

Kindling A Niche

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Forages look promising as fuel for pellet stoves

Burning pellets made from forages in home and business-office stoves is just one or two decent sparks away from catching fire in the U.S., says Jerry Cherney.

The concept may offer a partial solution to the nation's escalating energy crisis while creating a new niche market for forage producers, says Cherney, a Cornell University agronomist.

He has been working with grass pellets for roughly five years. He's burned pellets made from timothy, orchardgrass, goldenrod, switchgrass, wheat straw, barley straw and reed canarygrass in a variety of stoves at Cornell's Mt. Pleasant (NY) Research Farm. Results from the studies have him convinced pellets made from forages stack up favorably with the wood and corn pellets currently burned in pellet stoves.

For example, he says grass pellets have 96% of the Btus of high-quality wood pellets. They also have an energy input-output ratio of 1:15 and emit up to 90% less greenhouse gas than conventional energy sources.

Up to this point, says Cherney, the problematic part of using grass pellets as fuel for pellet stoves is that they have higher ash content than either wood pellets (made mostly from sawdust) or corn. A majority of pellet stoves on the market in the U.S. weren't designed to deal with the high ash content.

"Also, when you burn grass, you end up with a lot of residual clinkers (hard chunks of debris) that can be almost impossible to get out of the stove," he says. "And grass can also be more corrosive than wood."

In Europe, where biomass pellets have been used as fuel for more than two decades, stove manufacturers have made significant progress in addressing those issues.

"They're quite a few years ahead of us in terms of design," Cherney says.

But there are signs U.S. stove manufacturers may be ready to give grass a closer look.

"Up until a year or so ago, it was very difficult to get any company to donate a stove that we could use in our studies," he says. "Now they're literally lining up."

A changing supply-and-demand situation for other pellet sources is a key factor in the turnaround. Chorney points out that burning corn seemed like a good idea when the corn price was around \$2/bu.

“Now that corn is over \$4/bu, though, it's less appealing to stove owners,” he says.

Likewise, a dwindling supply of sawdust has created a scarcity of wood pellets.

“Our research has shown that approximately 80,000 wood-pellet stoves went without any fuel in 2006 because pellets weren't available,” says Steve Flick, president of Show Me Energy Cooperative, Centerview, MO.

The co-op is putting the finishing touches on a \$6.6-million pellet processing plant with a capacity to produce 20 million pounds of biomass pellets annually. The pellets are made from a variety of materials, including low-quality hay, wheat straw and corn and grain sorghum stover, supplied by 400 farmers within a 100-mile radius of the plant.

The price farmers receive is based on the Btu content of the raw material they deliver. A differential to compensate farmers according to farm-to-plant distance is also part of the co-op's pricing structure.

Under the co-op's marketing plan, about 20% of its pellets will be sold retail for use in biomass-pellet stoves. The remaining pellets will be delivered to a power plant in western Missouri, where they'll be burned with coal to generate electricity.

Flick says the co-op plans to begin marketing the pellets in retail outlets later this spring. The likely marketing territory would run along a north-south line stretching from Minneapolis/St. Paul to Dallas/Fort Worth and an east-west line of Denver to Indianapolis.

“We've designed the marketing logo, have the bags ready to go and are talking to potential retail partners,” he says.

Flick believes the Show Me Energy plant can serve as a model for producers in other parts of the country looking to capitalize on biomass energy. From a forage grower's standpoint, he says, producing raw material for the biomass-pellet market will most likely be a sideline or companion venture. In most cases, the best time to harvest forages for making biomass pellets is in late fall (after frost) or early spring.

“It fits in well with existing workloads and scheduling,” he says. “You can harvest your other crops, then bale up low-quality biomass for this market. Instead of worrying about rainstorms affecting the harvest, you'll be worrying about snowstorms.”

Producers don't need special haymaking equipment to supply raw material for pelleting, Flick adds.

"It won't require any retooling or recapitalization," he says.

Paul Adler, a USDA-ARS research agronomist at Penn State University, says there's a definite need for more research on the economics of grass pelleting.

"We've seen a lot of interest in this on the part of farmers and others over the past couple of years," he says. "Bottom line, though, it has to make economic sense for farmers. If it doesn't, they're not going to do it."

Adler hopes a demonstration project he's helping to launch in Pennsylvania this spring will offer clues about economic feasibility. It will feature a trailer-mounted, mobile pelleting machine that can travel from farm to farm. Among other things, says Adler, the project will give researchers a way of comparing the economics of producing pellets at a centralized, stationary plant to producing pellets on site.

"It's just a small piece of a much bigger puzzle," he says. "But it will at least give us a chance to get our feet wet — to kick the tires a little bit."

Cornell's Cherney advises farmers to reign in expectations about revenue potential.

"It's not something that's going to lead to a hay price of \$500/ton," he says. "But it will give some farmers an opportunity to generate some additional revenue by producing a cash crop on marginal or under-utilized farmland. Some farmers might want to sell the grass to a nearby pellet plant serving a local retail market. Others might decide they'd be better off using the pellets they produce to reduce the cost of heating their own farmhouses or other farm buildings."

For more on Cornell's research and other information relating to utilizing grass pellets as a biofuel, go to www.grassbioenergy.org.

To learn more about Show Me Energy Cooperative, check out www.goshowmeenergy.com.