

Bee Hive Handling Made Easy

By Jim Ruen, Contributing Editor

Handling bee hives that weigh from 200 to 400 lbs. when filled with honey is a tough job. Yet using bees for pollination services, an increasingly important income source for beekeepers, means having to constantly move hives to new locations. With a recommended rate of one hive per acre, servicing a 50-acre field takes a lot of labor. That's why Andrew Sperlich decided to come up with a hive handling system.

"We were providing pollination services to cucumber producers who staggered their planting season," says Sperlich. "As the season progressed, the hives got heavier, and the bees got meaner. We were moving hives all night and managing them all day."

Sperlich and his partner Ann Mifsud own and operate Norfolk Apiaries, a commercial beekeeping business they started about 10 years ago. What started with a goal of being a sustainable, manageable business had, in Sperlich's words, "grown into a monster."

Sperlich put his industrial engineering training to work and designed a rack and trailer system. Each rack or "bee cell" holds up to 24 bee hives with up to four supers (sections) each.

The cells stand up off the ground on legs and have drop-down catwalks for accessing the hives. When in the up position, the catwalks make the hives in the cells bear-proof in addition to securing the hives for transport. Awnings over the hives provide shade during the day. At transport, they drop down over the hives to reduce leakage of bees from the hives during the move.

The trailer can hold two cells and has a bed superstructure that conforms to the inte-

rior shape of the cell. To move a bee cell, Sperlich simply backs the trailer under the cell, and raises the bed with the aid of hydraulic cylinders to pick the cell up off the ground. Once the legs are removed, the trailer bed is lowered and then driven to the next cell.

Where he once required a five-person crew to move hives, he now does it by himself. In addition, because Sperlich doesn't have to manhandle heavy hives, he also no longer has to remove full supers midseason. He simply adds empty supers. Moving the bees with the cells also reduces noise and vibration that can make the bees hard to handle and reduce pollination and honey flow.

"I have six cells now and eventually hope to have all my bees on them," says Sperlich. "I store the cells inside during the off season. If I had a dark insulated building, I could just back them in with the bees on them for the winter and set them down for the winter with the hives on them."

The trailer is rated for 20,000 lbs. He estimates that two cells and a trailer would cost about \$40,000. Each additional cell would run about \$3,000.

"Their price actually compares very favorably with a \$30,000 articulated forklift commonly used by large beekeepers," says Sperlich.

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Kid-Safe, 4-Wheel Mini-Bike

Cross a mini-bike with parts from a lawn tractor, and you get a kid-safe 4-wheeler. The four wheels give it more stability than a mini-bike, while the geared down transmission keeps it at kid-safe speeds.

"It can do doughnuts without tipping and has a maximum speed of about 10 mph," says Tom Busse, Adell, Wis. "It only took about 40 hours labor and \$50 in parts to build it."

Purchased parts included a centrifugal clutch and some pipe for the frame. The main frame came from the mini-bike, while the steering, transmission, axles and wheels came from the Simplicity lawn tractor. Power comes from an old 5 hp Briggs and Stratton engine.

"I liked the 3-speed manual transmission on the Simplicity," explains Busse. "Originally I had a belt tightener on it, but the kids had a hard time engaging it, so I bought a centrifugal clutch for about \$30. It fit right on the power shaft of the Briggs."

He used a jackshaft with a sprocket on the clutch and one on the transmission. "Lining up the two sprockets was the most difficult part of the project," recalls Busse.

To transform the two wheel mini-bike into a 4-wheeler, he used a wire welder and 2-in. and 3/4-in. water pipe. The 2-in. pipe was used for a front axle, while the 3/4-in. pipe connected the mini-bike frame to the front and back axles and connected the axles. A small bumper on the front of the 4-wheeler was also fabricated out of 3/4-in. pipe. A small shock mounted ahead of the transmission provides limited suspension.

Busse welded spindles and front wheels from the Simplicity to the new front axle. He also attached the Simplicity steering system.

Initially Busse thought he would have to add spacers to the axles to spread the wheel base. An alternative took longer to think of than it did to do, he says.

"I cut the bolt pattern center out of the wheel rims, turned the rims around and welded them back in place at the edge of the rim," says Busse. "It only took about half an hour per wheel."

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Do-It-Yourself Alcohol Stills

Looking for a simple way to make your own ethanol on the farm? Bill Sasher and Dogwood Energy may have just what you need. He sells complete stills, still components or detailed plans for stills.

When energy prices rose over the past year, so did demand for alcohol stills.

"My dad did an interview on stills with an Associated Press reporter, and we went from selling 1 to 2 stills and 30 blueprints a week to selling a blueprint every 6 minutes and 30 to 35 stills in three days," says Sasher's daughter, Shelly McClanahan, who is spokesperson for Dogwood Energy. "We were overwhelmed."

What makes Dogwood Energy's still so attractive is they pretty much run themselves. Customers also like the fact that they can fit in a corner of a garage. Best of all, from a safety angle, they are designed so the cooker doesn't even have to be in the same building with the distillation column.

Like any still, you start with mash, ferment it and drain off the liquid, which is transferred to a cooking tank to begin the distilling process. Sasher recommends using a wood-fired 55-gal. drum and adding more liquid to it as it cooks down and turns to vapor.

Traditional still designs use a boiler with a distilling column and condenser attached to it. The higher the temperature, the higher the distillation rate. With the Dogwood still, the column and condenser are separate from the cooker. All the operator needs is to keep the fire burning, as there is no high-pressure boiler to watch.

Another advantage is safety. The drum and fire are kept at least 10 ft. away from the still. "You don't need to baby sit it," says McClanahan. "Some people even set up the cooker outside the building where the distiller column is. You can feed the fire and walk off and leave it anytime you want."

"The temperature control valve forces the



Bill Sasher sells complete stills, still components, and detailed plans for alcohol stills.

water vapor to condense. It has a 20 proof alcohol content and recycles through the system. Meanwhile 190 proof comes off at the top of the column," says McClanahan. "One hundred gallons of mash will make 10 gallons of ethanol."

The final step before blending with gas is to run it through a zeolite filter, which Dogwood also sells. It pulls the water out, leaving 200 proof alcohol.

"We just mix ours with gas," says McClanahan.

How much to mix depends on the type of vehicle, though she says most will handle 10 to 20 percent ethanol.

Dogwood Energy sells a full copper still for about \$1,500 that will produce 5 gal. per hour.

"A bushel of corn will yield 2.6 gal. of ethanol," she explains. "If corn is selling for \$1.95 per bushel, you can make ethanol for \$1.09/gal. in batches of 75 gallons compared to buying gas at \$3/gal."

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