Home-Built Tender Trailer Has 1,050-Acre Capacity

"In our farming operation we have to spray fields that are an hour or two from our farm, so we needed a liquid tender that would cover our needs for a whole day on one fill," says Mike Elsen of Elsen Homestead Farm, Hecla, S. Dak. Elsen and his farm crew built their own "supersized" tender on a 50-ft. spread axle drop deck trailer. They tow it with a 475 hp W900 semi tractor with a tag axle.

The tender has two 3,000-gal. free-standing leg tanks for water, two 500-gal. cone bottom tanks for chemicals, four 80-gal. cones for pre-mixing and bed space to carry two 275-gal. chemical totes. All those tanks are firmly anchored to the trailer with metal rods.

"We sized the tanks to max out the weight limit for the tractor and trailer and give us as much capacity as possible" Elsen says. "When every tank is full on the tender and our sprayer is full, I can spray 1,250 acres without refilling."

Elsen says he drew a detailed schematic of the system before finalizing all the hoses, fittings, liquid lines and air lines for the rig. Each water tank and cone mixer is plumbed with 3-in. lines. He has 2-in. lines running from the 500-gal. cone tanks and shuttles to the herbicide supply. Chemicals are pumped with a 45 gpm pump into the mixing tanks. All the water and chemical supply lines have check valves to prevent contamination. Only one tank can be accessed at a time to prevent incorrect mixing.

"We built this for efficiency because it seems like we're always spraying to beat some sort of weather event," Elsen says. He can fill his 1,200-gal. sprayer in about 5 min. with the 250 gpm Banjo pump. It pushes the spray mixture through a 3-in. hose mounted on an 80-ft. retractable reel.

The rig is also built for easy cleanout and operator safety. All tanks, hoses and fittings are secured to the trailer deck. Banjo flanged fittings were used throughout the setup for easy hookup and quick service. Clean water reservoirs for hand washing are mounted on both sides of the trailer. An enclosed box houses protective gear and field records. A pressurized air system is used for agitating mixed products and cleaning lines between product fills.

Elsen says the tender wasn't difficult to build and he figures it's paid for itself in just two years. "We've got more than $8,500 in Banjo fittings and hoses alone, but the system is set up right and it works great. The important thing is to be able to keep our sprayer moving and maximize our time in the field," Elsen adds.

Mike Elsen built this "supersized" liquid spray tender on a 50-ft. spread axle drop deck trailer. He tows it with a 475 hp semi tractor equipped with a tag axle.

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He Builds Cheaper Bee Hives

"I came up with a new bee hive design that eliminates the need for frames by hard-mounting the foundation. Frames cost about $1 apiece and there are normally 10 frames per bee hive, so I'm saving at least $10 per box," says Robert Prahovic, Branford, Conn.

Instead of frames, two sides of the super are grooved at regular intervals. There are also a series of wooden supports at the top and bottom of the super that lock in the foundation. Prahovic drops the beeswax foundations – on which bees make their honeycombs – into the grooves until the foundations rest on the bottom supports. Then he places corresponding top supports and nails them in.

"The foundations are locked solidly in place, or hard-mounted, and can't move. Even if you turn the hive upside down the foundations can't fall out," says Prahovic. Each hive is 2 in. shorter than a standard hive and also 1/2 in. less in height. The shortened hives can be used with standard hive covers, bottom boards or honey supers with frames.

"Having shorter hives means you can fit more hives on a truck, which lowers your transportation costs," says Prahovic.

"I can build a medium super for $22. That includes $12 for the wood and $10 for the foundation and nails," he notes.

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New bee hive design eliminates the need for frames by hard-mounting the foundation. Instead of frames, two sides of the super are grooved at regular intervals.

High-Speed Cultivator Adjusts Itself

The Robocrop 2 cultivator can chew through a weedy field at 12 mph, working to within half an inch of the row.

"You get your best performance when using GPS guidance," says Chris Lunn, Garford Farm Machinery (www.garford.com). "The machine holds its position, and the cultivator hoes adjust in increments of up to an inch at a time in corn and half an inch at a time in carrots, moving to the right or left with the crop plants."

Introduced at Agritechnica in Hannover, Germany in 2009, Robocrop was positioned as a combo in-row/between-row cultivator. Since then, the company has "split" the machine into two with the Garford InRow weeder and the Garford Robocrop high-speed hoe.

For high-speed work, a forward-looking camera identifies the crop rows and compares it to pre-entered row spacing patterns. Tillage units selected for the crop and row spacing are then centered on each row, adjusting right or left with the row.

"The guidance system is so accurate that we can put a single hoe between rows on 4 1/2-in. spacings, such as with cereal grains," says Lunn.

Garford offers two variations of the tillage unit. One has a maximum lateral movement of 12 in. and the other a movement of up to 20 in. A 4-row unit requires around 80 hp, a 6-row around 100 hp and 150 hp for 12-row units. Compact hydraulic side shift systems control hoes.

InRow cultivation uses the same camera system for between row weeding, but also computes spacing between plants in the row and loops a powered hoe in and out between plants. Lunn says the InRow unit requires a minimal 8-in. spacing between plants and has a maximum speed of 2 mph.

Lunn indicates that interest in mechanical cultivation is growing. "Higher chemical costs, restrictions on application and herbicide resistant weeds are all creating demand for mechanical cultivation," says Lunn. "Farmers also see the benefits of cultivation, as it aerates the soil, breaks up soil caps from a hard rain and mixes nutrients and moisture into that top inch of soil where roots can access it. The crop just looks healthier and better within 24 hrs."

The hoe units and guidance system can be mounted on existing toolbars or ordered already mounted. Lunn says the highest cost component is the guidance system, which includes adjustable tillage units, cameras, a control unit and in-cab monitor with push button controls.

"A guidance system mounted on a customer's existing 40-ft. toolbar for high speed cultivating of row crops would be around $30,000," says Lunn. "If mounted for use on a 20-ft. wide, 3-bed system for carrots, it would be around $60,000. And if intended for in-row cultivation on a 72-in. bed, you would be looking at around $100,000."

While the last seems high, Lunn says it would allow one man to do 6 to 7 acres a day. He says that same amount of cultivation would require 200 men doing hand hoeing. "Growers in Michigan told me they sometimes pay as much as $20 per hour for field workers," says Lunn.

Currently, Garford equipment is distributed by Solex Corporation in California and Willsie Equipment in the rest of North America.

Robocrop cultivator uses GPS guidance to chew through weedy fields at 12 mph, working to within half an inch of the row and weeding between plants in the row.

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