Louisiana Geo-Spatial News

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LSU AgCenter Extension Service Focuses on Geo-Spatial Technology

In 2008, the Louisiana Cooperative Extension Service's director, Dr. Paul Coreil, initiated a new extension program in the area of Geo-Spatial Technology in order to continue the LSU AgCenter's leadership on the production agricultural educational forefront.

A multitude of different Geo-Spatial tools exist, and the utility of each is based on case-by-case need. However, all Geo-Spatial tools are linked by one common denominator, the use of a geo-referenced point.

The Geo-Spatial program is led by professors with extension responsibilities in the Department of Biological and Agricultural Engineering at Louisiana State University. Twelve ANR agents throughout the state are assigned Geo-Spatial responsibilities.

Agents received educational training from Dr. Keith Morris on using the software program Arc GIS as well as Farm Works Site Mate. Agents were also encouraged to participate in online software training modules prepared by the ERSI Corporation on the many uses of Arc GIS.

Hand Held Computer Display of Farm WorksAfter Mapping Fields.

—Albert Orgeron

Using Arc GIS to Manage Information for Future Researchers

Arc GIS is a software program that has many uses and can be helpful in many different professional settings, including county planning and development committees, and by tax assessors, emergency services personnel, and agricultural professionals.

In the spring of 2009, a long-term citrus study was initiated by Dr. James Boudreaux, Extension Professor of Horticulture and Extension Citrus Specialist. Dr. Boudreaux desired to collect long term information (15+ years) on the cold hardiness and salt tolerance of several different rootstocks used in the Louisiana citrus industry.

Different combinations of rootstock scions were planted in several different parishes throughout the state. Parish Agents were asked to create long term records of the exact location of each scion.

Hand-held GPS units, equipped with the software program Farm Works, Site Mate were used to collect the exact location of the 10 different scions in the growers' orchards. This information was then uploaded in Arc GIS. In Arc GIS, 2007 imagery from the national agricultural database was used to develop a long-term map that shows each scion and its GPS coordinates.

Dr. Boudreaux feels like this is a great way to insure that his successor can continue to collect data long after his own retirement and make an ongoing contribution to the industry.

-Albert Orgeron

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"I Gotta A Yield Map – Now What"

A yield monitor is the first step many producers take into precision ag. A yield monitor alone is useless, but combined with Global Positioning System (GPS) technology, yield-mapping software, and training it becomes a useful management tool. The goal for properly interpreting yield data is to provide answers to the question that plagues most producers "how can I increase profits on this field'. Producers have to remember a yield map is not the magic bullet that will solve all their problems. Colorful maps are not knowledge. If yield maps are to be any real value, the data generated from them must be incorporated into the decision-making, analysis and overall planning process of the farm operation.

Many times a yield map raises more questions than it will answer and becomes a source of frustration. A yield map only documents crop yield, not what caused the yield difference. As yield maps are evaluated, variability can be grouped into two categories: **(1) producer management practices, (2) naturally occurring or environmental effects.**

Producer management practices:

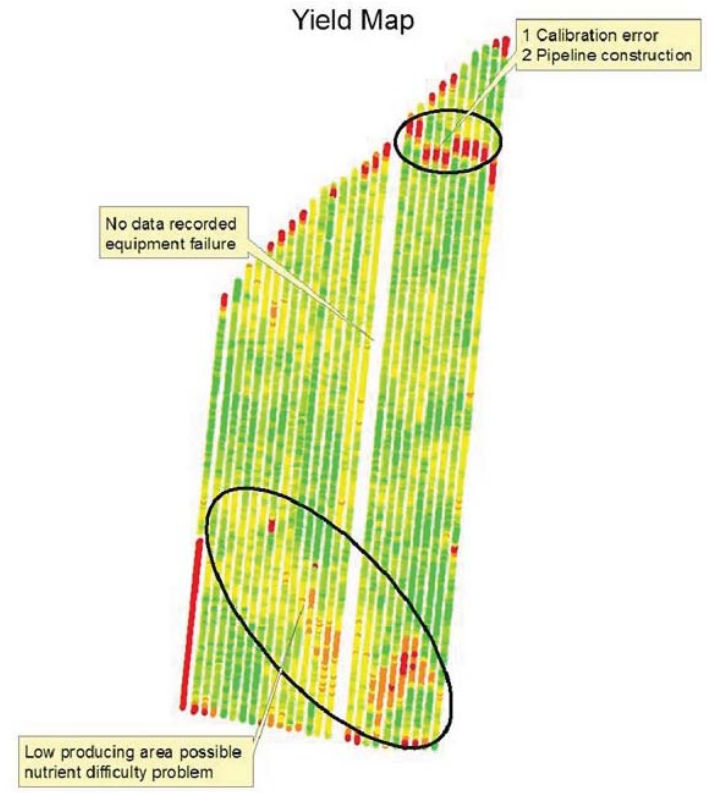
- •Field History - tillage practices, previous crops, spills, utility lines, construction
- •Compaction - working wet soil, heavy traffic, drainage
- •Water management - apply irrigation uniformly, improper drainage
- •Equipment/mechanical errors – dependable GPS signal, proper calibration of equipment

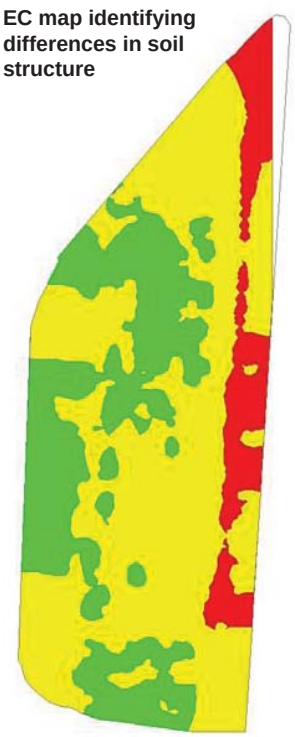
Natural occurring variables:

- •Weather – flood/drought, heat/cold
- •Soil fertility – Ph, soil nutrition, deficiencies, organic matter
- •Soil physical properties – soil-type, field variability
- •Pest concentration – weeds, insects, diseases

After studying a yield map, try and categorize yield differences into one of these two groups. Producer management practices are the easiest to identify and correct, if economically feasible. Natural occurring variables are more complex, harder to identify, and difficult to correct. Some suggestions for identifying soil related issues would be to use Eca data collected to identify differences in soil structure.

This information then could be used to set-up a grid or zone sample to look for fertility and Ph problems in the field. Once problem areas are identified, use a variable rate application to apply what may be needed and only where needed. Another area to look for would be water management. Can I add a drainage ditch to move the water off the field in a timelier manner, or alter the slope of the field to be able to get water to an additional part of the field? Don't be quick to jump to a conclusion, seek input from knowledgeable individuals about fertility, drainage, and irrigation before making changes in your operation. The producer's goal should be for uniform yields that produce maximum return for dollars invested. **-R. L. Frazier**





EC map identifying differences in soil structure

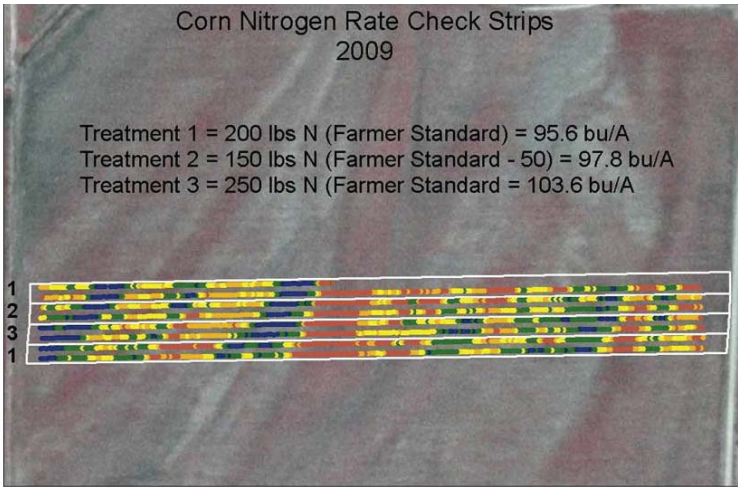
Grid sample map modified to ensure all soils zones have equal representation

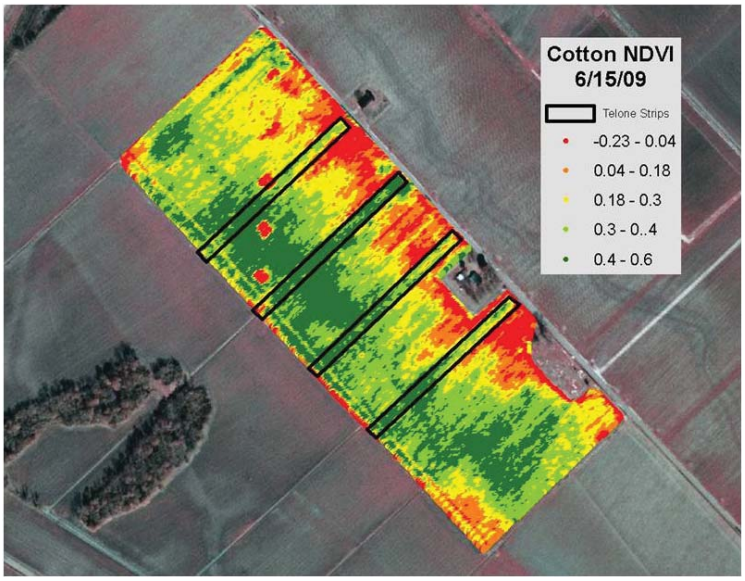
Verification Strips Defining Management Zones/Learning GPS Potential

Producers' use of verification strips in a field as a comparison with their standard application rate is a way to define management strips or learn what precision ag has to offer on their farm. A verification strip is a single rate application applied as one or two passes placed at one or more locations in the field. Yield monitor data is collected from the strips and sorted out using polygons created from the verification strip application. Depending on the amount of information available about the field (soil type, fertility, elevation, ECa data) reflect on the analysis carried out on the yield data.

Producers who have no other precision ag equipment except a yield monitor can use this demonstration to learn what to look for on yield maps and how to use the data to improve their own operations. One strip location in the field is easier for a producer who has little experience with precision ag to learn from. An example of a simple demonstration of this type is nitrogen rate strips for corn or cotton. At a point in the field, the producer lowers the nitrogen rate by 20 lbs of N and applies a round. He then raises the N rate to 20 lbs over his standard N rate and applies a round. The producer marks the strip locations and resets to his standard N rate and continues across the field. GPS points are taken on each end of the field to designate the rate strips (farmer standard, -20 lbs N, + 20 lbs N, farmer standard) and application polygons are created. After yield data has been collected and placed in the corresponding application strips, the producer can look for variances among the strips. If more information other than the producer's knowledge of the field is available, the data could be compared according to those parameters. The object of this demonstration is not to find a nitrogen rate but to educate the producer in what his equipment can show about his crop and encourage him to expand the use of precision ag in future cropping operations.

With multiple strip applications across a field, a producer can use the results along with other field information to create management zones. Depending on the product applied, the producer can create prescription applications to apply only to the zones where returns are justified or where the rate is best utilized for the highest return. An example is multiple applications of a nematicide in a cotton field. Using the yield data and other indicators, the zones (treated and untreated) would be defined by the returns from the nematicide application.





With a yield monitor a producer can work in fields on his own farm to increase his profitability through increasing his knowledge of what is happening in those fields. Whatever their goal for using verification strips, producers must realize that precision ag is an ongoing process and data collected each year will help them refine their operations.

If a producer would like to use this demonstration on their farm, they can contact one of the Geo-Spatial Agents for the LSU AgCenter to assist them in setting it up and following through with the analysis of the yield data. ***-Dennis Burns***

Environmental Stewardship and Good Business

LSU AgCenter's Best Management Practices (BMP) program focuses on proactive steps that agricultural producers voluntarily perform to reduce agricultural pollutants.

With the use of the AgCenter's Geo-Spatial program, St. James Parish producers Keith Martin, Reed St. Pierre, Thomas Kliebert, Robert Millet and Grady Poche worked hand-in-hand with local extension personnel to develop field boundary maps.

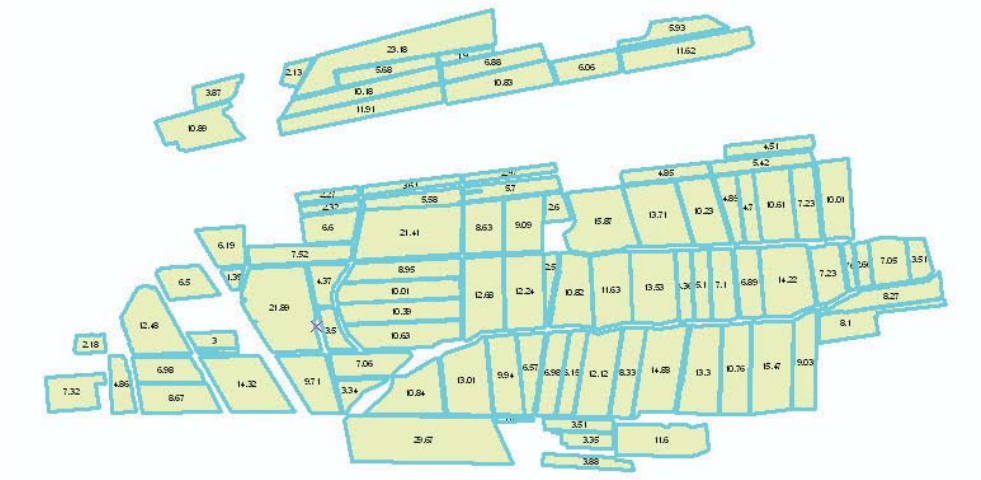
Field boundary maps were created using Arc GIS. Half-meter images obtained from the St. James Parish Government GIS Department were used to find exact locations of field boundaries. Arc GIS was then used to calculate each field's acreage.

Providing producers with precise acreage is vital in nutrient and pest management. The over-application of pesticides has the potential for run-off into the bayous and swamps, while under-application of the same pesticides will not properly control weeds, insects, or diseases, and may in fact lead to host resistance.

All producers agreed that these accurate maps help them to manage inputs, thus not overspending capital for unneeded inputs, and purchasing only the exact amount needed.

Using Geo-Spatially created maps is valuable in effective BMP management.

-Albert Orgeron



About the LSU AgCenter

The LSU AgCenter is dedicated to providing innovative research, information and education to improve people's lives. Working in a unique statewide network of parish extension offices, research stations and academic departments, the LSU AgCenter helps Louisiana citizens make the best use of natural resources, protect the environment, enhance agricultural enterprises and develop human and community resources.

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