

# NO-TILL BENEFITS

We no-tillers really make our money in the normal years'

BY LANCE NIXON

**One of the benefits** of no-till farming became apparent in 2002 as drought baked much of South Dakota, including the Dakota Lakes Research Farm near Pierre, managed by Dwayne Beck, SDSU plant science professor.

It's common knowledge with producers that no-till saves moisture, Beck says. But he adds that the advantage dwindles in a year like 2002, a historic drought in many parts of South Dakota and neighboring states for which no-till practices don't offer a solution.

"To no-till because you want to be able to deal with this extraordinary drought is the wrong reason," Beck says. "We no-tillers really make our money in the normal years or those that are a little dry or a little wet. We've never attempted to design rotations for extraordinarily dry or extraordinarily wet years. That's what crop insurance is for."

Though it might be possible to design rotations that would fare better in more severe drought, Beck says that would make no sense: A farmer would then be sacrificing the additional yields he would have received in normal years.

What no-till farmers should do, ideally, Beck says, is design crop rotations with enough diversity and enough intensity, or water usage, to use the moisture that is available in a typical year. Probably 80% of years are fairly normal, Beck says, and those are the years no-tillers should keep in mind.

"If you're doing it right, no-till will not protect you against this extraordinarily dry year," Beck says. "If that's what you're doing it for, you're not taking advantage of all the other years."

For example, Beck notes that some of the winter wheat he harvested at Dakota Lakes this year yielded 28 bushels to the acre in a continuous cropping rotation where wheat followed chickpeas or canola. If that land had been left fallow last year, as some conventional-till farmers in central South Dakota do, the wheat might have yielded 38 or 45 bushels,



Beck says. But for those extra few bushels this year, he would have sacrificed last year's yield—\$288/acre of chickpeas.

"In a more normal season, leaving the land fallow would have very little or no advantage in a no-till system. In a wet year, leaving it fallow would cause problems with excess moisture," Beck says.

Beck adds that just as certainly as there are droughts, wet years like the 1990s also will show up again—and then farmers who got into no-till because of drought will be up a creek.

"No-till saves moisture. Period. But that's only a benefit if you figure out a way to use that moisture to your advantage," Beck says. "The problem is that some farmers become no-tillers without thinking about the intensity. When they get a wet year, they want to be conventional tillers again."

## **"There's nothing magic about this. No-till is not a replacement for moisture."**

—GENE STEHLY, MITCHELL AREA FARMER

Ron Gelderman, manager of the SDSU Soil Testing Lab, says studies show that the soil loses from one-half inch to 1 inch of moisture from each tillage operation, depending on how wet the soil is and the conditions afterward. If a rain follows soon after a tillage operation, the soil might not lose much moisture at all.

On the other hand, since many conventional producers use a tillage operation in the fall and one in the spring, they could lose 1 to 2 inches total under certain conditions.

### **NOTES FROM A NO-TILLER**

Farmers in South Dakota, too, have embraced no-till, come drought or high water. Gene Stehly and his brother, Craig, began converting their Mitchell area farm to a no-till system in 1986, partly because no-till helped them with two critical tasks: saving time and saving moisture.

"I don't know which benefit would be greater if someone were to ask the main reason why we do it," Gene Stehly says.

The switch to no-till is part of what has made it possible for Stehly Farms to farm 11,000 acres, Gene says. But in a drought year like 2002 the moisture savings is probably the benefit the Stehlys think of first.

"I took on some new ground that the owner disked last fall before renting it to me. That's my worst crop," he says. "I have some land that hasn't been tilled since 1987 and that's doing much better."

Stehly says the higher level of decaying organic material in no-till fields, as well as the greater activity by earthworms, makes the soil able to absorb and hold more water.



Dwayne Beck, Dakota Lakes manager: No-tillers should design crop rotations that will use the moisture available in a typical year.

And the stalks and other plant debris on the surface acts as "microdams" to help hold runoff when rain does come—allowing more moisture to be absorbed into the soil preventing soil erosion.

Stehly's experience has been that soil structure on his no-till fields takes a long time to build up, making no-till farming a long-term management tool. Although the brothers remain committed to no-till, he notes that the drought of 1988 may have persuaded some farmers to get into no-till farming and the wet years of the 1990s persuaded many of them to get out just as quickly.

"The 1990s were hard on no-tillers," Stehly says. "People lost faith in it because they couldn't get to the field."

The Stehlys consider themselves "no-till purists" and stayed with it through the 1990s, partly due to the influence of Beck.

"Dr. Beck has proven to us over time that if you work your ground one year to get a crop in, you will pay for it in years when it's dry because your soil will not have the structure to hold the moisture," Stehly says.

But with all that said, Stehly notes that no-till farmers, too, lose crops in drought years like 1988 and 2002.

"There's nothing magic about this. No-till is not a replacement for moisture," Stehly says. "If it doesn't rain, it isn't going to matter. It's simply a question of what's going to die first."◆