

1800-Sq. Ft. Home Built Inside 24-Ft. Grain Bin

When he found a couple of 24-ft. dia. grain bins being given away just for the taking last fall, Ray Smail of Alder, Mont., decided immediately to take them. Not for grain storage. He was looking to build a house.

Ray works with his father, Dale, in earth moving and construction and also does a little farming on the side.

"I live in an old mobile home right now, and I wanted more room and something that was more energy efficient," he says. He also liked the idea of doing something a little different.

He dismantled the 20-ft. tall bins and combined them into one building at a site between a couple of other bins on his father's property. He now has a cozy four-story home that blends into its surroundings, but affords a great view of the mountains in the distance.

Smail first dug a shallow basement into which he put the bottom three rings of the grain bin. "I poured a concrete floor in it, just like you'd pour to set the bin on if you were using it to store grain," he says. Then he tarred the bottom 4 or 5 ft. of the rings and backfilled to that level and graded around the basement so water drains away.

Once the basement floor was poured, Smail put the rest of the rings on top, capped by one of the bin roofs so the structure is 40 ft. tall.

He roughed in three stories, giving him four floors in all, with ceilings that are about 7 ft. 3 in. high. A curved staircase links the floors. "I thought about putting in a fireman's pole from the top to the bottom. I also considered mounting a section of large galvanized culvert on the outside of the bins and installing an elevator in it," says Smail. In the end, he decided a stairway would be the best.

He attached 2 by 4 studs to the bin wall by drilling through the width of the board and on through the steel wall and then running a long bolt through the wall and board. "I used galvanized bolts with carriage heads, so they

look just like the ones holding the rings together," he says.

Once the wall studs were in place around the interior of the bin wall, he roughed out some smaller rooms on each floor. Before applying drywall over the studs against the bin wall, he filled the gaps between them with foam insulation.

Smail figured the bin walls would heat up and at least partially heat itself. With this in mind, he made an air gap between the insulation foam and the steel bin wall by stapling heavy paper between the studs about 1 in. from the exterior wall - on the south half of the bin only - from the basement to the roof. He ducted these gaps together so he can pull warmed air from them into the basement and then let it rise naturally through vents located in the floors and ceilings of each of the upper stories.

Smail went shopping for windows and found all he needed at a local discount building materials outlet. However, installing normal house windows in a curved corrugated steel wall left him scratching his head - but not for long.

He needed a flat surface to mount the windows, so he made a frame for each from 1 1/2-in. by 3-in. steel tubing. With a plasma cutter, he cut each opening precisely. Then he welded the steel tube frame into the opening and, finally, mounted the windows in the frames with self-tapping screws. The steel frames were all painted with rust-inhibiting paint that matched the color of the bin.

He put one window in the basement, four on the second floor and third floors, and five on the top floor. He's still thinking about skylights in the roof.

As for living space, Smail figures the basement will have a family room, complete with standard sized pool table, and a small storage area. The first floor has a bathroom, mudroom/laundry combination, and storage space. On the second floor there's a small



Ray Smail dismantled a pair of 24-ft. dia. grain bins and combined them into this cozy four-story home.



A curved staircase links the floors. Note window on left side of stairway.

kitchen and a combination living/dining room. Also on this floor is a door that will open onto a wooden deck 12 to 14 ft. wide that completely encircles the bin/house. He selected a bay window, arched at the top, for this floor to allow him to enjoy the view. On the top floor he's installing a half bath and two bedrooms.

To supplement the solar collector on the south bin wall, Smail put a freestanding propane heater on the basement level. Like the warm air pulled off the bin wall, warm air from the heater rises naturally from floor to floor, so there were no heating ducts to waste

space inside the house. Wiring and plumbing runs along the exterior walls.

To some, a grain bin house may sound rather small and confining, but each floor has about 450 sq. ft., giving Smail a total of about 1800 sq. ft. of living space. That's the same amount of living space as you'd have in a 30 by 30-ft. two story house.

He's planning to be all moved in sometime next fall. When it's all finished and the deck is in place, Smail figures his out-of-pocket cost will be less than \$12,000.

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"Chariot" Slashes Spraying Time For Tree Growers

Don and Craig Winship, South Dayton, N.Y., used to hand-spray most of the Christmas trees and nursery plants they grow on about 60 acres.

"When the trees are young, machine spraying them is easy," Don tells. "But by the time they're three or four years old, they've grown enough that applying insecticides and fungicides must be done by hand."

To make the job easier, they bought a small spray tank with a wand that they could mount on their Suzuki 4 by 4 ATV. It was better than a backpack sprayer, but the job was still quite time consuming. "We have about 70 miles of rows, and the best we could do with the 4-wheeler and the wand was about 1 mile per hour," Craig says. And to do it that quickly required one person on the 4-wheeler and another walking behind, operating the wand. They took turns riding and walking, but it was still strenuous.

It took 70 hours to spray one time, and they had to spray 4 or 5 times a year. They felt they were spending too much time.

They decided if they could devise a cart to pull behind the 4-wheeler, they could save time and maybe even do a better job of covering the trees.

"We took our idea to a local welder, who built us a small cart," Don says. "It's just big enough for a person to stand on, measuring

about 20 by 24 in. We put an axle under it, with 8-in. lawn mower wheels. The floor is made of expanded steel mesh, which helps keep your footing. And we built a guard to help us stay on it. It looks like a chariot, so we call it our Spray Chariot."

The Winships still take turns running the spray wand, but Craig says, "We can now spray at 2.5 to 3 miles per hour, which means the Chariot has cut our spraying time by about 2/3. That gives us a lot more time to do other chores."

They spent less than \$200 to build the Spray Chariot, including all materials and the welder's time, too.

The sprayer they bought came with a light plastic wand. They replaced that with a gun-type wand with a 3-ft. pipe and an adjustable nozzle on it. A plastic cone with an 8-in. outside end diameter was added over the end of the nozzle, too.

Don says the Chariot goes anywhere the 4-wheeler can go. In addition to using it for insecticides and fungicides for the trees, they also use it to spray Roundup and other herbicides where needed in the nursery, around fences and buildings, etc.

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Don and Craig Winship made a spray "chariot" to pull behind their ATV. "It cut our spraying time by two thirds," says Craig.

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