THE DESIGN OF A PLANT MAP ANALYSIS PROGRAM (PMAP) FOR COTTON FOR THE WINDOWS 95 ENVIRONMENT

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Abstract

Various design issues have been considered in the development of the Plant Map Analysis Program (PMAP) for personal computers. The main emphasis was given to the power to analyze the collected field data, backward compatibility support for old data, ease of use, and better integrability with other component software of an Integrated Crop Management System (ICM). A version of the software program was implemented under the Microsoft Windows platform for IBM compatible personal computers. The Windows 95 compatible version is currently under construction.

Introduction

The plant mapping software is one of the most important software tools available to cotton farmers, consultants, and researchers in managing their crops (Hopkins et al., 1995). Development of a useful, easy to use and state of the art software is an enormous challenge, especially in agriculture. To meet this challenge, we designed and implemented the Windows version of PMAP which supports the old DOS version of PMAP as well.

Design Issues

The Microsoft Windows environment was chosen as our development platform for its state of the art design as well as its popularity with IBM PC users. At this time, this environment offers the best integrability with other standard software programs running under it. This gives us the opportunity to access required information from another component of the ICM e.g. Weather Station Program (Shahed et al., 1995). We chose Microsoft Visual Basic for the fast implementation of our design. This version of PMAP supports both the Metric and English systems. The following are some of the important design aspects.

Data Entry

It is the most important issue to consider to make PMAP useful and a popular tool to it's users. Data can be easily entered using the keyboard and the mouse. We have worked closely with field scouts to design our keystroke sequences so that data can be entered fast, easy and with few or no errors. In addition, its powerful navigation through the whole data set is available providing simple data editing.

Data Storing

Due to the requirement of supporting the old DOS version of PMAP, we are storing one field data (with any number of replications) in one text file. However, for the analysis of data, the software places the same data into a database so that intelligent queries can be made easily. Currently, we are using the Microsoft Access database manager for this purpose.

Data Analysis

The power of analyzing data is the maximum requirement for the PMAP to be a useful tool for it's users i.e. cotton farmers, consultants and researchers. Our goal is to provide graphical bar charts, line charts, and text outputs to its users. In addition, you will receive a WYSIWYG (What You See Is What You Get) print out. You will be able to see your data per plant, feet/meter or acre/hectare.

The PMAP for Windows provides the following options for the analysis of plant mapping data. (We are omitting the extensive list of all the variables for the sake of clarity)

1. Single Field :
   - I) Text Summary for all or any one replication:
     - e.g. : Average. Plant Height
       - Average Internode Length
       - Open Bolls/Acre
       - etc.
   - II) Comparison of different replications:
     - e.g. : Average. Number of Green Bolls/Plant by Branch
       - Average. Number of Open Bolls/Hectare by Position
       - Average Plant Height
       - etc.

2. Multiple Fields :
   - I) Comparison of different fields:
     - e.g. : Average. Number of Squares/Foot by Branch
       - Average. Number of Abscised Fruit/Meter by Position
       - Nodes Above White Bloom
       - Frequency Distribution of Plant Height (can choose the range)
       - etc.

Conclusions and Future

The primary two design issues for PMAP are the fast and easy data input facility and the power to analyze data in various ways. In our PMAP, we are providing the capability for analize data and to make it useful to it's users. It is our perception that in the near future, a durable portable computer will have a sensitive screen as an input device. One of such portable PCs can be used along with the PMAP program to collect data in the field. This makes the data collection faster and almost error free.

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