



NCHPBA Corn Questions January 2007

1. What kind of corn can be burned? Sweet, field, etc.

A. A variety of field corn can be burned. The most readily available corn is called field corn (yellow dent) and is grown almost everywhere in the US. Treated seed corn, corn with high wax contents and corn with high starch should not be used. Seed corn is treated with a chemical pesticide that can be harmful and should not be accessible to children. Seed corn that is not treated is inexpensive and makes a great fuel because of its typical low price and it is cleaned.

2. Can husks and cobs be burned?

A. It is best to use only the corn kernels or if the husks/cobs have been pelletized. Husks and cobs can jam the auger and have lower BTUs values and higher ash contents. Corn used in corn burning stoves and furnaces should be cleaned and free of debris such as rocks and metal objects. Most suppliers of corn for home heating offer clean dry corn.

3. Why is moisture content important?

A. Corn with higher moisture means there is less energy per pound in the corn and energy from the corn is needed to extract the moisture from the corn. Moisture also reduces efficiencies and creates more ash and cleaning for the exhaust system and the stove. For most corn burning stoves 11-12% moisture is preferred and corn at 14.5% moisture or less is allowed.

4. Can corn be bought in bulk? If so, how and where?

*A. Corn can be purchased from a variety of outlets in addition to feed stores and grain elevators. Most dealers sell corn or can direct consumers to local corn suppliers. **MANY NEW COMPANIES HAVE COME INTO THE MARKETPLACE WITH NEW BULK CORN AND BAGGED CORN DELIVERY AND STORAGE SYSTEMS.** It is best to get as close to the grower of the corn as possible. When corn is purchased at a feed store, the price is inflated because it is now used to feed deer, chickens, etc. and has now become a value added product.*

5. How do I find a list of farmers who will sell directly?

A. The best place to check for corn suppliers is with corn stove dealers. Agricultural Associations, the state corn growers associations and other entities have directories of farmers that can be contacted. Internet searches for corn suppliers can work in some areas.

6. How do I store either bulk or bag corn?

A. Corn should be stored in a dry place. Bags or containers should be kept sealed to prevent corn from absorbing excess moisture. There are many ways to store fuel. 55 gallon drums are inexpensive and easy to fill. Many dealers are now offering corn delivery services along with bulk bins and automatic auger systems.

7. Will I have problems with rodents getting into my corn?

A. This can sometimes happen. If rodents become a problem, use pest control measures and keep bulk corn in sealed containers. Typically you will not find an increase in rodent problems over what you are already having. With the dry weather, the rodent populations have increased and rodents are finding their way to homes whether you are burning corn or not. Preventative measures such as keeping your corn in sealed containers and putting out rodent control easily takes care of these issues.

8. How much corn does it take to heat my home during an average winter? Provide charts if possible.

A. Most homeowners will use around three tons of corn per year depending on the climate you are in and the severity of the winter. The house size, design and the burning habits of the user will determine how much fuel is needed in a given winter. History has shown that consumers will use between 30(app. ½ bushel) and 56 (app. 1 bushel) pounds of corn a day to heat their homes 100%.

9. How much does corn cost and what are the comparisons with other fuel?

A. The price of corn varies by the quantity you buy, where you live, the moisture content and who you buy it from. Heating with corn still costs a lot less than of many other fuels such as natural gas, propane, fuel oil, and especially electricity for home heating as measured by BTUs. Over the last five years corn has provided homeowners savings of 50%--70% on home heating bills. Despite the rapid rise in corn prices late in 2006-corn is still a good value as a home heating fuel. The 30 year average price of corn is app. \$2.00 per bushel. Recent interest in Corn for Ethanol, etc. has raised the price for a while. Experts are saying that the price will settle down and become stable at around \$3.00 to \$3.50 per bushel.

10. Is corn sold by weight or cubic feet? What is the normal bag size?

A. Corn is sold by the ton, the bushel or by the bag. A normal bag size is 50 pounds, but some suppliers offer bags of 1000 pounds. Mini bulk bags of 30 to 60 bushels that can be stored in a garage offer a better price and are becoming popular—the bag can easily be removed when it is empty.

11. Explain the differences in the types of corn stoves?

A. Corn stoves will vary in design, technology, hopper size, heating capacity, features and options that are available. Some manufacturers use a fuel stirrer in the firepot to mix the corn with air for combustion. Others use a firepot without a fuel stirrer and obtain adequate combustion, and some manufacturers offer both systems. It is important to buy a corn stove that can burn 100% corn and not a stove designed to burn wood pellets or wood pellets mixed with corn. In addition to a variety of designs in corn stoves, you can also purchase fireplace inserts, fireplaces, and furnaces to heat your home with corn.

12. What are clinkers?

A. Clinkers are a harden form of ash mainly made up of silicon dioxide that can build up in the firepot and can be easily removed with a cleaning tool, tongs or the cleaning mechanism in the stove. The type of corn you burn, the moisture content of the corn and individual burning habits will determine how often you have a clinker.

13. What is the routine cleaning and maintenance needed and how often must it be professionally serviced?

A. For most stoves the heat exchanger should be cleaned daily and is easily done in many cases by pulling and pushing a rod that scrapes the fly ash off the heat exchanger tubes. The firepot should be checked or cleaned of build up daily and the clinker removed if needed. The ash chambers and the ash pan should be cleaned every 3 to 7 days depending on the model and your burning habits. The exhaust system should be cleaned monthly or as needed with a chimney brush and/or an ash vacuum designed for pellet and corn stoves. Usually there is an annual spring cleaning of the stove in which the auger and motors are lubricated and the fan/fan motors are cleaned. An ash vacuum designed for fine ash makes the cleaning process easy and more effective.

14. Do these appliances have computers and other electronic devices? Are they under warranty? If so, what is the typical warranty?

A. Corn stoves are designed to meter fuel to the firepot and have different settings to increase the feed rate and the heat output via a circuit board. Some models offer igniters, thermostats and other options. Most corn burning stove manufacturers offer a five year warranty with a one year warranty on electrical components. Good fuel quality and proper maintenance will greatly reduce warranty issues. Modern electronics are used in most appliances offering state of the art safety, reliability and performance.

15. Does the appliance work if the power goes out?

A. If the power goes out the stove will shut off without any safety issues. The smoke will continue to exhaust through the venting, especially if there is some vertical rise in the exhaust system. Some manufacturers offer "DC" model stoves that will automatically convert to DC power if the power is lost. Generators and converters with a 12 volts battery do allow for the use of corn stoves in power outages. It is important to have a rise on the venting so that the smoke will exit the home if the power goes out. If the venting is straight out of the home you will have some smoke that may enter the home through the hopper and other openings.

16. How will a corn unit affect my homeowners insurance?

A. You will need to check with your insurance company as it sometimes does not affect your insurance and sometimes it will. Some insurance companies will require that a corn stove is installed by a qualified installer in order to get insurance or to avoid paying a higher premium. Qualified dealers can meet the requirements set out by insurance companies. Most insurance companies promote corn stoves because of the safety provided without a typical chimney. Most insurance claims on wood burning have been tied to creosote igniting in a chimney. The efficiency of combustion in a corn stove dramatically reduces this risk.

17. How do I find a retailer that will sell and service a corn stove?

A. You can do an internet search for a dealer or manufacturer by entering "corn stoves" and your city and state and use the dealer locator offered by many manufacturers to find a dealer near you. You can check the yellow pages, newspapers, and other media to find corn stove dealers.

18. Can I get an insert or furnace that burns corn? Can I convert my wood furnace?

A. A variety of corn burning inserts and furnaces are available. Corn furnaces can be connected to new or existing duct work to heat an entire house. Corn burning inserts can convert a drafty wood burning fireplace into an efficient corn burning appliance. You can not convert indoor wood burning furnaces to corn burning because of modern codes, testing requirements and certifications.

19. What is the range of heat output (utilize BTUs and compare with other stoves)?

A. The heat output on corn burning stoves ranges from about 8,000 BTUs to about 58,000 BTUs per hour with some models having a limit of 32,000 BTUs per hour. Corn stoves have adjustable heat settings, but a steady burn with a BTU output of 15,000 to 30,000 BTUs per hour can effectively heat many homes in the winter. Corn burning stoves usually have higher BTU outputs than gas or wood burning stoves—unless a wood stove with secondary combustion is constantly stoked--then they are similar in BTU outputs. When larger BTU values are needed, the consumer has a choice of furnaces or boilers to meet their needs.

20. What are the efficiencies? What is my rate of return? How long will it before I will be saving money by switching to corn from wood, gas, etc.

A. Efficiencies range from about 70% to 85% for corn stoves depending on the manufacturer and the fuel being used. Homeowners will see an immediate savings on their heating bills and with normal burning will have a two to five year return on their investment-- some people have received a full return on their investment in less than two years. In the five year period from July 2001 to July 2006 most people saved \$300 to \$1500 per year heating the average 2,000 sq. ft. home with corn (Source: Dr. Chris Shilling Saginaw Valley State University). In buying a corn stove you are investing in a back up heating system and you add value to your house, make it more saleable and your house is worth more—you can get your money back if you sell your house.

21. How do emissions from a corn stove compare with a wood stove?

A. Corn stoves burn cleaner and have lower emissions than wood stoves—even lower than high performance wood stoves as documented by several studies at universities. Corn stoves either meet or are exempt from EPA regulations because of low emissions.

22. What kind of venting is needed? Can I use my wood stove vents?

A. It is required to use the venting specifications of the manufacturer and in most cases you can use 3” or 4” venting designed for corn burning stoves, “PL” vent pipe, or “L” vent pipe. In isolated cases you can vent into or through a chimney designed for burning wood, but it is best to run the 3” or 4” venting to the end of the exhaust system and use the proper termination cap.

23. Does it smell like popcorn inside or outside when it burns? If not, what is the smell like?

A. There is a slight smell when burning corn that most people find to be pleasant. If the appliance is installed, operated and maintained properly you should not notice any smell inside the home and very little outside.

24. Can I grow my own corn? What size field would it take?

A. To heat a 2,000 sq. ft home it would take approximately 200 to 250 bushels of corn and today farmers have an average yield of 150 bushels per acre. You could grow the corn needed to heat your home on 1.5 acres!

25. What are multi-fuel units?

A. These are stoves that can burn a variety of fuels such as corn, wood pellets, wheat, grains, cherry pits and other pellet fuel. Research is being done to bring other pellet fuel to the market such as switch-grass and pellets made from a variety of grasses and brush.

26. Are corn burning units nationally certified and if so, by whom?

A. Corn stoves are certified by independent test laboratories such as Warnock Hersey, OMNI Test Laboratories, Underwriters Laboratories (UL) and others. These laboratories also test the stoves for safety.

27. What is the average size of a hopper and how long will it burn? Are there thermostats to control heat output?

A. Hoppers will hold from about 45 pounds to 80 pounds of fuel with furnaces exceeding 200 pounds of fuel. On a low steady burn most corn stoves will burn 40 to 50 hours and with a thermostat they can burn longer without filling the hopper. Thermostats help control the heat output; give more comfort and better fuel savings.

28. Are the units self starting and will they start with corn?

A. Some stoves are self lighting on corn and/or wood pellets, but corn stoves are easy to light with a starter gel and wood pellets. To protect our natural resources it is best to manually light the appliance as it can cost more to start your appliance with a self igniter than it costs to actually heat your home.

29. What are the safety features?

A. Corn burning stoves have several safety features and will turn off if they get too hot or if the unit plugs or runs out of fuel. In some cases there are safety switches if the hopper or the door is left open-- or there is a drop in the draft pressure.

30. Is the unit hot to touch and if so where?

A. The glass and the front of the stove are hot to the touch and fireplace screens can be used to prevent toddlers from touching the glass door or the stove. Some models have cool touch sides backs and tops.

31. How does the flame compare with a wood flame?

A. There is a constant flame several inches high and several inches wide that will increase or decrease with your heat setting. The flame is bigger than a wood flame with a small fire or a coal bed, but smaller than a wood fire that is stoked up. Depending on fuel, the fire might have a narrow torch look to it or a natural fire look. Corn burning technology lends itself to a natural looking flame.

32. Will a permit be needed to install such an appliance? Do Building Officials have to inspect all installations?

A. Homeowners should check with their city or local jurisdiction to verify if a permit and/or inspection is needed. In some areas permits are not required and other areas they are. Qualified dealers can take care of the permits and inspections. In states like Michigan it is required that a licensed mechanical contractor install corn burning stoves and it is required most everywhere for a heating contractor to install the duct work for corn burning furnaces.

33. What are the best stoves to buy?

A. Stoves that have been on the market a long time and stoves that can burn 100% corn are the most desirable so that you do not have to mix fuels or try a new product to burn corn. There are many types of appliances on the market that will fit the consumers need. the consumer should get expert advise from a dealer that has handled corn burning appliances for a while to assure total satisfaction.

34. What are some other concerns when buying a stove that burns corn?

A. It is important to have the proper floor protection, clearances to combustibles around the stove and clearances around the venting components. The manufacturers specifications should be followed for venting components and the location of the termination cap—e.g. one foot above ground level or the proper distance above the roof. Make sure to obtain a consistent fuel supply and purchase a unit from a dealer that installs and services the appliances.

35. What should I look for in a dealer when a buy a stove that burns corn?

A. Many homeowners prefer to buy from dealers that can install, service, and provide parts for the stoves they sell. Good dealers can give out good information on corn stoves and on your particular application. When a qualified dealer installs a stove they can check for safety and performance issues.

36. Why is corn and renewable energy better to burn than fossil fuels?

A. It took more than four million years to create fossil fuels (oil, gas and coal) and it only takes four months to grow corn. By using corn for heating purposes, we can help to decrease our use of fossil fuels and other rapidly depleting energy sources. Burning corn and renewable energy for home heating allows Americans and Canadians to use home grown fuel instead of importing it from other countries.