

Moveable Greenhouses Roll Where Needed

Moveable "high tunnel" greenhouses could change the way nurseries and market gardeners raise crops. They make it possible to do several successive early season plantings by moving from place to place as plants get established. During the growing season, they can be moved where needed to protect crops from weather, birds or other predators.

"These mobile greenhouses can pay for themselves in a year," says Greg Garbos of Four Season Tools, Kansas City, Mo. "You get year-round crop production and the ability to easily rotate growing areas that helps with disease and pest control."

As an example, one grower uses his mobile greenhouse to seed carrots on February 1. By April 15, the carrots are able to handle outside temperatures, and the high tunnel is moved ahead one full space. This area is then filled with transplanted tomato seedlings, and the high tunnel is left in place throughout the growing season.

After the carrots are harvested in late spring, a winter crop such as leeks is planted in that area. Later that summer, a third area is planted to spinach. By Nov. 1, with the tomato harvest completed, the high tunnel is moved to protect the spinach. By December 1, the spinach is harvested, and the high tunnel is moved again, this time to protect the cold hardy leeks through harvest.

One acre of land can accommodate as many as twelve 30 by 48-ft. high tunnels moving across three positions each, says Garbos. He notes that not all hoop houses can be moved like the Four Season high tunnels.

"They are really beefy, heavy-duty structures with dozens of added braces," says Garbos. "At the same time, the components are common. They're structurally strong, very affordable and easy to move."

The concept was developed by Maine market gardener and author Elliot Coleman.

"He says with high tunnels, you effectively move 1 1/2 growing zones to the south," says Garbos.

Four Seasons Tools offers high tunnels in a variety of sizes ranging from a 16 by 24-ft.

gardener unit starting at \$3,500 to a 30 by 192-ft. tunnel starting at \$20,000. A 30 by 38-ft. tunnel, at \$6,000, is the entry-level market gardener unit. High tunnels can be ordered in larger sizes by increments of 6 ft. Garbos says most people add irrigation and temperature control systems that can add several thousand dollars to the price of a unit.

"We can set a high tunnel up with everything from thermostat-controlled side walls to more advanced professional greenhouse controllers," says Garbos. "An irrigation system can be installed for \$150 and automated for a few hundred more."

The standard design calls for drop down sidewalls for controlling air movement. The market garden designs also include roof vents. End doors have 26-in. flip-up panels that allow high tunnels to be rolled over existing crops.

It is the mobility that is most impressive. Garbos explains that units can be set up with steel plate skids and pulled by a tractor, or fitted with removable rubber wheels. With wheels, a 30 by 48 unit can be moved by as few as four people.

"Units can also be mounted on permanent pipe tracks with fixed steel rollers so one or two people can easily move a 16 by 24-ft. home garden unit," he says. "Once you know what you are doing with skids or wheels, you can move a 30 by 48-ft. high tunnel and secure it in place in less than 2 hrs."

Four Season Tools also offers consultation services to help establish schedules, crop rotations and even seed orders. A full line of garden tools developed by Coleman and his wife over the past 40 years is also offered for sale. They include soil blockers for starting plants, as well as seeding devices and tillage and weeding tools.

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"Moveable high tunnels effectively move your production 1 1/2 growing zones to the south," says Greg Garbos, Four Season Tools. The company offers high tunnels in a variety of sizes.



Removeable rubber wheels can be attached to the skid plates, or units can be set up on permanent pipe tracks with fixed steel rollers.



"These are really beefy, heavy-duty structures with dozens of added braces," says Garbos.

Fold-Down Hayrack

"I have a barn that I have to back into to unload hay. It can be difficult to unload bales around the back of the rack, so I made a hinge for the rack so I can fold it down," says Brett Hundertmark, Bode, Iowa.

"I got parts from an old bean bar. I cut it in half and bolted the pieces to the stringers on the rack. The wings of the bar became the back rack," Hundertmark explains. A hitch pin in each wing hinge holds the rack upright. Pulling the pins lets the rack down. The 4 by 6-in. bean bar channel beams are strong enough to hold the

6-ft. rack horizontally without additional support. It's strong enough to stand on while unloading.

With a 22-ft. length when the rack is down, Hundertmark has used the wagon to haul long sheets of tin and telephone poles, and he's lent it to the local elevator to haul augers.

"And it makes a good workbench for cutting steel," he adds.

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Wagon's back rack folds down for easy unloading of bales.



Hundertmark used parts from an old bean bar to build rack's hinge system.

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