



Better soil with less toil

Growers using cover crops say they improve soil aeration and nutrients, resulting in better plants

Buckwheat is grown between rows of trees at J. Frank Schmidt & Son Co. to also assist with erosion control. PHOTO COURTESY OF J. FRANK SCHMIDT & SON CO.

BY KYM POKORNY

The benefits of cover cropping run long, but according to research at Tennessee State University, only about 10% of nurseries take advantage of the age-old practice of planting seasonal cover crops to regenerate the soil, produce better inventory and cut costs in the long run.

With five generations of experience behind them, the people at **Motz & Son Nursery** in Portland, Oregon, are one of the 10%. They use cover crops because they've seen the results for a long time.

"We've always used cover crops; we use it as a rotational crop," said Anne Marie Boyd, vice president and production manager for Motz & Son. "You can't plant tree after tree after tree without damaging the soil. You have to have something to build the soil back up as much as possible. To do that, we use cover crops."

So does **J. Frank Schmidt & Son Co.** in Boring, Oregon. The nursery has used cover crops since the early 1970s, testing

18 over the years, according to production manager Sam Doane. From the nursery's perspective, using cover crops helps in a variety of ways. From improving soil structure to disease suppression, the long list of cover crop benefits includes controlling weeds, capturing nutrients, minimizing erosion, conserving water and reducing the use of herbicides and fertilizers.

Cover crops, which are plants usually sown in late summer and grown through the winter in fallow fields or in rows between trees, include sorghum-sudangrass, sunflower, barley, rye, winter peas, cereal grass and nitrogen-fixing clover (sometimes rejected because it can be aggressive).

Benefits of cover crops

Anyone who tries to grow something soon learns the importance of soil. If not, their crop will never flourish. Anthony Witcher, associate professor for nursery production and sustainability at Tennessee State University in Memphis, said his

research shows cover crops help by retaining water, keeping soil from eroding and adding organic matter.

Cover crops in the legume family, such as clover, pull nitrogen from the atmosphere and convert it to a nutrient that is useful to beneficial soil organisms. Those organisms then make it available to plants, giving nutrients back to the soil naturally and reducing applications of fertilizer.

"The soil tilth is going to be improved as well as conserving carbon in the soil," Schmidt's Doane said. "More often than not, we make management decisions that get in the way. If I make four or five passes to put carrot seed in, then mow and disc in at the end of the season, how am I increasing soil structure? Each pass is destructive. We learned the importance of using low-input cover crop solutions. Let the cover crop do the work, not you."

Erosion control counts as an obvious advantage of cover crops. No one wants a repeat of the Dust Bowl of the 1930s ➤

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A field trial of potential cover crops at Motz & Son Nursery. The nursery has been using cover crops for many years because it has seen results. PHOTO COURTESY OF MOTZ & SON NURSERY.

when windstorms and years of intensive agriculture turned the soil into viscous storms that carried away precious topsoil from 100 million acres of farmland.

As agriculture began to recover, new practices focused on soil health, and cover cropping became more prevalent. The nursery industry, Witcher said, has been slower to get on board, partly because of the dearth of research specifically about how cover cropping can help the industry. But research is catching up and so are growers.

Doane grows cover crops in fallow fields and in between rows for erosion control. Workers and equipment compact the soil and damage the structure, creating hardpan, a dense compacted layer of soil that is nearly impermeable to water and restricts root penetration. Some cover crops — like radish or sudangrass — grow deeply, breaking up hardpan as they go.

And, he points out, cultivation makes the spaces in the soil smaller and smaller. Cover crops can help mitigate the damage and keep the soil healthy.

Cover crops provide excellent weed control, said Noe Rodriguez, production manager at **John Holmlund Nursery LLC** in Boring, Oregon. They compete for water and nutrients and shade out the weeds.



A mixture of crimson clover and triticale is grown between rows at Motz & Son Nursery. PHOTO COURTESY OF MOTZ & SON NURSERY

A benefit to the business

Science offers much information on cover cropping, but observation is second to none for seeing close-up the ways the practice can help business.

"When I started, I saw that the nursery down the street never used fallow or cover crops," Doane said. "There was decreased uniformity and vigor. When people saw that happen, it shifted a lot of peoples' perception of cover crops. If you do it right, it saves money."

Mike Hiller, production manager at **KCK Farms LLC** in Dayton, Oregon, also saw the difference. His decision to use cover crops was also influenced by other nurseries growing them.

"If you break down the decision," Hiller said, "It was their successful use of cover cropping. 'Well, if it worked for the nursery down the road, I'm going to do it.'"

If a nursery makes the decision to use cover crops, there's information out

there to help. Reach out to the Oregon State University Extension Service, local water conservation districts and National Resources Conservation Service.

"Managing Cover Crops Profitably" a book from the U.S. Department of Agriculture Sustainable Agriculture Research and Education program, is a free PDF, downloadable at **TinyURL.com/CoverCrops**. It has a national focus, but has plenty of information for the West Coast such as seeding rates, timing and projected biomass, Doane said.

Sorghum-sudangrass

Sudangrass is a popular choice as a cover crop. At Schmidt, Doane typically plants sorghum-sudangrass as a large percentage of the nursery's cover crop because it has the highest green manure quality.

The cover crop is drought tolerant, can outcompete weeds, and grows quickly. The roots go deep, breaking up soil as

they go. Boyd, too, is a fan of sudangrass, which she said has dramatically cut her need for herbicides and tilling.

"We are very big on keeping clean fields," Boyd said. "We use sudan because we can use it in conjunction with pre-emergent. The cover crop grows through the pre-emergent. It's easy. If we leave a field fallow it will just be weeds, and I have to send in workers and herbicide. We use the pre-emergent in spring and fall. Other than that, we're not having to use herbicide."

Some nurseries use sudangrass for weed control, said Holmlund's Rodriguez, who grows it successfully on sloped ground. He sows in August and irrigates twice until it settles in. Since it dies in spring, the nursery doesn't have to worry about mowing or biomass building up in a wet spring.

Other cover crops

At Motz & Son, Boyd said they grow cover crops in between the rows of >>



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J. Frank Schmidt & Son Co. plants sudangrass as a large percentage of the nursery's cover crop because it has the highest green manure quality and the roots grow deeply, breaking up hardpan. PHOTO COURTESY OF J. FRANK SCHMIDT & SON CO.

trees for erosion control in winter. They use oats or wheat or some other kind of grain and let it grow until January. Then they spray it and it creates a nice mat for people to work on.

Because they want to disturb the soil as little as possible, pre-emergents are their choice of herbicide. The oats or wheat will create a layer that helps keep the pre-emergent off the workers' shoes, so less is wasted.

At Schmidt, Doane's approach is to experiment with a large number of cover crops to see what works. Right now, he plants, among other things, annual rye grass. It doesn't need water to germinate or establish. "It takes care of itself," he said.

"Every field is like a recipe that has to be put together," said Esteban Herrera, Dayton, Oregon, farm manager for **Bailey Nurseries Inc.** "Whether it's between crops or a whole field you have to put it together. Look at the field and see what to use. Is the soil structure compacted? Do you need green manure? Then you start to build a recipe."

Doane's goal is to do as little to the soil as possible. Sunflower is a low- ➤



A comparison of rows planted with hard fescue vs. an unplanted row shows that cover crops between rows can help prevent soil erosion. PHOTO COURTESY OF J. FRANK SCHMIDT & SON CO.

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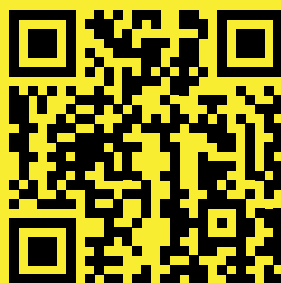
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input crop that fits the bill, he said. After broadcasting the seed, there's not a lot to do. At the end of the season workers go in with light, gentle equipment to knock it down.

Nursery owners like Boyd lease idle fields to farmers. Wheat and clover are the preferred cover crop because they can be sold. It turns a profit and makes it possible to leave the soil uncultivated to recover.

Benefits outweigh costs

Cover crops sound like a sure thing, but they have a few drawbacks. Some cover crops grow a little too well, and getting them cleaned out can hurt tree roots.

There's also the complication of getting everything to work out at the same time. If you're trying to get something to germinate, it's not smart to send equipment or workers into the fields. Care must be taken with herbicide applications.

But in the long run, Rodriguez said



Sunflower is a low-input cover crop. PHOTO COURTESY OF TENNESSEE STATE UNIVERSITY

cover cropping saves money in herbicide and labor. First there are up-front costs, though.

"I think it saves money," Rodriguez said. "Yes, you have to work the ground,

buy seed and sow it. But if you don't do it, you'll get weeds and have to cultivate to keep them from going to seed. That compacts the soil. By putting in a cover crop you're doing a lot of good things for the soil. Although it involves money to plant and establish, it pays for it in the long run."

Witcher agrees. Cover cropping is worth the initial investment, he said. There's the need for equipment, seed and the labor that goes into planting the cover crop, but over time the nursery saves money through less herbicide and fertilizer and improving the quality of the crop.

Soil is — or should be — the No. 1 concern of nurseries, Boyd said.

"That has always been instilled in me by my mentors," she said. "You only have so much ground to put into a nursery. I have to take care of what I have. To do that, you have to be building the soil profile as much as possible as you go. If the soil is better, the turnaround is quicker and you get quality trees that customers appreciate." ©

Kym Pokorny is a garden writer with more than 20 years' experience writing for The Oregonian (Portland, Oregon) and other publications. She can be reached at Madrona29@Yahoo.com.

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