

**INTERNET INFORMATION DELIVERY SYSTEM  
FOR REPORTING HELIOTHINE MOTH  
TRAP CATCHES IN ARKANSAS**  
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**Abstract**

Realizing the importance of early detection of pests in the Arkansas cotton crop, and wanting to capitalize on the availability of the Internet and the technology that it provides, entomologists and computer specialists from the University of Arkansas Cooperative Extension Service have developed an on-line database system to allow cotton scouts from participating Arkansas counties to enter daily scout information and make statewide comparisons, thus allowing for trends in pest population to be determined quickly. The focus of the program during the first year, during which 14 Arkansas counties participated by reporting 8060 observations, included the tobacco budworm, *Heliothis virescens* and the cotton bollworm, *Helicoverpa zea*. The ability to have statewide information on a daily basis leads to a better response time for the producer and consultants in controlling the pests.

**Introduction**

Bollworm and budworm infestations have been taking their toll on Arkansas' cotton crop, being the most expensive pest to control four of the previous five years from 1995 - 1999. These pests have also caused an average reduction in yield of Arkansas cotton by 3.056 % for the previous five years (Williams, 1999).

Increased resistance to insecticides has made control of these pests more difficult (Allen et al., 1999). The early detection of any pest is of prime importance in controlling the pests' effect on the host crop, and being able to accurately estimate the current population level is most beneficial to cotton producers. The placement of traps, the number of traps used and continuous sampling of adult moth activity during the growing season are critical components in the Arkansas Integrated Pest Management program (Lorenz et al., 1999). The Trap and Survey Summary System hosted by the University of Arkansas Cooperative Extension Service provides this information as close as the nearest computer with Internet access.

Previous versions of this program were MS-DOS based and did not provide a means for statewide data comparisons or compilations. The on-line concept of the current version of the program not only provides an ease of entry, but a quick and easy way to retrieve county and state summaries and comparisons, while enabling quick program updates because of the central location of the main program.

Data is entered on an actual count-per-trap basis. These actual counts are then calculated into a daily average per trap. Graphs are created using calculated average (Figures 1 and 2).

Future updates of this program for 2001 will use the species composition formula or ratio of tobacco budworm to bollworm in creating graphs, and additional graph types will be used. (Figure 3). Additional surrounding states are also invited to participate in the program.

**Methods**

This system consists of cooperator enrollment screen, trap enrollment screen, and daily scout screens to allow for daily entry of trap counts on seven types of species: tobacco budworm (*Heliothis virescens*), cotton bollworm (*Helicoverpa zea*), boll weevil (*Anthonomus grandis*), Armyworm (*Pseudaletia unipuncta*), fall armyworm (*Spodoptera frugiperda*), beet armyworm (*Spodoptera exigua*), Southwestern corn borer, and European corn borer. Counts for tobacco budworm and cotton bollworm were entered daily, or as scouted. Data could be accumulated immediately to provide the user with a graph reflecting trap counts and averages with a user-specified range from one to seven days. Data could also be downloaded in a comma-delimited format to allow for importation into a spreadsheet. This is useful when creating county specific graphs or when needing to customize graphs for a specific purpose.

The Texas cone pheromone trap designed by Hartstack et al (1979) is used throughout Arkansas for most moth species. The total trapping system involves around 500 traps distributed throughout the counties that are involved with crop production. Traps are monitored each week from 1 to 5 times depending on the species. Typically, the armyworm traps are monitored weekly and others from 2 to 5 weekly. County Extension Agents with the University of Arkansas Cooperative Extension Service coordinate the monitoring of pheromone traps. Scouts, county agents, cooperating consultants and agri-business personnel conduct monitoring. Pheromone is purchased from Hercon Inc. and Great Lakes IPM Inc.

Data entry began on June 7, 2000, by designated users in the cotton producing counties of Ashley, Clay, Crittenden, Drew, Jefferson, Lafayette, Lee, Lincoln, Lonoke, Monroe, Phillips, St. Francis, White, and Woodruff in Arkansas.

Each county could enroll their traps by individual cooperators, or a "cooperator" could become an actual trap type, which enabled users to read graphs in a more descriptive manner. Information for each trap enrolled included the trap type, location description, longitude, and latitude. Daily trap count data recorded included beginning date of scouting period (usually the previous day), ending date (the day the count was made), the actual count and whether or not the trap was actually scouted. Traps that were not scouted were not included in the daily trap average so as not to skew the data.

**Discussion**

The Trap and Survey Summary System provides an easy method to summarize pheromone trap data collected throughout the state. Data is collected on several species of pests that commonly occur in Arkansas. The most commonly surveyed insect species are the tobacco budworm and cotton bollworm. These species are economically important to cotton in Arkansas and the data collected is used to aid cotton producers in the selection of insecticides.

The Trap and Survey Summary System is hosted on a Gateway 7210 server running Windows NT with 512 Meg of RAM. The system consists of two access points. The first is located at [http://apps.uaex.edu/TrapPublic/trap\\_home.asp](http://apps.uaex.edu/TrapPublic/trap_home.asp) and allows for public access so that anyone can review a graph for a given Arkansas county for a particular species. This page is also accessible from the IPM home page at <http://ipm.uaex.edu>

The second access point is used only by registered users of the system, and is located at [http://apps.uaex.edu/Trap2000/Trap\\_Home.asp](http://apps.uaex.edu/Trap2000/Trap_Home.asp). Users are required to obtain a login and password, and may then enter information as needed into the system. Users only have direct access to data that they have

entered, although they can see graphs of any and all information entered into the system.

Entomologists from surrounding states who are interested in participating in our program are encouraged to contact us at bbridges@uaex.edu or djohnson@uaex.edu for additional information, or visit our home page of the University of Arkansas Cooperative Extension Service at <http://www.uaex.edu>.

### References

Allen, Charles T., Marwan S. Kharboutli, Kenneth R. Williams. Insecticide Resistance in Tobacco Budworm and Cotton Bollworm in Southeast Arkansas. AAES Special Report 193. pp 223-227.

Hartstack, A. W., J. A Witz, and D. R. Buck. 1979. Moth Traps for the Tobacco Budworm. J. Econ. Entomol. 72:519-22.

Lorenz, Gus, Donald R. Johnson, Charles Allen, Glenn Studebaker, 1999. Using Moth Traps in Cotton IPM Programs. FSA 7050. University of Arkansas Cooperative Extension Service.

Williams, M.R. 2000. Cotton Insect Losses 1999. Proceedings Beltwide Cotton Conferences. pp. 887-913.

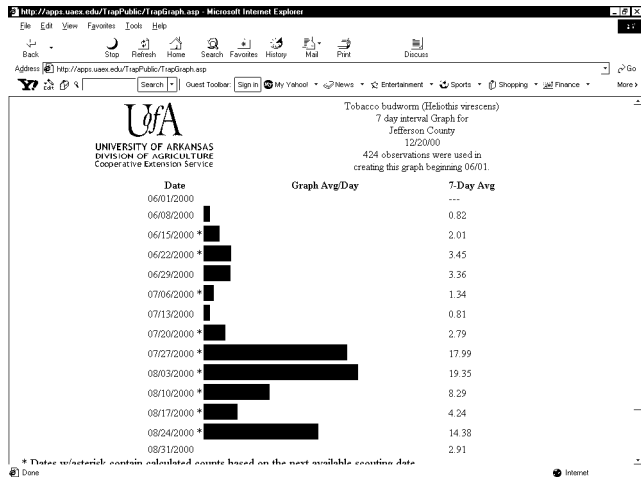


Figure 1. Tobacco Budworm (*Heliothis virescens*) 7-day interval graph for Jefferson County, Arkansas 2000.

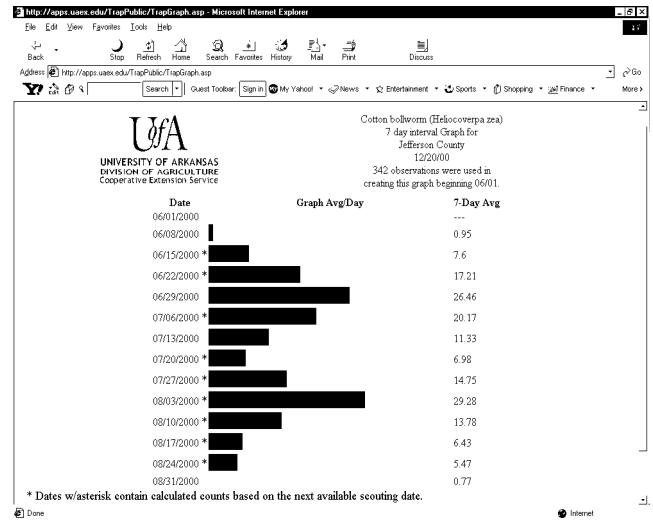


Figure 2. Cotton bollworm (*Heliocoverpa zea*) 7-day interval graph for Jefferson County, Arkansas 2000.

### Jefferson County, Arkansas 2000 Trap Averages

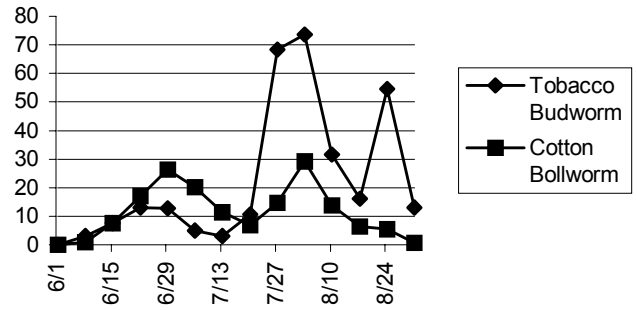


Figure 3. Bollworm and Tobacco Budworm Trap Count Averages Jefferson County, Arkansas.