



Precision Soil Sampling

Precision-farming techniques can save or make you money. In a year with high fertilizer costs, precision sampling can have greatly increased savings in input costs. Precision farming adjusts treatments across the field in order to maximize the economic return at each location within the field.

- Precision farming is an application to assist in managing field variability
- Precision farming is not a replacement for traditional farm knowledge

Precision farming techniques involve several new technologies and equipment, including Global Positioning Systems (GPS), which are used to establish an accurate position in the field, Geographical Information Systems (GIS), which are used to visualize and map data, Variable Rate Technology (VRT), which provides variable applications of fertilizers and chemicals on the field, IDI (Yield Monitors collect yield data "on-the-fly"), and Remote Sensing (RS), which provides a picture from above.

At Agro Engineering, we have been using precision farming techniques specifically for nutrient management and yield monitoring. Precision soil sam-

pling involves taking multiple soil samples within a field based either on known zones of differing soil characteristics or a grid. The zones to be sampled separately are delineated based on historic aerial photos, yield data (if available) soil maps, and the farmer's and consultant's knowledge of the field.

The soil test results are then mapped providing a better understanding of soil nutrient variability across the field. Fertilizer recommendation maps may also be produced for variable rate applications. Many fertilizer products can be variably applied. These include: major nutrients (such as Nitrogen, Phosphate, and Potassium), micro nutrients (such as Zinc and Iron), and reclamation products (such as Gypsum, Elemental Sulfur, and Lime).

If your soils are variable, the potential benefits of site-specific nutrient management can:

- Provide more uniform yields
- Maximize crop production at all areas of the field
- Save you money on fertilizer costs
- Increase per acre return

There are also some side benefits that occur. Site-

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Snow Water Levels Above Average

The snow levels in the upper Rio Grande Basin are higher this year than the thirty-year average. The snow water equivalent is 109% of average, while the total precipitation is 108% of average. The San Juan River Basin is 99% of average for snow water equivalent. However, the total precipitation is at 108% of average.

All other areas of the state are lower than normal. The range of snow water equivalent is from 68% of average at the South Platte River Basin to 88% of average at the Upper Colorado River Basin. The total precipitation also follows this trend for the rest of the state.

Can Precision Soil Sampling Help You?

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specific nutrient management is environmentally friendly (fertilizer is only being applied to the areas of the field where it is needed and at the proper rate needed). Nutrient mapping also provides more complete record keeping.

In what instances will site specific nutrient management pay off?

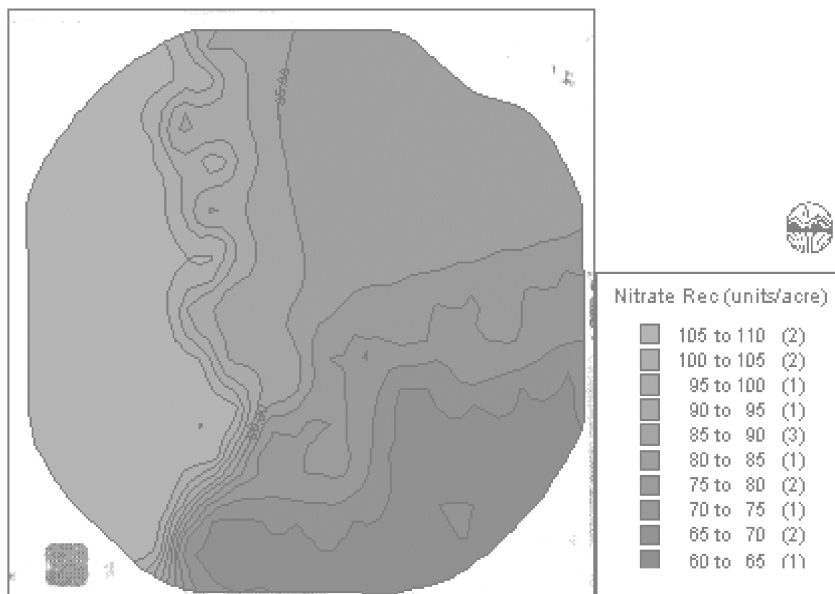
Site specific nutrient management is cost effective on fields where soil fertility is limiting production and soil fertility is variable across the field.

Situations where variable sampling is cost effective:

- Fields with dramatically different soil textures (i.e. river bottom soils).
- Fields with different cropping histories (i.e. evening out the residual nitrogen resulting from different cultivars grown the previous year)
- Fields needing reclamation (i.e. fields that have adobe holes, sodic spots, saline spots, or are both saline and sodic).
- Fields with gravel bars.

This technology will not be cost effective on fields where the soil type is uniform or where soil fertility is not limiting production.

In actual field experiences in the San



Luis Valley on variable soils, we have found that in some instances variable rate fertilizer applications have been able to save up to \$15 per acre in fertilizer costs by directing applications at the optimum rate to the areas of the field that need it. We have also seen average yield improvements across the field of \$30 per acre in grain (10 bushels per acre), and \$56 per acre in potatoes (14 cwt per acre). The total savings that have been realized from fertilizer savings and increased yields (above and beyond the additional sampling and application costs) has been up to \$50 per acre in potatoes and \$20 per acre in grain.

If you have a field with variable soils that you think might benefit from precision soil sampling, give us a call and we would be glad to provide you with a recommendation.



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