



Texas Agricultural Extension Service

The Texas A&M University System

Yield Mapping: Guidelines for County Demonstrations

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New information technologies are impacting both the content and delivery of continuing education programs. The availability of these new tools brings an expectation of their use by audiences and the potential for innovative programming. County level agronomic demonstrations are an example of traditional programs that can be enhanced with new technologies. Yield mapping systems are being adopted by producers, and may be available to increase the information delivered through and obtained from crop demonstrations. The following information should help you determine whether or not your demonstrations might be improved by mapping the yields. The question and answer format is intended to aid your decision regarding mapping your demonstration fields.

Why should I consider using a yield mapping system in my crop demonstrations?

1. It is an educational opportunity.

Precision farming practices, yield mapping in particular, have become highly visible in the farm press. Most producers have read about the systems, but may not have had the opportunity to view the systems in action or to examine the yield maps recorded under local conditions. The opportunity to see the systems operating and to discuss the results will improve the awareness of yield mapping and the associated pros and cons.

2. Better interpretation of demonstration results is possible.

Yield maps can document within-plot variability, can make a more dynamic presentation of the results and aid in the interpretation of the results. In addition to the yield means, the maps can show the variability that occurs within the plots. If individual plots have highly variable yields, there may be factors other than the variety or management practice being tested that affect the means. When only mean values are considered, these extraneous factors can lead to inaccurate conclusions.

What problems might I encounter with yield mapping?

1. Availability - The lack of an available combine with mapping capability may affect timely harvest. The use of yield mapping requires the cooperation of a specific producer with the proper equipment.
2. Printing costs - Yield maps really need to be presented in color. While black and white maps can be created, they are not as clearly interpreted. This may require the purchase of a color printer. Copying costs will be significantly increased for color.
3. Map creation - You will need to either obtain software to create the yield maps or get your cooperating producer to print the maps. Purchasing software places an additional demand on budgets and the time to learn to use the program. Free software is available on the Internet, but might not have all the features desired. Relying on the producer to create the maps might limit your ability to examine the data and may cause hardships in order to meet the producer's schedule.

What kind of equipment do I need to effectively use yield mapping?

1. Access to a combine with a yield monitor and DGPS receiver is critical. A combine with a yield monitor alone does not add very much additional information unless detailed notes are taken of the monitor readings during harvest. In most cases, this is really not feasible.
2. A weighing grain cart is still needed when yield mapping. Demonstrations should not rely on yield maps alone to obtain the yield data.
3. If you choose to obtain your own software and print the maps, you will need the following.
 - a. Pentium class computer with several hundred megabytes of free disk space.
 - b. Drives for Zip disks, PCMCIA cards or Internet access for transferring large data files.
 - c. A color printer.

Where can I find this free software for creating yield maps?

Software is constantly changing and being updated. The best information will come from a current search of the Internet for available software. The software appropriate for your situation may depend on the make of yield mapping system that your cooperator is using.

Farm Works Software makes available a free version of yield mapping software that is very useful. The package is called Quick Yields, and can be down loaded from the Farm Works web site <http://www.farmworks.com/quickyld.html>. This package can accept exported yield files from most yield mapping systems. It will allow you to display and print maps, customize legends and perform limited editing of the data. It does not calculate any statistics for the yield data. Quick Yields will handle maps from several sources and allow you to select the one to be displayed.

Ag Leader Technology makes their mapping software, Precision Map 2000, available for download at no cost at <http://www.agleader.com/pm-upgrade.htm>. This package can handle data from Case and Ag Leader yield monitors only. It will store and summarize the yield data directly from the PCMCIA cards in the compressed format. The software will create seven field maps free, but after that number, a license must be purchased to continue making maps. The software will continue to archive and summarize data even though it will not make maps.

O.K., I want to include yield mapping in my demonstrations. What do I need to do?

While valuable information can be obtained with a last minute decision to map yields, advance planning will enhance the information gained. Following are steps that will improve your results.

Prior to Planting

1. Obtain the cooperation of producers with a yield mapping combine, preferably the same one who has agreed to test the demonstration. Discuss your expectations for establishing and harvesting the plots.
2. Obtain producer knowledge about field variability and use that knowledge in the experimental design. Use replication to cover the range of conditions.
3. Layout plots as strips so that no turns are required in the experimental area and the operator can have a full header width. Plot sizes should be at least the combine header width and 300 feet long.

During the Season

1. Monitor the crop throughout the field with assistance of the producer. Note: any areas that seem different, the position and relative size and the causes of the condition. If a DGPS receiver is available, it can be used to determine location and areas. However, a DGPS receiver is not necessary. Sketched notes will be valuable for later interpretation of maps.

Prior to Harvest

1. Set up the yield monitor. Enter varieties or test labels into Deere systems. For Ag Leader or Case, use load numbers to represent the different plots. This information can be entered into the monitor prior to starting harvest.
2. Arrange for a weighing grain cart to be present at harvest. This provides an important backup to the yield map data, provides a check of calibration and provides data for educational programs related to yield mapping.
3. Discuss operating procedures with the combine operator. A major source of error in yield maps is data recorded over previously harvested areas. Operator should fully lift the header immediately when exiting rows, and maintain a full header width. Make sure the operator knows how to select the different plot labels.

4. Set up flags for expected conditions (weeds, lodged grain, etc.) at harvest.
5. Assist producer in calibration of the combine. Try to ensure proper calibration is performed. Use a calibrated weigh wagon for best accuracy.

At Harvest

1. Check with the operator on the variety or treatment being harvested prior to each plot.
2. Harvest each plot as a separate load. This will allow later comparisons of the summary totals. Multiple grain tank loads can be recorded as a single load on the monitor.
3. If possible, ride in the cab to assist operator with setting flags. Operators are often too busy with driving and monitoring machine operation to accurately record flag information.
4. Unload each grain tank/plot into weigh wagon and record total for each plot.

After Harvest

1. Perform a statistical analysis of the weigh wagon yield data to determine the significant differences between treatment means. The least significant difference between the means may also be useful in interpreting within plot variability.
2. Obtain the load summary sheet from producer and compare the indicated weights with weigh wagon weights. If you have access to mapping software, also get a copy of the exported data file. Deviations for a well calibrated system should be three percent (3%) or less, but small loads will often have larger differences.
3. Work with the producer to obtain color maps of the field showing all plots. An appropriate class interval should be selected. An interval related to the mean differences will illustrate the within plot variability.
4. Examine the map for areas of yield differences that do not match the plot boundaries. Look at treatment performance to see if low yielding areas due to unique conditions (weeds, poor plant stand, etc) impacted a portion of some plots. This information may justify examining a subset of the plots for the means comparison.