

Corn Stoves as an Alternative Heating Source

With the rising fuel costs and winter approaching, people are starting to think about the cost to heat their homes this winter. Analysts are predicting the average cost to heat a home will be between 50 and 100% higher this year than last heating season. For that reason, I have been receiving a lot of calls asking about the feasibility, efficiency and economics of corn burning stoves. These stoves are an offshoot of pellet stoves and burn shelled corn in place of the purchased pellets. In some cases, pellet stoves can be converted to burn corn. The corn stove uses a 100% natural and renewable fuel that is readily available in our area. The real advantage is the amount of heat available from a bushel of corn. With the exception of coal, corn provides more BTU's per dollar than any other fuel source.

Corn burning appliances generally consist of a hopper for holding a supply of fuel (corn), an auger-feed system, a separate combustion chamber, a combustion air-delivery system, and an exhaust system. Hoppers can hold enough fuel for over 24 hours, depending on the manufacturer. Most corn stoves require electricity to operate the feed auger, combustion air blower, and for some, a heat-exchanger blower. Unless backup power is available, they won't operate in a power outage. Corn-fed systems can either operate from the top or bottom. This may affect how often the clinker (burn residue) needs to be removed from the stove. Combustion-air and exhaust systems must be installed according to manufacturers' directions. Depending on stove design, vent pipes may be stove pipe similar to that used on wood stoves, through-the-wall systems that preheat combustion air as it exhausts the products of combustion, or pipe used for pellet stoves.

There are several things to consider before you purchase a corn burning appliance;

1. Does the corn-burning stove have corn-burning certification on the testing label?
2. Does the operator's manual for the stove state that 100% shelled corn can be burned or must the corn be mixed with wood pellets for good combustion? Is an additive (such as oyster shells) required for effective combustion of the corn?
3. Are there any other fuels that can be burned in the corn-burning stove? If so, what adjustments or stove modifications are required to burn some other fuel?
4. What are the maintenance requirements of the corn-burning stove compared to other stoves? How often do clinkers need to be knocked loose and removed?
5. Are sugars from burning corn likely to accumulate in the combustion chamber? If so, what is the recommended way to remove the sugars?
6. What type of exhaust ventilation system must be provided for the corn-burning stove?
7. What size corn-burning stove is needed for the intended application?
8. Can the corn-burning stove be connected with an existing hot water or hot air distribution system?
9. How much experience does the dealer have with installing and servicing corn-burning stoves and boilers?

10. What warranty comes with the stove? Under what conditions will the warranty be voided?

For best results, the quality of shelled corn burned in a corn-burning stove must be specified. Moisture content of the shelled corn should be no higher than 15.5%. If the moisture content is higher than 15.5%, there will be less heat available from each pound of shelled corn. Furthermore, you will encounter storage problems with corn having a higher moisture content. The corn is more likely to mold and clump together in the hopper and especially in the storage area.

The shelled corn also needs to be clean, with a minimum of fine particles, cob pieces, husks, and other residue. The presence of fine dust particles may interfere with proper combustion and likely cause some smoking problems. The cob pieces and other foreign materials will interfere with the proper flow of the corn kernels into the stove's combustion chamber.

It will probably be necessary to purchase a large amount of corn (maybe 50 or 100 bushels) at a time to get the most economical price for the corn. Proper storage of the corn is essential. The corn should be stored in a clean, dry environment. It should not be stored directly in contact with a concrete or dirt floor. Assuming the corn is in bags, the bags should be placed in a stack on a pallet in an area free of rodents, birds, and other varmints. Inspect the corn from time to time to ensure that there are no insect or disease infestations and that the corn does not have a musty odor.

While the operating costs for a corn burning appliance may be lower than for other forms of heat, the operation requirements for the user are much higher. Corn must be purchased, stored and added to the stove hopper on a regular basis. Clinkers need to be removed periodically and the heat exchanger cleaned. There is an increased time requirement for using one of these products.

If you have any questions, please feel free to contact me or your local county extension office.