

No-Till Notes:
The Four Phases of No Till

By Kathy Buttle
NRCS Resources Conservationist

This week's column is written by Kathy Buttle, Resources Conservationist specializing in soils. Kathy is based out of the USDA-Natural Resources Conservation Service (NRCS) office in Scottsbluff.

The world's most advance no-till researchers and organization contend that continuous no-till progresses through four phases.

It is our belief that if you equip yourself with a thorough understanding of the best agronomic practices that are availed to you and if you comprehend scientifically the principals of water infiltration into the soil, including its structure, properties and chemistry of which it is comprised, including the incredible amount of biological and microbial activity, then you will arrive at the realization that continuous no-tillage is the best method to achieve high-yield, sustainable agriculture. Armed with the best knowledge, long-term vision and a keen awareness of the need for continued education, producers should be prepared to successfully endure. With this knowledge we shall remain stalwart in our vision and promise to you: No Till for Life.

Phase One: Initialization (0-5 years) This level is the basic, primary or fundamental stage where the beginning processes start their transformation from low soil organic matter and low residues to begin regenerating soil structure and an increase in microbial activity. This stage requires additional nitrogen.

Phase Two: Transition (6-10 years) This phase represents a shift, passage or transformation into the next level of no-till. Soil organic matter accumulates, residues increase, soil aggregation and soil microbial activity elevates. Phosphorus accumulation, nitrogen immobilization and great mineralization are also experienced.

Phase Three: Consolidation (11-20 years) A strengthening, solidification and/or fortification featuring increased carbon accumulation, residues and additional available water in the soil. This is accompanied by nitrogen mineralization and greater immobilization with an increase in cation exchange capacity and greater nutrient cycling.

Phase Four: Maintenance (+20 years) Sustaining, continuance, upholding or preservation best describes this final stage wherein a continuous flow of nitrogen and carbon and high residues are common. Greater available water in the soil and high nutrient cycling with increase nitrogen and phosphorus attainability are achieved.

Source: Adapted from Joao Carlos Moraes, Sa 2003