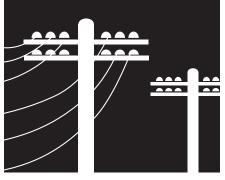
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Energy Conservation in Agriculture

Low-Cost Energy Conservation: Ventilation and Heating Systems

Scott Sanford

Depending on your farm operation, the following actions could reduce your on-farm energy consumption. Refer to the references at the end of the bulletin for more information.

Ventilation

- Install thermostats to control fans so they are on when needed and shut off when not needed. Research has indicated that cows begin to show mild heat stress at 74°F and 75% relative humidity, so thermostats should be set between 70°F and 75°F.
- 2. Clean fan blades, guards, motors, thermostats and shutters monthly.
 - a. Dust build-up on motors increases operating temperatures and can lead to overheating.
 - b. Dust-covered thermostats do not sense temperatures accurately.
 - c. Dirty shutters can decrease fan efficiency by 25%.
- Lubricate shutter hinges with graphite—not grease or oil every 3 months.
- Check belt condition, tension and alignment on fans with belts.
 Slippage of belts can cut belt life in half and reduce air flow rates by as much as 30% or more. Always replace guards after servicing.

- Install efficient fans. For fan efficiency ratings refer to Agricultural Ventilation Fans, Performance and Efficiencies published by the National Food and Energy Council, Columbia, MO 65203. (573) 875-7155 or www.nfec.org.
- 6. Cover unused fans during the winter with plastic or insulated panels. Disconnect power to fans.
- 7. Clean air inlets (inside and outside) yearly to maintain free flow of air.
- 8. Clean air ducts of dust accumulation.
- 9. Trim weeds, tree branches and brush away from air inlets and fan outlets as needed.
- 10. Make sure ridge vents are properly sized in freestall buildings.

Heating systems

- Clean air exchangers. Dust reduces the heat transfer rate of heat exchangers allowing more heat to go up the chimney.
- 2. Clean dust from thermostat; dustcovered thermostats do not sense temperatures accurately.
- 3. Cover hot weather fans with plastic or insulated panels during the heating season.
- 4. Install high efficiency heating units. These should have thermal efficiencies of 90% plus.



References

- Dairy Freestall Housing and Equipment, Midwest Plan Service, MWPS-7, 2000
- Swine Housing and Equipment Handbook, Midwest Plan Service, MWPS-8, 1983.
- Heating, Cooling and Tempering Air for Livestock Housing, Midwest Plan Service, MWPS-34, 1990
- Mechanical Ventilating Systems for Livestock Housing, Midwest Plan Service, MWPS-32, 1990



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