

## CORN CAN'T SOLVE OUR PROBLEM<sup>1</sup>

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The world has come full circle. A century ago our first transportation biofuels -- the hay and oats fed to our horses -- were replaced by gasoline. Today, ethanol from corn and biodiesel from soybeans have begun edging out gasoline and diesel. This has been hailed as an overwhelmingly positive development that will help us reduce the threat of climate change and ease our dependence on foreign oil. In political circles, ethanol is the flavor of the day, and presidential candidates have been cycling through Iowa extolling its benefits. Lost in the ethanol-induced euphoria, however, is the fact that three of our most fundamental needs -- food, energy, and a livable and sustainable environment -- are now in direct conflict. Moreover, our recent analyses of the full costs and benefits of various biofuels, performed at the University of Minnesota, present a markedly different and more nuanced picture than has been heard on the campaign trail.

Some biofuels, if properly produced, do have the potential to provide climate-friendly energy, but where and how can we grow them? Our most fertile lands are already dedicated to food production. As demand for both food and energy increases, competition for fertile lands could raise food prices enough to drive the poorer third of the globe into malnourishment. The destruction of rainforests and other ecosystems to make new farmland would threaten the continued existence of countless animal and plant species and would increase the amount of climate-changing carbon dioxide in the atmosphere.

Finding and implementing solutions to the food, fuel and environment conflict is one of the greatest challenges facing humanity. But solutions will be neither adopted nor sought until we understand the interlinked problems we face. Fossil fuel use has pushed atmospheric carbon dioxide higher than at any time during the past half-million years. The global population has increased threefold in the past century and will increase by half again, to 9 billion people, by 2050. Global food and fossil energy consumption are on trajectories to double by 2050.

Biofuels, such as ethanol made from corn, have the potential to provide us with cleaner energy. But because of how corn ethanol currently is made, only about 20 percent of each gallon is "new" energy. That is because it takes a lot of "old" fossil energy to make it: diesel to run tractors, natural gas to make fertilizer and, of course, fuel to run the refineries that convert corn to ethanol. If every one of the 70 million acres on which corn was grown in 2006 was used for ethanol, the amount produced would displace only 12 percent of the U.S. gasoline market. Moreover, the "new" (non-fossil) energy gained would be very small -- just 2.4 percent of the market. Car tune-ups and proper tire air pressure would save more energy.

There is another problem with relying on a food-based biofuel, such as corn ethanol, as the poor of Mexico can attest. In recent months, soaring corn prices, sparked by demand from ethanol plants, have doubled the price of tortillas, a staple food. Tens of thousands of Mexico City's poor recently protested this "ethanol tax" in the streets. In the United States, the protests have also begun -- in Congress. Representatives of the dairy, poultry and livestock industries, which rely on corn as a principal animal feed, are seeking an end to subsidies for corn ethanol in the hope of stabilizing corn prices. (It takes about three pounds of corn to produce a pound of chicken,

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<sup>1</sup> Washington Post, March 25, 2007

and seven or eight pounds to grow a pound of beef.) Profit margins are being squeezed, and meat prices are rising.

U.S. soybeans, which are used to make biodiesel, may be about to follow corn's trajectory, escalating the food vs. fuel conflict. The National Biodiesel Board recently reported that 77 biodiesel production plants are under construction and that eight established plants are expanding capacity.

In terms of environmental impact, all biofuels are not created equal. Ethanol is the same chemical product no matter what its source. But ethanol made from prairie grasses, from corn grown in Illinois and from sugar cane grown on newly cleared land in Brazil have radically different impacts on greenhouse gases. Corn, like all plants, is a natural part of the global carbon cycle. The growing crop absorbs carbon dioxide from the atmosphere, so burning corn ethanol does not directly create any additional carbon. But that is only part of the story. All of the fossil fuels used to grow corn and change it into ethanol release new carbon dioxide and other greenhouse gases. The net effect is that ethanol from corn grown in the Corn Belt does increase atmospheric greenhouse gases, and this increase is only about 15 percent less than the increase caused by an equivalent amount of gasoline. Soybean biodiesel does better, causing a greenhouse gas increase that is about 40 percent less than that from petroleum diesel.