LEPTON KIT – A CONSULTANT'S PERSPECTIVE

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Abstract

Lepton HTK is another tool that consultants can use to more accurately identify tobacco budworms from cotton bollworms. The incorporation of Lepton HTK as an identification tool by AMS Inc., a Louisiana agricultural consulting firm, was efficient and organized. The implementation was segmented into five steps: (1) storage; (2) collection; (3) processing; (4) interpretation; (5) implementation. As the experience and expertise of the individual practitioner using the Lepton kit increased so did the efficacy of its use.

Introduction

The development of resistance to insecticides by the tobacco budworm, the increased costs of insecticides, and the development of transgenic Bt cotton has increased the need to more accurately identify tobacco budworms from cotton bollworms when both are in the egg or the first instar larval stage. Agricultural Management Services, Inc. (AMS) located in east-central Louisiana , consults on approximately 50,000 acres of cotton that consistently has serious infestations of tobacco budworms. Since it is advantageous to distinguish between tobacco budworms and the more easily controlled cotton bollworm it is imperative to distinguish between these two species early in their life stages.

Discussion

The development of Lepton HTK by Abbott Laboratories has given consultants another diagnostic tool in addition to (1) observation of moths in the field; (2) moth traps; (3) visual egg & larvae identification; (4) experience; (5) intuition; (6) guessing; and (7) selection via insecticide application.

The steps for use of Lepton HTK kits was segmented into (1) storage; (2) collection of eggs/larvae; (3) processing; (4) interpretation; and (5) implementation.

Storage consisted of selecting a centrally-located area where a cool, comfortable, well-lighted room with adequate table space was available. The office of AMS is essentially in the center of a three parish area where AMS consultants work. Refrigeration of the Lepton kits is necessary, therefore, a working refrigerator is essential for storage.

Eggs and small larvae were collected in small, light-weight cotton bags by scouts and consultants. Leaves, bracts, terminal buds, and/or squares with the attached eggs or small larvae were broken off and placed in the bags. Approximately 200 – 250 eggs and/or small larvae were collected for each membrane (100 spots) that was tested. It took from 15 minutes to over 2 hours to collect the required number of eggs. Eggs were randomly selected both from the field and from the location on cotton plants. The field, farm, area, or region to be represented were taken into consideration. Collection was best when conditions were dry so that the plant parts collected did not stick together and damage the eggs and/or larvae.

Processing was done by two experienced, qualified personnel. The eggs or larvae were collected singly from their location on plant parts and moved onto the membrane using small, plastic spatulas. The spatulas were dipped in water after each egg/larvae was mashed onto the membrane. Fresh reagents were used and the development and drying of the membranes was accomplished with little trouble. The first samples that were collected required approximately one hour to process including the time for mashing. This time was reduced as personnel became more experienced and efficient.

Interpretation consisted of observing the membranes for the positive coloration that is observed if the eggs/larvae were cotton bollworms. No pigmentation or coloration was evident if eggs/larvae were tobacco budworms. Results were recorded directly on the membrane.

Implementation included using the information gathered to aid in deciding what action should be implemented by the cotton producer and transferring that information to the producer in written form. Results from the Lepton test would be recorded on the reporting form. One copy was given to the producer, one was kept by the consultant, and one was on record at the AMS office. Implementation must be done by qualified personnel and must be adjusted to field, farm, area, or region.

Conclusions

Lepton HTK was used in an efficacious manner by AMS as another tool to help distinguish between tobacco budworm and cotton bollworm eggs and small larvae. Storage, processing, and interpretation was done in a centrally-located environmentally-friendly office and the results implemented into the decision-making process used to determine insect control recommendations. The value to cotton consultants at AMS included (1) more accurate identification of the target pest; (2) better selection of the most efficacious treatments; (3) better timing of applications; (4) monetary savings to producer-clients; (5) preservation of the environment; (6) demonstration of technological advancements in pest management. Lepton HTK was valuable to cotton producers in this study since it

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gave them (1) confidence that they could make (2) prescription applications based on more accurate species identification thusly (3) demonstrating environmental conservation while (4) producing higher yields at (5) lower costs. Lepton HTK was an effective tool when used in combination with other diagnostic tools to aid in cotton insect management.