

# Project Examines Switchgrass' Potential To Produce Alternative Fuels

LEXINGTON, KY.

University of Kentucky College of Agriculture forage specialists and 20 farmers in north-eastern Kentucky are exploring the potential of using switchgrass, a warm-season grass native to the state, to produce ethanol and electricity.

The four-year project involves UK forage specialists assisting farmers with the establishment of five acres of switchgrass on their land. UK researchers will examine switchgrass' ethanol and pelleting potential. The majority of the switchgrass will be transported to East Kentucky

year, and we were just getting it established," he said. "We could be on the forefront of something if it does work."

Thirteen more farmers will establish five-acre demonstration fields in 2008. Smith said more definite results should be available this year as the season unfolds and more farmers establish their stands of switchgrass.

Switchgrass may also be an alternative to corn-based ethanol. It can grow in areas where corn cannot, and it has low input costs due to its ability to grow in low pH, low phosphorus soils with minimal nitrogen applications, even under

Photo courtesy USDA



Power Cooperative's Spurlock Station in Maysville, to explore the possibility of using it as a supplement to coal to produce electricity.

"We knew when we were developing the project that one of East Kentucky Power Cooperative's generating units has a fluidized bed delivery system and can burn a whole range of products," said Ray Smith, UK College of Agriculture extension forage specialist. "So it's easy for them to take a product like this and burn it directly."

The project's goals include determining if switchgrass can sustainably and economically be grown and developing viable markets for the product. It is funded through a grant to the Kentucky Forage and Grassland Council from the Kentucky Agricultural Development Board.

The farmers involved in the study are located within a 60-mile radius of Maysville. This distance is considered by the U.S. Department of Energy to be maximum distance a producer can economically transport forages. With the price of fuel on the rise, this radius may need to be smaller. This is one thing researchers and farmers need to evaluate and determine.

This year is the second year of the project for seven farmers, who planted their first crop in 2007. Even with last summer's drought, most of the farmers were able to successfully establish switchgrass.

"We were surprised at the end of the season that five of the seven farms had established switchgrass, Smith said. "It shows the resiliency of switchgrass during the establishment year."

Willy Campbell, a Fleming County farmer, was one of the farmers who participated in 2007. He said his crop was about knee high at the end of the season, which he expected, considering it was the establishment year. At the peak of its growth, which is around three years, switchgrass can be seven to 10 feet tall.

"We have not actually seen the stuff grow because we were in the middle of the drought last

drought conditions. It also does not affect the food supply, which has been a major concern in using corn for ethanol production. Switchgrass, when cut early, also provides quality feed for livestock.

To convert switchgrass into ethanol requires a cellulosic ethanol plant, of which, Kentucky currently has none, but there are pilot plants being constructed in Tennessee, Georgia, Canada and other locations. Switchgrass also produces a high lignan by-product. Smith said this by-product could be burned to help produce some of the energy required for ethanol production.

Similar to working with any new crop, farmers will have to adapt to differences and solve potential problems. Switchgrass is different from other forages because it is harvested once per year in the late fall or early winter. Since switchgrass has to be dry when it reaches the power plant, storage will be an issue many farmers will have to tackle, said Tom Keene, UK hay marketing specialist. Smith and Keene said they believe farmers can most efficiently bale and transport switchgrass in mid-sized square bales. Many farmers do not own this size of baler, and prices for one range from \$65,000 to \$100,000. For this project, the UK College of Agriculture has two mid-sized balers on loan to the university.

"I don't think we can utilize the economies of scale on most farms in northeast Kentucky due to the cost and size of this equipment," Keene said. "So whether it's five farmers or 20 farmers, I'm not sure what the number will be, but some type of cooperative effort will likely be necessary for this project to work."

Unlike hay rolls, once baled, switchgrass cannot be left on the ground. Ideally, farmers should store it in a shed or barn with a concrete floor until they are ready to use it. If it has to be stored outside, farmers should place bales on pallets, and cover all visible sides with a tarp. Δ