

SEASONAL ABUNDANCE OF 13 SPECIES OF MOTHS CAUGHT IN LIGHT TRAPS IN TENNESSEE

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As a part of a study of the biology of the armyworm (*Pseudaletia unipuncta* (Haw.)), a number of light traps were placed in operation in Tennessee. The chief purpose of operating the light traps was to accumulate data on seasonal abundance over a period of years. Also the light traps served as an experimental survey method with the possibility that traps would be of value in warning farmers of impending outbreaks. In addition to the armyworm, records were obtained on 12 other species of economic importance, namely:

Feltia subterranea (F.), granulate cutworm; *F. gladiatoria* (Morr.), clay-back cutworm; *F. ducens* and *F. subgothica* (Haw.), dingy cutworm*; *Agrotis ipsilon* (Hufnagel), black cutworm; *Caenurgina erechthea* (Cram.), forage looper; *Heliothis zea* (Boddie), corn earworm; *Amathes c-nigrum* (L.), spotted cutworm; *Laphygma frugiperda* (J. E. Smith), fall armyworm; *Peridroma saucia* (Hub.), variegated cutworm; *Prodenia ornithogalli* (Guen.), yellow-striped armyworm; *Protoparce sexta* (Johan.), tobacco hornworm; *Protoparce quinquemaculata* (Haw.), tomato hornworm.

The trap was modified from an early model (Peterson 1934), using a 10-gallon garbage pail (Fig. 1A, B, C). The source of light consisted of two 15-watt, black light lamps—designated in the trade as “BL” (black light) fluorescent-light lamps. About 1 gallon of isopropyl alcohol was placed in each trap as a killing agent. During the season from March 1 to November 15 about 25 gallons of isopropyl alcohol were required for each trap. The traps were emptied every Monday morning by pouring the alcohol through a strainer. The insects were then placed without drying in a syrup can, either a 5- or 10-pound size, and mailed to the Entomology Department at Knoxville, Tennessee, for identification. The alcohol was poured back into the trap and re-used. During periods of heavy flights the alcohol had to be renewed, as it became greasy resulting in discoloration of the moths. It was found that better specimens were obtained, especially in the summer when moth flights were heavy, if the insects were removed daily and allowed to dry. Usually the weekly collections were received in excellent condition.

The traps were located at and operated by the superintendents of branch agricultural experiment stations with the exception of those in Johnson County which were operated by County Agricultural Extension Agent John E. Walker. The site in Johnson County (extreme northeast Tennessee) was at an altitude of 2,500 feet; the site in Madison County (west Tennessee) was about 500 miles distant at an elevation of 400 feet

Fig. 1A. Light trap constructed from a 10-gallon garbage can. Note that the top has been cut out and replaced with a funnel and baffel which supports the lamps and aids in directing the insects downward.

* Moths of these two species are difficult to separate and since their occurrence is similar they are reported as one species.

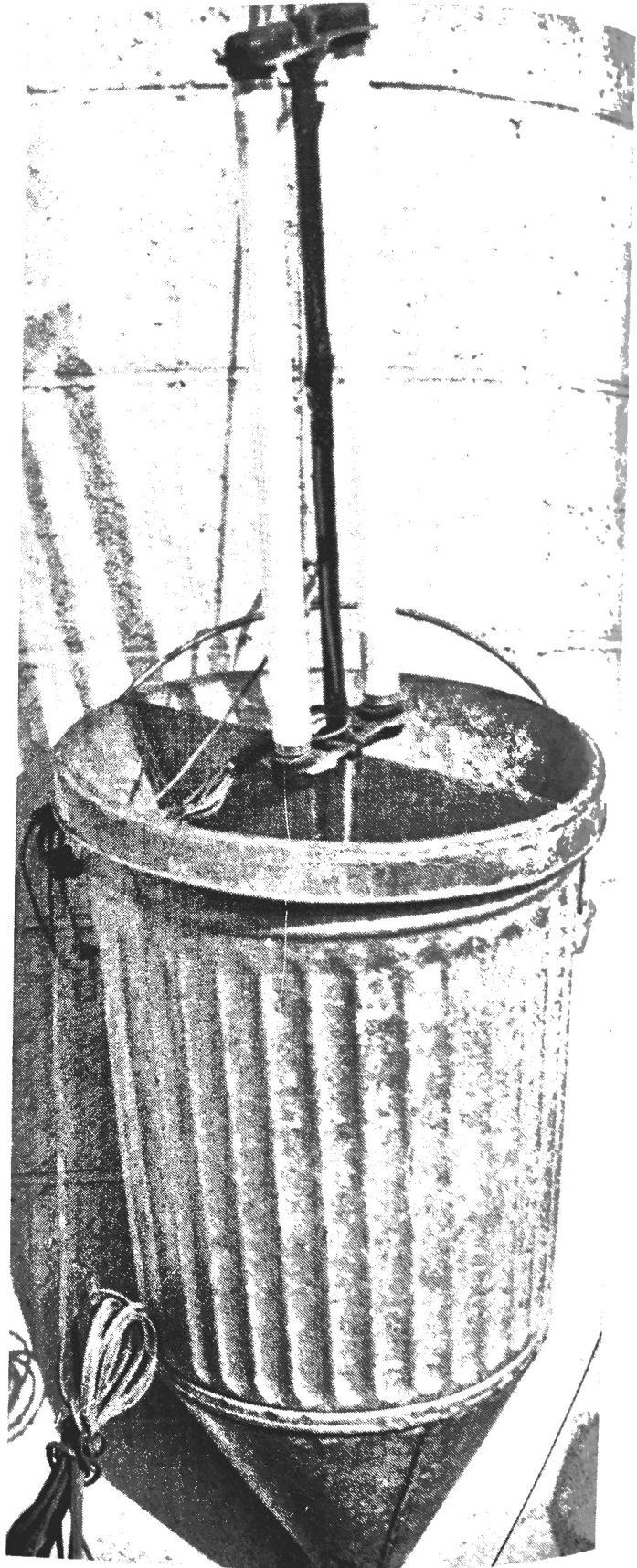


Fig. 1A.

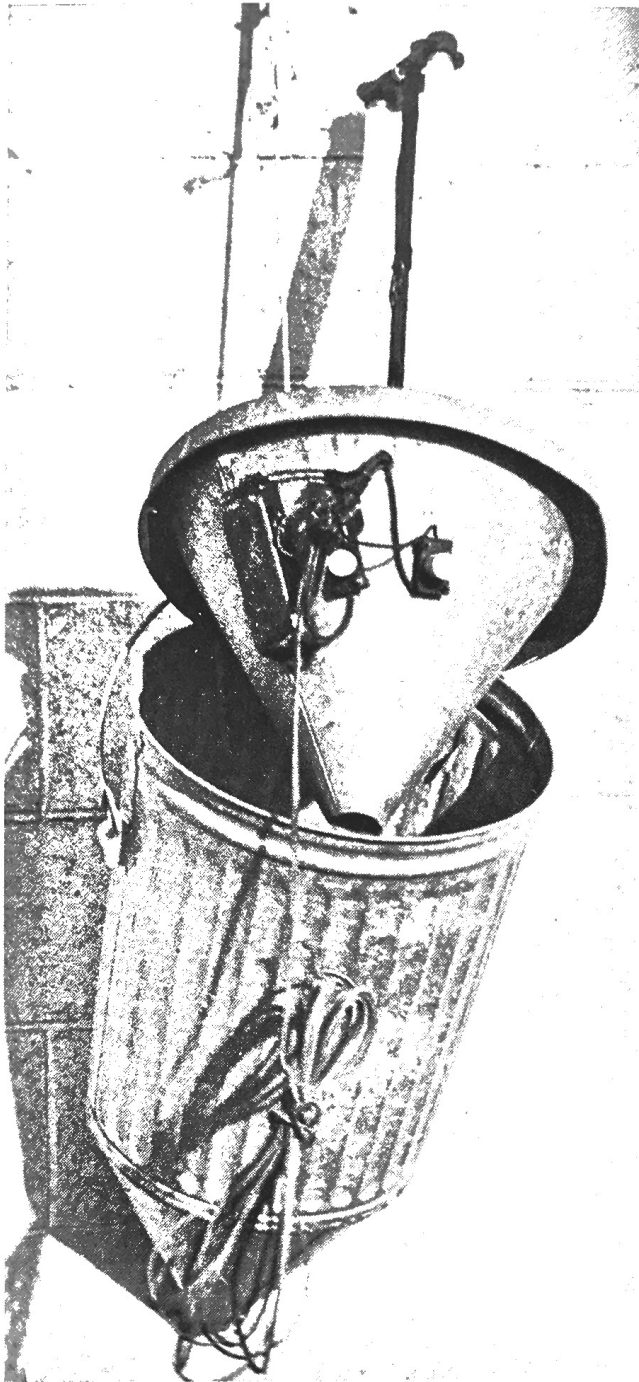


Fig. 1B. This shows a method of locating the balast and starters which are necessary for this type of light.



Fig. 1C. This shows the method of keeping rain out of the trap. A small screen-covered funnel with a stem is positioned directly under the top funnel thus permitting the rain to pass through. About 1 gallon of isopropyl alcohol is poured into the trap which kills and preserves the specimens.

(Fig. 2). Traps were abandoned in Marion County because large numbers of "caddiceflies" ruined the collection almost weekly, and in Shelby County, because of "diving" beetles and giant water bugs.

The data are presented in chart form in plates 1 through 12 to show the seasonal occurrence of moths of the various species for the years of 1955-58. In the multi-brooded species the broods are often obscured due to overlapping; for example, the armyworm has 5 broods of moths, but without rearing records the two summer broods would have been considered as only a single brood. Due to the multiplicity of various ecological factors no attempt has been made to correlate the abundance of moths with rainfall, temperature, etc. In general, the light traps have served as a good survey too, even though no outbreaks occurred within the local vicinity of any trap. In two instances, following a catch of about 1,000 armyworm moths per week, light and inconsequential infestations were reported. In another instance corn earworm moths were caught at the rate of 5,000 per week for three weeks at Jackson, Tennessee, but no outbreak either on corn or cotton was subsequently reported in that vicinity.

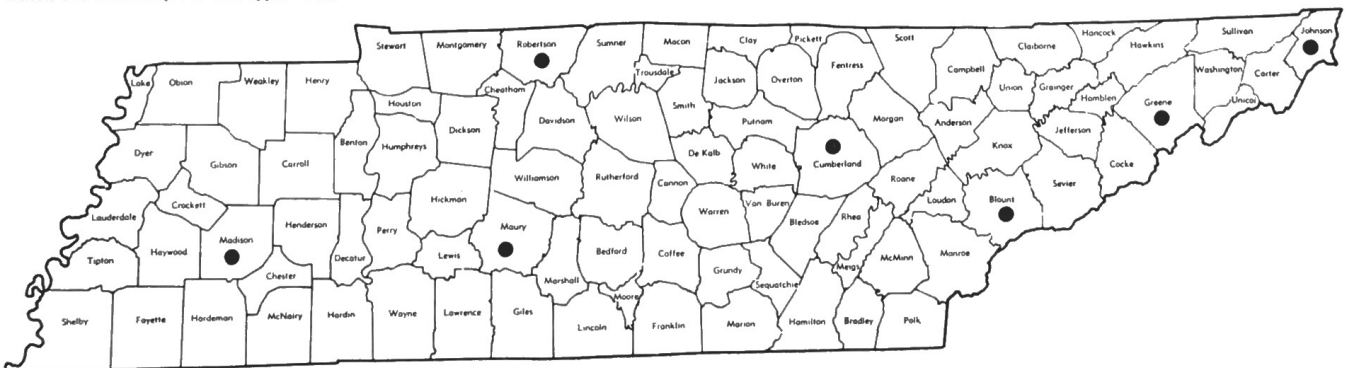
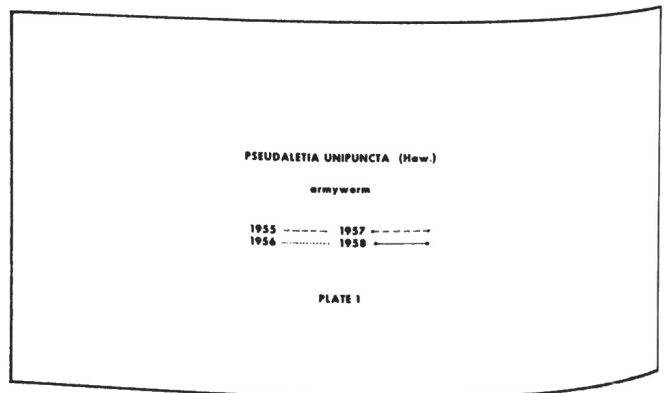
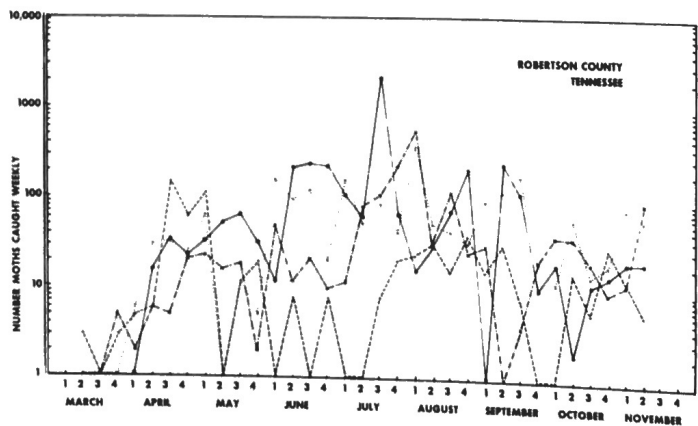
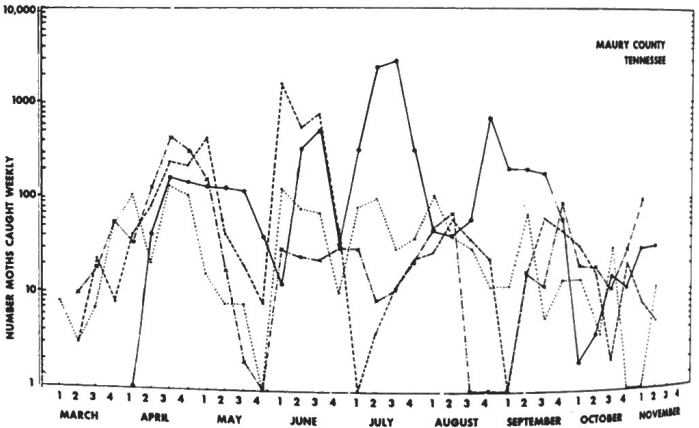
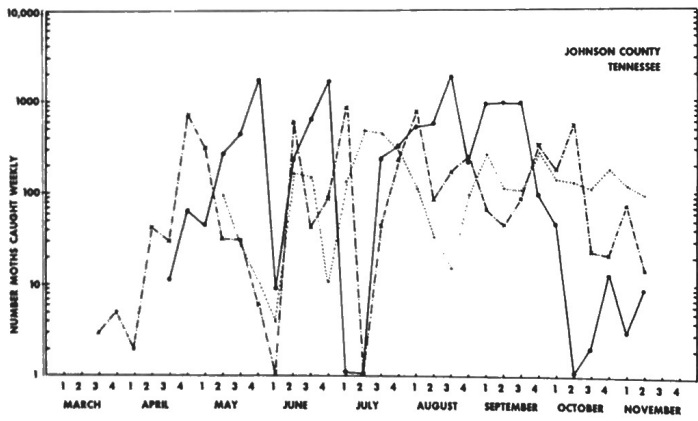
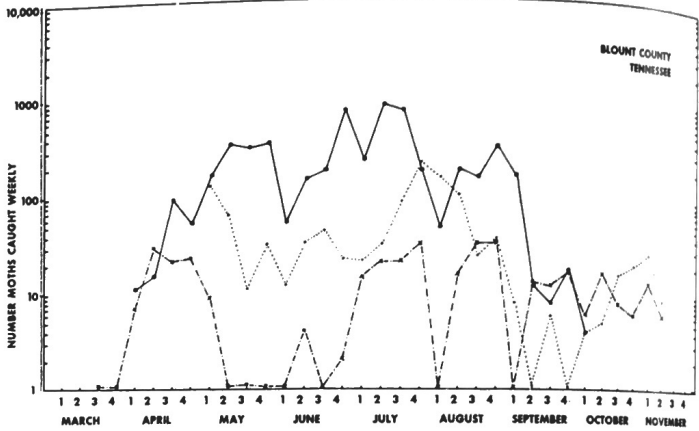
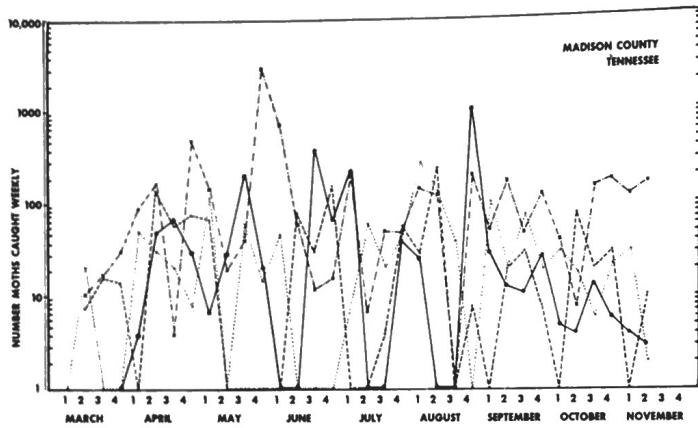
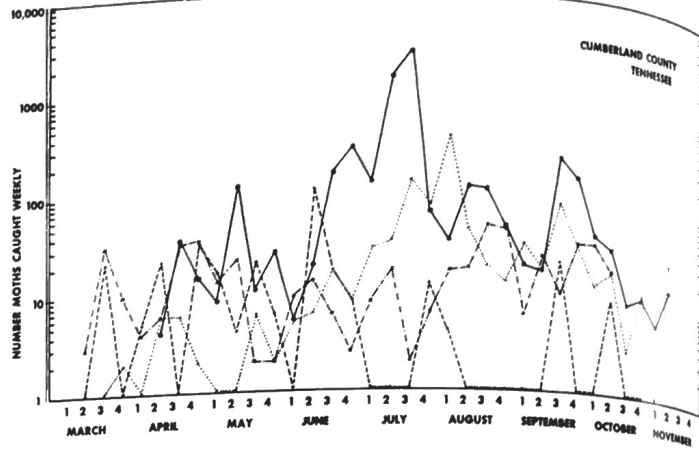
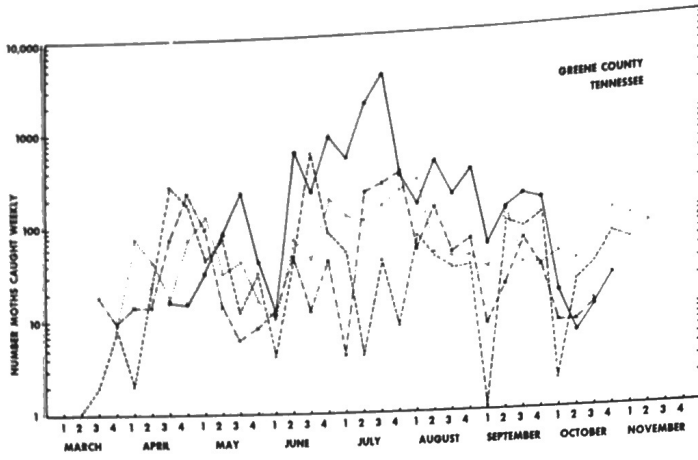
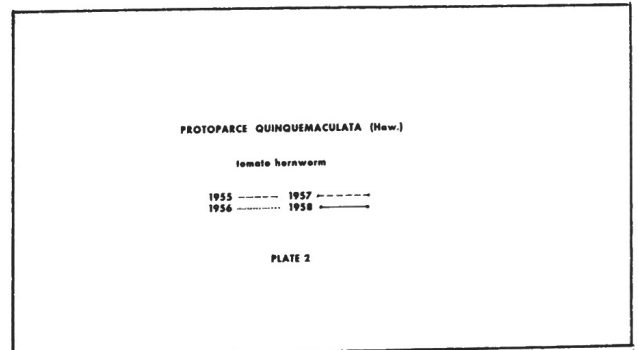
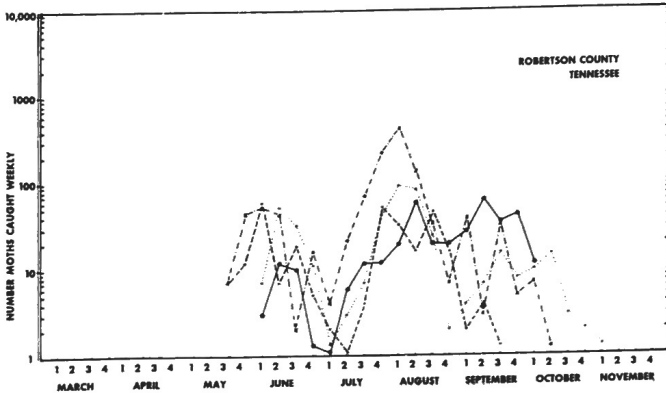
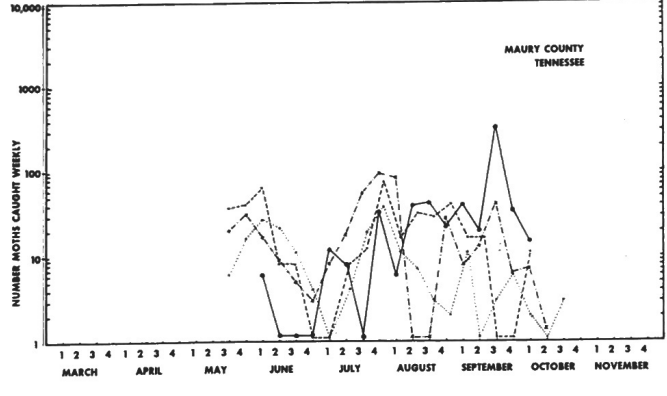
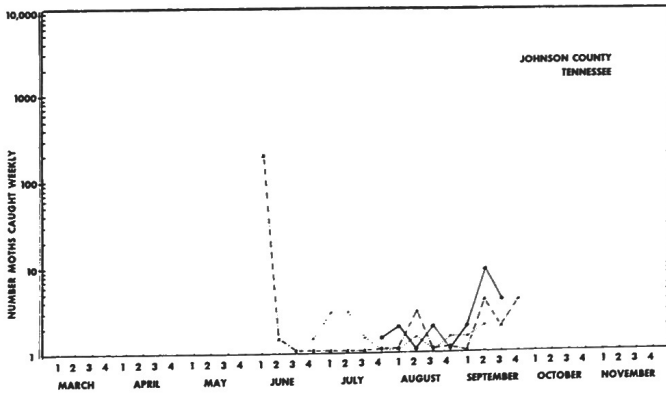
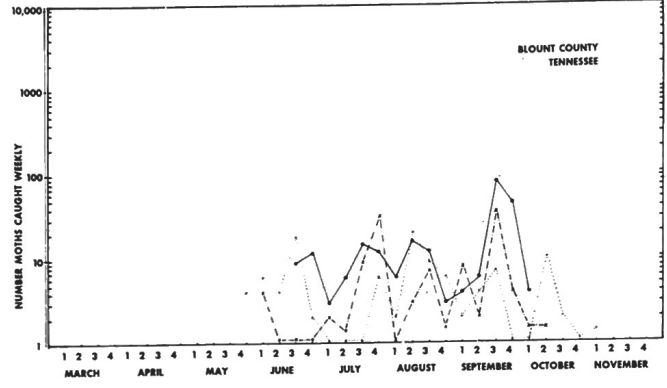
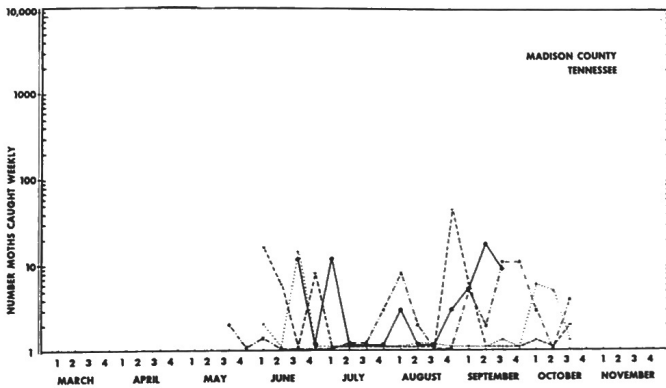
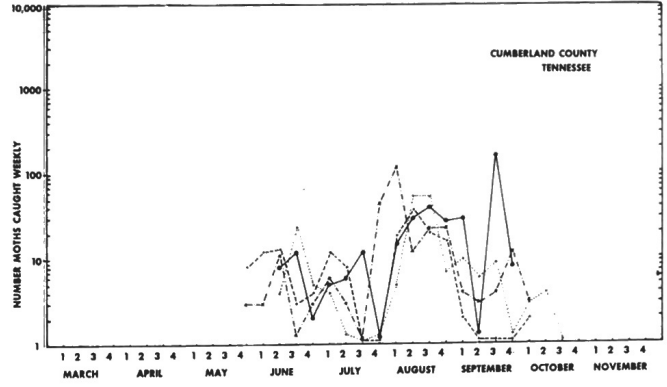
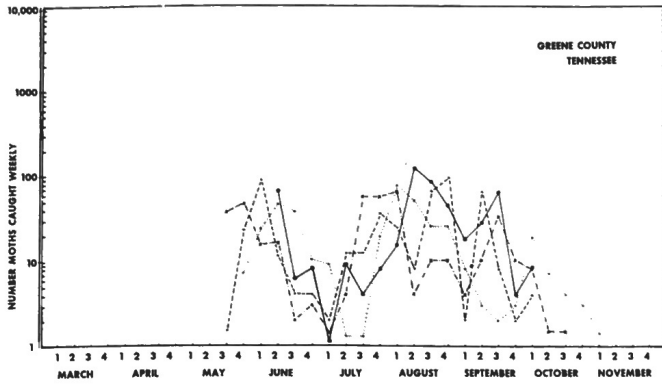
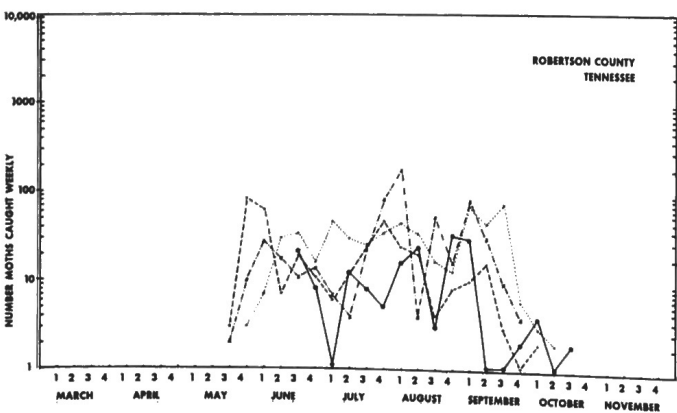
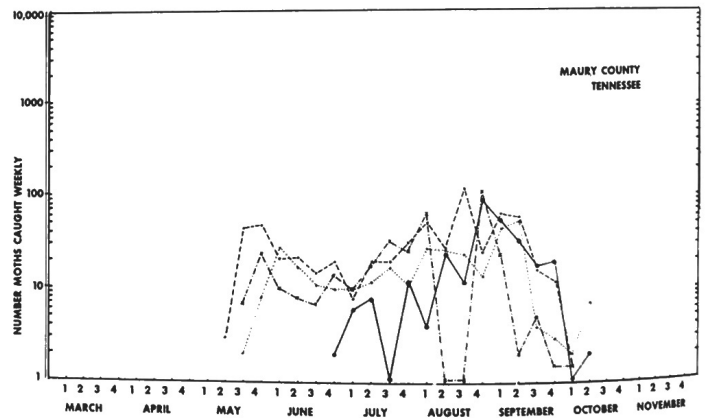
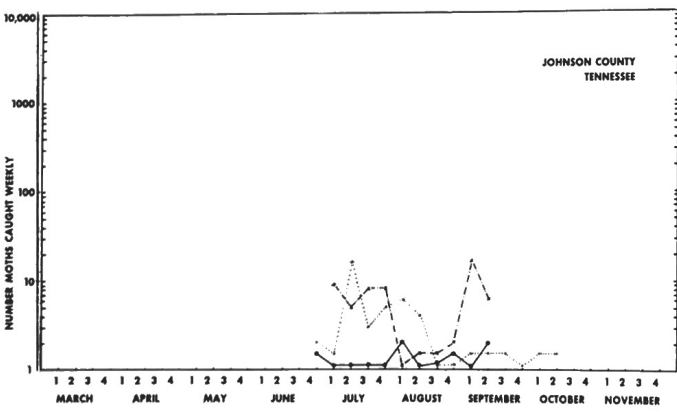
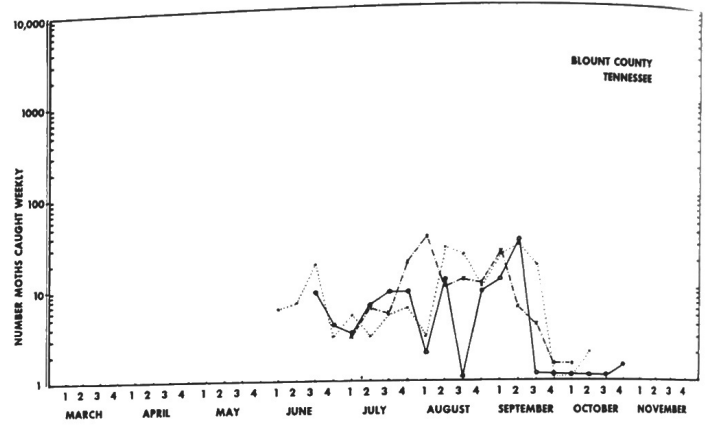
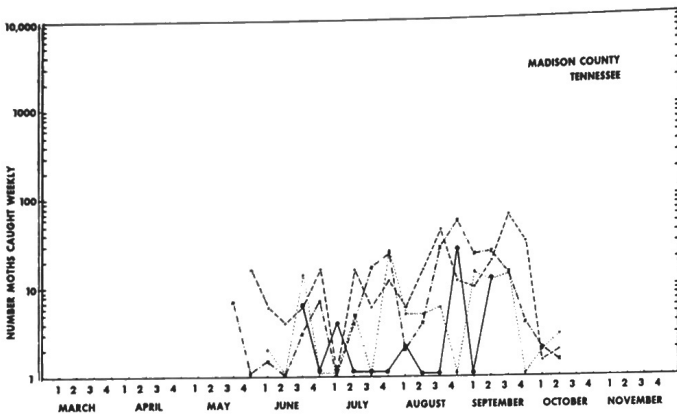
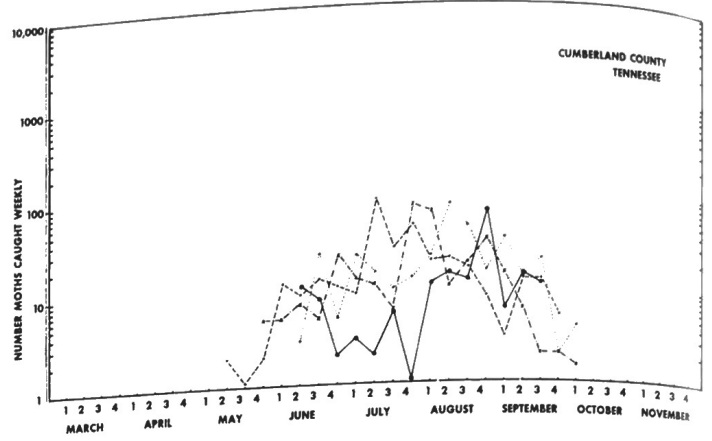
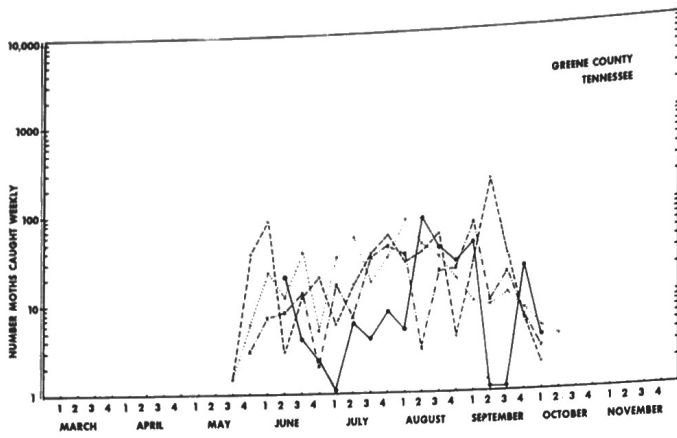


Fig. 2. Location of traps in Tennessee.



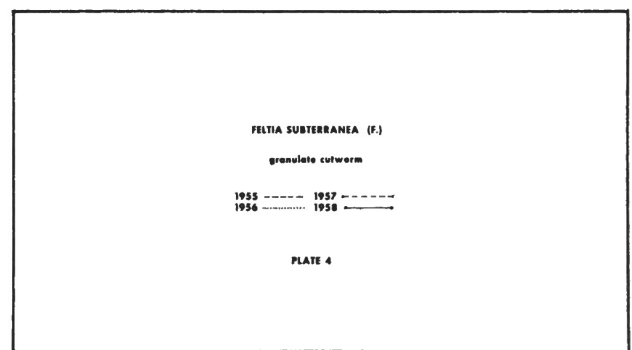
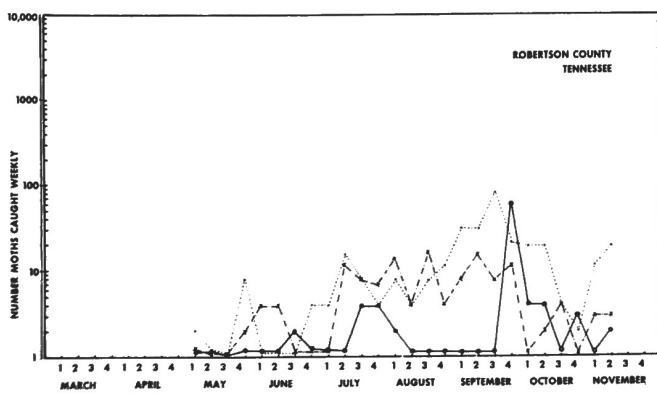
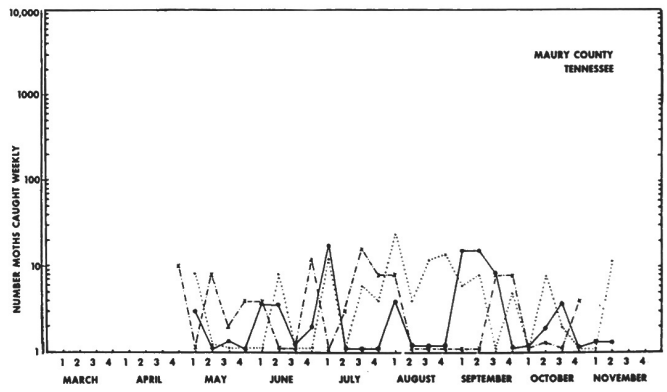
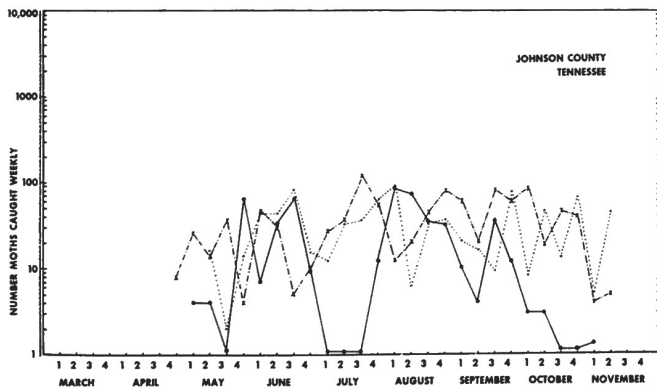
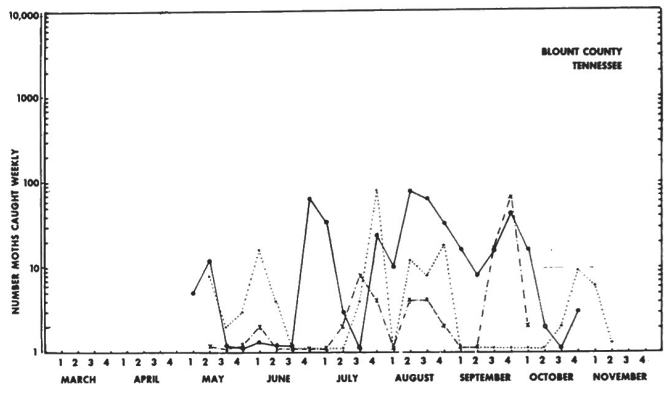
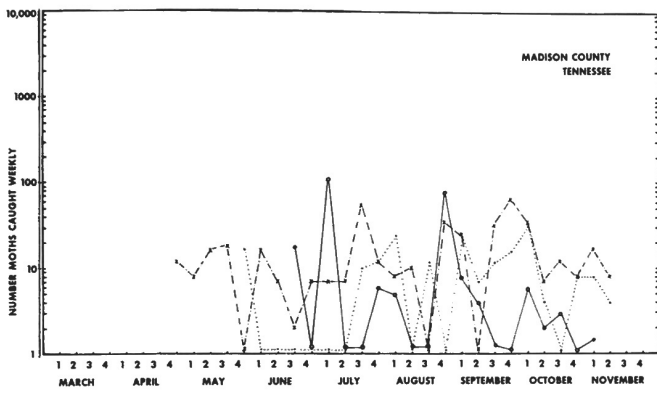
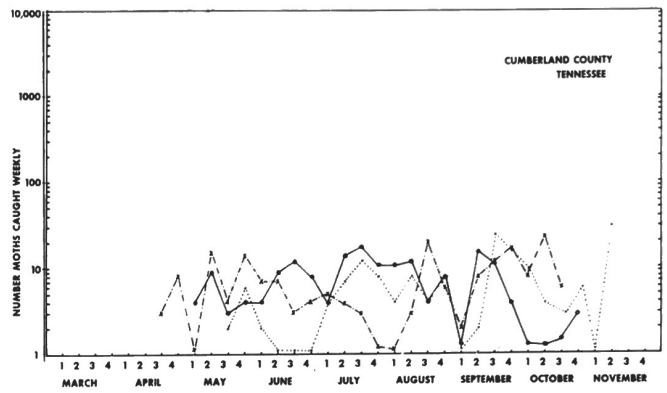
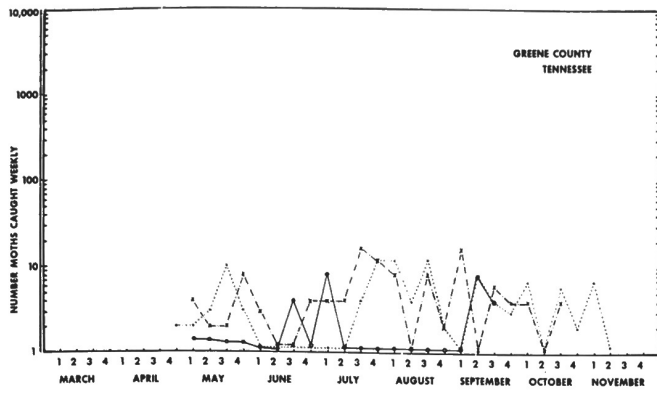


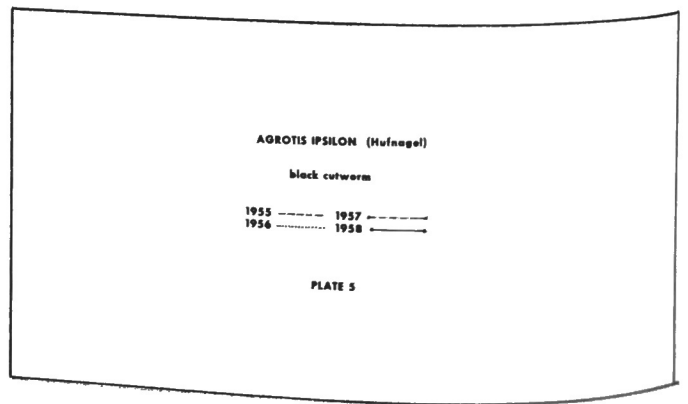
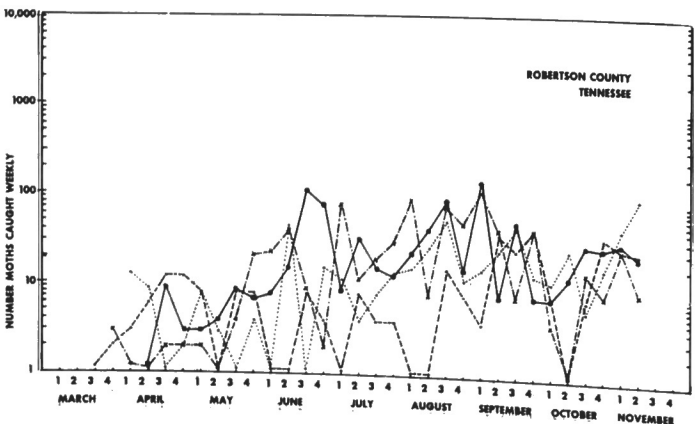
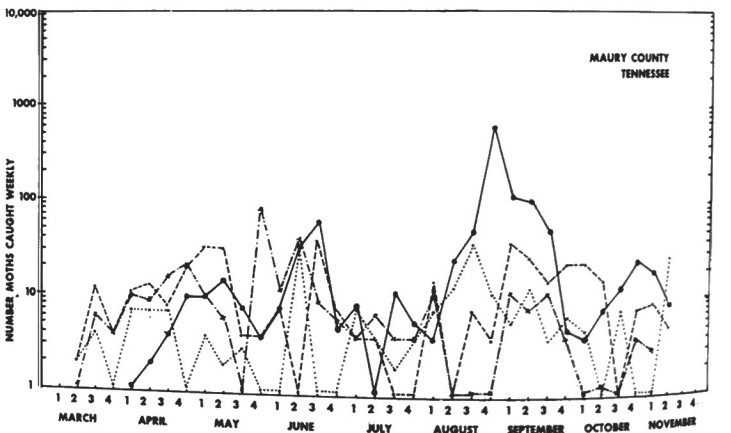
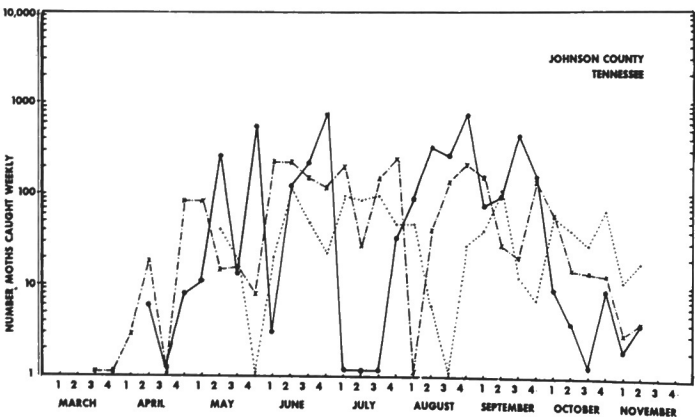
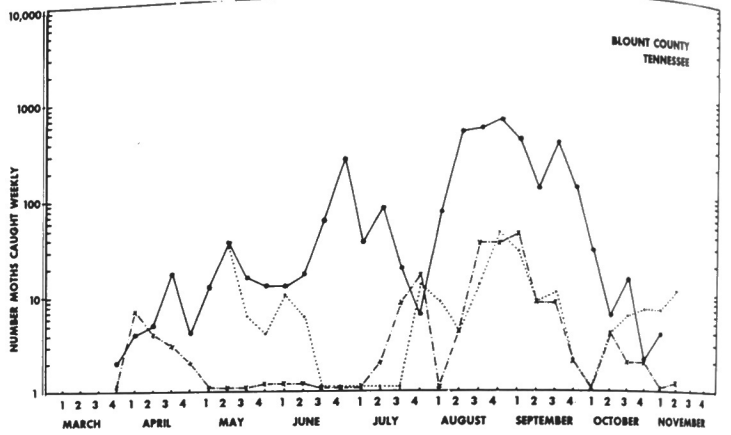
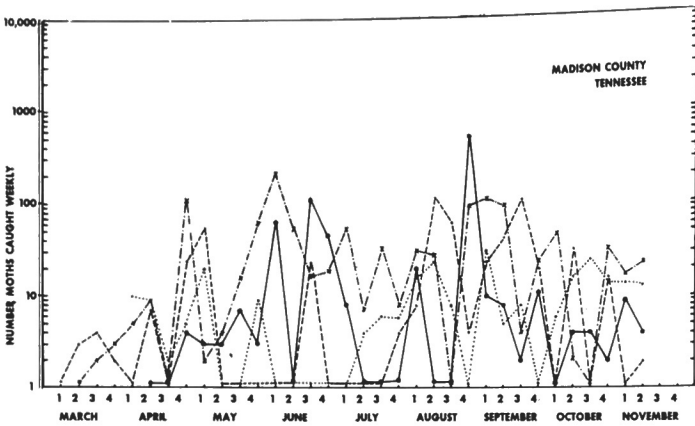
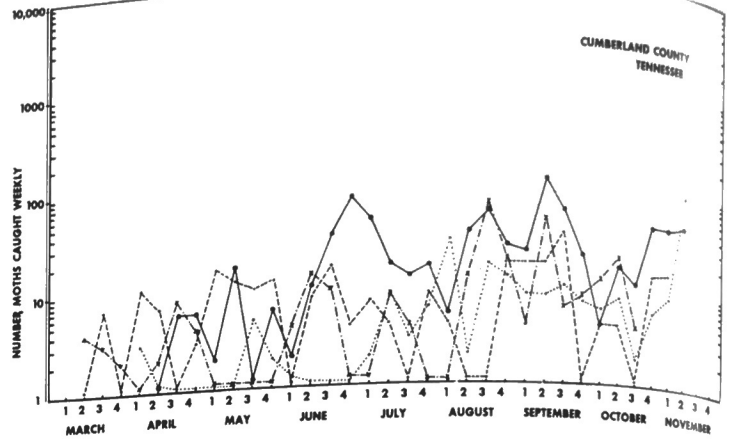
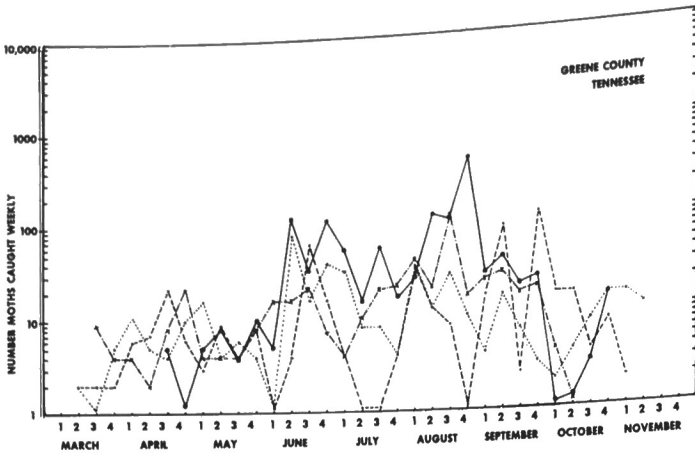


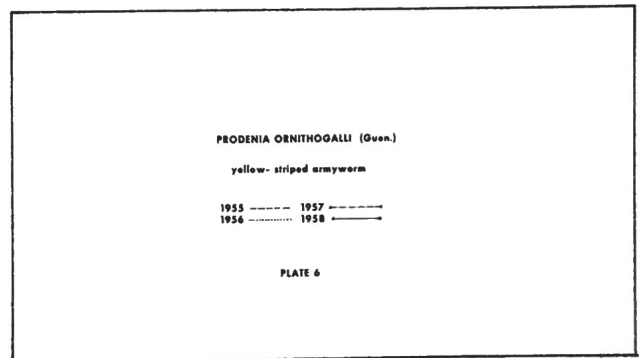
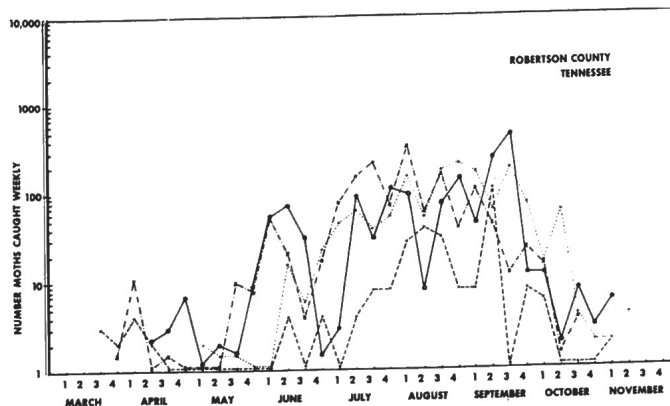
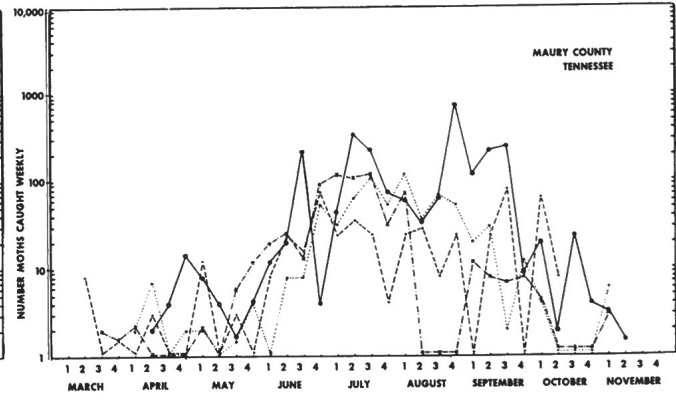
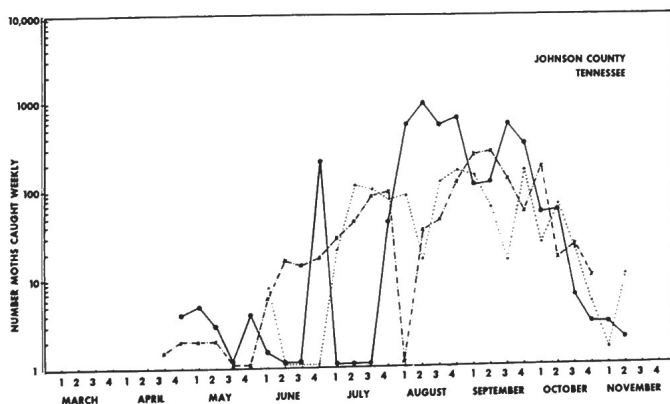
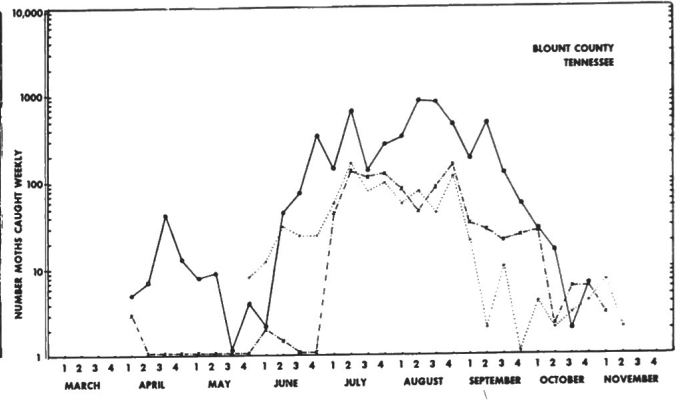
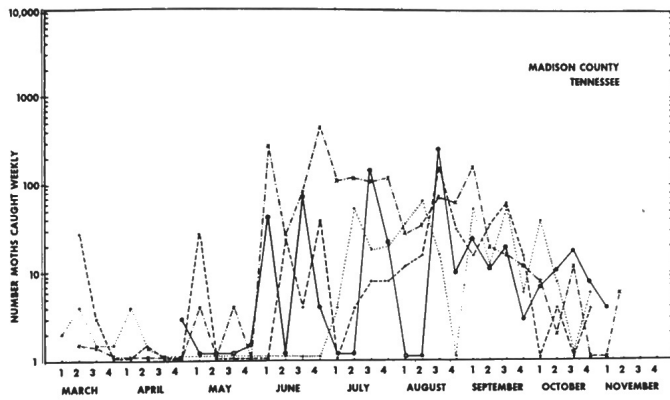
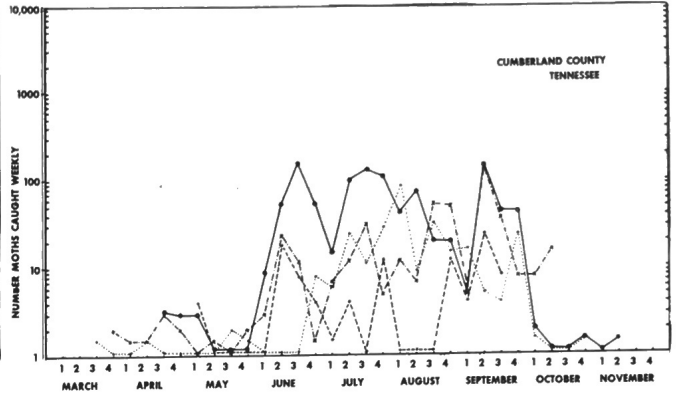
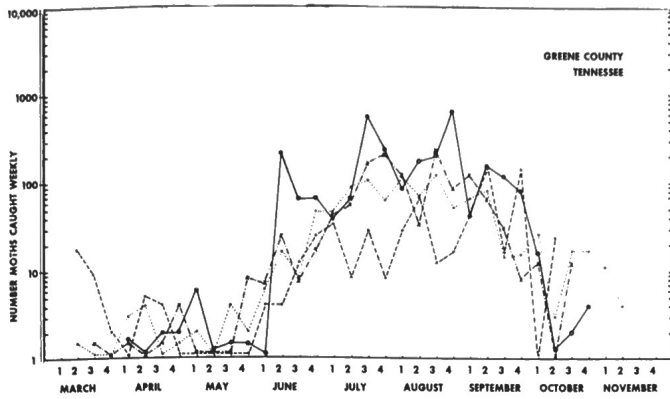
PROTOPARCE SEXTA (Johan.)
tobacco hornworm

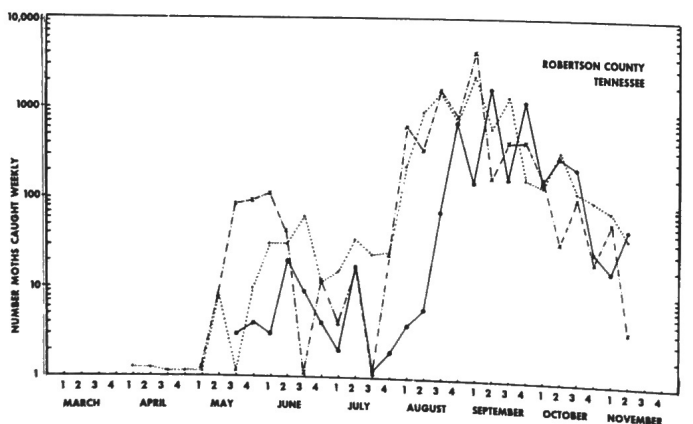
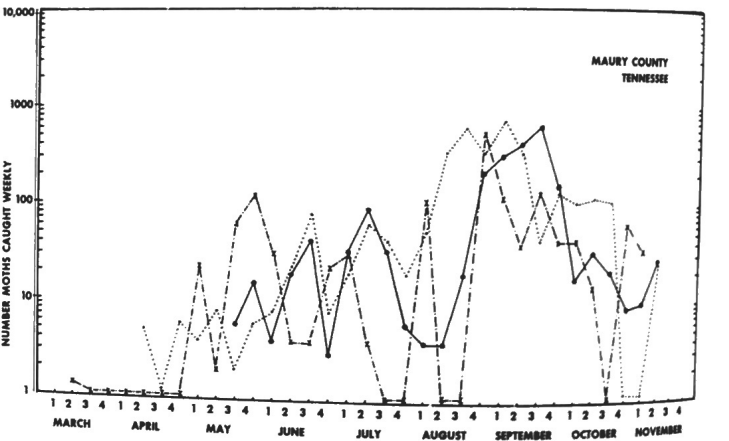
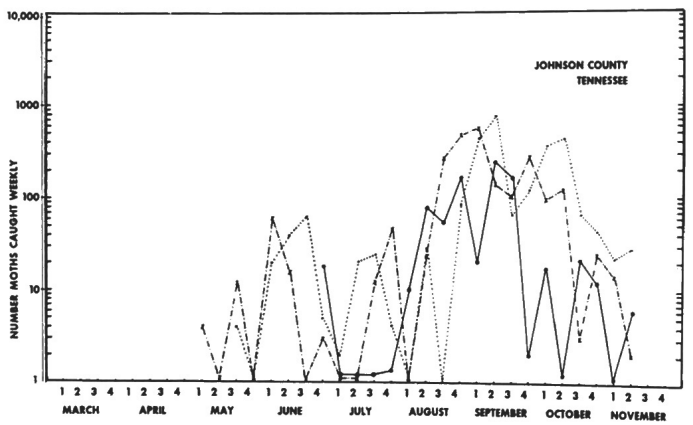
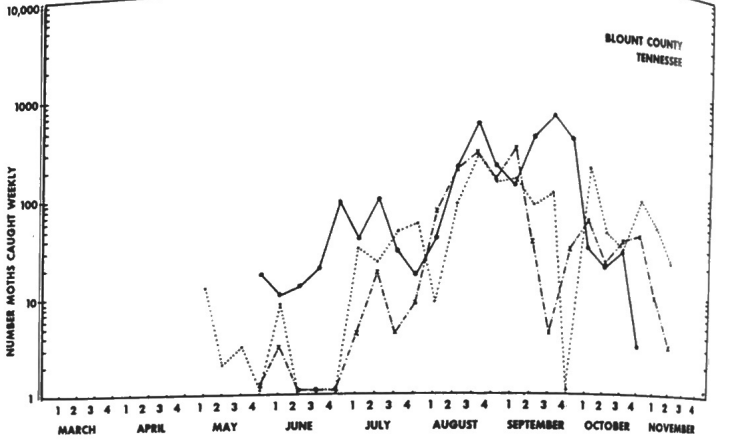
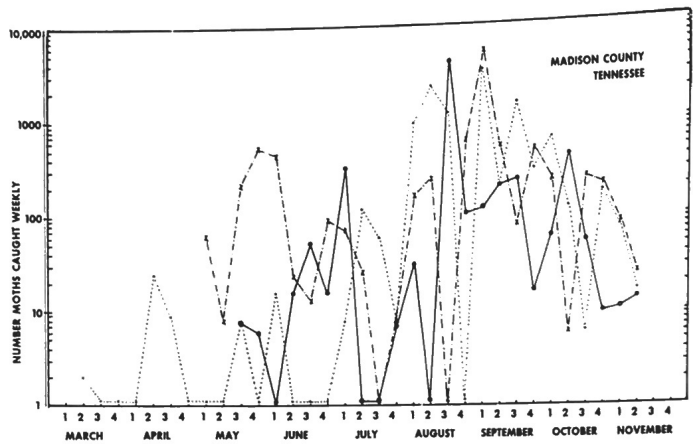
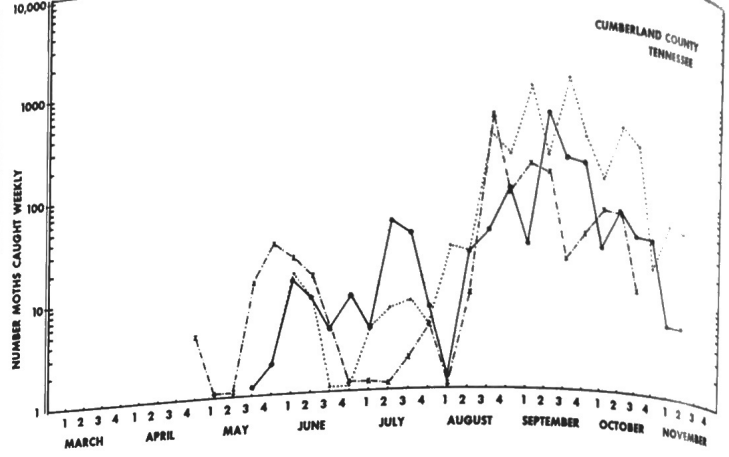
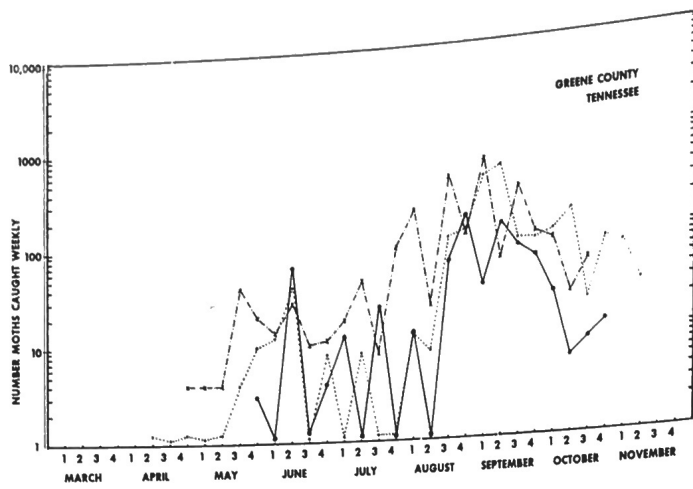
1955 - - - - - 1957 - - - - -
1956 ······ 1958 ————

PLATE 3





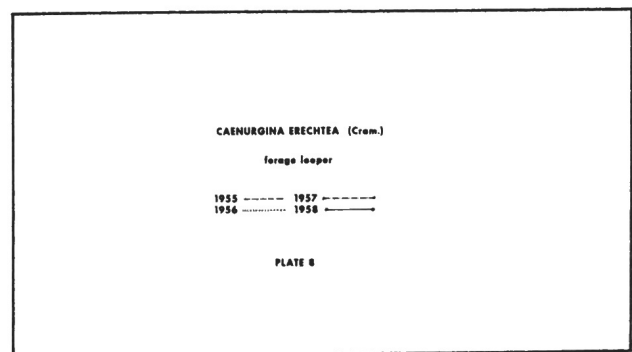
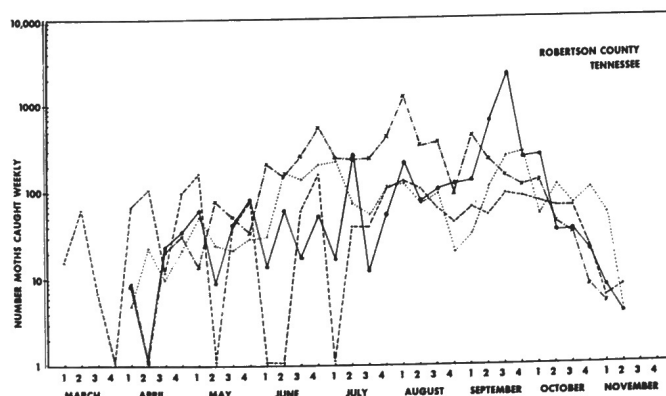
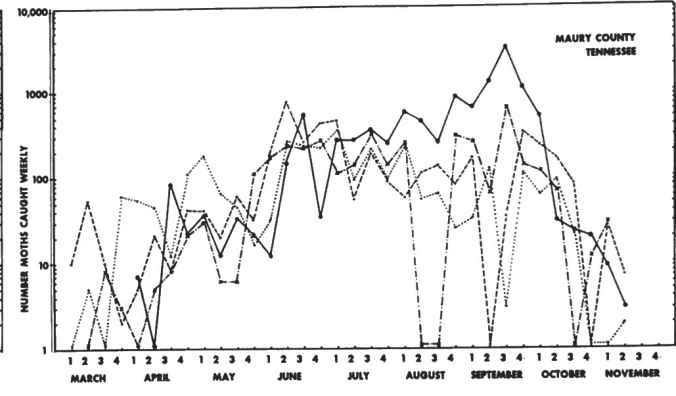
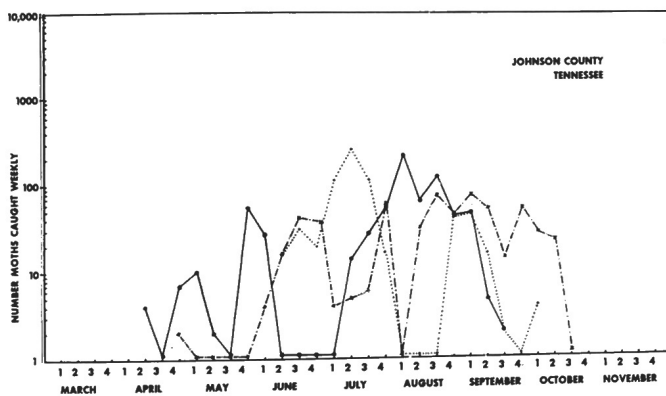
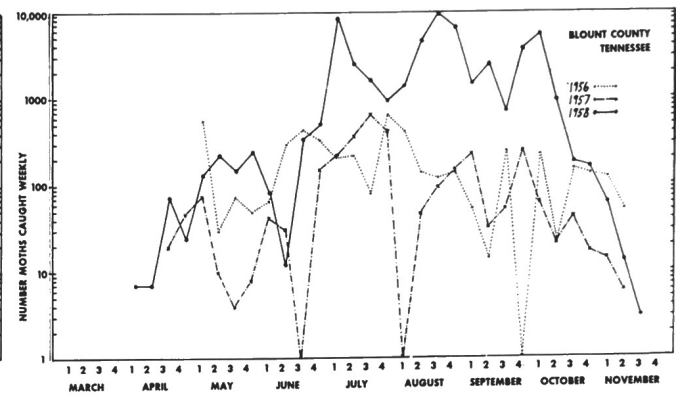
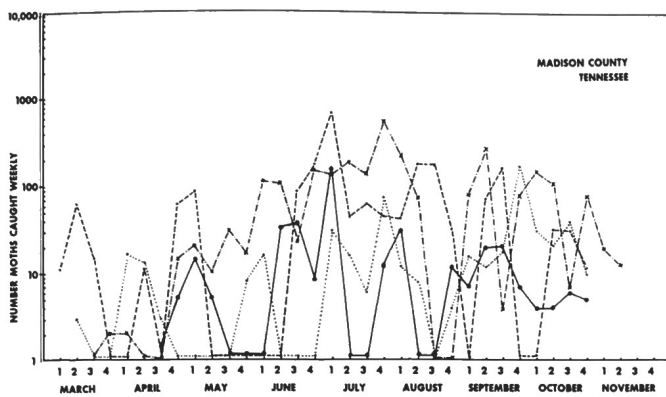
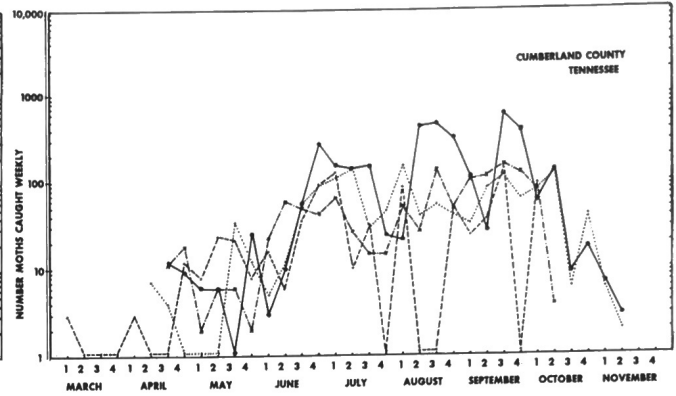
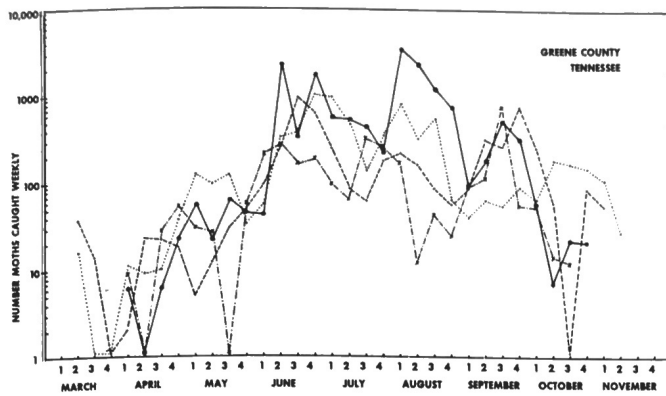


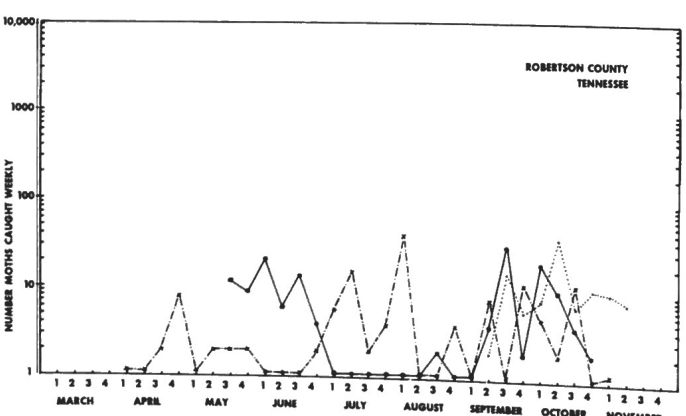
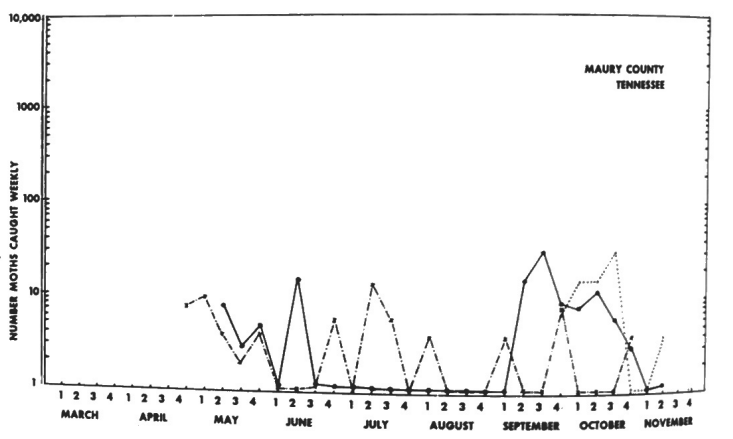
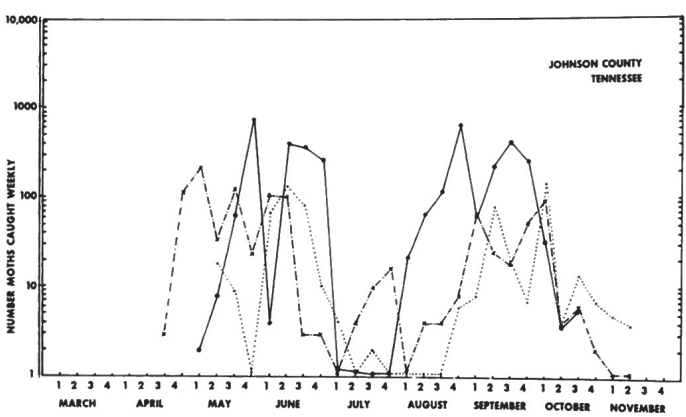
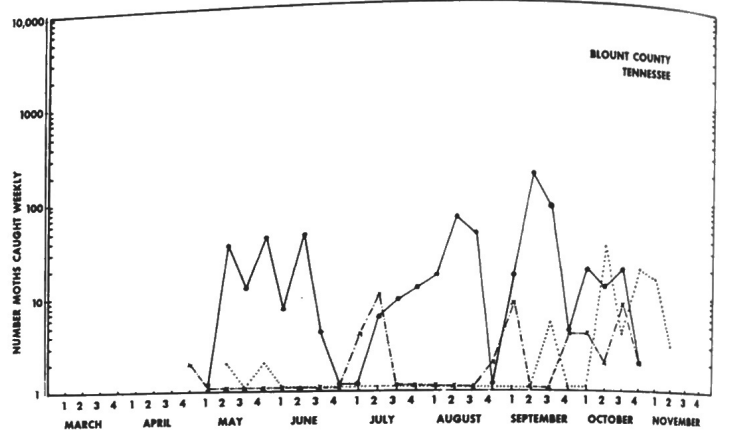
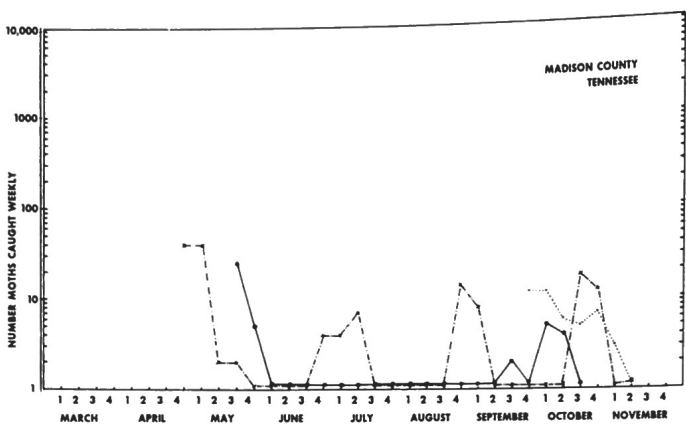
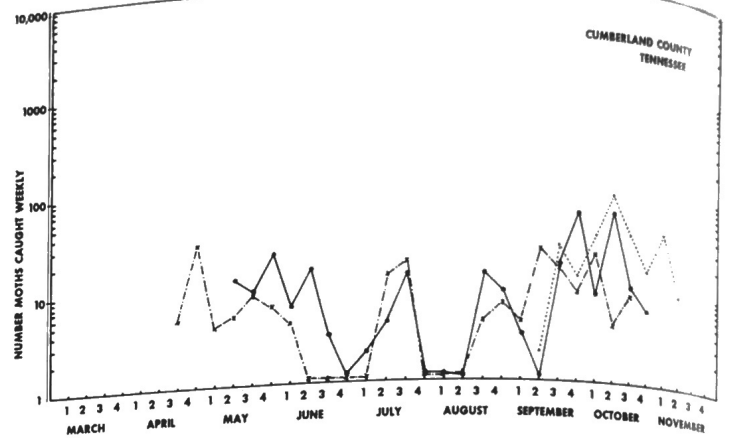
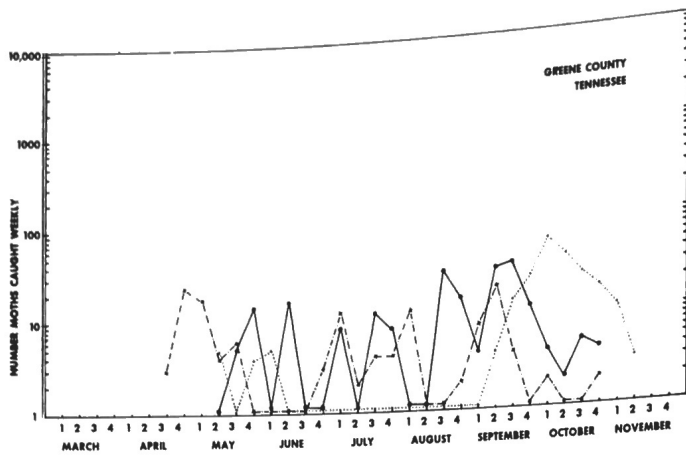


HELIOTHIS ZEA (Boddie)
corn earworm

1955 - - - 1957 - - -
1956 - - - 1958 - - -

PLATE 7

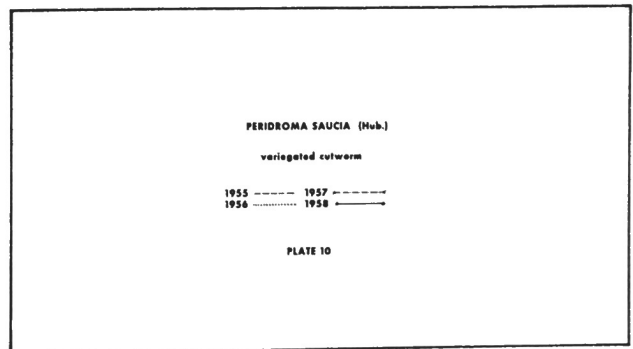
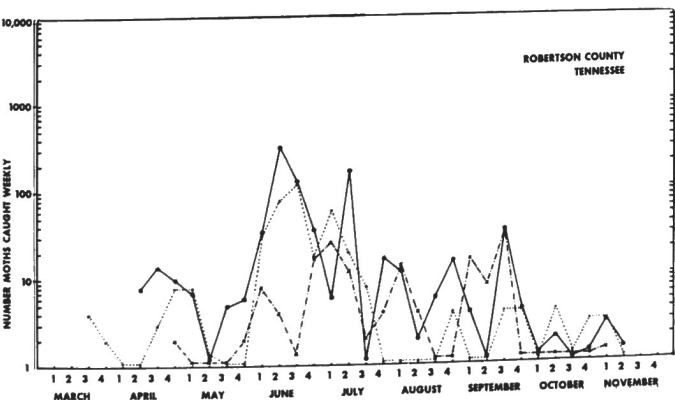
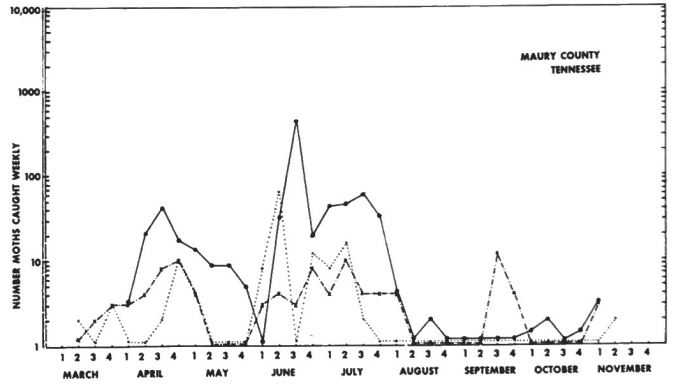
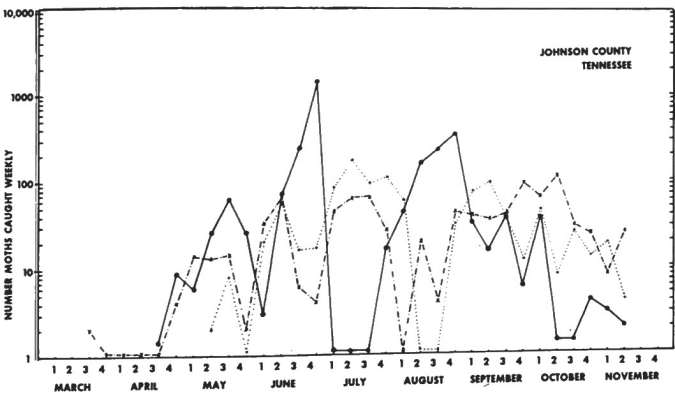
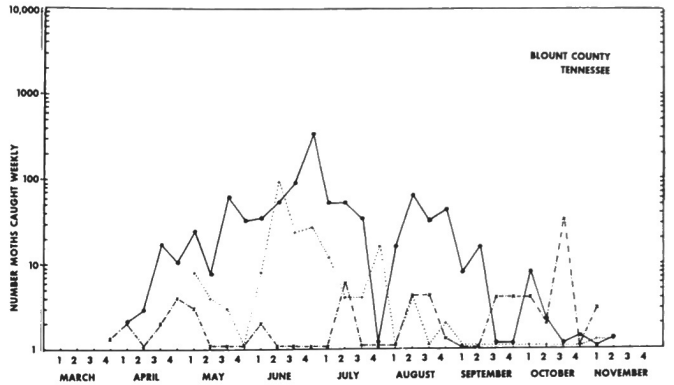
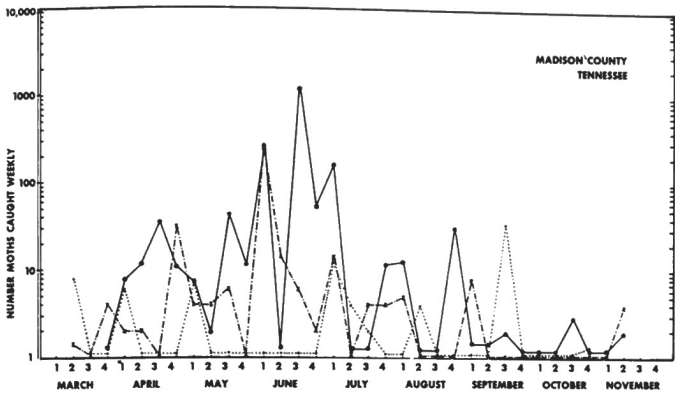
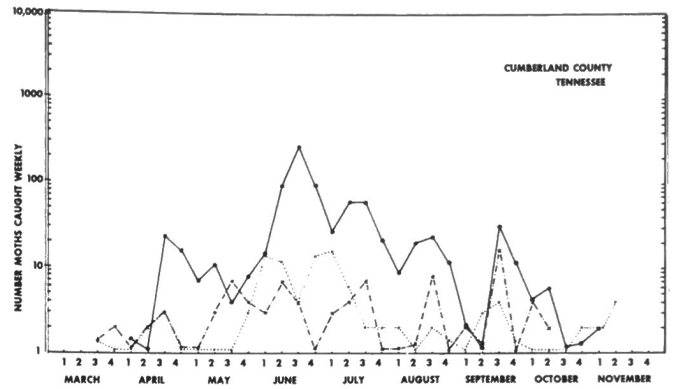
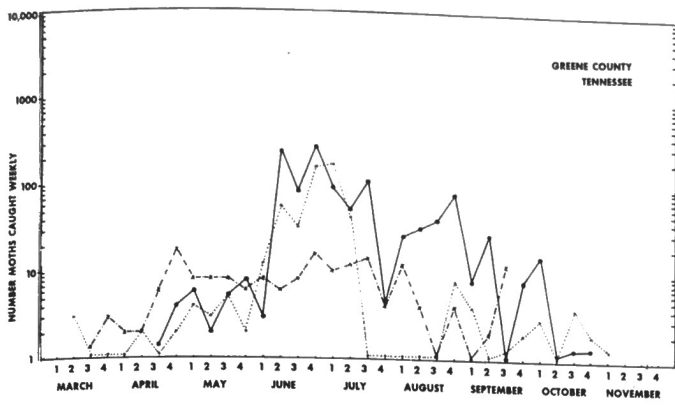


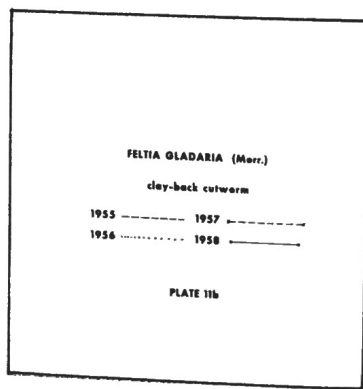
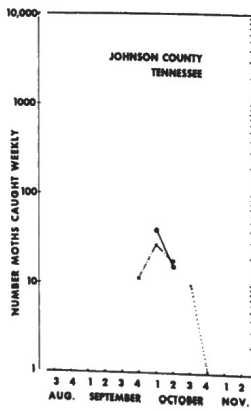
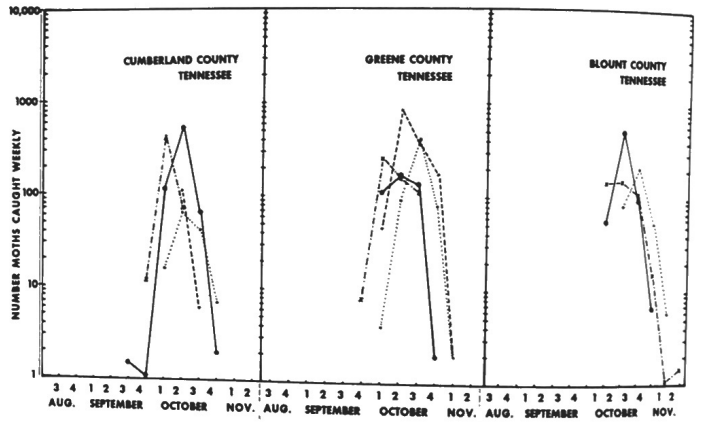
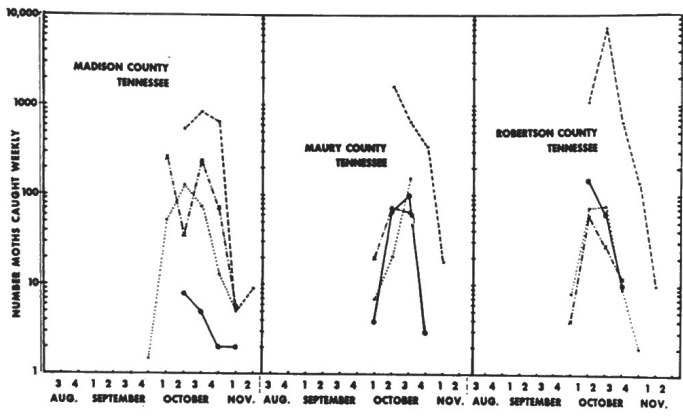
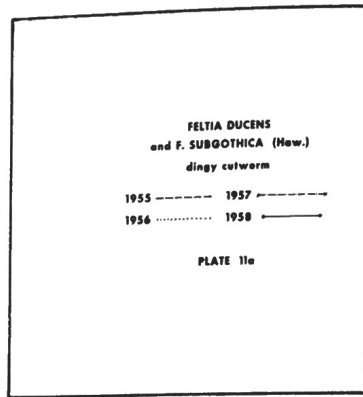
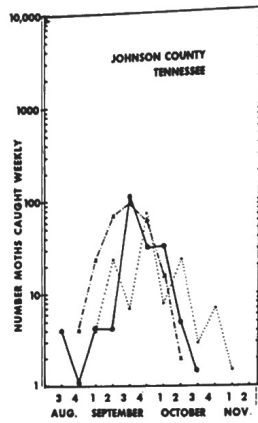
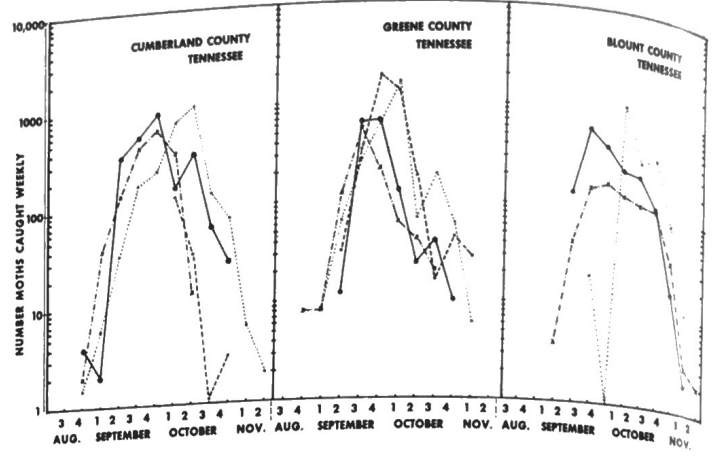
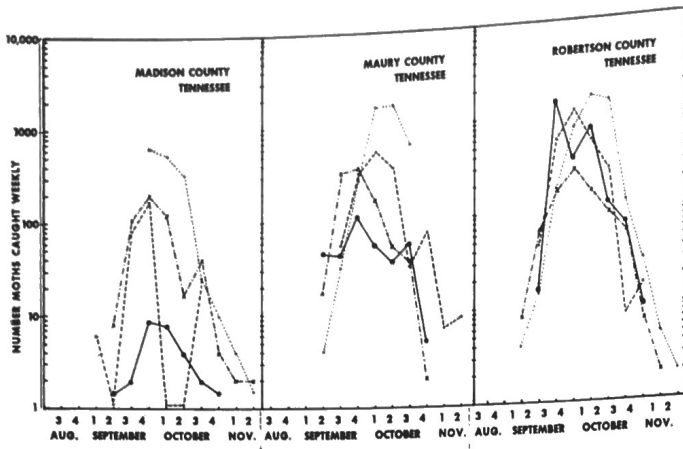


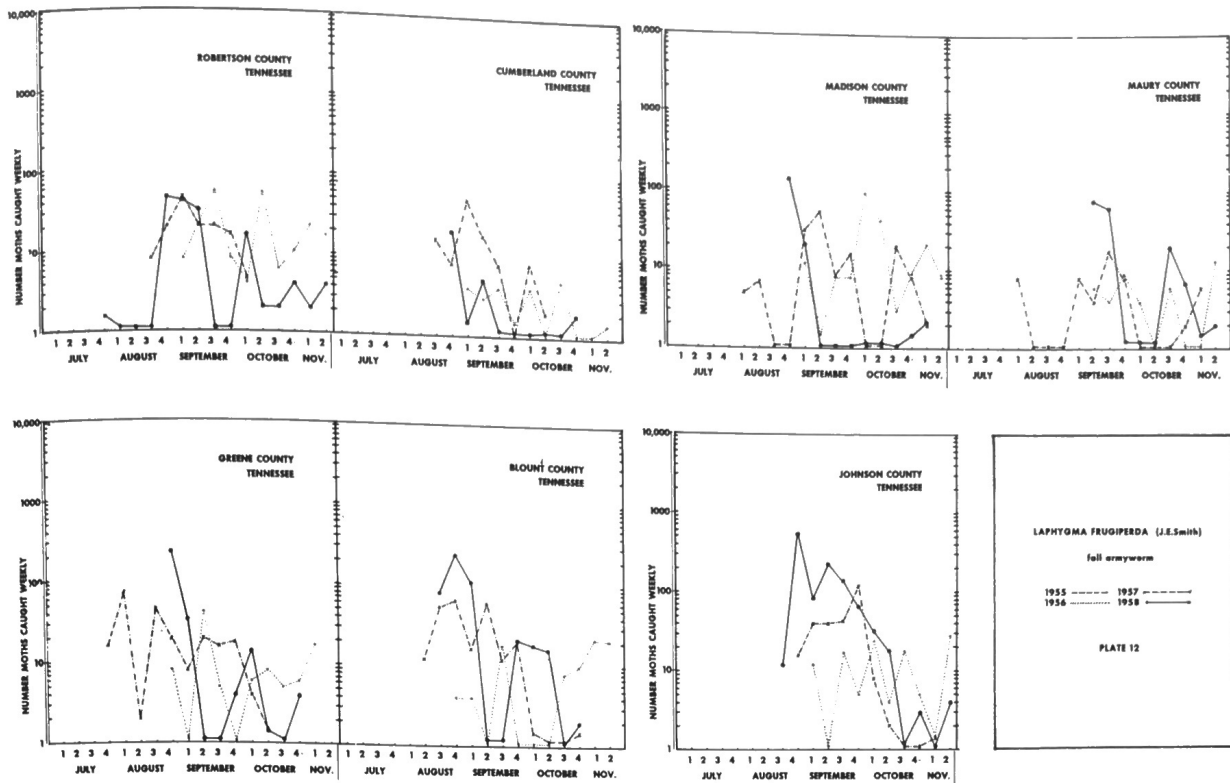
AMATHES C-NIGRUM (L.)
spotted cutworm

1955 ——— 1957 ———
 1956 - - - - 1958 ———

PLATE 9







LITERATURE CITED

Peterson, Alvah. 1934. "A Manual of Entomological Techniques," Edwards Brothers, Inc., Ann Arbor, Mich.

NEWS OF TENNESSEE SCIENCE

Dr. Ernest Furchtgott, University of Tennessee psychology professor, will continue his research entitled "Behavioral Effects of Fetal X Irradiation" for the eleventh consecutive year under a \$15,292 grant from the National Institutes of Health. The research is being conducted by Dr. Furchtgott and several UT graduate students to determine the types of behavioral changes resulting from prenatal irradiation and how this affects the growing process. For the past 10 years, NIH has supported this research program at UT.

The University of Tennessee has received funds totaling more than \$160,000 to support research in physics and engineering:

Norman M. Gailar, associate professor of physics, was awarded a three-year grant of \$98,247. He will continue his research study entitled "Theoretical and Experimental Very High Resolution Spectroscopic Studies of Line Shapes of Atmospheric Gases and of Absorption Bands of Inorganic Solids."

A one-year contract for \$38,500 was received by C. J. Remenyik, assistant professor of engineering mechanics, for research on the "Study of Bubble Growth in an Oscillating Pressure Field." The purpose of the study is to develop an analytical method of predicting the formations and behavior of bubbles and bubble clusters in containers and pipes under certain conditions.

P. F. Pasqua, professor and head of the department of

nuclear engineering, was given a \$27,080 grant for research in stochastic calculation methods for radiation field analysis.

The National Aeronautics and Space Administration awarded the grants.

Paul M. Elza, assistant director of ORINS, has returned to his post after an 18-month leave of absence, during which he served as a staff member of the International Atomic Energy Agency in Vienna, Austria. In his position as senior officer in the IAEA's Division of Exchange and Training, Mr. Elza was in charge of the Agency's fellowship and training activities, which provide technical assistance primarily to help developing nations achieve economic stability more rapidly through peaceful applications of nuclear energy. In connection with these programs, Mr. Elza visited Lebanon, Jordan, Israel, and several major training centers in Europe.

August W. Eberle, formerly provost of the University of Chattanooga, has joined the staff of the ORINS Special Training Division as chief of educational services. Dr. Eberle has been a teacher and administrator since his graduation from Kansas State Teachers College in 1936. He received his bachelor's and master's degrees from that institution, and his Ph.D. from the

(Continued on page 142)