

This super-insulated house in Saskatchewan faces south to catch winter sun.

NORMAL HOUSEHOLD ACTIVITIES ARE ENOUGH TO HEAT IT EVEN IN CANADA

“Super-Insulated” House Heats For Under \$100/Yr.

By Doug Sorenson

Super-insulated, air-tight homes that require almost no outside source of heat to stay warm, even during long Canadian winters, are the wave of the future, say Saskatchewan builders who've constructed some of the first "conservation" houses anywhere.

In Montana, Dave and Marcia Borst, of Butte, live in a super-insulated home built by Buffalo Homes, also of Butte. They've spent \$5 for heat since last February.

"If it's cool in the morning when I get up, I bake a batch of cookies or a loaf of bread. That's enough to warm the house to 68 or 70°F. A boiling tea kettle will take the chill off most mornings," says Marcia Borst. However, she notes that in the summer "you have to be careful to bake in the morning or at night. You have to plan for the heat gain."

The Borsts say the house is extremely quiet and draft-free. They suggest that a super-insulated home might be especially suited for anyone with allergies, such as hay fever, if care is taken to keep the allergy-causing materials out.

David Eyers, construction engineer for an experimental building project in Regina, Sask., told FARM SHOW that they've been able to build conventional looking super-insulated homes that operate with heating bills of less than \$100 per year without any kind of solar heat, wood-burner or other alternative heat source. The houses are so tight that they're heated with only the body heat of people, cooking, hot showers, baths, laundry, and other activities that generate heat.

"The conservation house is based on several principles," says Eyres. "It must be highly insulated, have an airtight vapor barrier, adequate ventilation, a heat exchanger and be built to capture the sun's heat without using special equipment."

Here are the details on each feature:

Insulation: A 2-story wood frame

house with a crawl space should have double studded walls with 12 in. of insulation and ceilings with about 20 in. The crawl space should be insulated to an R-value of 35 and the underside of the basement floors should have an R-value of 10. Those values are about double, or more, those of a conventional house.

Vapor barrier: A layer of 6 mil. polyethylene is placed between the inside and outside walls. Special techniques developed by the Canadian National Research Council, the project's sponsors, make it possible to achieve a near-perfect airtight seal, even around windows, doors and vent pipes. In conventional construction, the vapor barrier has many gaps and holes for air to leak through.

Ventilation: In the conservation house, one complete change of air takes place every six hours, compared to a change of air every two hours in a conventional house. By having less outdoor air to heat, energy use is reduced 65%. The system can be stepped up to exchange 80% of the air every hour, if necessary.

Heat exchanger: This is the "furnace" in the conservation house. It collects the stale warm air in the house and forces it out, at the same time drawing in cool air. But the key point is that all cold air that comes in through the heat exchanger is warmed by the stale air going out. Eyers says the exchanger recovers 70% of the heat in the exhausted air.

Passive solar heat: The house is oriented to the south to catch the sun, is painted brown to absorb heat, and 90% of the window space is on the south side.

Eyers mentioned some other details that create the optimum energy-efficient house: "The conservation house is a 2-story, cubical structure which exposes a minimum of exterior per square foot of floor space. It also has deciduous trees on the south side to shade out the sun in

LOW-COST WAY TO PREVENT GRAIN LOSS ON HILLY OR CONTOURED LAND

Grain Saver For Gleaner Combines

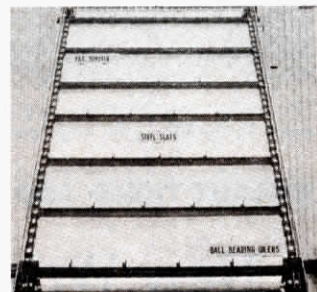
If you own a Gleaner combine, you'll be interested in the grain-saving Hillside Raddle from Manchester Mfg., Manchester, Okl. It converts all makes and models (except the new N series rotary) into a low-cost "hillside" combine for a fraction of the cost of a factory-made hillside combine, or the air-type attachment for preventing grain losses on hillsides, according to Mel Kloefkorn, owner.

Manchester's Hillside Raddle has patented lugs attached to the steel slats. These lugs prevent grain and chaff from sliding to the downhill side of the raddle pan before it reaches the chaffer, thus helping to prevent overloading of the lower side of the chaffer sieve and cleaning shoe.

"Regardless of the tilt of the combine, the grain is held in place across the full width of the raddle," explains Kloefkorn. "Our design does a more even job of feeding than the blower type system, which costs hundreds of dollars more. What's more, the blower system takes a lot of horsepower whereas ours uses no extra power whatsoever."

Kloefkorn adds that, "Custom combine operators who operate conventional Gleaner combines, and who have discovered our Hillside Raddle, are our best salesmen. They know it works."

Manchester Mfg. also offers roller chain, steel slat raddles for all models of Gleaner combines (except the new N series) which are available without the patented lugs making up the Hillside grain-saving feature. However, since the Hillside feature only adds 10 to 15% to the cost of a replacement raddle, Kloefkorn advises owners of Gleaner combines who operate flat ground to buy it. "It'll soon pay for itself by saving grain normally lost because of centrifugal force when making turns," he points out.



Note small lugs on slats which prevent grain from sliding to "downhill" side. Manchester also makes replacement steel raddles for wooden raddles found in pre-1971 Gleaner combines.

Manchester Mfg. also offers a replacement for wooden slat raddles for all Gleaner combines built before 1971. It includes roller chain with steel slats, drive sprockets, idlers and all other necessary parts.

Manchester Mfg. also makes a force feed feeder chain which solves plugging problems on all makes of conventional and rotary combines equipped with quick-tach headers. "When they introduced quick-tach headers, combine manufacturers eliminated the front beater, leaving the combines vulnerable to a host of feeding and plugging problems, especially in short, weedy or downed crops. We solved the problem by designing a slat with a flap on it. Each slat, in effect, works like a beater to feed material into the cylinder," explains Kloefkorn.

For more details, contact: FARM SHOW Followup, Manchester Mfg., Mel Kloefkorn, Owner, Manchester, Okl. 73758 (ph 405 694-2292).

summer but let it come through in winter.

The average cost of a super-insulated house built in Saskatoon, Sask., in 1980 was \$60,000, excluding the lot. A similar conventional house would have cost \$55,000 according to Eyers.

How about using the super-insulation concept on older homes?

"We bought six older houses in various styles and designs, and made them energy efficient," Eyres told FARM SHOW "Generally, the cost of converting an old house is much higher than building it into a new one. It could cost \$10,000 to \$15,000 with a contractor, and about one-third less doing it yourself."

How does solar energy compare to super insulation? "We're not opposed to solar energy," he says. "But the economics just aren't there. You can spend \$10,000 to change to or install solar, and another \$1,500 to keep it in operation, and end up with \$30 annual fuel saving."

For more super-insulation information, contact: FARM SHOW Followup, Office of Energy Conservation, Saskatchewan Mineral Resources, Toronto Dominion Bldg., Regina, Sask. (ph 306 565-3036). The Mid-America Solar Energy Complex, 8140 26th Ave. So., Bloomington, Minn. 55420 (ph 612 853-0400) also has information available.