Getting From Point A To Point B

Researchers Look At Storage And Transportation Efficiency In Ongoing Switchgrass Study

JACKSON, TENN.

The switchgrass is already being grown. The biorefinery is now under construction. But the best way to get this product from the field to the factory is still unknown.

As the University of Tennessee begins construction on a pilot-scale biorefinery and state-of-the-art facility for cellulosic ethanol development, researchers are seeking the answers to this question. At the AgResearch and Education Center at Milan, University of Tennessee professors Burton C. English, Jim Larson and Don Tyler are conducting a study to measure efficiency in switchgrass storage and transportation. It's one of the first studies of its kind in the entire nation.

"I felt it was time to look at it," says English. "One of the tremendous unknowns in the whole biofuels area is in regards to the storage quantity and quality of biomass that will be required of the facility."

The 500 day study compares the pros and cons of storing switchgrass in the large round bales that are commonly seen in Tennessee, versus large square bales. The study also looks at the benefits of covering the bales and storing them on pallets or gravel as opposed to directly on the ground. According to preliminary observations the round bales are much better at holding up to weather damage, and are also less expensive to produce. However, square bales do have a distinct advantage when it comes to transportation.

"If you want to transport switchgrass, you can get more weight on a truck with square bales than with round," says English. "In addition, you don't have the problem of having the bales overlapping the sides of the truck."

Studies similar to this one have already been conducted involving hay bales. But as Dr. Don Tyler explains a good hay bale and a good switchgrass bale have different standards.

"In a hay crop we want protein. We want all of the nutrient values left. You don't want it to mold," says Tyler. "But we're not trying to harvest switchgrass when it has good feed quality. All we're trying to do is maintain the cellulose and the hemi cellulose, which are the last things that are going to be left."

In other words, weather damage and rot may or may not have an effect on successfully converting switchgrass to ethanol. So every 100 days, researchers are sending samples of these round and square bales to the Idaho National Laboratory and the National Renewable Energy Laboratory. There scientists can determine the amount of ethanol in each weathered layer of switchgrass bales. Tyler says once researchers know exactly what they are working with, and what the biorefinery needs, they can then better determine the most economical way for producers to store and transport their product – round or square.

"We can tell somebody reasonably well what it will cost to produce it. This study will find out what its going to cost to properly store it and have it where it will be transportable," says Tyler. "What's the minimum you can do that's going to satisfy a biorefinery for relative efficiency?"

English and Tyler both say this study will help bridge the unknown gap between production and conversion, and perhaps solve the problem of getting switchgrass grown at point A to point B, the successful conversion to ethanol. Δ