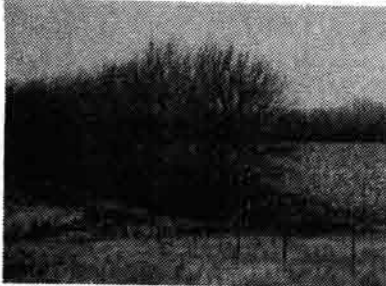


Heating With Wood

September, 1979



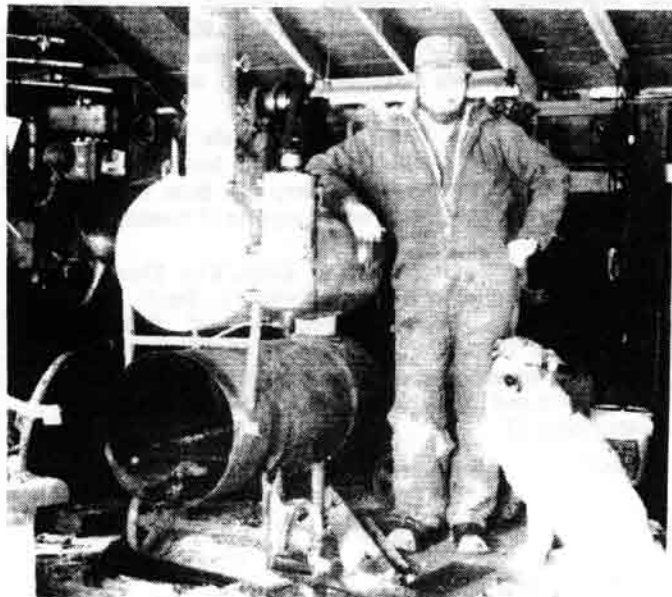
—Trees can be an important resource. There are many benefits available from trees on farms, such as wood for space heating. However, in many areas, including Nebraska, more trees are destroyed annually than are planted. Planting of trees is a major energy conservation step.

Wood heating has gained popularity with cooperators of the Energy Project as the cost of energy rises, although many of these farm families never discontinued wood heating after gas and oil first came into use years ago. A variety of equipment is used for wood heating, including some home-built versions. Wood heating is a low-cost, renewable form of energy particularly suited to rural areas. However, wood use requires responsible replacement of trees for future generations. Wood heating also requires specific safety procedures to avoid serious fires.



An Early Method of Heating

For the settlers of the Plains states wood was a prime concern, not only for construction, but mainly as a home heating source. Since Cedar County, Nebraska is bordered on the north by the Missouri River, the river valley was viewed as a natural wood supply. As a result settlers made tree claims which were used as their source of fire wood. In addition woodlots were established on nearly all farmsteads. Today many of these woodlots which have been mismanaged in the past are coming under use once again. Dutch elm disease has killed many of the American Elms which were widely planted in windbreaks, woodlots, and as shade trees. This has resulted in a short term dry wood supply.



Costs of Wood Heating

Prices for new wood heaters range according to the quality of construction and size of the wood heater. In addition, other accessories will be required for handling wood, including saws and splitting equipment. Rural areas are most suited for wood heating, where wood supplies are nearby. In urban areas, the cost of transporting wood may be prohibitive.

As with other types of alternative energy used in space heating, **insulation of the home is important.** Such conservation will help to make the best use of a resource, like wood.

Tax credits have been considered for wood heating equipment as with solar devices, but to date few credits are available for wood heaters.

Wood Heating Safety

Wood safety is of such importance that it can't be over-stressed. **Chimney fires can be avoided if chimneys are kept clean of soot and creosote.** The best way to accomplish this is to **burn only dry wood—never green wet wood—and to sweep the chimney periodically.** A chimney in good shape is very important. It should have no cracks and it should be lined. Many of the older chimneys are unlined thus making them dangerous. Wood safety must also be stressed in the making of firewood. Everything from felling the tree to working it up requires the use of buzz saws, chain saws, axes, wedges and sledges which require some skills on the part of the user.

Independent, Renewable Heating

The burning of wood as a fuel is not a total act of consumption like the use of electricity or fossil fuels. Most users of electricity or fossil fuels don't know or care where it comes from or what was required to obtain it. Their only concern is that it is there when the light switch or the furnace is turned on. Instead a user of wood is required to be responsible. Not only must he/she be responsible from the view point of safety but also **responsibility must be assumed for replenishing the trees so that wood can indeed be a renewable form of energy.** Individuals who make their own firewood are fully conscious of where their fuel is coming from and what is required to maintain a long term supply. A long term supply in the Plains region can only be assured if the users of wood make sure that more trees are planted.

—Martin Kleinschmit, left, and farm friend display the home-built wood heater used in Kleinschmit's shop. The heater was built from used water heater tanks. Wood is fed into the lower tank with flue gases passing through the top tank for better heating efficiency. Kleinschmit had hoped to use the small tank shown at the side of the heater for burning waste oil, but was unsuccessful.

A Variety of Wood Equipment

Commercial Systems

Wood stoves were removed from most rural homes because they were "too messy" and fossil fuels were cheaper and much easier to use. But today wood stoves are finding their way back into many homes. Today there are literally a hundred different makes and models available on the market. With this sudden interest again in wood as a fuel resource, several new innovations have been developed. Probably the most popular innovation among Energy Project cooperating farmers is the "Convert-A-Furnace", "Furnace-mate", "Side-by-Side", "Helper Furnace", etc. all of which are supplemental wood heating stoves. They make use of existing gas or oil furnace air ducts and chimney. These wood furnaces are usually thermostatically controlled so that as long as the wood fire is warm enough it will provide space heating. When the fire dies down the regular gas or oil furnace will provide the heat. As a result these types of wood furnaces prove to be mainly supplementary and don't completely replace the existing furnace. Because the oil or gas furnace is still present, the Energy Project has found that it is easier for the busy farmer to defer use of the wood heater when wood needs to be made or the stove needs to be fed during the night. These tasks couldn't be put off if the wood stove was the only heat source.

Home-built Wood Heaters

Another innovation that has become popular is the construction of a wood stove from barrels or other materials. Martin Kleinschmit, an Energy Project cooperator solved his shop heating problems by using two 50-gallon hot water heater tanks. He placed them one on top of each other using the bottom tank for the fire box and the top one as a heat exchanger. The same can be done with barrels. Persons have also built their own wood heater next to their conventional oil or gas furnace.

Fireplaces

Fireplaces generally have low efficiencies in providing heat to the home. Although more efficient systems are now available than in the past, many fireplaces may remove more heat from the home than is provided for space heating, due to the draft created. Newer designs of fireplaces incorporate heat exchangers with forced or gravity air circulation to provide for improved combustion efficiencies while retaining the attractiveness and appeal of a fireplace. As with other wood heaters, consideration should be given to utilizing air from outside the house for combustion air, therefore lowering the draw on heated interior air, which must be replaced by outside cold replacement air to the living area.

Wood Water Heaters

Commercial wood heating devices are also available for heating water with wood energy. In addition, various ideas have been utilized by the "do-it-yourself" enthusiasts, including wrapping coils of tubing carrying water around the flue or in the firebox of the wood heater. With a tank separate from the conventional water heater, the wood water heater can function on the convection or "gravity" principle.

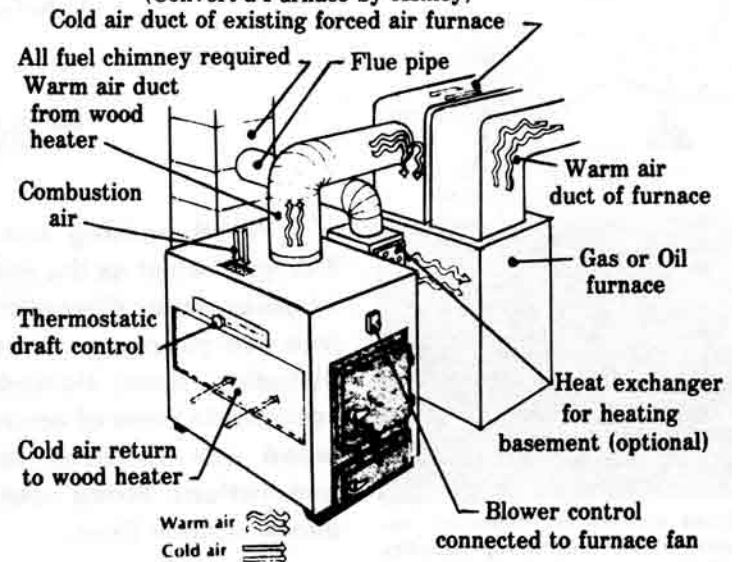
The wood water heater can be a low cost heater, that also can be used in conjunction with low cost solar water heaters, where the solar system is used only during the mild months of the year, with the wood water heater used during cold winter months. The solar collector in this case is drained down for the winter.

Stock Tank Heaters

Another farm use for wood heat which is becoming popular again is the use of "cob burners" to melt the ice in livestock watering tanks. These consist of nothing more than a metal firebox placed in the stock tank in which cobs, wood scraps, or anything else which will burn are used to heat up the water. □

EXAMPLE OF WOOD SUPPLEMENTAL HEATING

(Convert-a-Furnace by Ashley)



More Information

A variety of plans, books and other resources are available for constructing wood stoves and for utilizing wood as a fuel. The Energy Project has a "Wood Energy" bibliography for 25 cents. Most local and state Extension Service offices have good heating information. Listed below are several other good resources:

References

Convert Your Oil Furnace to Wood by William White. 1976. Firebuilders, 352 Stetson Rd., Brooklyn, Connecticut 06234. \$3.00. 55 pp. This booklet tells step by step how to convert an oil furnace to wood by building a brickwork wood furnace right in front of the oil furnace and ducting the hot flue gases through the oil furnace.

How To Build An Oil Barrel Stove by Ole Wik, 1976. Alaska Northwest Publishing Company, Box 4-EEE, Anchorage, Alaska 99509. \$1.95. 24 pp. This booklet provides simple directions for making a stove out of an oil barrel entirely without welding equipment or power tools.

The Woodburners Encyclopedia. Vermont Crossroads Press, Box 333, Waitsfield, Vermont 05673. \$6.95. 155 pp. It covers the phases of wood heating, combustion properties, economics, a list of system manufacturers and wood system specification charts.

Wood Heat by John Vivian. 1976. Rodale Press, Inc., Emmaus, Pennsylvania 18049. \$4.95. This book provides reading that ranges from woodlot to fireplace, from stove to flue, giving practical information on all aspects of heating and cooking with wood.

Woodstove Construction: How to Build Two Excellent Wood Heaters—Materials—Tools—Techniques, Small Farm Energy Conservation Project, Federation of Southern Cooperatives, P.O. Box 95, Epes, Alabama 35460, 46 pp. \$3. This booklet is to acquaint persons with the principles of wood stove construction and to provide a basic model and design for their construction. □

