

Variable Rate Nitrogen: Classic OR New Solo™ Surveyor™ with Solo™ PC™ Applicator Soil Doctor® Systems



"The potential for precision [nitrogen application] technology may well lie in letting you crank down the rate for higher yielding (physically low) spots in the field, while cranking up the rate on lower yielding (physically higher) spots."

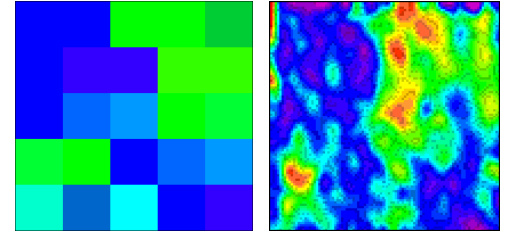
--Dr. David Mengel, Purdue University.

But, Doesn't Grid Sampling Provide

Equal Precision?

Today, when writing about variable rate technologies--some call grid sampling by plots as large as 2-1/2 Acres as "farming by the foot". That certainly makes grid sampling methods *sound* as precise as the analysis by the Soil Doctor system. But we all know:

One rate for 100,000 square feet is not farming by the "Foot."



The Soil Quality (CEC and topsoil depth) map on the left shows 25 composited sample grids of 2-1/2 acres each, the one on the right 7,250 samples/acre from one trip through the field with a Soil Doctor system. Like above, grid sampling can miss all the high productivity areas and most of the low productivity areas, while still eating up time and money. It provides only five levels of data, while one-step Soil Doctor technology detail fifty times more, as it **simultaneously** treats the field. **Soil Doctor systems provide field performance and economic benefits unmatched by any other precision farming technique.**

Farm like you mean business -- With Precise On-the-Go Analysis & Right-Now Application

The Precision Dilemma. You want to farm more "Precisely", more Efficiently, starting Right Now; but many insist: "Wait! First collect Years of yield data and don't do anything different. . . it might bias your data. After five years you will know how to start making more money."

Their advice ignores the fact that you already farm "precisely" field-to-field, based on fundamentals you learned long ago. You know that your better soils deserve higher investments and that crops need certain ranges of nutrients. All you need is that detailed foot-to-foot field information and a system that automatically Does What you Want, Based on That Data, At That Location -- **TRUE PRECISION.**

The Soil Doctor® Solution. This System is STILL (since 1987) the only system in the World with On-the-Go Soil Sensing, which empowers you to **farm "precisely" foot-to-foot**, like you now farm field-to-field. Only by treating your crop precisely and on a scale as fine as an individual plant's root zone can you **realize your highest profits.**

It is common to find that over 50% of the variability present within 2-1/2 acres is already present in a few square yards.

-Agricultural Research Service, USDA



Soil Doctor® applicators apply the level of nutrient needed. They sense soil conditions and nutrient levels, foot to foot, with On-the-Go Soil Analysis and **immediately** apply only the additional amount needed.

Yes, **Right-Now Application.** No "homework" Required. No extensive studies. No conventional soil analysis. No Delaying vital, timely applications. By instantly applying more to the deficient areas, while withholding from the areas with abundance, 1) Field Yields and Crop Quality are Increased, 2) Input costs are Minimized, and 3) Groundwater Protection is Optimized. **Homework and Mapping optional.**



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Many May Promise

.... Soil Doctor®

Applicators Deliver™

Using a large grid for soil sampling is no better than sampling at random.

-Purdue University

Soil sampling at random is not precision farming.

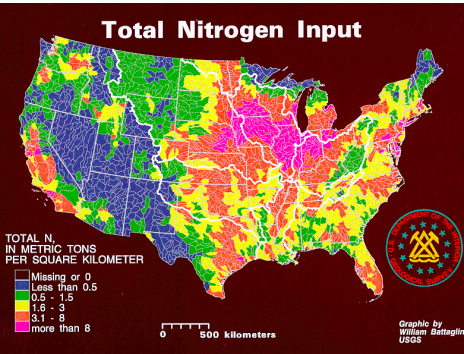
Soil Doctor applicators change application rate as needed, five times a second--more than once every foot of travel and permit independent sensor control for each wing and center section of a folding implement. Soil Doctor fine field treatment delivers over 10,000 times the resolution possible through other "site-specific" techniques.

Many May PromiseSoil Doctor Applicators Deliver™. Nitrogen Performance Guaranteed.

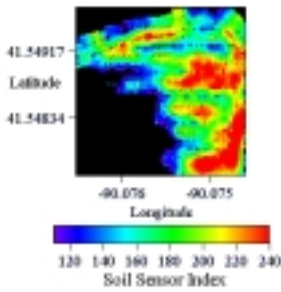
Of roughly a dozen nutrients important to grain production, nitrogen is the one you can't afford to reduce without precise help. Because soils produce N, you can reduce N while increasing yield at the same time. Through just nitrogen management alone, *Soil Doctor applicators demonstrate advantages of \$15 to over \$60 per acre. Typically, nitrogen use is reduced by 30 to 40%, with customer yield increases ranging up to 17 bushels per acre.* Why wait five years? With N costs up dramatically and rising, increase net profits now and limit costs, by focusing on N management.

Seventy percent of observed corn yield variation is due to soil nitrogen availability.

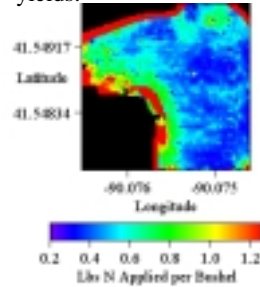
-Iowa State University



Nitrate and phosphorous, moving in very wet years from fields--through watersheds--to the Mississippi River, have contributed to the generation of a Hypoxia region (a zone of low oxygen concentration) in the Gulf of Mexico. Presently, this depleted area is about the size of New Jersey. Federal legislators reside near the discharge from Pennsylvania's Susquehanna River valley, where heavy N and P losses from Dairy manure have been blamed for the decline of the Chesapeake Bay. If fertilizer and manure were voluntarily applied in a more efficient manner, then there would be no need for federal legislation to restrict N & P application.

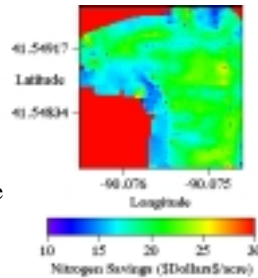


End of season corn yield correlates very well with the spatial distribution of the measured nutrient potential. The areas of highest nutrient potential are also the areas of the highest yields.



Traditional recommendation is: **Apply 1.2 lbs N/bushel!** Soil Doctor technology enables significant spatial reduction in N use. Only the edges of the field, adjacent to wooded land which blocks sunlight, approach conventional, higher application practice. **And, Soil Doctor® Technology can even respond to overrides from operators or additional data sources, like this shady boundary.**

Left to traditional practices, through following University of Illinois/Fertilizer Industry guidelines, this farmer would have applied a fixed rate of 160 lbs N/acre.



This final map demonstrates the dollar advantage this Soil Doctor system returned within the field. Producers know that yields vary by soil type. Good yield monitors, GPS, and Mapping can confirm these variations. Within soil types, however, the dominant factor controlling yield is soil nitrogen status.



High Speed Applicator Kit

The composite soil sensor index, or Nutrient Potential of the Soil, measures the variations of soil nitrates, soil organic matter, and topsoil depth, revealing productive areas that require little added N.

Soil Doctor systems reliably provide producers the technology to properly, foot-to-foot, distribute inputs between soil types and within a soil type for maximum efficiency, productivity and profit.

Although Soil Doctor Applicators are general purpose tools, they are designed to take first things first, which means that they are powered to accurately address the single most important element of your fertility program and your grain production --Nitrogen.

At Crop Technology, Inc. we put our money where our mouth is with a **money-back Performance Guarantee.**

How can Crop Technology, Inc. offer a money-back Guarantee when others do not? Through On-the-Go Soil Sensing and Right-Now Application, CTI's Soil Doctor applicator addresses fine field variability with precision placement of the correct amount of N. The Results: fertilizer savings and yield optimization, measurable by any farmer-owner. **Other Variable Rate Technology companies** do not, which is why they say: "Let me give you a formula to estimate your savings & profits."

Since 1987, Soil Doctor applicators have been increasing, by measurable levels, net profits in production agriculture for real farmers just like you. **Talk to Soil Doctor system owners.** Owners know about performance because CTI asks them to assess the system. Customers compare fertilizer use and yield results in replicated side-by-side tests to confirm economic benefits on their own farms.

"Bottom line
It works and makes me money."
-Terry Behmyer, Mt. Sterling, Illinois.

The Soil Doctor Nitrogen Performance Guarantee

If your properly installed, maintained, and used Soil Doctor® Applicator does not provide you with a measurable economic advantage over your current practice the first year on your farm, your purchase price will be cheerfully refunded.

"In my tests,
I saved 40% of my N and
Increased corn yield by 8 bushels/acre."
--George Holsapple, Jewett, Illinois.

Soil Doctor® Soil Sensing Technology is a major scientific advancement to the exploratory, basic research conducted over the last fifty years by the United States Department of Agriculture for irrigated western states production. After CTI introduced its technology to domestic midwest agriculture in 1987, USDA and DOE initiated several major programs in Iowa, Missouri, Illinois, California, Nebraska, Texas and Idaho whose research has produced findings proving and supporting scientific principles underlying CTI technology.

CTI technology is protected by issued patents, including U.S. 6,138,590 (in review); and U.S. Patent 6,484,652. CTI patents cover on-the-go soil sensing technology, incorporating electrochemistry, complex resistivity, and conductivity -- serving immediate application, post traverse GIS analysis for assay of soil properties, soil fertility & chemical levels; and enable certified, real-time or post-survey treatments that rely on sensed soil data.

