

# No-till not enough

BY JOHN VOGEL

**J**IM Biddle has figured it out: Better, healthier soils produce better yields at lower costs. And he didn't have to move to another farm to make it happen.

Since 2002, the veteran no-tiller from Williamsburg, Pa., has been cover-cropping each acre of Mill Hill Farm in Blair County.

"He really saw soils respond to no-tilling once he started using cover crops," says Penn State Extension agronomist Greg Roth. "Last fall, he had a wide range of great cover crops — triticale, triticale-radish mixes, some mixes with ryegrass and/or crimson clover, and loads of earthworm castings."

Triticale is the base ingredient on all 580 acres of corn, soybeans and some double-crop forage sorghum, says Biddle. It fits the dairy farm's systems approach for top-quality feed, plus timing of manure application and planting. Triticale is harvested in mid-May and followed by no-till corn and soybeans.

"That allows three to four weeks extra root growth where we use triticale for a spring forage harvest," adds Biddle.

Biddle and son Josh, who manages the dairy, drill their cover crops between late August and late October.

"Since there are huge advantages to

## Key Points

- Pennsylvania farmer's no-till soils improved with cover cropping.
- Early-fall cover crop plantings fit dairy farm's cropping system.
- Triticale is a key base ingredient for his system.

multispecies," Biddle says they add radishes in early September and crimson clover in late September.

Clover needs a longer season to build soil nitrogen. The triticale cover crop benefits, as well, with longer root growth and higher forage protein quality and close to 8-ton yields. Biddle also notes that only 25% of the farm's cover crops are harvested.

No-till helps build soil structure. Cover crops increase soil microbial activity, which in turn feeds the entire food chain up to and including earthworms, he says.

"The key to cover cropping is in the roots, which feed those microbes and create soil pores to allow air and water to flow through a larger portion of the soil profile," notes Biddle. "It's a proactive process to building soil carbon levels and improving soil health."

Biddle considers cover cropping just as important as no-till. It keeps every acre protected and biologically active year-round. That's one reason Mill Hill Farm won Pennsylvania's Chesapeake Bay Clean Water Farm Award.



PHOTO: PENN STATE/ GREG ROTH



**SHOVEL-BUSTER:** Jim Biddle broke the fiberglass handle on his shovel digging out this cover crop "tool!"

**GREEN AND CLEAN:** With every acre cover-cropped, Mill Hill Farm is building soil health and productivity.



**SOIL IS ALIVE:** Proper care and feeding of soil's microbial populations will start building organic matter and plant health within two years, says NRCS agronomist Ray Archuleta.

## Where no-till missed the mark

**R**AY Archuleta may be a fervent no-till "preacher," but even this Natural Resources Conservation Service agronomist agrees: "No-till is not enough — not for building soil health.

"I don't recommend it without cover crops and excellent rotations. No-till stops soil destruction, but doesn't feed it," he says. "While it does better than conventional tillage, it's no match for no-till and cover crops grazed by animals."

NRCS initially promoted no-till incorrectly by making it the central focus. "We missed the mark. However, no-till plus cover crops changes the whole equation."

Thinking in terms of a holistic system best mimics regenerative nature — keeping soils covered 100% of the time and building healthy soil microbial populations to feed crops, he explains. This has reduced fertility needs more than 50%, completely eliminated insecticides and fungicides, and reduced herbicide applications by 90%. Teaming up no-till with covers has improved soil infiltration rates and increased water-holding capacities.

"Our best producers use no-till, cover crops and animals to graze the cover crops," says Archuleta. "These guys have reduced inputs by huge amounts. It's raising great corn yields at costs of only \$1.75 per bushel. It's systems synergism!"