

ment is sterilized with a chemical. Welch heard about the problem from his local growers and offered to bring over the sterilizer and a tractor. Flame Engineering recommends that the tractor pull the unit at a rate of about 2 mph, but the Commission representative requested that he slow the machine down.

Welch has demonstrated the sterilizer for several Texas poultry growers since April 2004 and has received good feedback. Word of mouth has brought in requests for additional demonstrations, including one from Louisiana. Welch or one of his poultry house customers actually does the demo for the marketer. Welch estimated it costs about \$200/house to do the demonstration.

Generally in the spring, growers will be thoroughly cleaning out their poultry houses down to the dirt floor. Welch or his customer will then take the unit inside and slowly pull the unit across the floor in about six or seven passes. A fan is positioned at one end of the house to keep the air circulating while the unit is in operation. For a 500-sq-ft house, it takes approximately an hour and about 40 gallons of fuel. He will also sterilize the house between growth cycles. The grower cleans out the house and removes about 2 in. of the excrement, then the sterilizer is used to heat the floor to a temperature level that kills the pathogens but doesn't ignite what is left on the floor.

The poultry growers have told Welch that after the sterilization demo, they have seen an increase in their chick survival rate, which they attribute to a cleaner environment.

### Ammonia Emissions

In the Southeast, Scott Cosper with Gas Equipment Co. (Dallas) has received great feedback from poultry growers who are impressed with the sterilizer's ability to not only sanitize but also to reduce the ammonia fumes. Gas Equipment received its first unit in September and has done demonstrations in Georgia, North Carolina, and Mississippi.



A standard 120-gal. fuel tank is recommended to supply the sterilizer's six liquid propane torches that maintain the heat at a minimum of 1400°F. Photo courtesy of Welch Gas.



A hand-held torch is used to apply heat along the edges of the poultry shed's walls and corners. Photo courtesy of the Oklahoma Propane Gas Association.

One grower, who also runs a poultry supply company, purchased a unit in December and just ordered a second one.

According to Cosper, one of the first things growers ask about is the sterilizer's ability to reduce ammonia emissions. Flame Engineering has done some preliminary studies on emissions, but Cosper is excited about the University of Georgia ag department's interest in studying the effectiveness of reducing the ammonia and destroying pathogens. USDA is expected to work with the university.

Cosper's customer who purchased a unit in December began using the sterilizer right away in four of his eight houses. In the other houses, he used a chemical sterilizer. The results were very noticeable in the houses that were heated with the sterilizer, said Cosper. The farmer said the lack of ammonia odors was very apparent, and this effect of the sterilizing remained much longer than in the chemically-treated houses.

Representatives of the university and USDA have attended demonstrations put on by Cosper or his customer along with several growers and the poultry companies, also known as integrators, they represent, including Pilgrim Pride, Tyson, and Gold Kist.

Flame Engineering ag manager Steve Koch agrees with the need for additional research to confirm the extent of the sterilizer's effectiveness. Despite successful demonstrations, growers want the hard data, he said. Koch has taken the sterilizer to demonstrations in several Midwestern states and will be demonstrating one for the University of Delaware this spring. They are very interested in checking out the ability of the unit to reduce ammonia emissions as well.

Dr. Susan E. Watkins with the University of Arkansas has done much of the recent research on heat sterilization in poultry sheds. Her research agrees with the findings of Flame Engineering's poultry growers. The exposure to heat in poultry houses reduces substantially pathogens such as *e. coli*, *coliform*, and *salmonella*. By reducing these pathogens, poultry growers saw an increase in chick survival rates and an increase in the health and size of the broilers. —Ann Rey