

Fan maintenance saves energy

MANY farmers are eager to move forward with construction projects this spring, especially since our April weather seemed more like a typical March! If your building plans include a new hog barn or just some spring cleaning in and around your existing facilities, you can improve the energy efficiency of your ventilation system with proper fan selection and maintenance.

Fans are the engine of any ventilation system. Inefficient or mismanaged fans may allow air quality and quantity to diminish, causing undue stress on hogs, says Jay Harmon, ISU professor in Ag and Biosystems Engineering. Stressed pigs are more susceptible to disease and have less-than-optimal growth and feed conversion.

Maintaining adequate air movement is an important consideration for healthy and productive pigs. Performing routine maintenance on new and existing fans ensures consistent air quality and efficient fan performance. Also, selecting energy-efficient fans can help you minimize production expenses.

Inefficient fans waste energy. Other costs include poor air quality in the building due to underventilation or wasted heat due to overventilation.

Fan efficiency ratings

If your spring plans include building a new hog barn, review fan efficiency ratings to select ventilation fans with good ratings, says Harmon. Fan efficiency is measured based on the amount of air delivery that a fan will provide per unit of electric power used, given in cubic feet per minute per watt (cfm/W). Efficiencies typically range from 5 to 25 cfm/W.

According to Harmon, a common mistake is to select fans based on fan diameter. Never assume two fans of equal size will perform the same since different motors, curvature of blades and other attributes greatly influence the performance. For instance, testing of several 24-inch fans at 0.10 inches of water showed air delivery ranged from 4,090 to 7,270 cfm and efficiency ranged from 9.9 to 17.1 cfm/W.

Fans should be rated by an independent lab to show air delivery and efficiency as a function of static pressure. This information is typically presented using either a graph or table. Accessories on the fan such as guards, shutters and discharge cones impact performance and should be noted when examining test data. Test results are available from the Bioenvironmental and Structural Systems lab at the University of Illinois at www.bess.uiuc.edu.

Always check with your local electric utility provider regarding available rebates and eligibility requirements when replacing fans or selecting new fans.

Fan maintenance

Fan ratings are based on a fan that is in a new condition and should include all accessories that will be used in your application. Installation and ongoing maintenance can greatly affect fan performance, says Harmon. For example, regular cleaning and maintenance keeps fan shutters operating at their manufactured level of efficiency. Dirty shutters and blades can reduce air delivery by as much as 40%. Some spring cleaning may be just the ticket!

Shutters may reduce fan performance



Farm Energy

By DANA PETERSEN

from 10% to 25%, but they're needed when the fan is not operating. Guards generally

decrease fan performance less than 5% and should always be left in place to protect workers from the fan and the fan from obstructions, says Harmon.

Well-maintained discharge cones increase fan efficiency by 15% or more. If belt-driven fans are used, check belt tension regularly. An overtight belt will cause undue wear on bearings. Loose belts will

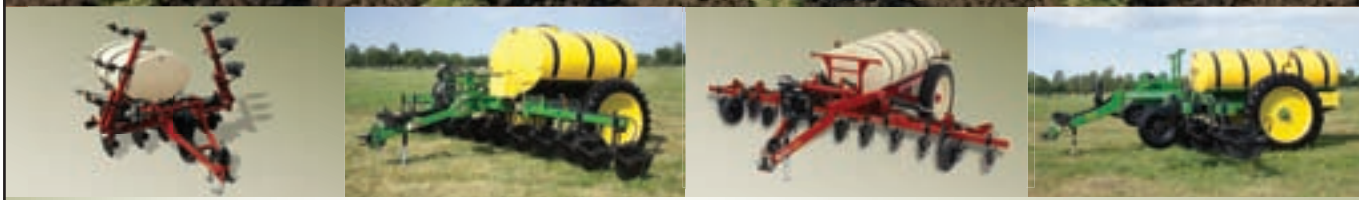
cause the fan to be less efficient and effective, perhaps by as much as 50%.

Find these publications at farmenergy.exnet.iastate.edu: "Managing Swine Ventilation Controller Settings to Save Energy," PM 2089T, and "Energy Efficient Fans for Swine Production," PM 2089E.

Petersen is program coordinator for ISU Farm Energy.

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