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## The Future of Food vs. Fuel

**MU experts examine the food security trade-offs of biofuel.**



Shibu Jose, MU professor of agroforestry, stands in a test field of switchgrass, the front lines in the search for biofuel alternatives to corn ethanol. Jose estimates there are 116 million acres of marginal crop land near the Mississippi River. That land could grow crops such as switchgrass and cottonwood and willow trees, which can be converted into cellulosic ethanol. Photo courtesy of MU Cooperative Media Group.

*Story by Erik Potter*

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**S**o long as there is corn-based ethanol and gasoline, the markets for corn and oil will be linked, says Pat Westhoff, MU program director for the Food Agriculture Policy Research Institute, a federally funded center that researches agriculture policy and economics. The question is what that link means for food security — the reliable availability of nutritious food. The answer, it turns out, depends on who you are.

Diverting corn to make ethanol and soy to make biodiesel has an impact on the cost of food, although “the effects are probably overstated by the opponents of biofuels and understated by their proponents,” Westhoff says.

Although ethanol plants process about 40 percent of the U.S. corn (producing 13 billion gallons of ethanol a year), the overall financial effect of biofuels on Americans is fairly small, Westhoff says. Biofuels make corn and soy more expensive, pushing up food prices slightly, but they also hold down gas prices. Because most Americans drive cars, those impacts tend to offset.

However, for people in the developing world who aren't farmers and don't own cars, they only experience the cost increases of the food/fuel trade-off.

“If you're focused just on food security, it's a negative,”

says Ron Plain, D. Howard Doane Professor of Agricultural Economics, before adding, “If you look at global energy security, it’s a positive.”

Who experiences a net benefit from biofuels is not something that can be described in general terms. “For any individual, you could probably come up with a reasonable guess whether the pluses outweigh the minuses or not,” Plain says.

Researchers at MU and across the country are attempting to find the next generation of biofuels that will put more people on the “plus” side of that equation.

Shibu Jose, H.E. Garrett Endowed Professor in Agroforestry and director of the Center for Agroforestry, estimates that within 75 miles of the Mississippi River lies 116 million acres of marginal land, a portion of which can be used to grow bio-crops such as switchgrass and cottonwood and willow trees. Those plants, which aren’t used as food, can be converted into cellulosic ethanol.

“Say you have a 500-acre farm; it’s that 50 acres that’s flooded every year,” Jose says, describing the pockets of marginal land tucked into the nation’s breadbasket. “Only 450 acres are really productive — you’re wasting your time, money and energy with that other 50. Every year you plant something, but you never harvest anything, because during the growing season

it's always flooded and gets destroyed.”

Westhoff cautions, however, that even marginal land is almost always put to some use, so the trade-offs are never eliminated.

“[Marginal land] might be just pasture now, but if it's pasture and you're going to grow switchgrass on it, it's not being used for pasture anymore,” Westhoff says. “There's still going to be some effect. It might not be the same type of effect you get from corn-based ethanol, but it's also not zero.”

The other downside of advanced biofuel crops is their cost. The cost to grow, transport and convert them into ethanol is high, though Jose says new pilot plants are coming online soon that could change those calculations.

“By 2050 the world population will be 9 billion. It's no secret we need to increase food production by 70 percent and energy production by perhaps 50 percent [to accommodate that],” Jose says. “The question we need to ask is how we can balance our food and fuel needs without compromising one or the other. ... It's not food *versus* fuel. We need both.”

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