He Laid His Own Subsurface Drip Tape

When Russ Winter decided to install subsurface drip irrigation (SDI) on a 12-acre field, he built the machine to do it and laid it himself. He already had three 40-acre center pivots, supplied by a 10-acre lake he dug himself.

"I have a 14-acre field next to the lake that's too small and irregular for a center pivot. I decided to try SDI on it," he says.

Winter credits University of Missouri extension agronomist Rusty Lee with helping him figure out what was needed. To go deep enough and still come out of the ground at the end of the field, the plow shanks had to be designed just right. I checked with Rain-Flo, an irrigation equipment supplier, and asked if they would sell me the shanks."

Winter ended up buying not only the shanks, but also the tape reel holders and the system that feeds the tape to the plows. He still needed to build a 3-pt. frame strong enough to mount the plows.

"I had an 8-row cultivator that hadn't been used in years," says Winter. "I stripped all the parts off the 5 by 7-in. toolbar and cut the 20-ft. length in half. I doubled it using 4 by 6-in. steel tubing for cross pieces. A neighbor who rents my pivot irrigated fields provided heavy-duty gauge wheels from a no longer used tillage tool."

Initially Winter had planned to mount 3 shanks on the toolbar, but Lee warned him his 150 hp. tractor was not big enough to pull 3.

"Three would have been crowding each other on the 10-ft. frame. It just meant making a few more passes," says Winter. "The problem wasn't power. It was traction, even with front wheel assist. I couldn't use draft, so I just put it down all the way and let the gauge wheels carry it."

Winter made a platform on the back for two helpers to ride and watch the tape feed into the ground. He used 1 1/2 by 1 1/2-in. angle iron, welded and bolted for safety. He also added a bar on the front of the toolbar to hold extra reels of tape.

"Once I had everything installed, laying the tape was the easy part of the job," says Winter. "I wanted to do it in March, but it rained every day. When it finally dried out, we laid the tape and tied it into a 4-in. supply pipe at one end and a 3-in. drain pipe at the other."

The applicator laid 15-mm drip tape with emitters every 24 in. at a depth of 16 in. Individual tapes are buried every 60 in.

Russ Winter built this machine to install subsurface drip irrigation by himself. "I use it on a 14-acre field that's too small and irregular for a center pivot," he says.

Corner side view of machine shows plow shanks, tape reel holders and operator platform.

Winter planted the field to soybeans. By early August, the soybeans were up to his ribs, and he stands 6 ft. tall.

Winter notes that the 2 shanks cost him around $900. He estimates total costs for the unit, including the reel holders, at less than $2,000. That didn't include the tape, fixtures and other components that he purchased from Trickl-Eez, a Michigan firm, or pipe that he bought locally.

Winter is already planning refinements for the 2019 crop year. This year he used a 30-yr.-old irrigation pump powered by a tractor's pto.

"I didn't like leaving the tractor running," he says. "I think I'll look into an electric motor on the pump next year."

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How To Make Your Own Rope

Martin Korson had no interest in paying $300 or more for a rope-making machine so he built his own. With lots of engineering and drafting experience, he also created step-by-step plans with illustrations.

"I suggest 2 options for making the gears," says Korson. "The simpler option uses a hole saw and spaded drill bit to make the gears, while the other uses a scroll saw or band saw."

Making the gears was the biggest challenge. He uses planetary gears, with the drive gear as an outside gear with 3 smaller gears on the inside.

"It took a lot of trial and error to get the tooth spacing to mesh," says Korson. "After that, the challenge was to make one that was strong enough. If I was going to sell plans, I didn't want the buyer to be disappointed."

For quality control purposes, Korson would throw the big gear on the ground. If it broke, he knew it wasn't strong enough. When the big gear didn't break, he was satisfied.

"I've had very few questions, and they have been easily cleared up through email or a phone call," says Korson. "Most of my orders have been from the U.S. However, enough are from Canada, Europe and Australia that I made a version of the plans using metric."

Korson offers not only plans, but also advice on rope making on his website. He has recommendations on twine and also a plan for rope walk supports needed for longer ropes.

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Martin Korson says making the gears was the biggest challenge in building his own rope-making machine (above). Close-up photo shows the wooden gears that drive it.

Anyone with backyard chickens can raise their own mealworms and save money, says Kenny Coogan.

How To Grow Your Own Mealworms

Want to treat your backyard chickens to mealworms? You can raise your own and save money, says Kenny Coogan, a poultry guru who's known for his chicken training techniques (Vol. 38, No. 4).

"The idea is to buy 500 (or more) worms in the beginning and be able to sustain the colony for several years," Coogan says.

Cost for 1,000 mealworms online runs between $14 and $20 and a 10 by 20-in. clear plastic tub can sustain 1,000 to 5,000 mealworms. Coogan cuts a hole into the lid for adding table scraps daily, and covers it with a screen. Place the mealworms in a few inches of wheat bran, corn meal, bone meal, or commercial mealworm bedding.

The mealworm cycle is larvae-to-pupa-to beetles, which lay the eggs. Once the eggs are laid, Coogan suggests moving the beetles to another bin. A female beetle can lay as many as 500 eggs. Kept at 70-80 F degrees, the eggs hatch in 10 to 12 days, and the larvae grow to about an inch in about 10 weeks.

"The larvae stage is the typical stage that they are fed to chickens," Coogan says. "A small handful (of mealworms) every day or two is fine."

He uses mealworms to train his chickens and to reinforce behaviors like going in the coop at night.

Growing superworms takes longer - about 5 months to grow to 2 1/4 in. - and adult beetles need to be removed every two or three weeks to allow the eggs to hatch, as adults will eat the eggs.

Coogan suggests starting with 100 superworms (about $5) and placing worms in individual compartments of a clear grid jewelry organizer box. Cut a small breathing hole in each cell and place the container in a dark area for 10 days. Once they change into pupae, put them in a separate nursery container so beetles and larvae won't eat them. After the pupae turn into beetles, put them in a breeder container and feed them as you would feed mealworms. After the beetles' eggs hatch in about a week, move the beetles into another container, so that the larvae can grow into superworms. Repeat the cycle for a continuous supply. Besides feeding your own chickens, growing the worms can be a sideline business.

"There is a large pet reptile sector who are interested in growing mealworms and superworms. These people should not be overlooked if you are thinking about raising your own beetles for resale," Coogan says.

"It's fun to watch the life cycle of insects," he adds. "It's easy to raise them and easy to incorporate kids helping out in the husbandry tasks."

For more details, check out his books, blogs and workshops on his website.

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