noting is that biofuels processors are continuously improving yields and reducing energy use.

What's your take? Please feel free to comment below! Copyright 2013; Biofuels Digest *[8]*

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