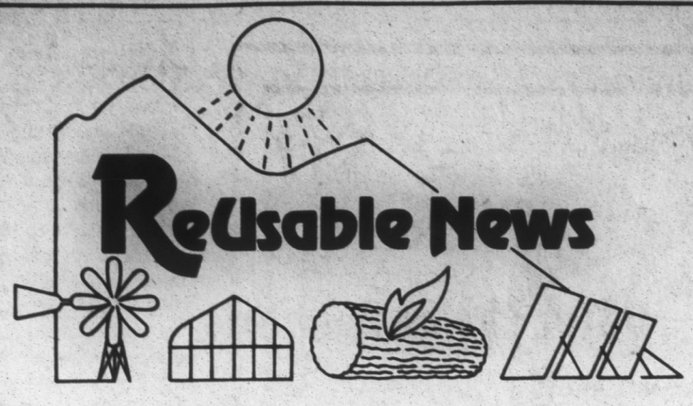

It looks like a billboard tilted at a 50 degree angle. What it is, in fact, is an 1844-square foot, hot air solar collector designed to help heat a commercial sized greenhouse.

Harry Suddreth owns and operates Low Meadows Farm near Mount Holly in Gaston County. His numerous commercial sized greenhouses use up to 70 cords of wood and thousands of dollars worth of oil every year during the heating season.

When Randall Stevens and Michael Lawing approached Suddreth about the possibility of solar heating one of his greenhouses, he was understandably enthusiastic. Stevens and Lawing formed the Poly-Solar Company to specialize in solar heating commercial greenhouses.

Last Spring they submitted a proposal to the Department of Energy's Appropriate Technology-Small Grants Program to solar heat a commercial sized greenhouse on the Suddreth farm. The Department of Energy funded their $15,000 proposal later that year.

Suddreth allowed Stevens and Lawing to use two of his greenhouses for their project. One greenhouse would be traditionally heated with No. 2 fuel oil, while the other one would be heated by the sun with a back up oil furnace.

By using one greenhouse as a control, Lawing and Stevens can determine whether or not they achieve their goal of supplying 50 per cent of the heating requirement for a 2,800-square foot commercial greenhouse with solar energy.

If you have ever stood in front of a large window on a cold winter's night and felt your heat escaping outside, you can appreciated the amount of heat required for a building made of two layers of polyethelene.

Since the largest heat requirement occurs when the sun goes down, Stevens and Lawing designed a rock storage system to save solar heat for the cold winter nights. The storage bin lies beneath the center growing stand in the greenhouse. It reaches a length of 90 feet, a depth of three feet, and a width of seven feet. In all, the storage bin used 150 tons of washed granite gravel.

The rocks will provide approximately 2.2 million BUT's of stored heat; enough to maintain an indoor temperature of 62 degrees when the outside temperature on a winter night averages 32 degrees F.

When the sun is out and the collector is producing air warmer than the rock storage bin, a differential thermostat switches on a 30-inch fan. The fan draws air from the top of the collector via a plastic duct and delivers it to a cement block air channel below the rock storage area. The hot air rises from the channel and gives up its hat to the cooler rocks.

At night, when temperatures in the greenhouse begin to drop, the differential thermostat switches the fan on, and it pumps heat from the rocks into the greenhouse keeping the plants warm.

Lawing and Stevens placed temperature probes about every ten feet or so in the storage bin so they could monitor differences in temperature at the various points over time. They are also constructing a digital control panel which will give temperature readouts at a central location. This will make it easier for them and for visitors to monitor the performance of the greenhouse solar system.

Given the current tax incentives, and assuming the system works as designed, Lawing and Stevens estimate the payback time to be from three to six years. That ought to be a good investment return in anybody's book.

One of the nicest features of the Poly-Solar system is that almost all of its components came from local building supply stores as off-the-shelf items. What this means to the owner is obvious; if somebody puts a baseball through the collector's glazing, repairing it will not be an expensive or time consuming chore.

Lawing and Stevens had no major problems in constructing the collector. They made it out of plastic; clear for the front glazing, and black for the back heat absorber. The two plastics are separated by a layer of chicken wire, which in turn, is attached to the 2 x 6 support frame that is mounted on creosote pilings. The 2 x 6's are spaced three feet apart for the entire length of the 96 foot collector. Openings along the bottom of the collector allow fresh air to enter and a plastic header-duct runs across the top of the collector carrying the hot air to the rock storage bin.

Next Fall, Lawing and Stevens plan on using a closed loop system with a cold air return to the collector rather than the open air intake system they are currently using. Even without a cold air return from the greenhouse, the collector has been delivering 120 degrees F. heat to the rock storage bin.

If you would like more details on the Poly-Solar system you may write to Poly-Solar Co., 313 Quail Hollow, Lincolnton, NC 28092.

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Millions Of Dollars Spent Annually On Weed Control

By Bob Cairns

Mary, Mary, quite contrary, how does your garden grow?

With crabgrass, kudzu and cockleburs all in a row.

That version of the old nursery rhyme is appropriate for North Carolina, where every inch of lawngrass, ground cover and agricultural crop wages a war for its share of turf.

"In one way or another every homeowners, farmer and consumer in the state is adversely affected by our weed population," said Dr. Harold D. Coble, a N.C. State University weed scientist.

Millions of dollars are spent annually on weed control in North Carolina, and at the Weed Research Laboratories at NCSU, Coble and other scientists are working to reduce this astronomical cost.

Emerson might have described a weed as a plant whose virtues have not yet been discovered, but Coble defines one as an unwanted plant which causes an economic or aesthetic loss.

"By studying the interaction of weeds and other plants we are able to develop management programs for lawns, farm crops, and waterways," Coble stated.

The activities range from basic physiological weed-crop studies and applied research in the NCSU laboratories to field work between NCSU specialists and farmers and homeowners fighting the weed battle on the home front.

The modern NCSU facilities include spacious greenhouses and growth chambers capable of selectively simulating almost any environment. Ten full-time weed scientists and more than two dozen student assistants are studying virtually every weed that grows in the state.

"The management of weeds affecting money crops like tobacco, soybeans, peanuts and cotton is a mjaor thrust of our research," Coble said.

According to Coble, 95 per cent of North Carolina's crops are sprayed with some type of herbicide. In the past, weed research in large part meant the testing of these heavily used chemicals.

"Today our investigations cover every aspect of weed control. In-field experiments are looking at how herbicides like 2,4-D work," Coble said. "We're also performing experiments in our laboratories to discover which parts of plants are affected by the chemical sprays."

We have known for a number of years that chemicals like 2,4-D will work successfully, but that doesn't mean they're always the best method of weed control. It just means that the sprays are an effective method, and that farmers have great confidence in them, Coble said.

A major thrust of the ongoing research at NCSU is to learn more about the economics of spraying. The goal is to get answers about comparative costs and returns from weed control expenses to farmers and turf growers so they can make informed decisions on the most economical form of treating the weed population, he commented.

Chemicals aren't the only means of good weed control. For example, Coble noted that crops planted in narrow rows can be more competitive with aggressive weeds.

Other NCSU experiments have indicated that small-grain crops like wheat can give off a chemical that is harmful to weeds. The next crop grown in that soil tends to experience fewer weed problems.

Weed control efforts also include pinpointing of planting dates, testing competitive plant varieties, scanning various types of herbicides to learn more about their effect on weeds and considering the weed populations influence on insects and other pests.

NCSU's weed control investigations aren't limited to agricultural problems.

"Crabgrass is an enemy of every lawn, ground cover and crop in North Carolina. We are testing chemicals for home lawns, recreation areas, golf courses and parks," Coble said.

Data on where and when to grow specific grasses and ground covers also is being collected and distributed.

Another important area of weed science research involves solving problems in aquatic areas. Many of the channels in tidewater North Carolina which drain the

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The oldest known song written in English is a ballad called Judas. A manuscript of this survives from the 13th century.