



Egg-laying female bees are attracted to blocks of wood with holes drilled in them. Some growers use boxes of paper drinking straws.

## How To Set Up A Wild Bee Nursery

Instead of renting honeybees, it may be more economically feasible for small fruit and orchard producers to attract their own wild bees. It's not that difficult according to James Cane, a research entomologist with USDA's Agricultural Research Service. In his work with fruit growers in western states, he attracts egg-laying female bees to plastic totes filled with straws, or to blocks of wood with holes drilled in them.

You have to provide nesting holes, Cane says, to mimic the natural deadwood cavities wild bees need for laying their eggs.

One of his favorite designs is a "BeeMail" shelter that begins with a corrugated, polyethylene plastic tote placed on its side. The totes, used by the U.S Postal Service, sell for \$14 at [www.postalproducts.com](http://www.postalproducts.com). They're reinforced with 1/4-in wire rims and don't break down in the sun. They should last for years, especially if they're only outside during bloom time. The totes are light, stackable and can be easily mounted on poles. The 14.3-in. tall models are deep enough to hold 6-in. deep nesting cavities with enough overhang to protect them from rain.

The space can be subdivided in a variety of ways, with foam or wooden blocks or even with 2-quart milk cartons, stuffed with paper drinking straws.

Cane describes how the tote nurseries work with the wild orchard bees he manages. "Each female progressively subdivides each tunnel into a series of nest cells," he explains, "with each cell receiving a pea-sized provision of pollen moistened with nectar, followed by a single egg. Nest cells are partitioned, and ultimately capped with mud."

The bees lay five to seven eggs in each 6-in. tunnel. They lay fertilized eggs (females)

first and unfertilized eggs (males) last in the front of the tunnel. Male bees hatch in less time, so they'll break through their cells about the same time as the eggs laid earlier. One tote can accommodate as many as 3,000 bees — enough to pollinate a 1/2 to 1-acre orchard.

Cane says he prefers to use paper straws because they can be removed and replaced to prevent disease. Other materials can also be used to create bee-nesting cavities, from foam blocks to dry, round, conifer blocks of wood with 5/16-in. diameter holes drilled across the grain.

Cane suggests placing the totes on metal T-posts with a support frame. One frame is commercially available at [www.quiedan.com](http://www.quiedan.com). But he notes that resourceful growers can come up with their own attachment ideas.

"You want sun on the bee's nest entrances early in the morning," Cane says. "Place them chest high where it's easy to work on them. Select bright color totes for visibility. Also avoid bee-toxic insecticides during bloom and make sure sprinklers don't reach the opening."

Cane shares bee nursery building ideas at [www.ars.usda.gov/npa/beelab](http://www.ars.usda.gov/npa/beelab). Within a few years it's possible to double and triple the number of pollinating wild bees if the nesting is managed well.

As a bonus, wild bees do not sting like honey bees, which the neighbors will appreciate, Cane adds.

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## Simple Stand Empties Spray Jugs

During spraying season, emptying out chemical jugs and triple rinsing them can be a frustratingly slow job.

"My sprayer manufacturer sells an option for rinsing jugs, but it costs \$1,000, which is more than I want to spend," says Roger Gutschmidt of Gackle, N. Dak., "Besides, when you use their system, you need to have the sprayer pump and agitation system running, and that produces a lot of foam that needs to be expelled from the tank once it's full."

Gutschmidt chose to design his own simple device to ensure that chemical jugs empty completely without taking up much of his time. Although his solution doesn't actually rinse out the jugs, it does make sure that every last drop makes it into the sprayer.

It consists of a 25-in. long, V-shaped trough with four evenly-spaced 19-in. rods welded to the center so they extend upwards. The jugs go over the rods.

The trough mounts on the sprayer at a 45 degree angle, with the bottom resting on the inside edge of the mixing cone. A 1/2-in. pin welded to the upper end of the trough goes through a hole drilled in a bracket on the sprayer frame. A cotter pin and compression spring hold it in place.

"When it's not in use, it pivots out of the way so the lid on top of the cone can be closed," Gutschmidt explains. "By leaving the jugs upside down for 5 to 10 minutes, almost every drop of fluid drains out. At spraying time, I don't have time to triple rinse, so just getting the jugs drained completely is



To keep his farm pond from overflowing, Art Briggs-Jude used a 50-ft. section of flexible 4-in. drain pipe as a giant siphon. He sealed off the bottom, left, and filled the pipe from the top using a 5-gal. bucket.

## Giant Siphon Saved Farm Pond

Art Briggs-Jude came up with a simple solution for a big problem when spring melt just about washed out his new pond. A plugged overflow pipe had pushed water levels to within inches of the top of the pond's dam.

"My wife and I had been talking about what to do if a problem like this developed, and we had settled on a siphon as a possible solution," says Art. "So I went into town to get a 50-ft. section of flexible 4-in. drain pipe."

He and his wife laid the flexible pipe over the top of the dam and down the hill below. They stuffed a foam rubber plug into the lower end and tied four layers of plastic bags over the end. Returning to the upper end, they filled the tube with water and plugged the upper end of the tube with a second foam piece. They secured the pipe in place with a steel post and submerged the upper end well below the surface of the rising waterline.

"I went to the lower end, and my wife Wendy yelled 'cut'," says Briggs-Jude. "I cut through the plastic, but before I could pull the plug it blew out 20 ft. as water swooshed out like a pressurized fire hose."

Scrambling back up the dam side, he discovered his wife holding the intake under water. When she had tried pulling the plug out of the upper end as he cut loose the lower end, the suction had pulled it and her arm down the pipe.

"When I finally let the plug go, I thought I had botched the whole thing," she told him. As it was, the suction had blown the upper



Water swooshed out lower end of pipe plug right through the pipe and out the other end as well. The siphon quickly lowered the water to a safe level.

"It was an elementary process, but it prevented a major washout, and we preserved the pond," says Art.

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Photos courtesy Landowner Magazine ([www.landownermagazine.com](http://www.landownermagazine.com))



Stand consists of a 25-in. long, V-shaped trough fitted with four evenly spaced rods.

enough for me. When I'm finished draining my jugs, I pour clean water down the trough to rinse it out so dirt doesn't stick to chemical residue left behind. It works great. I wish I would've had this invention years ago."

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