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This is the second note in a series of Soil Agronomy-No-Till Management technical notes on the management techniques for successful adoption of No-Till Cropping systems. This information is applicable to most Indiana soils and cropping conditions and covers broad application.

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# AGRONOMY

## Technical Note No.2

# No-Till Management- Nitrogen Management

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## Nitrogen Management in a No-Till Corn System

### Understanding the Nitrogen Cycle during the Early Stages of No-Till

During the first 3-4 years of a no-till system, the soil biology and chemistry undergoes several significant changes. Soil microbial populations increase rapidly as the organic matter level rises. These microbes can tie up most of the available nitrogen early in the growing season. Nitrogen that is tied up by the microorganisms will be greater in finer soil textures. This can result in nitrogen deficiency during the early corn growth stages. Corn plants determine ear size and thus yield potential from emergence through the 5<sup>th</sup> leaf stage. A corn plant, which is stressed during these growth stages, will set smaller ears and thus have a lower yield potential. Supplying available nitrogen during this time period will preserve yield potential. The nitrogen, which is tied up early, will be made available later in the growing season or stored in the soil organic matter. The total amount of applied nitrogen will not necessarily need to be increased. The timing and/or formulation of nitrogen may need to change.

### Management Strategies

1. Start your No-Till system with soybeans.
2. Use starter fertilizer, which delivers 20-40 pounds of nitrogen per acre.
3. Inject at least half of the nitrogen below surface residues.
4. Side dressing of N should be done as early as possible. Use knives that seal well, yet cause as little surface disturbance as possible.
5. Consider using DAP if applying phosphorus ahead of corn.
6. Consider using 15+/- gallons of 28% UAN as part of the carrier with pre-plant soil applied, residual herbicides (not with glyphosate products).
7. At least 35-70 lbs. of nitrate nitrogen must be available during the first 40 days of growth to provide for full yield potential.

An increase in soil organic matter improves soil health and overall productivity. Increases in total soil nitrogen become a valuable part of your total nutrient bank. Managing changes in the nitrogen cycle when entering into a No-Till system can preserve and potentially improve corn yield potential.

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