Sweet Corn Trapping Network

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Objective 1 is for the bulk purchase and distribution of pheromone lures and dichlorvos vapor strips to operate the trapping network.

Objective 2 is to determine the natal origins of fall armyworm arriving in Pennsylvania.

PVGA and Extension Educators form the backbone of a pheromone trapping network that helps in management of lepidopteran pests of sweet corn and other vegetable crops. Grower surveys confirm that information from the sweet corn trapping network helps with management or marketing decisions. The key components are (i) hardware; (ii) pheromones, and (iii) information organization and dissemination. The primary objective of this proposal, using 70% of the funds, is to continue this trapping network and distribute the resulting information.

This network enables additional research to proceed with relatively little cost. One of the species that infests sweet corn is the fall armyworm. Although ranked third among sweet corn pests, the fall armyworm shows up in very high numbers in Erie, Blair and Centre County every year, and is also be a late season problem in some years in other parts of the state. It only survives winters in subtropical latitudes, southern Texas and southern Florida, and annually re-invades the continent east of the Rockies into Canada. Thus, each year, the population that arrives in Pennsylvania originates from either Texas or Florida. USDA now has genetic (haplotype) markers that distinguish between populations that originated in Texas and Florida. Coupling haplotype markers with air flow modeling helps us model the migratory process of this species, and thus provides insight into similar processes that occur with similar species, which include true armyworm, yellow striped armyworm, beet armyworm, soybean looper, and other noctuids. This also has relevance for advance warning of populations carrying resistance. A second objective of this proposal will help get fall armyworm samples collected and analyzed to determine haplotype ratios that define natal origins of fall armyworm.

Objective 1. Key results were (i) distribution of the lures, (ii) dissemination of trapping information, (iii) continued progress on replacing traps in the field. We purchased and distirubuted pheromone lures and Vaportape (plastic strips impregnated with dichlorvos which is placed inside the UniTraps that used to monitor for fall armyworm). Lures and Vaportape was provided for a 2-week replacement period (~10 lures per trap per site) to 18 collaborators, who provided data from 44 sites. We purchased and distributed 4 types of lures:

Lure Identification	*Source*
Corn Earworm / *Helicoverpa (Heliothis) zea*	Hercon
European Corn Borer / E isomer / New York strain / *Ostrinia nubilalis*	Hercon
European Corn Borer / Z isomer / Iowa strain / *Ostrinia nubilalis*	Hercon
Fall armyworm PSU - *Spodoptera frugiperda*	Scentry

Data were summarized weekly, in 15 weekly reports, from June 6 to September 12. The synopsis considers data from Pestwatch in Pennsylvania and neighboring states, past experience, and model projections of the timing of the life stages of European corn borer based on phenology

models which are posted through the PA-PIPE. These were sent to PVGA for compilation and distribution. We also contributed reports to a 1-800 phone line, and to the Veg Hort team blog.

Objective 2. Key results were trapping efforts for fall armyworm from six sites for haplotyping. Collections in 2012 were low or late in most sites, but sites in Erie and Centre Co. were productive. All samples were shipped to USDA labs and compiled with samples from previous years. To date, 1,317 moths have been genotyped from PA, mostly from Centre and Erie Counties. Of these, 928 were of the corn strain which allows further genotyping to determine natal origins.   A very large majority show a genotypic signature that comes from Texas. This suggests that the migratory route for fall armyworm that we collect in the central and western portion of the state have moved up the continental interior and shifted eastward, which follows prevailing wind directions. Further work is underway to haplotype specimens from other portions of PA.