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Our agronomist who travels the world gives us a short but informative list of Strip-Tillage benefits in the agronomic sense. Read on and enjoy, as you do, think about whether these benefits are happening on your farm and soils.

By: Mike Petersen

It has been brought to our attention here at Orthman Manufacturing that we should offer more ideas of what are the agronomic benefits to employing the Strip-Till methodology here in the United States and abroad where Strip-Till is becoming adopted. I am happy to do so and offer a list that phrases what a number of the benefits are in brief statements. Here goes….

First is the seedbed we are able to prepare for any row crop

a.] Allowance for more accurate placement of individual seeds in the soil surface layer

b.] Diminish the issue of hair pinning of residues in the seed trench by 95-98% which can reduce germination

c.] Decrease planter bounce due to old root balls, stalks, clods and stems which can cause poor seed placement

Second, exposure of the soil surface from the after harvest protective blanket of residues to allow warming of the soil to germinate seeds earlier and in the more correct temperature for individual crop to be grown, [ie: 50-55°F./10-13° Celsius for maize]

Third, a warmer root zone for the early plant to reach greater depths and start quicker nutrient uptake from surface into the subsoil (2 to 7° F warmer, 1 to 4°C)

Fourth, Strip-Till accentuates early root development both vertically and laterally. Soil temperatures are warmer so young infant plants can extend roots deeper vertically and lateral roots will get started to spread parallel with the soil surface.

Fifth, in the strip-tilled zone the soil density is lowered with a higher percentage of medium and larger sized pores [medium 1-2mm diameter/2-5mm diameter for large pores] for improved water intake throughout the growing season

a.] Early root development at the root tip is not as robust until the plant is 25 days old
(the root tip driving pressure is no more than 150lbs/sq. inch at 15 days after emergence)

b.] With a shank implement as is the Orthman 1tRIPr we can alleviate soil compacted layers within the first 12 inches (30cm) but not shattering the entire soil profile from shank to shank.

Note: it has been suggested by soil physicists that the medium sized pores are best for adsorbing and releasing water to the plant roots because of soil-water tension characteristics. Interesting yes?

Sixth, nutrient placement with the Strip-Till system has several redeeming values.

a.] Accuracy of placing fertility package/nutrients below the seed for the first 25 days has great effect

b.] Accuracy of placing nutrients for the first and second critical phases of crop development, extremely important

c.] Opportunity to place 30 to 85% of the N-P-K load as per desired levels for yield in the root path with Strip-Till

d.] Ease of placing nutrients in pre-plant either fall or spring tillage passes

e.] Reduction of nutrient loads that are due to efficiency and proximity to the root growth

Seventh, the opportunity to place both mobile and less mobile ions in the soil which can reduce losses from wind and water erosion – avoiding surface water pollution issues which is a growing like wildfire concern and rightfully so.

Eighth, the opportunity for growers to reduce nutrient loading to lakes and water courses. May seem to be a repeat of item #7, but consider the Phragmites, algae blooms, and Cattail invasions to the clogging of small reservoirs or streambanks due to N and P being transported in the process of siltation and sediment flow. Cattails do not thrive unless levels of P is higher than

normal.

Ninth, the elimination of unnecessary pre-plant passes across the field, able to reduce to 1 pass (till 'n plant) in many cases.

Tenth, with strip-till we observe greatly improved earthworm populations in the soil profile and other friendly insects and bacteria to thrive and benefit residue breakdown

a.] For example – worms can return up to 17lbs N per acre as they digest carbonaceous material

Eleventh, we see residue breakdown is more of a natural breakdown slowly recharging the carbon storage of soils in the surface and subsurface layers

a.] The improvement of soil organic matter levels has a number of benefits

{1} Assists in improving soil applied and activated herbicide efficacy

{2} Provide more organic exchange sites for nutrient availability to the growing crop

{3} Improve soil tilth – ease of pulling tillage tools thru the soil

{4} Improve soil resiliency (how well soils respond and resist destructive impacts such as heavy traffic, hard raindrop impact, wind sorting, shearing action and downward pressure

{5} Allow soil structure to redevelop back to original vertical units and resist breakdown

b.] Biological function improvements

{1} Allow soil born fungi to thrive and create the symbiotic root relationship for better nutrient uptake

{2} Allow microorthopods to repopulate the near soil surface and digest residues and release nutrients for crop uptake

Twelvth, we know Strip-Till works in many different crop rotations, small grains being seeded into a strip-till environment is not common, but row crops into wheat or barley stubble – great scenario!

Note: this is not just for one segment of a crop sequence

Thirteenth, since it's inception, Strip-Till has continually offered improved yields from 5 to 22% increases over broadacre tillage systems

Fourteenth, Strip-Till has shown increases in yield over Direct Seeding (No-Till), especially in colder regions north of the 41st degree Latitude --North Hemisphere

Fifteenth and Last for now, Definite and measured intake of water into the soil and water storage potential does increase

[1.] Measured water intake improvements over a 4 year period compared to conventional broad acre tillage

[2.] Potential savings of irrigation water for irrigating farmers

[3.] With improved water intake and water storage – the plant root can access more water stored in the soil to increase above ground biomass production