

Don't Be Subtle With Stubble

While many farmers may not think stubble is the most attractive thing in the world, it's still the real key to successful no-till farming.

By Katherine Meitner, No-Till Farmer

IF YOU WANT to be successful with no-till, you can't neglect the importance of stubble. At least, that's what Carlos Crovetto says.

This no-tiller from Concepcion, Chile, says stubble plays a much bigger part in his no-tilling success than one would think.

"Stubble is the main thing in successful no-till farming," he says. "If you feed the soil, you feed the plant, allowing us to use less fertilizer."

Stubble And The Carbon Cycle. With all the interest regarding carbon storage in the soil and atmosphere, Crovetto attributes no-till stubble to helping keep harmful carbon dioxide from escaping into the atmosphere. When stubble is worked into the ground, the opposite reaction can occur.

"Any remaining stubble left on the soil will begin decomposition as soon as the water content and temperature are adequate," he says. "If the stubble is buried and the soil is moist and contains adequate levels of oxygen, rapid oxidation of incorporated organic matter will take place because the microorganisms will be nurtured excessively from the stubble."

"This phenomenon implies quick loss of carbon that escapes to the atmosphere as carbon dioxide. This rapid decomposition and release of carbon dioxide prevents the buildup of organic carbon within the soil profile."

While Crovetto admits the carbon cycle is a naturally occurring phenomenon, he says it's difficult to balance the human intervention element of the gas in the soil with the gas in the atmosphere.

"At the recent World Congress of the Environment in Bonn, Germany, it was reported that the level of carbon dioxide in the atmosphere in 1850 was 280 ppm. By 1997, it had increased to 365 ppm," Crovetto explains. "At the present time, the increase of carbon dioxide in the atmosphere is 1.5 ppm annually. This may be partially responsible for the devastating effects of the El Niño and La Niña weather patterns."

Curbing The Problem. Crovetto says excess carbon dioxide in the atmosphere is responsible for 50% of the greenhouse effect, compared to other gasses.

Before you become down-trodden with this bad news, keep in mind that Crovetto is convinced that much of this could have been prevented and resolved with no-till. Not only would the residue hinder carbon dioxide from leaking into our atmosphere, but it would preserve the soil, preventing the higher levels of sedimentation in our rivers and lakes that we are now observing.

Stubble To The Rescue. No-tilling in Chile, Crovetto started farming what he calls "the worst soils in the world" (alfisol). Today, these soils are producing an average of 105-bushel wheat and wheat yields as high as 160 bushels per acre. His secret is feeding the soil properly with all the stubble left in the field.

“The farmer that seeds without plowing can harvest both grain and straw,” he says. “It is of vital importance that the farmer remember ‘the grain is for the man, the stubble is for the soil.’”

“This means returning the stubble to the soil for the grain that it produced. Fertilizers by themselves only feed the plants and do not nurture the soil.”

Crovetto doesn’t like to leave more than 3,000 pounds of wheat straw residue per acre. Any more than that amount would be too much, due to allelopathic activity.

“You need straw and chaff spreaders,” he says. “Windrow your straw in the field if you have more than 3,000 pounds of wheat or small cereal straw. Keep the cattle out of your grain field, and do not bale or burn the straw.”

Added Benefits. Keeping a closer eye on soil nutrition, Crovetto has maintained high-yielding crops.

“After 20 years of no-tilling, I don’t apply phosphate anymore,” he says. “When we do, it disturbs the soil. Phosphate becomes available to the plant as we feed the biology of the soil.”

Utilize Residue Fully. Knowing and effectively using stubble in your fields can help in other areas, too. Crovetto names five areas:

- Improves soil quality, closely related to the increase in soil organic matter.
- Improves water-holding capacity.
- Improves water plant usage.
- Stops erosion.
- Is easier on your bank account.

The Lignin Secret. While soil organic matter is made up of many different compounds, Crovetto says most no-tillers should pay closer attention to one of those elements: lignin.

Improving soil organic matter dramatically from 1.5% in 1978 to 8% today, the importance of lignin has taken priority on the Crovetto farm with a no-till wheat and corn rotation.

“Much of this lignin should last 6 to 20 years if farmers leave straw on soil surface, avoiding the plow,” he says.

The richness of the soils depend on this type of compound. Wheat straw and other cereals contain up to 9% of lignin that produce humins, the most valuable humic compound beside others like fulvic acid and humic acid.

The Bottom Line. Of course, if you’re already no-tilling, you’ve been reaping many of these benefits, even if you didn’t know it. But there’s always another step that can be taken for better soil and atmosphere health.

“No-till takes 6 years to get the benefits and it takes more time to get better soil,” Crovetto explains. “Be patient. With no-till, you have the opportunity to protect, preserve, respect and love your soil. We need it to feed our children.

“If we take care of our soil, then we will have good water and air quality, not to mention better yields.”