PRECISION AG PRESENTATIONS

Program 3PA-2

Turning Yield Maps Into Management Tools

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Yield monitors on combines and cotton pickers are becoming more commonplace across the Mid-South. Producers are gathering information about their fields and crops at a faster pace than ever before. This information is gathered with GPS coordinates and by using GIS software the yield information can be placed in the area of the field where it originated. While this is important information to a producer, collecting yield maps on all their crops every year can lead to confusion and data overload. Each crop year has different factors (weather conditions, fertility, pests, drainage) which influence the crop yield for that year. How does a producer equate corn yield to cotton yield in two different years? What about yields that are below average for a particular field but normally are considered high, how does a producer process those? All of these questions lead a producer to the next step of managing yield data and turning this information into management decisions.

The first step for a producer working with calibrated yield monitor data is to clean the outlying yield points out of the field data. Raw yield data coming out of a combine or cotton picker will have yield points that contain values of zero or extremely low or unrealistically high. Removing these high and low yield points creates a more realistic map for a producer to work with. The producer can use the actual yields to analyze the field and determine management zones for the high and low yielding areas. The yield data can be divided into several ranges using different methods. Some of these are equal range (dividing the yield values into equal segments), equal points (dividing the number of yield points into equal segments), manual (producer discretion), or statistical (using the standard deviation to separate the yield values into segments). The number of ranges can vary with the result that a producer is looking for. The larger the number of ranges the easier it becomes to pick out the smaller differences in areas of the field. The problem with this approach is the map can become confusing and loose clarity because of the number of different colors or markers present. A better approach is to start off with three to five ranges and work with the yield values as they separate out. A potential problem with too few ranges is the yield data becomes blended and the high and low yielding areas can't be easily discerned. By increasing or decreasing the number of ranges, looking at the field map and the yields within the ranges the producer can determine the best fit for the field. The more a producer works with their yield data the better they will understand how to interpret it and produce useful information about the field. Once a producer has become comfortable with working with yield data using actual yields the next step is working with yield data over multiple years and multiple crops.

To work with multiple year & crop yield data some manipulation of the data for each year must occur. The first step is to normalize each year's yield data. Normalizing yield data can be done one of several ways. One way is to determine the average yield for the field and divide each yield point by this average. This will return a value which is below, near or above the average for the field. Another method of normalization is to determine the maximum yield in the field and divide each yield point by this value. This will show the yield points as a percentage of the maximum. The higher the resulting value, the closer it is to the maximum yield of the field. There are several other methods of normalizing yield data, some using statistical information. Regardless of the method used the normalization of yield data gives a

producer a different look at a field. After normalizing the yield data for a field for each crop year, they are combined into one yield analysis map which gives a more complete picture of the field. This map allows a producer to determine yield potential and goals for a crop, recognize problem areas, develop management zones, and analyze yields for profitability.
Part of the process of using the gathered yield data to its maximum potential is its analysis. Producers must gather their data and either have it analyzed by someone else or do it themselves. Several of the farm related GIS software programs have the normalization and multiple year/crop option as part of their analysis packages. The normalization of yield data and combining of multiple years and crops allow producers to take a realistic look at a field without becoming sidetracked in the bushels per acre yield.

14th Annual National Conservation Systems Cotton & Rice Conference

MASTER FARMER PRESENTATION

Program 1MFP-2

Water Quality Monitoring of Agronomic Best Management Practices

Presented by Donna S. Morgan
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Collecting agronomic data from various research trials is not only a common practice, but a top priority within the research division of the land grant university system. This information may include weed and other pest populations, plant heights, stand counts, and ultimately, yield potential. In addition, it is becoming more and more important to validate the significance of Best Management Practices (BMPs) in production agriculture and their effect on soil and water quality. BMPs, or conservation practices, are practices used by agricultural producers to control the generation and delivery of pollutants from agricultural activities to water resources. One validation method of these practices is through edge of field monitoring. Impaired Louisiana surface waters contain over 32 different types of pollutants, with many of them binding to soil particles and relocating off-site through the erosion process. Agricultural operations, in addition to contributors such as construction sites, supply various amounts of sediment and nutrients to our state's water bodies and therefore must be addressed in pollutant reduction strategies. Implementation of one or more of these Best Management Practices can result in reduced sediment leaving the fields, increased soil moisture, and increased organic matter over time.
By using various methods of sampling, runoff can be collected where a number of these conservation practices are implemented and compared to standard practices. Through statistical analysis, pollutant levels for each treatment can be determined and used to evaluate the water and soil quality, as well as production benefits, of these specific practices. With changing technologies and increased public concern over water quality issues, agricultural producers must utilize the best available technologies to minimize environmental impacts while maintaining or increasing production. Best Management Practices are one tool that can help meet that goal.
Research stations provide optimum environments for monitoring projects where inputs and management practices can be controlled. One monitoring project that was conducted at the Dean Lee Research Station in Alexandria included a wheat stubble management/soybean research trial. The study began in 2008 with cotton planted into various wheat stubble treat-