

Erob energy farms
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Is there an 'energy farm' in your future?

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The average U.S. grain farmer could harvest additional profits from the ethanol boom if he's willing to invest in a cooker, separation columns, a small building and a little sweet sorghum seed

According to those familiar with small-scale ethanol production technology, much of the know-how currently exists for such an enterprise. Ideally, a farmer could not only produce ethanol on-farm from either sweet sorghum or sugarcane, but he could grow the feedstock for his ethanol plant as well.

So-called energy farms could be the wave of the future, or not, but one thing is ever clear – it's one way for American farmers to participate directly in the race to replace as much as 15 percent of America's gasoline use with biofuel over the next two decades.

Currently, there are three technologies for producing ethanol. The first is the current starch-based platform based on grain. This system is already impacting farmers with higher corn, wheat and grain sorghum prices. Today, the markets are being driven by the starch-based systems.

Cellulosic or switchgrass based systems could be the Holy Grail or they could be cold fusion, according to Tim Sharp, a former Oklahoma State University, now involved in a venture to sell small-scale ethanol production equipment to farmers, cooperatives and small companies, "We're not sure how to do it now and we're probably not going to be doing it for five years at best. It offers all kinds of potential and all the university research and grant money and science is focused on it."

The third technology for ethanol production is based on sugar and eliminates several steps needed to turn a feedstock into sugar, since the feedstock itself contains a high percentage of it. Brazil uses sugarcane as a feedstock for its ethanol, however the United States does not have a large dedicated acreage of the crop.

At OSU, part of Sharp's job was researching cellulosic ethanol, but he soon became interested in sugar-based systems because the technology already exists. Recently, Sharp left OSU to become operations manager at FasTech, which sells equipment for small-scale ethanol production.

According to David McDowell, a former automobile repair shop owner and founder of FasTech, the ethanol technology he developed can run on corn, sugar beets, molasses and sugarcane, or anything that can be turned into a sugar product.

For Sharp, the feedstock that makes the most sense for the energy farm concept is sweet sorghum. It produces sugar in the 18 percent to 20 percent range and yields between 400 gallons and 900 gallons of ethanol per acre.

Assuming a harvester is developed for the sweet sorghum, an ideal energy farm would have 600 acres of land, including 300 acres for sorghum production and 300 acres for rotation. According to Sharp's calculations, such an operation would require \$95,000

in total variable costs and \$85,000 in fixed costs (including pay off of equipment) for a total cost of around \$180,000 to \$200,000. "If you produce 550 gallons per acre off 300 acres and you sell it for \$2.30 a gallon, you would have \$400,000 in sales, providing an annual net return of about \$250,000.

Sharp believes a government incentive, consisting of a floor price of \$2.35 a gallon for the first 120,000 gallons of ethanol produced by a small-scale energy farm, would be enough to offset economic risk from falling gasoline prices. A second 120,000 gallons would have the same floor price if the feedstock (sweet sorghum or sugarcane) was grown in the United States.

Because ethanol contains alcohol, the U.S. Department of Alcohol, Tobacco and Firearms has expressed more than a passing interest in how a small-scale operation might be regulated, according to Sharp.

"This is where our senators and congressmen need to get involved. All the regulations for ethanol production are based on producing spirits. This is an agricultural enterprise for producing motor fuel. It may have to be some type of local cooperative for it to work, where you have business entities, which ATF is happy dealing with.

"It would take 650 farmers working 300 acres each, to produce the same amount of ethanol as a typical 100-million-gallon, corn ethanol plant currently on-line today. But if you look at the economic impact of the small-scale plant, from a rural economy standpoint, this is where I think we need to be. Let the farmer share make some of the money.

"You're not selling the corn guy your corn, you're selling the oil company your ethanol. So you're getting all the added value. Currently, a corn plant costs \$2.10 a gallon for production capacity. Right now, you can put in molasses capacity for around 50 cents a gallon. So our costs are less than one-fourth of those of a corn plant."

Sharp adds that until a reliable harvester is designed for sweet sorghum, energy farms can truck in molasses for \$135 to \$150 per ton. Production costs for trucked-in molasses are between 97 cents and \$1.14 a gallon. "If you're running on sweet sorghum, the costs are between 70 cents and 90 cents. This is a whole lot cheaper because we have really low energy costs."

A risk of using molasses could occur if production capacity is ramped up without ramping up molasses production. "We'd be in the same boat the corn guys are in, the price of sugar goes up big time. Then the cost of production goes up and there is less profit. On the other hand, if you're growing your own sorghum, you're not vulnerable to raw materials costs."

Sweet sorghum is also a drought tolerant crop and, therefore could be grown with fewer inputs.

In the future, energy farms could be set up to make electricity, ethanol and biodiesel. "We need these small-scale operations, not several big scale operation. Then the farmer gets to participate in the value-added product."

"To be independent of foreign oil, this country needs to get farmers and ranchers to get them involved and get them to start producing their own fuel," McDowell said. "The corn ethanol plants need to be involved. The oil companies have to be involved on a bigger scale to make a 150-million gallon plant. It's all needed for us to become independent of foreign oil."

The sweet spot on the sweet sorghum stalk ranges from about a foot off the ground to about 3-4 feet down from the top of the plant. The plant produces a seed head, might be captured for livestock feed. The rest of the plant could be used as cattle forage or perhaps for cellulosic ethanol.