

Solar-heated house nears completion



The English "vegetable marrow" is a squash to Americans.

GREENVILLE, S.C. - Construction of a medium-priced, three-bedroom family dwelling heated with solar energy, designed by the U.S. Department of Agriculture's Agricultural Research Service (ARS), is nearing completion.

The completely insulated attic of the house serves as the solar collector and a 12-inch thick layer of crushed rock beneath the floor of the house serves as a heat storage tank. The house is conventional in other respects.

The heating system is simple in design. Two layers of translucent fiberglass replace conventional roofing on the south roof slope and transmit sunshine or solar energy into the attic where it is absorbed by a black plywood floor. This heats the air in the attic and the heated air is circulated to heat the house and the rocks beneath the house. The heated rocks can store a four-day supply of heat to warm the house at night and during cloudy or rainy weather.

The solar heated house

was designed at the ARS Rural Housing Research Unit, Clemson, S.C., by architect Harold F. Zornig. It is part of the ARS effort to lower the operating costs of rural housing with a low-cost, low-maintenance heating system using solar radiation as the energy source. Such a heating system could be modified to match the demands of other geographic and climatic areas.

Zornig predicts that at least 75 percent of the house heating load during the coldest month in Greenville can be supplied by solar energy. To meet the small need for extra heat during the heating season a slightly larger than normal hot water heater is used as an auxiliary heat source. Hot water is automatically pumped from the hot water supply to heat exchanger in the air distribution system when and if the house has no solar heat in the attic or in storage.

The rocks that are used as a heat storage tank in winter can keep the house at a

pleasant daytime temperature during the warm months. This is achieved by bypassing the heat from the solar collector and allowing the rocks to cool at night.

Hello-Thermics, Inc., builders of the house is cooperating with ARS in the project. The Greenville firm developed the solid-state electronic controller which operates the house's energy conserving system.

The ARS Rural Housing Research Unit will monitor the performance of the prototype house through four seasons starting this winter, according to Mr. Zornig.

Performance during the year will be measured while the house is occupied. Although designed by ARS and built to ARS specifications, construction is being done by the

Greenville firm for a local resident who contracted for the house. The owner has agreed to allow installation of the instrumentation necessary to properly monitor the heating and cooling system.

The prototype house has a calculated average heat loss of 216,000 BTU per day in the Greenville area in January. In this same month there should be available a calculated 457 BTU per day of solar energy per square foot of transparent roof, assuming the prototype house will have the same 43 percent attic collector efficiency as a small test house previously built by the Rural Housing Research Unit.

With a collection area of 442 square feet, the solar system should provide an estimated 201,994 BTU per

day, or 94 percent of the heat needed. Mr. Zornig says, however, that because of loss of heat through the storage system, the predicted 75 percent supply of solar heat to meet heating loads in January is probably more realistic.

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to fewer acres harvested than was expected at that time.

U.S. fall potato production was estimated at 271.9 million cwt., and is one percent above last month but 6 percent below the 1974 record harvest.

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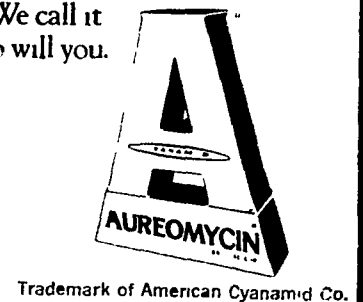
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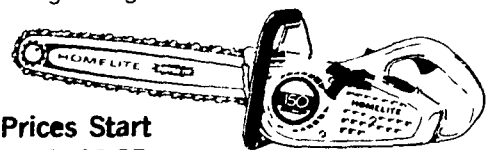
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