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Can a S.C. grass be a viable fuel alternative?

November 8, 2007, 12:00 a.m. EST

by **Matt Wake** ([Contact](#) / [Staff Bio](#))

FLORENCE — With gas prices back around \$3 a gallon, Clemson University is pushing a native plant as an alternative fuel.

According to Clemson researcher Jim Frederick, switchgrass could be a more efficient petroleum substitute.

"About 18 percent of the U.S. corn crop this year was used to make ethanol," Frederick said. "That takes away from the food and feed chain. That's the big dig on ethanol."

Inefficiency is another. The process to make one gallon of corn-derived ethanol requires roughly one gallon of gasoline.

Switchgrass is one of the possible ingredients for cellulosic ethanol — others include tress, woodchips and even municipal waste. Cellulose is a complex sugar found in the cell walls of all plants.

The advantage of cellulosic ethanol is that it's made from vegetation, not crops. Corn is an annual crop requiring planting and other processes every year. But switchgrass is a perennial that would only need to be planted once every 15 years or so. Switchgrass is also reasonably drought tolerant. Because it has a deep, dense roots system, switchgrass may actually improve soil over time by adding organic matter.

In addition, the grass — which grows pencil-thin and up to 12 feet tall — could be used to mix with coal for cleaner burning electrical power.

An acre of land can produce around six to 10 tons of switchgrass. That gives switchgrass the potential to produce 1,000 gallons of ethanol per acre — compared to 400 gallons from corn or 665 gallons from sugar cane.

According to Frederick, the process to make 10 gallons of switchgrass ethanol burns only one gallon of gasoline.

However, there are obstacles to a switchgrass-powered America. The chemical process to break down cellulose for fermentation into ethanol is costly and slow. Frederick believes efficient science is approximately two to three years away.

"Like anything else, you put everything in one basket, you're going to have problems," Frederick said. "For a year-round supply, you're going to need to use switchgrass, wood chips and municipal waste, not a single source. In addition to ethanol, you'll see hydrogen and more emphasis on solar and wind power — especially along the ocean. There's no one silver bullet. It's going to be lots of different things in the future."

As part of its non-recurring PSA requests from the state, Clemson has asked for \$12 million to construct a pilot-scale facility to support commercially viable production of fuels from biomass, including switchgrass. A \$32 million nonrecurring item for a bioprocessing facility would be used to recruit biotech companies to S.C. to boost the state's economy.

On Nov. 15, Clemson's Pee Dee Research and Education Center in Florence will host "Switchgrass: Energy for the Future." The conference will include a tour of facilities and presentations by researchers, legislators and corporate sponsors.

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Photo



Clemson University researcher Jim Frederick cuts a sample of switchgrass, a plant being researched as a source for making ethanol, an alternative fuel.

Photo: submitted

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