

Strip-Tilling in 2007 --- It's Worth It!

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The winter of 2006-2007 for some of us was long and drawn out. We had too many days cooped up and saw white stuff more days than we had remembered in a long time and our backs felt each scoopful. Now the corn stalks and soybean stubble out there appears to need some attention and many have the itch to get on the tractor and burn fuel. Others have already pushed the start button and are tilling in far too wet of conditions.

To this date there is a good amount of discussion about strip-tillage being a favorable method to prepare the seedbed for this year's crop. True, however we place a caution flag out there to suggest this method is not the answer to being in the field too early and making a mess. Anytime getting on the tractor when the soils are above 75% of their know field capacity of moisture, one can cause compaction and a myriad of other bad symptoms. If we would ask, is it too wet to be out there with a disk? Then why go with another tool and create a problem? The strip-till tools are for you to gain advantages in rooting development, precision placement of fertilizers, proper vertical tillage in a zone, top notch seedbed for seed to soil contact, reducing soil disturbance, and reducing fuel consumption.

Let's look in a series of some short articles, starting with this one, what are those benefits to the soil, your dollar spent, your time, and to the crops future.

Soil Biology.....

As said by an older soil scientist sage friend of mine, "in one cupful of prairie soil there's over the population of New York City living and breathing." He would then hand a handful and asked for any of us to breath what that all smelled like. Well most anyone of us have taken that lungful and said that it smells earthy – sure enough. Thousands of aerobic and anaerobic bacteria all having a specific chore to do living, respiring, changing carbon material with nitrogen as their sugar/energy to convert it to forms plant roots can use. All of this happens in and around roots. Plant roots are leaky, they release polysaccharides, humates, dead epidermis-like cells, gases, lipids, and acids all which specific species of bacteria work on and digest. Just in one teaspoon, about 2.5 grams of soil their can be 1 million microbes working on these substances enriching the soil rhizosphere.

Elaine Ingham of Soil Foodweb, Inc tells us, "a number of other N-fixing bacteria abound in certain soil environments. Cyanobacteria form filaments, and are typically photosynthetic, so the bacteria fixing their own carbon from carbon dioxide also fix N inside those filaments, in many different extreme environments". These creatures are very important in the near surface of active and carbon enriched soils

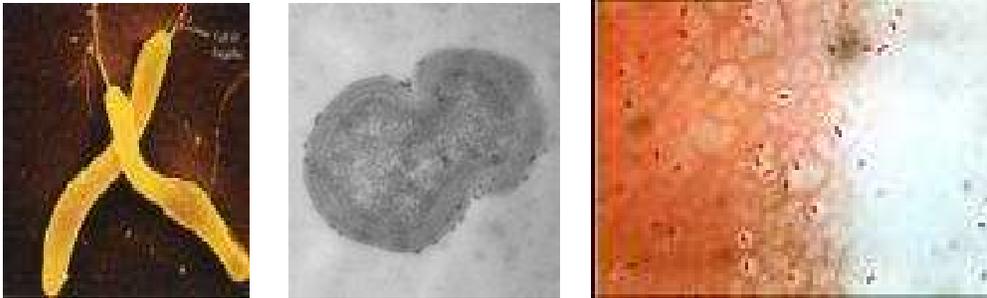
Elaine writes further to say; "free-living N-fixing bacteria, such as Azotobacter and Azospirillum, also fix N in the root systems of many different plants. The crop root supplies the sugars that these bacteria need in that small sphere around the root itself, in

the amounts they need to perform N-fixation.” So, while not truly symbionts, these bacteria usually are most active in the rhizosphere.

What does that have to do with strip-till? Everytime a rollover tillage event occurs, such as disking, plowing, chisel operation bacteria are abused, some smothered or smashed, laid to rest and this reduces the release of oxygen, carbon based products for the plant root to absorb, nitrogen cycle, and the phosphorus cycle to work properly. Microbes play very significant roles in the growth and proper growth of crops such as corn, sunflowers, soybeans and dry edibles, along with small grains like wheat and barley.

Look below at some examples of these microscopic creatures and what they do for your soils and crop roots.

Vibrio fischeri.. produce a reductase material that will break down nitrites and nitrates so roots can absorb it in an organic form. [the creature with a ciliate structure at one end, on left.]



Nitrosomonas europaea ... this bacteria oxidizes nitrous oxide all the while reducing ammonia products and hydrogen [the grayish colored bacteria in the middle].

Azotobacter chroococcum ... this nitrifier produces some complex products that make nitrogen into a source that roots can readily utilize [the small fish eye like objects on the right].

In brief conclusion:

With strip-till one is only tilling 25 to 28% of the soil surface (30 inch row spacing, tilled zone of 8-10 inches wide) leaving the remaining segment of the soil alone. The vertical section where tillage does occur we are causing disruption but we have observed the tilling action has less fatal action on the soil microbes. The microbes continue propagate, flourish, utilize carbon sources, convert N sources and live off the leaky roots giving plants a leg to stand on so to speak.

Strip-tillers can benefit from these creatures doing well so nutrients are available to produce grain and biomass for more carbon and the cycle continues.

Note: Elaine Ingham’s efforts can be read on www.soilfoodweb.com and she provides learning opportunities which may be of interest to you.