Wood Biomass Powers Truck

(How to Get More Mileage on Less Gas!)

Photo by John Pirtle

By *Allen Varner*, Stewardship Forester,
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Wayne Keith believes that this country needs to reduce our dependence on foreign oil and fossil fuels. Using good old-fashioned American ingenuity, Keith has converted his 1984 diesel truck to run on *wood*. As gasoline prices rise toward $3.00 per gallon, alternative fuels are becoming more attractive. **Solid biomass** which in part consists of wood, switchgrass, corn, or even chicken litter (manure) may prove to be part of a growing number of viable alternatives to gasoline.

Using a technology called **gasification**, solid biomass is placed in a container called a "down-draft gasifier" installed in the bed of the truck and ignited. The amount of oxygen is restricted in the system so instead of producing carbon dioxide and water vapor as normally occurs in regular combustion, the gasifier produces a mixture of carbon monoxide and hydrogen known as synthesis gas.

The synthesis gas is cooled down as it is directed through a gas radiator behind the cab and condensed into a liquid. The synthesis gas passes through a series of filters in front of the hood, and directly to the carburetor where it burns almost as well as gasoline. The engine is usually started with gasoline but is switched to synthesis gas after the engine warms up.

"It takes about 20 pounds of wood to do what one gallon of gas will do," Keith said. "But when I burn off the wood, you get the same emissions you'd get if the wood just deteriorated on its own. You can't say that about fossil fuels."

This is known as carbon recycling which occurs naturally in the environment and in this form is less polluting than hybrid cars.

"I don't think you'll ever see many vehicles using this process," he stated. "Maybe some farm trucks. But we could use the system for co-generation of heat and electricity such as heating chicken houses and other buildings. I heat my home with it."

Solid biomass such as wood debris probably will not power our pickup trucks in the near future. More than likely there will be an increase in the availability and use of ethanol, a fuel also

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*Synthesis gas – produced from solid biomass by a technology called **gasification** – passes through a series of filters in front of the hood, and directly to the carburetor where it burns almost as well as gasoline.*

produced with agricultural products. Most ethanol is made with corn. However, other crops such as switchgrass or even wood debris from logging activities are possible options. Many fueling stations in the Midwest already sell ethanol. In Hoover, Alabama, the entire police force — 92 vehicles — runs on E-85, a mixture of 85 percent ethanol and 15 percent gasoline.

On a national perspective, Alabama Senator Jeff Sessions sees Alabama playing a key role. Senator Sessions is a member of a bipartisan caucus that last November introduced the Vehicles and Fuel Choices for American Security Act. If passed, it would require the U.S. government to reduce the country's daily oil consumption 2.5 million barrels per day by 2016 and promote the use of advanced field technologies such as ethanol and hybrid vehicles.

"Researchers at Auburn University believe up to 1,000 gallons of ethanol can be produced from a single acre of switchgrass each year," Sessions said.

"**Timber products, paper, and pulp** also seem promising. The Energy Policy Act that was signed into law last summer mandates that 7.5 billion gallons of ethanol be produced annually, and Alabama is rich with the biomass materials that will be needed to meet this goal. Nothing will slow us down unless the production costs just turn out to be too high."

America is known as the land of opportunity and we have always believed that necessity is the mother of invention. As foreign oil and fossil fuels become more expensive, the development of alternative sources of energy will increase and the utilization of solid biomass will become an increasingly viable option. Alabama is blessed with nearly 23 million acres of forestland, and by more completely utilizing our vast renewable resource we have the potential to possibly *grow* our way out of our foreign oil dependence.

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