# *SCOUT MASTER:* NEW COTTON INSECT DATA ENTRY AND ANALYSIS SOFTWARE FOR WINDOWS 95

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## Abstract

*Scout Master (SM)* is a computer software package for Windows 95, developed by a team of entomologists and computer programmers, with input from the private sector, at Texas A&M University. *SM* allows quick, efficient entry and summarization of a large amount of cotton insect field scouting data and agronomic information. *SM* supports various types of graphic output of scouting data for reporting, education, and research uses. *SM* was vigorously tested in 1997 and is currently being improved and revised for general use by the Texas IPM Program in 1998. The addition of several advanced applications to *SM* are also planned, as is a *Scout Master* version for corn and other Texas crops.

## Introduction

The Texas Agricultural Extension Service conducts the Texas IPM Program in most of the state's major cotton producing areas. Large amounts of data are collected concerning major insect pests, crop damage, beneficial arthropods and agronomic information from commercial cotton fields around the state. An estimated 700,000 or more data points, representing insect and crop damage counts, are collected in a normal season by the Texas IPM Program. Extensive paper archives of scouting reports also exist from about 1975 -1997 for various areas.

Because of the need for more efficient management of this large amount of cotton scouting data, the Texas IPM Program, in cooperation with the Texas Pest Management Association and the Texas Department of Agriculture, developed *SM,* a computer software package for Windows 95, which facilitates quick and efficient summarizing of the various cotton scouting data. A team of Texas A&M University entomologists, representing various cotton production regions of the state, and with input from the private sector, participated in the planning of *SM.* Since cotton insect data collection techniques and reporting forms varied widely aorund the state, *SM* was designed to be sufficiently robust to allow data entry from a varietyof sources. The development of *SM* was initially funded by the Texas Department of Agriculture's Biointensive Integrated Pest Management Competitive Grant Program. Programming of *SM* in Visual Basic was conducted by Jenny Wang at Dr. Ted Wilson's lab at the TAMU Department of Entomology.

## Discussion

*Scout Master* supports data input of 500 fields including the variety grown; row spacing; plant population; planting date; emergence date; yield; sampling date and time; scout name; number of plants and squares checked; growth stage; and counts of 10 cotton pest species, all major beneficials, and crop damage. Scouting data can be input by either site or field total. (Fig. 1-5). In addition to the graphics output capability, *SM* allows scouting data to be entered in the field and produces individual, detailed field scouting reports (Fig. 6). Data can be saved to other applications, such as WordPerfect, so that the scouting reports can be e-mailed or faxed (Fig.7).

*Scout Master* allows quick summarization of pest, beneficial insect, or crop damage data across either a large number of individual fields (Fig 8-11) or across a series of sample dates for any field in the program(Fig. 12-13). These summaries are produced in bar graphs of up to 20 fields per graph, which can be printed in either color or black and white. A full range of help topics are provided in the help menu (Fig 14).

Extensive testing of *SM* was successfully conducted in 1997 at various locations in Texas by Extension Agents-IPM. Additions and improvements to *SM* are now being planned and include improving the data averaging options, integrating plant mapping inputs, developing a data upload utility, adding geo-referencing of cotton fields, and making minor improvements to allow easier use of the software. It is anticipated that *SM* will be used by all Texas IPM Extension Agents working in cotton in 1998. *SM* will also serve as a template for the future development of *Scout*

*Master* software for all major crops in Texas, beginning with corn.

With these planned improvements, *SM* for cotton will allow Extension to more efficiently summarize cotton field scouting data for electronic delivery to producers, private consultants, agribusiness, university scientists and other agencies and organizations which use IPM information. The summarized field scouting data will also be used in newsletters, field meetings and other traditional educational approaches. In addition, we will be able to store large amounts of organized field data, forming a readily accessible historical database; and pest population data can be compared between and among years for different regions of Texas. Also, the database will be useful for validating computer prediction models of pest population development, evaluating resistance management programs and evaluating area-wide management approaches.
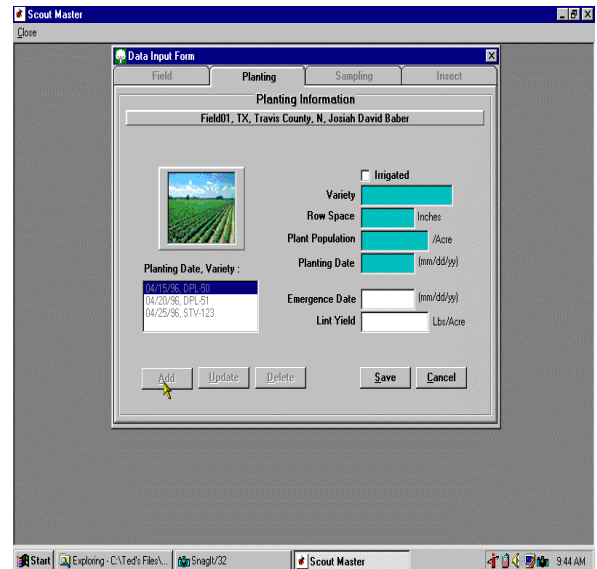


Figure 2. Agronomic information is entered in the planting input screen for each field. Screens can easily be updated later. Current field identification is displayed at the top of screen.
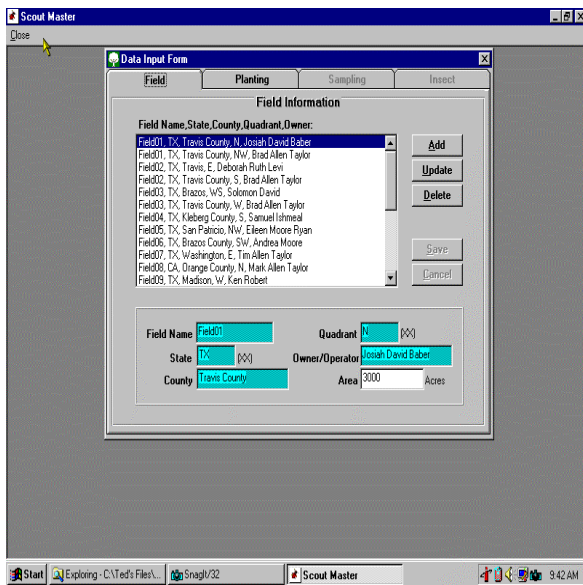


Figure 1. Field information for up to 500 fields is entered in the field input screen. Turquoise boxes (at bottom, color not visible here) indicate required inputs. Data can be updated or deleted.
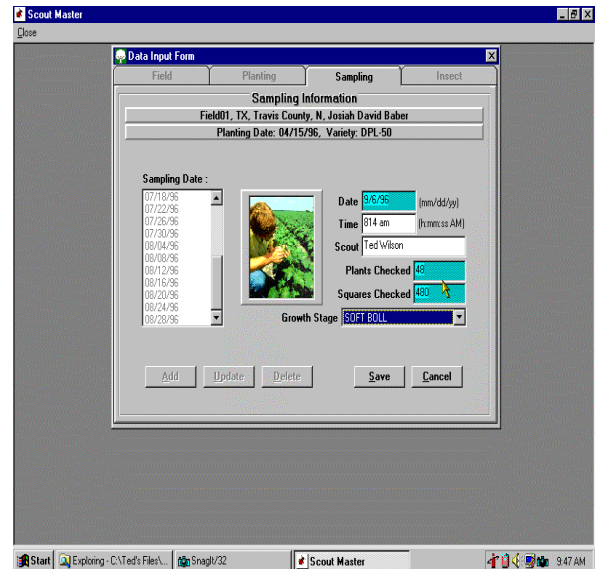


Figure 3. Information about the current sampling date is entered in the sampling input screen. The number of plants and squares checked are used in later automatic calculations. Growth stage is selected from a drop down menu. All available sampling dates for the current field are listed at left and can be selected for review.
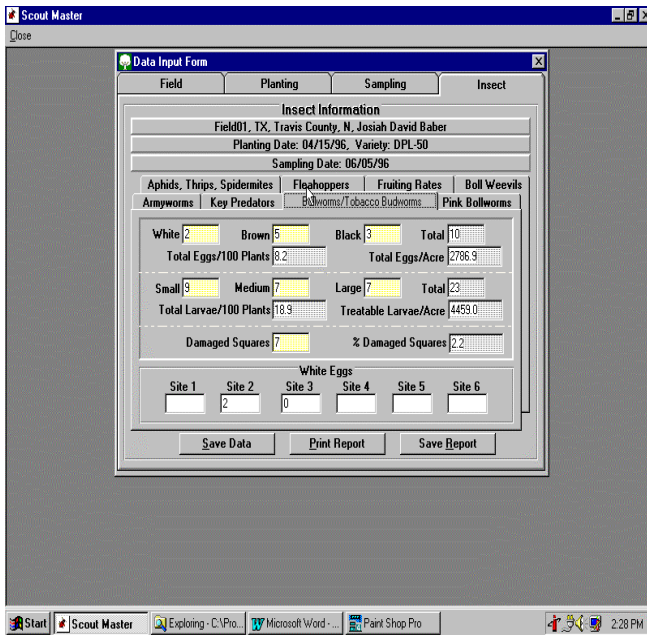
Figure 4. The insect, damage, and fruiting rate coutns are entered in the insect information input screen. Both totals and site (location in field) counts are displayed. Counts are entered by site (bottom of screen). Shaded boxes are automatic calculations based on information provided. Headings above site boxes ("white eggs" here) change for data entry of each parameter as it is selected in total boxes above.
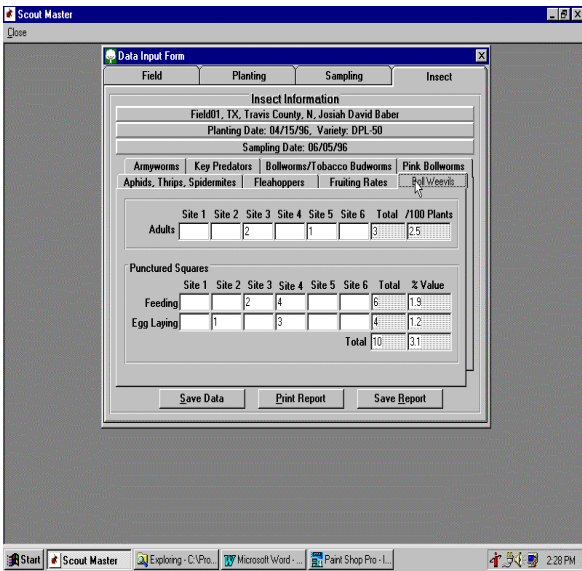


Figure 6. The scouting report form for each sample date can be printed for distribution to the grower. If data is entered only in site 1, then program prints total by field, not by site. Addition of georeferencing to SM May should allow production of filed map or report form.



Figure 5. Data for 10 insect pests, major beneficials, and simple plant mapping information can be entered in their individual sub-folders. The default case is "no data taken" if no number is entered. Sites can differ from each other in the number of plants checked, because graphics and calculations are based on total plants or squares checked.
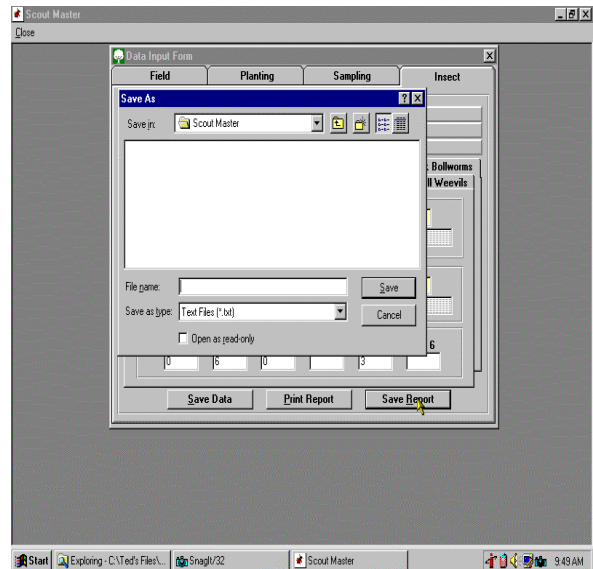


Figure 7. Insect data are saved in a data file for graphic output (save data). The scouting report form can be saved to another application, such as Word Perfect, so it can faxed or e-mailed (save report).
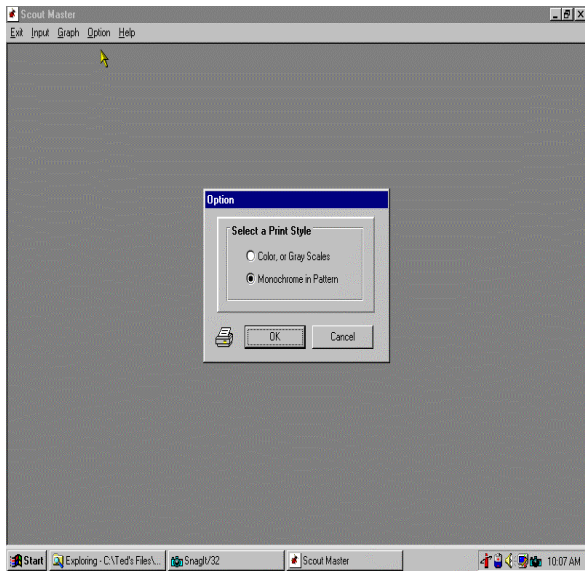
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Figure 8. Insect data can be graphed in either color or monochrome-hatched patterns. Computer screen always shows color.
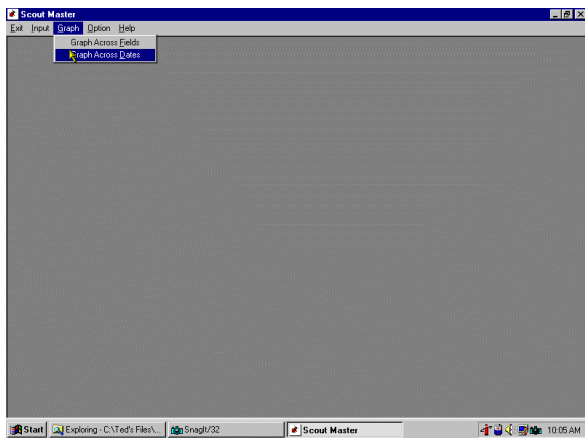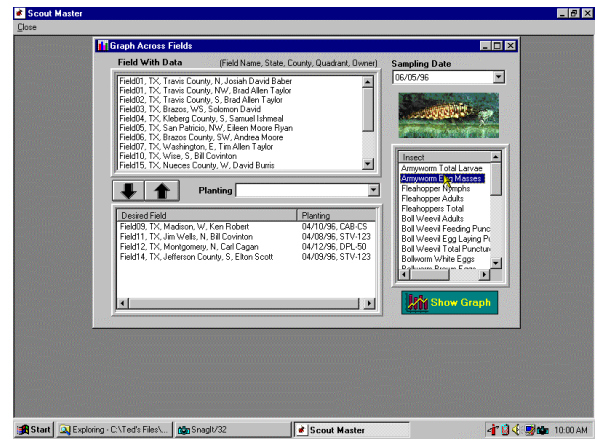


Figure 10. Up to 20 fields can be selected for graphing for a given sample date. Sample date is selected from upper right drop down menu. All fields with data for the selected date (+/- 2 days from the date) are listed at upper left. Fields are selected with down arrows for graphing. Changes in program will allow dragging of cursor over multiple fields in list. Insect or damage to be graphed is selected in lower right drop down menu.
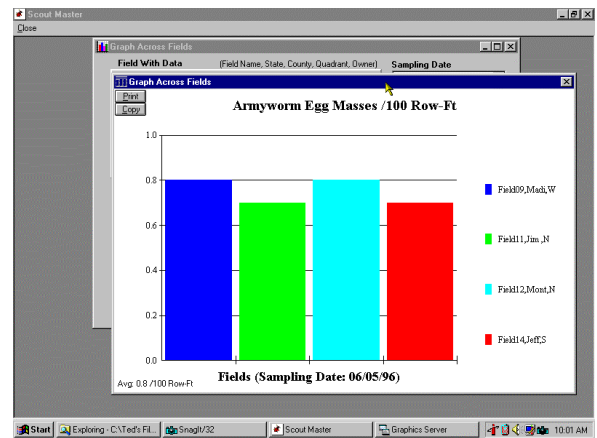


Figure 9. Data can be summarized by either graphing several fields for a given sample date (graph across fields), or by graphing a single field's count over several sample dates (graph across dates). Additions will include ability to graph average of all fields over time.



Figure 11. Example of graphing across several fields for a given date. (Color bars not visiblehere, black and white hatching was slected for this printout). Fields graphed were sampled within +/- days from date selected. Graph can be either printed or copied (using Windows copy/paste function) to another application (such as WordPerfect)) for further graph manipulation, e-mailing or faxing. Average values are returned in lower left corner.

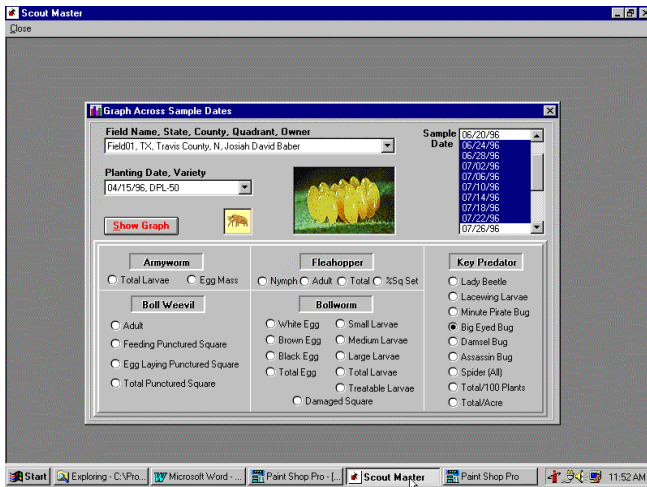Figure 14. Extensive help topics are provided in the help menu.

Figure 12. Option screen for graphing data for one field across several dates. Field is selected from drop down menu and sample dates with data for that field are displayed. Dates are selected by dragging cursor across dates. Insects to be graphed are selected below.
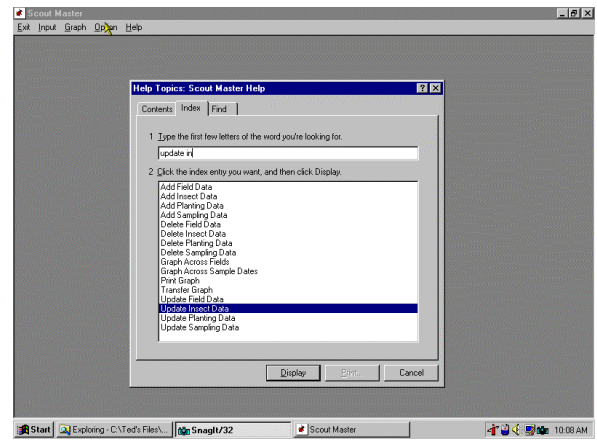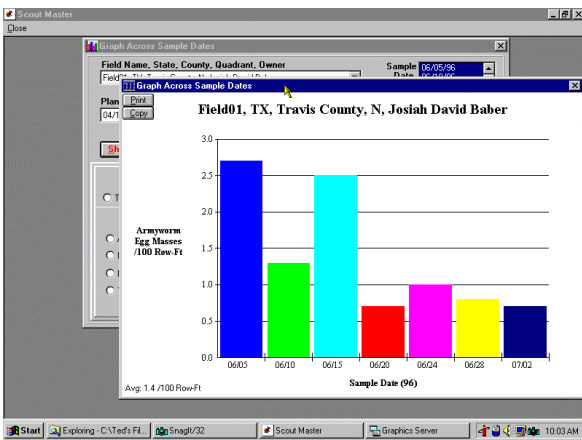


Figure 13. Example of graphing across dates for one field. Average is returned in lower left corner.