Hog Farmers Go Green

Butler Farms turned from tobacco to hogs and can see a cleaner, brighter future

By Sidney Cruze I Photography by Doug Van de Zande

At left: Thomas Butler inspects the flare that burns methane gas created by hog waste. Methane is a formidable greenhouse gas. Burning methane converts it to water and carbon dioxide, which has less heat-trapping power.

Above: Will Butler works with the farm's hogs every day. The farm has about 8,000 hogs.

Thomas and Robert Butler have fond memories of their father. A lifelong farmer, he instilled a strong work ethic in his sons.

"He always told us, 'It's *our* farm. We all work hard, and we all benefit,'" Thomas says. "Then he joked that when he died, we would probably sell the farm and move to town."

Years later the Butlers are still farming the family land; they operate a large-scale hog farm on 108 acres in Harnett County. Once traditional tobacco farmers, they are now agricultural pioneers working to promote a hog waste storage system that farmers can use to cut down on greenhouse gas emissions, earn carbon credits and transform animal waste into electricity. Their use of the system has attracted attention from across the country and helped put North Carolina on the cutting edge of agriculture's green revolution.

The Butlers grew up helping their father grow tobacco. Changes in the industry brought changes to their farm, and by the early 1990s, they were leasing most of their land to other growers.

"We love the farm. But with tobacco on the way out, we were more or less losing it," Robert says.

They began raising hogs to keep the farmland in the family, and today they house 8,000 animals on the property. As farmers the Butlers are committed to being good stewards of their land, and they know confinement hog farms can be hard on the environment, if not properly managed. So when Thomas learned about a system for storing hog waste that would make their operation more earth-friendly, they decided to give it a try.

Covered lagoons clear the air

The system has two components: covers for lagoons filled with hog waste, and technology that captures and burns the methane gas that the waste creates.

The Butlers covered their lagoons in 2006, after signing a contract with the Environmental Credit Corporation (ECC), a Pennsylvania-based company that provides the lagoon covers. Today they store almost 11 million gallons of effluent beneath a layer of bright green polymer. Decomposed hog waste produces methane—a greenhouse gas 21 times more powerful than carbon dioxide. In 2008 the Butlers installed a flare system that collects the methane then burns it. This process converts it to water and CO_2—a form that makes less of an impact on the earth's atmosphere. Today the Butlers can sequester almost 6,000 tons of carbon annually. Each ton can be converted to carbon credits they can sell on the Chicago Climate Exchange.

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"We can use our system to show young people that a career in farming means more than spending time in a barn. Here we have a chance to make electricity."

Brothers Thomas and Robert Butler decided to raise hogs to keep their Harnett County farm in the family. The polymer cover over their waste lagoons keeps out rain. A built-in piping system carries the methane gas byproduct to the flare to be burned off.

ECC provides the carbon credit services for the Butlers; it also owns the lagoon covers and the flare system. By using the ECC technology, the Butlers give the company a chance to test the system and participate in the carbon economy. In return, ECC pays the Butlers a fee for maintaining the covers and keeping records of how much gas is produced.

So far profits are modest, but that could soon change. The methane capture system is a potential source of green energy. The Butlers plan to install a generator that will convert the collected methane into electricity that can be used by the utility grid. Once the generator is in place, their Touchstone Energy cooperative South River Electric Membership Corporation will work with the Butlers to purchase the energy it produces.

The Butlers are not the only hog farmers exploring the use of this technology; another located in South River EMC's five-county region has installed lagoon covers and the flare system. The cooperative is assisting both.

"Any use of renewable energy is a good thing, and this is our first biogas project," says Catherine O'Dell, manager of member and public affairs at South River EMC. "The Butlers are great to work with. It's impressive they want to use their methane capture system to produce electricity. They want to be good stewards of the environment and for the swine industry. We'll do all we can to help them succeed."

One of the nicest farms here

When hog waste is stored in uncovered lagoons, it releases ammonia into the air. By covering their lagoons the Butlers cut down on the emissions and the odors associated with the farm. They estimate they have reduced the smell by more than 75 percent, and neighbors say it makes a big difference

Farmers, public health officials and others for years have debated how hog farm ammonia emissions and nitrogen byproducts affect public health and the environment. Professor Michael Aitken, chair of the Environmental Sciences and Engineering Department at the UNC Gillings School of Public Health in Chapel Hill, has developed a way to reduce the amount of nitrogen and ammonia in hog waste. He plans to use the Butlers' covered lagoons as a test site for his system. A Gillings Innovation Lab will be based at the farm, where a researcher will spend 18 months studying how well Aitken's process for removing pollutants works with the Butler methane capture system.

"We're trying to show whether it's both technologically and economically feasible to couple the Butlers' already-established energy recovery system with our method for increasing environmental performance," says Aitken, who will manage the lab. "The innovation is in integrating these two processes."

At only six millimeters thick, the plastic that covers one of the Butlers' lagoons can support 50 adults—making it strong enough to keep tens of gallons of rainwater out of the lagoon. By keeping rainwater out, the cover prevents waste spills and protects water quality in nearby creeks and streams.

"It saves us money too," says Thomas' son Will, "because we don't have to pump the water out of the lagoon."

US Department of Agriculture Secretary Tom Vilsack visited the Butlers' farm last fall, and he was impressed. "He said it was one of the nicest farms here. He said it was what he didn't smell that impressed him," Thomas says. "He was also excited about the educational opportunity it offers. We can use our system to show young people that a career in farming means more than spending time in a barn. Here we have a chance to make electricity."

The Butlers' father passed away years ago. But when talk with their mother, 92, turns to farming, she always tells them, "Your dad would be proud."

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