

Conserve heat

By DANA PETERSEN

HERE in the Midwest, you don't have to travel far from the homestead to find a pair of matching hog buildings. Side by side, their identical roof lines stretch along the horizon and large ventilation fans are visible on all sides. Despite these outward indicators of symmetry, any producer can tell you that the climate conditions inside twin barns are not necessarily identical, especially during winter.

Try as we may, no two facilities are constructed exactly the same. While design characteristics do affect the overall energy efficiency of a building, the way a facility is managed is also critical. Maintaining proper ventilation rates ensures a healthy environment that fosters pig growth.

During cold weather, understanding how your controller makes adjustments to your ventilation system can help you hit that "moving target" to optimize minimum ventilation and energy efficiency, says Jay Harmon, Iowa State University professor of ag and biosystems engineering.

"Overventilation is responsible for 80% to 90% of heat loss in swine housing during winter months," he says. "Unfortunately, overventilating is more common than expected because it's difficult to gauge exactly how much air is actually being exchanged by the ventilation system."

Wean-to-finish buildings present one of

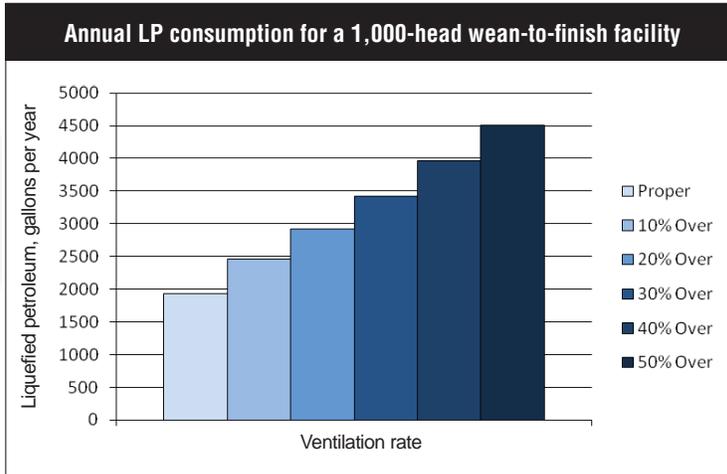


the greatest challenges to efficient winter heating. For example, a reasonable target for annual liquefied petroleum LP-gas consumption is 2 gallons per pig space per year. However, actual consumption is directly affected by the time of year the weaned pigs are placed in the building.

The accompanying chart is from ISU Farm Energy publication PM 2089J, and it estimates the average annual LP consumption for a 1,000-head wean-to-finish facility. Overventilating by as little as 10% can increase the estimated annual LP consumption by 27%, the chart shows. Overventilating by 40% can double estimated annual LP consumption.

Variable-speed fans

In this example, the 1,000-head wean-to-finish building with newly placed pigs should be ventilated at 1,500 cfm during the coldest weather, says Harmon. As pigs grow larger, this rate is adjusted. In order to meet the changing needs of the pigs and to minimize the total number of fans, a controller is used to slow fan speed and reduce air delivery. These are commonly referred



to as "variable-speed" fans. "Variable-speed fans can be used to fine-tune the ventilation rate," he says. "Under-ventilation doesn't provide sufficient air exchange to exhaust noxious gases like ammonia and carbon dioxide, which ultimately results in a poor production environment."

When selecting variable-speed fans, don't expect them to deliver less than half their rated airflow at 0.10 inches of water. For example, if 1,500 cfm is needed, select a fan rated at 3,000 cfm. This fan can be used with a variable-speed controller to deliver half its rated amount. An additional fan would be required once the pigs grew beyond 75 pounds and required more air. In most cases, the electricity required to operate variable-speed fans accounts for

less energy than the heated air forced out of the building due to overventilation.

There are limits to how much a fan can be slowed down using variable speed and still be effective. Fans operating at low speed cannot operate against much pressure. Protect fans facing prevailing winds with diverter cones or wind hoods.

Mastering controller response to regulate minimum ventilation can be complicated, but the energy savings are real. Additional resources on ventilation are available from Midwest Plan Service. Also, look for discussion of controllers coming up in the Farm Energy publication series.

Petersen is coordinator for the Farm Energy Conservation and Efficiency Initiative, sponsored by the Iowa Energy Center.

It is Comforting to Know Today's Residue Management Solution is Prepared for the Future!



As residue management challenges are getting tougher, be confident your investment equips you for tomorrow's residue and agronomic needs. With the latest genetics and use of fungicides, healthier plants have provided increased yields, as well as increased amounts of tough residue. The LANDSMAN® offers the most residue capacity due to an industry leading 150" shank-to-shank frame length, and is designed for today's tough conditions while providing the best seed bed leveling in its class. Experience why LANDSMAN® owners highly recommend this tillage system to accomplish your Spring agronomic goals.

Ask your dealer about great financing offers from Krause Agri-Finance™!



For more information call 800-957-2873 or visit www.krauseco.com.

©2010 Krause Corporation. LANDSMAN is a registered trademark of Krause Corporation.

