

Nebraska ENERGY

Q U A R T E R L Y

Nebraska Energy Office

Fall 1988

Moles See the World, Back to the 60s and Into the Future

Videos Teach Kids

Three new energy educational tools are now available through the efforts of Hoeger Communications of Omaha. Hoeger, under contract to the Nebraska Energy Office, has produced three videotapes on energy efficiency designed for three age groups: kindergarten through third grade, fourth through sixth grades and junior and senior high school students. The high quality videotapes and accompanying study guides are designed to instill values of energy efficiency and conservation in Nebraska's youth. The videotape, *Stick Together, Never Waste and Leave Things As You Found Them* features three sisters starting life on their own. *Leave It to Stevie* parodies 1960s situation comedies. *Tommy the Waster* combines music, animation and special effects. These lively stories grab students' attention and absorb them in important lessons about energy use.

Dr. Howard Halpern of the Lincoln and Lancaster County Child Guidance Center reviewed the three scripts, saying "I was impressed by all three scripts. They were entertaining, informative and largely consistent with what we know about the changing nature and focus of children's interests and cognitive abilities," and the scripts are "superb."

How to Get Them

The videos were developed and produced with funding from an Exxon Oil Overcharge grant to Hoeger Communications. Schools in Nebraska can borrow the videos by contacting JoAnn McManus at the Nebraska Council on Energy and Economic Education, College of Business Administration, Room 307, University of Nebraska, Lincoln, NE 68588-0402, or by phone at (402) 472-2333 or 472-5612.

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Governor Orr Issues Proclamation

Energy Awareness Month

With the support of the General Federation of Women's Clubs (GFWC) and the American Public Power Association, Governor Orr declared October as Energy Awareness Month in Nebraska. By doing so, Nebraska joined the rest of the nation in celebrating the ninth annual Energy Awareness campaign. The goal of the month-long effort was to make Nebraskans aware of where their energy comes from, how it can be used efficiently and energy's importance to economic prosperity and national security.



Proclaiming National Energy Awareness Month are (left to right) Gary Rex, Energy Director; Walt Canney, Lincoln Electric System; Governor Orr and GFWC members Carolyn Peterson, Stromsburg; Nerine Newsham, Lincoln and Ellen Smiley, Lincoln.

The theme of the 1988 Energy Awareness Month was "Energy Makes America Work," recognizing the close relation between energy and maintaining economic prosperity.

For many years, the GFWC has joined in the promotion of energy awareness activities. As part of the GFWC Energy Awareness program, GFW clubs across Nebraska educate their communities on the need to conserve energy and to explore all possible sources of energy.

The American Public Power Association's support of energy awareness activities is especially important to Nebraskans. As the only state in the nation served entirely by an electric system owned and operated by its citizens, Nebraskans have the unique opportunity to have a say in the nature, costs and distribution of their power. A strong energy awareness by Nebraskans insures the efficient operation of our public power districts, rural electric and municipal systems.

Warm Spaces

Home Space Heating Options

One of the strategies used to combat the high cost of home heating is to heat just the part of the house or room you are using at the time. This allows you to turn down the thermostat on the central furnace yet remain comfortable. Even if you are using a more expensive fuel like electricity for the area heat, the savings from reducing the temperature in the rest of the house will be enough to lower heating costs. Depending on how much you set the central furnace back, you may be able to reduce your normal heating bill by 10% to 30%.

If there are several people sharing the house or if they are using several different rooms, then this heating method may not be appropriate.

"Radiant" or "Convective"

Space heaters are usually designated as "radiant" or "convective," although their output is a combination of these two methods of heat transfer.

Radiant electric heaters, which may use a quartz tube or glowing red wires, typically have a reflector to focus the beam of infrared radiation (heat) in a particular direction. Radiant heaters are best for rapid warming of a small space, such as your favorite chair or a workbench area. They are slow at warming a larger room, and their heat is uneven in such applications.

Convective electric heaters heat the air, and the heat is spread around the room by air movement. Convective heaters may use a small fan to circulate the air while others, such as the oil-filled, radiator-style units, rely on natural convection to distribute their heat. Convection heaters are better at keeping an entire room at comfortable temperatures, but may be slow to warm a specific area in the room.

All electric heaters are 100% efficient. A 1500-watt heater will produce about 5,000 BTU/hour, whether it is designed to be primarily radiant or convective. The choice between these types should be based on the intended use of the heater.

An electric space heater should be equipped with sensors which will turn the unit off if it tips or overheats. If an extension cord is used, it should be a heavy-duty type. As with any electric appliance, avoid use near water.

Kerosene

Kerosene heaters were very popular a few years ago. Kerosene heaters generally provide more heat than electric space heaters (9,000-20,000 BTU/hour) although they are available in both radiant and convective designs, with the same strengths and weaknesses as the electric models.

Kerosene heaters produce both carbon monoxide (mostly when the wick is trimmed too short) and nitrogen

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dioxide. Since there is no chimney to remove these products of combustion from the living space, it is important to provide a kerosene heater with an adequate supply of fresh air. This usually necessitates cracking a window or door open, which will reduce your energy savings somewhat.

Kerosene heaters should be equipped with a switch to stop the flow of fuel if the unit tips over, and guards or grilles should be in place to protect you from accidental contact with hot surfaces. Use only K-1 kerosene (low-sulfur) and take the heater outside for refueling.

Economic Development

Community Energy Management

West Central Nebraska Development District in Ogallala has assisted 15 communities in the district in forming community energy management committees.

In 1988, West Central completed a study detailing energy consumption in the district. The study showed that towns in the district paid \$47 million for energy in 1987. The study estimated that if energy efficiency improved by only 10%, the district's economy could receive a \$7 million boost.

Steve Krajewski, acting project director, explained that many communities were concerned about their energy use and its effect on their economy. "These small towns recognized the drain energy consumption has on their economies and they decided to do something to reduce it."

Examples from Lexington

In September, Krajewski and other community specialists from West Central organized a workshop to help the energy committees plan their activities. Vance Bricker, assistant city manager for Lexington, was a featured speaker. "Energy management is your economic development program," said Bricker. Bricker outlined Lexington's many energy management activities including load management, street lights and low-interest loans for weatherizing homes. Bricker explained that by controlling its energy consumption over the years, Lexington kept thousands of dollars in the community where it could support local jobs and incomes.

The energy committees have now started their local energy awareness campaigns and project planning. Several communities have also applied for over \$91,000 in loans and technical analysis studies from the Nebraska School Weatherization Program.

The energy management communities are Arapahoe, Benkelman, Cozad, Danbury, Farnam, Gothenburg, Haigler, Holbrook, Imperial, Ogallala, Palisade, Paxton, Thedford and Wilcoxville.

For more information on how your community can reduce its energy consumption or start local energy programs, contact **Ann Brockhoff in the Energy Office.**

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Reducing Nitrogen and Strip Cropping On the Farm

Reducing production costs is an ongoing concern of Nebraska farmers. With oil overcharge funds from the Nebraska Energy Office, the University of Nebraska Department of Agronomy is demonstrating techniques to cut energy costs while reducing soil erosion and groundwater contamination.

Chuck Francis, project director, explained that the projects will show farmers how to use the following techniques:

- soil sampling to six foot depths
- crop rotations
- realistic crop yield calculations
- strip cropping
- relay cropping

These techniques will help farmers calculate how much nitrogen is needed by each crop. Applications of purchased nitrogen fertilizer can be reduced by preventing the loss of soil nutrients by soil erosion and by growing nitrogen-producing crops.

Each ton of ammonia nitrogen fertilizer consumes the equivalent of:

- 297 gallons of diesel fuel, or
- 330 gallons of gasoline, or
- 12,084 kilowatt hours of electricity, or
- 40,000 cubic feet of natural gas

Nitrogen and Oil

Nitrogen fertilizer prices are very dependent on worldwide energy prices. Using only the nitrogen needed for crops will help producers reduce costs and nitrate problems, say University of Nebraska-Lincoln extension specialists.

Farmers in the South Central, Southeast and North Central extension districts receive help to implement these practices. This year's drought increased farmers understanding of how much fertilizer is needed, but has made implementation of strip and relay cropping difficult. The most exciting outcome of the program's first year, says Francis, is seeing farmers' interest in the results. "Participating farmers have organized their own tours to share results with their neighbors. They are really excited about this because they know they'll save money."

"Cheap petroleum and high commodity prices caused producers to apply nitrogen in abundance over the past two decades," said Dick Wiese, extension soils specialist.

What Crops Really Need

Recent studies of the amount of nutrient a crop needs has changed the ideas surrounding nitrogen application. "Farmers are now advised to consider all sources of nutrients in the field and adjust applications accordingly," Wiese said. The first step is a series of deep soil samples in each field. Using soil analysis results as a guide, farmers can determine how much nitrogen the soil can supply and

how much must be added. Farmers should also consider the benefit of legume crops such as soybeans and nitrogen applied through irrigation.

A realistic yield goal, preferably based on the last five years' average yields, should be made, said the extension specialists. A rule of thumb long-used for fertilizer application is one-and-one-quarter pounds of nitrogen for each bushel of expected yield. A farmer seeking a 300-bushel yield would apply 250 pounds of nitrogen per acre. When no soil test is used and other sources are not considered, over fertilization may result in unnecessarily high costs of production and nitrates leaching into the groundwater.

Myths

A number of myths relate to fertilizer use, said Don Sander, extension soil specialist. "One myth is that good managers apply more fertilizer. In fact, those who are good managers apply just the needed amounts," Sander said. "Another myth is that you can't afford to be short on fertilizer. In fact, there is a need to carefully provide the needed fertility for crops, but there are other sources besides the nitrogen fertilizer applied and these must be calculated into the recommendations." For example, legumes in the crop rotation contribute to the soil fertility for the next grain crop. When legumes are included in a sound management plan, production costs, energy use in production and the potential harmful effects to the environment can be reduced. Farmers participating in the reduced nitrogen aspect of the project will compare results of their conventional application rates and rates determined by soil tests and other nitrogen sources.

Erosion Control

Reducing erosion on sloping land under tillage is a key concern of Nebraska farmers who want to comply with government farm programs, said Francis. "Alternating strips of different crops, such as soybeans and corn, on a contour pattern is one way to meet the requirements while reducing energy consumed in agricultural chemical production," Francis said.

Waiting to prepare fields until just before planting or no-till planting directly into residue also can help reduce soil erosion, said Alice Jones, extension soil erosion/tillage specialist, but there still is soil and nutrient loss from many fields. "When nutrients are lost, they must be replaced for the next crop, which increases both production costs and energy use. Using alternating strips of corn and soybeans and no-till planting can substantially reduce soil and nutrient loss."

For example, soil that may be washing down the hill from a soybean strip will be caught by the corn strip. "If the strips are maintained from year to year, it may take topsoil ten years to reach the bottom of the hill rather than ten minutes in a heavy rain," Francis said.

An improvement in erosion control over the corn-soybean strip crop system is winter crop-summer crop

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combinations of wheat and soybeans. Another option is a perennial crop-annual crop system with alfalfa and corn or soybeans in alternating strips. A long-term crop rotation of strips can be established so that there is always a growing crop in every other strip.

A Practice from the Past

Strip cropping is not a new practice but it has been abandoned by most Nebraska farmers due to the time required to plan and manage the system. The strips must conform to the width of the planter, cultivator and combine to have an efficient use of the field and fuel.

An added benefit of strip cropping with legumes, such as soybeans and alfalfa, is that they produce nitrogen for corn and sorghum. Legumes also can be seeded into summer cereal crops where they provide cover through the fall and winter as well as produce some nitrogen in the spring.

Relay cropping of soybeans into wheat is being tested by UNL. "Relay cropping," Francis explained, "allows two crops to be harvested from the same field the same year." Relay cropping reduces the fixed costs per crop and maintains a cover crop over the soil through the major part of the year, thus further reducing erosion and nutrient loss, he said. The relay cropping plots rely heavily on farmers' ideas and participation, and the involvement of county and district staff of the Cooperative Extension Service.

Next Year

"The farmers who conduct the trials are the first to benefit from the results," Francis said. Farmers who wish to participate with fields next year should contact **Chuck Francis at (402) 472-1581** or **Alan Franzluebber at (402) 472-1574**.

This summer's drought conditions highlighted the value of these farming techniques. In a Saunders County demonstration field, a windbreak of corn was planted in soybeans. The crop yielded six more bushels per acre than previous years, thanks to the presence of the corn reducing water loss from the wind.

Energy Conservation

Questions

1. Today, what percent of all energy consumed in the U.S. is wasted as heat loss through windows?
A. 2% B. 5% C. 10%
2. The difference between inadequate and proper home insulation can be what percentage of your fuel bill?
A. 10% B. 25% C. 40%
3. It takes less gasoline to stop and restart your car than to let the motor idle for more than _____ minute(s).
4. If you set your thermostat back 10 degrees for an 8-hour period at night, you may reduce your heating bill by _____.
A. 5-10% B. 10-15% C. 20-25%

Answers

1. C. 10%. 2. C. 40%. 3. 1 minute. 4. 10-15%

CAREIRS Factsheet

Caulking and Weatherstripping

Many homes, especially older ones, have leaky windows and doors that lose heat in the fall and winter. In fact, on the average, air leaks account for 30 to 40% of the heat lost in homes that have not been weatherized. Not only are leaky homes uncomfortably cool and drafty in the winter, they also can lead to high energy bills.

Other openings can also leak air, such as light fixtures, electrical outlets and switches and vents in the bathroom and kitchen. You can easily combat air leaks in the home by sealing those cracks and gaps with caulking and weatherstripping. If you have already caulked and weatherstripped your home, you may need to check and replace weatherstripping.

Caulking and weatherstripping are inexpensive, do-it-yourself home improvements. Caulk is a resilient, semi-liquid material that may be applied on the inside or outside of window frames or other openings. You need just a few tools and minimal skills to caulk your home. Weatherstripping is a narrow piece of metal, vinyl, rubber, felt or foam that can easily fill gaps between the frames and the moving parts of windows and doors.

It's Free

The Conservation and Renewable Energy Inquiry and Referral Service (CAREIRS) is distributing the free fact sheet "Caulking and Weatherstripping" (FS 203) that discusses these techniques. This fact sheet describes the different types of caulking and weatherstripping, where and how to use them and the best seasons to start your project. Contact CAREIRS at P.O. Box 8900, Silver Spring, MD 20907 or call toll-free (800) 523-2929. CAREIRS provides basic information on renewable energy technologies—solar, wind, hydro, photovoltaics, geothermal and bioconversion, in addition to energy conservation.

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