

## “Rock Bank” Keeps Greenhouse Warm

Steve Schwen markets vegetables nearly year round. Thanks to his “rock bank” greenhouse, he can do this in Minnesota with no outside energy costs. The 60 by 30-ft. deep greenhouse collects extra heat during winter days and stores it in river rock beneath 5-ft. wide growing beds.

“We try to plant the beds to cold hardy crops for late winter, early spring sales,” says Schwen. “It will get close to freezing during the night, but not enough to kill the plants, even when it’s coldest outside.” As winter crops are harvested, tomatoes and peppers are planted for late spring sales, months ahead of outside production.

Schwen designed the greenhouse with a 15-ft. deep workroom behind it. Living quarters for farm interns take up second floor space. During the day, heat naturally rises to a collection area above the peak of the greenhouse. Here it’s collected in a black, 8-in. collection duct. A solar-powered fan pulls it down and into a 10-in. dia. manifold buried down the center of the greenhouse. A series of 4-in. dia. perforated loops disperse the air to either side through 1 to 1 1/2-ft. deep beds of 1-in. smooth rock. The hot air heats the rock and moves upward through 2-ft. deep planting beds of sand/soil/compost mix.

“We covered the rock beds with used Remay row cover to help keep the planting mix

from filtering in over time,” explains Schwen.

Six 4-in. standpipes are situated around the greenhouse to release heat into the air on cold nights. Sensors in beds monitor soil and rock bed temperatures.

A thermostat in the roof peak triggers the fan when the temperature there is higher than bed temperatures. However, if soil bed temperatures get too high, the fan stops, and excess heat in the roof peak is vented into the living quarters or through the roof.

Schwen notes that the greenhouse is important to the farm in the summer as well. This past year, tomatoes and peppers in the greenhouse started producing in late spring and continued late into the fall.

“We’ve sold a lot of tomatoes, peppers and cucumbers from the greenhouse when they weren’t very good out of the field,” he says.

The entire greenhouse with thermal banking cost about \$45,000, not counting labor. A \$5,000 grant helped cover some of the costs. At the time he estimated that energy savings over conventional heating would pay for the building in about 10 years. Since it was built more than 10 years ago, current savings go right to the bottom line.

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Photo Courtesy Steven Schwen /Cooking Up A Story

Thanks to his “rock bank” greenhouse, Minnesotan Steve Schwen can market vegetables nearly year round.



The 60 by 30-ft. deep greenhouse collects extra heat during winter days and stores it in river rock beneath 5-ft. wide growing beds.



Bottom of each raised bed is lined with hardware cloth to keep mice and voles from tunneling underneath. Small Quonset-like covering keeps cats and dogs out.

## Three Garden Problems Solved

Joe Earley, Raymond, Wash., recently sent FARM SHOW photos of several ideas he’s come up with over the years to solve problems he was having in his garden.

“Our garden is located on the roof of our earth-sheltered house. We’ve always had an abundant supply of weeds and after years of pulling and hoeing, we finally gave up and covered most of the area with 6-mil black plastic,” says Earley, who cuts holes in the plastic for plants.

Another problem was keeping cats and dogs out. The problem was solved by cutting 3 to 5-ft. lengths of 2 by 4-in. welded wire fabric, using the curve of the roll to form a Quonset-like covering over the bed.

“The wire sections can be easily lifted at one side, or even removed, for easier weeding and picking and then replaced,” says Earley. “We plant low vegetables at the edges and taller ones in the center to give them more room to grow. The wire doesn’t blow off and will support clear plastic the following spring to create a greenhouse effect.”

He also had a problem with small varmints or birds digging out seeds after planting. “To stop them, I made mini Quonsets out of 1/2-in. hardware cloth to cover the newly-planted seeds and blocked the ends with more of the same material. Problem solved,” says Earley.



Weed-killing 6-mil black plastic has a slit cut into it to expose the soil for planting.



Seed protectors, made out of 1/2-in. hardware cloth, cover newly-planted seeds.

To keep mice and voles from tunneling under raised beds, he lined the bottom of each bed with 1/2-in. hardware cloth. No more tunneling.

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## Garden In A Barrel

“A lot of people want to have a garden but don’t have enough space. Barrel gardening may be the answer, even if you only have a few square feet to work with,” says Nathaniel Burson of Big Sandy, Texas.

He’s come up with a low-cost system that lets you convert used plastic barrels into highly productive container gardens.

“Lettuce, beets, carrots, strawberries, potatoes, tomatoes, and many other kinds of plants can be grown in barrels. You can grow practically an entire garden in just one barrel,” says Burson.

The idea is to make “pockets” around the outside of the barrel, and then fill it with soil. Plants grow in the pockets and also on top. The bottom of the barrel is punctured to create drainage.

To make the pockets a heat gun is used to heat the plastic, then a saw is used to cut 6-in. long slits at intervals into the barrel. A specially cut wooden brace is then wedged into each slit to make the pocket. Once the plastic cools down the braces can be pulled out.

“The beauty of this system is that every available square foot is used,” says Burson. “A 30-gal. barrel will produce enough lettuce for the average family to have a salad a couple times a week. The barrels can even be stacked on top of each other for more efficient use of space.

“A 55-gal. barrel will hold 72 plants on the outside and a lot more on top. If you’re really cramped for space, you can also use plastic 5-gal. buckets,” says Burson.

To make the barrel gardens easy to water, he inserts a piece of pvc pipe down the center of the barrel with holes drilled into it.

Burson sells an instructional Plans/DVD set that shows in detail how to make a barrel garden for \$29.95 plus \$4.95 S&H. A video preview is available on his website, along with other gardening ideas.

Contact: FARM SHOW Followup, Easiestgarden.com; 10758 St. Hwy. 155 S., Big Sandy, Texas 75755 (ph 903 576-6800; orders@easiestgarden.com; www.easiestgarden.com/barrel-garden).



Plants grow in “pockets” on outside of barrel and also on top.



“The beauty of this system is that every square foot is used,” says Nathaniel Burson.