

**Minimum Standards
for
Pink Bollworm Post-Eradication**

As recommended by the
NCC Pink Bollworm Technical Advisory Committee
And adopted by the
NCC Pink Bollworm Action Committee
October 28, 2009

BACKGROUND

The Pink Bollworm Eradication Program began in the El Paso/Trans Pecos area of Texas (Phase I) and New Mexico (Phase I, II), and expanded into Arizona (Phase II, IIIA, and IIIB), and Southern California (phase IIIA and IIIB) areas below the historical suppression/containment zone of the San Joaquin Valley (see attached map).

As pink bollworm eradication moves toward completion, modifications in program activities must be addressed. The first step in this process involves a change in organizational focus namely, moving from: 1. active, to 2. confirmation of eradication, and ultimately, 3. post-eradication status. Thus pink bollworm moves from common to eradicated pest status. Concurrent with this change in status is the need to implement a system which identifies minimum standards for program management, while simultaneously providing the flexibility necessary to accommodate the diversity of growing conditions, risk exposure levels, management structures, funding levels, etc. across the region. This document provides the minimum standards for pink bollworm program operations within the attached map in areas identified as Phases I-IIIB. These minimum standards are for programs in confirmation of eradication and post-eradication status.

I DEFINITION OF ERADICATION

An area may be considered for confirmation of eradication status after a year in which no evidence of a reproducing population is detected. Post-eradication status is obtained when an area has completed four consecutive years with no evidence of reproductive native populations.

II MAPPING

Accurate knowledge of the location of cotton grown each year in all areas is essential to an effective surveillance system. Necessary reductions in funding and staffing will occur in programs which are in the latter categories of eradication as identified above. This will require long-term commitments to provide the information that is needed to locate and map cotton fields. Program personnel must be able to accurately map cotton fields with the limited resources that will be available. This may involve cooperative interaction with other agricultural organizations such as USDA, Farm Service Agency (FSA), where crop certification information may supplement program personnel data and mapping. At a minimum, program managers should have maps indicating all cotton fields the previous year to begin a program year, and should have updated the cotton field locations by first bloom.

III TRAP DEPLOYMENT AND DENSITIES

Minimum standards are needed for pink bollworm programs in both confirmation and post eradication pheromone trap surveys. Program managers and each state's organization should be expected to comply with the established minimum standards.

Program managers may, at any time, adopt trapping protocols that are more rigorous than the established minimums.

Detection traps should be placed within the cotton-producing areas of each state.

A The following represents the trapping protocol:

- 1 Year one (confirmation of eradication)
 - a Trapping Density
non-Bt – 1 trap/10 acres cotton
Bt – 1 trap/40 acres cotton
 - b Trapping cycle – weekly
 - c Trapping duration – pinsquare to defoliation
- 2 Year two (confirmation of eradication) – If no native captures year one*
 - a Trapping Density
non-Bt – 1 trap/20 acres cotton
Bt – 1 trap/160 acres cotton (1/4 section)
 - b Trapping cycle – weekly
 - c Trapping duration – pinsquare to defoliation
- 3 Year three (confirmation of eradication) – No native captures years one and two*
 - a Trapping Density
All cotton – 1 trap/160 acres cotton (1/4 section)
 - b Trapping cycle –bi-weekly (unless dust/dirt accumulation in trap is an issue) requiring weekly service for a period of time
 - c Trapping duration – pinsquare to defoliation
- 4 Year four (confirmation of eradication) and post-eradication*
 - a Trapping Density
All cotton – 1 trap/square mile with maximum separation of traps
 - b Trapping cycle – bi-weekly (unless dust/dirt accumulation in trap is an issue)
 - c Trapping duration – pinsquare to defoliation

* If one or more natives are captured in the previous year, management procedures will begin again with Year One procedures. For example, if a native moth is captured in 2010, Year One procedures will be used in 2011. The size of the area returned to Year One procedures will be at least nine square miles encompassing the field where the native moth was captured.

IV TRAPPING QUALITY CONTROL

Failure to operate an effective program of trapping quality control could pose a serious threat to areas in late stages of eradication. Weaknesses in quality control of trapping may result in expensive, large-scale pink bollworm infestations.

States in both confirmation and post-eradication status must maintain sufficient quality control of trapping. These programs must be in place to assure that traps are being inspected and serviced with fresh lure to assure that traps are being kept clean and functional. Programs must maintain a practice of routinely placing marked pink bollworm specimens in traps to ensure that program personnel find and report all captures. San Joaquin Valley quality control will be used as a model for these procedures.

V DETECTION OUTREACH

It is strongly recommended that growers, Extension Agents, crop consultants, or other interested parties be encouraged to report pink bollworm damage or presence to program personnel as this can be critically important surveillance. Program managers for each state or region should develop protocols for responding to such reports. These protocols should include clearing reports through the official eradication program organization as with prescribed rapid response on the part of program personnel.

** Program Population Management Tools

Active eradication programs will utilize multiple approaches to achieve population suppression and eventual eradication. Program managers will employ 1) pheromone mating disruption treatments of cotton fields, 2) encourage maximum allowed use of two gene transgenic Bt cotton's, and 3) release of sterile moths (SIT) to reduce and eventually eradicate native pink bollworm populations. 4) Chemical applications will be utilize only when necessary to achieve native population control.

As programs transition from active eradication to confirmation of eradication and subsequently post eradication, programs shall continue monitoring for native populations while encouraging the maximum allowed use of two gene transgenic Bt cottons to provide a "safety-net" that will minimize the chance of large re-infestation establishment. Mitigation measures for confirmed native captures are described in this document under Minimum Standards When Pink Bollworms are Detected.

VI IDENTIFICATION OF SUSPECT MOTHS

Following completion of pink bollworm eradication in various states or regions, program staff undergoes natural attrition. The capability to retain program staff to properly identify pink bollworm is extremely important. For the foreseeable future, programs must be able to correctly identify pink bollworm specimens whenever they occur in traps. Experience has shown that one of the best ways to maintain the identification capability of field staff is through the continual use of marked dead specimens placed in random traps across the program area. When these pink bollworm specimens are inconspicuously marked to confirm their intended use, and carefully inventoried to monitor their placement and recovery, they can be a valuable component of an effective surveillance program. To this end, maintenance of the sterile moths rearing facility

albeit at a reduced level of production remains a reliable source of dead, marked pink bollworm specimens.

USDA-APHIS maintains a staff of trained “certified identifiers” for a wide range of exotic pests. After pink bollworm has been eradicated from this region of the United States and Mexico, it will be considered such, an “eradicated plant pest”.

USDA-APHIS should establish and maintain a system for certified identification of suspect pink bollworm submissions. Certified identifiers, including APHIS staff or others trained by them, should be available to respond to program needs. Multiple identifiers will be needed to provide redundancy, so that occasional leave or illness of personnel will not delay the confirmed identification of a trapped pink bollworm or other life forms. Until confirmation, suspect moths will be responded to on the basis of best possible local identifier.

Program managers will be provided certified identifiers contact information to notify when a suspect insect has been trapped or field-collected to arrange for timely identification. Electronic images of suspect moths will be e-mailed to the identifier for initial identification. USDA-APHIS will provide instructions to ensure that images obtained and submitted are of proper magnification and clarity, and that the specimen is positioned or dissected in a manner that allows proper identification.

Pre-addressed overnight mailing containers should be provided and used for shipping insect specimens to identifiers for confirmation. USDA-APHIS will provide these as part of its role in identification coordination. The need for rapid confirmation is critical because treatments require immediate response. In addition to adult captures, the presence of immature life forms (larvae or pupae) would also satisfy treatment criteria. USDA-APHIS will develop a manual to train employees on how to contact the identifiers, obtain electronic images of a specimen, e-mail the images for tentative identification, and process and ship the specimen for confirmation.

Systems must also be in place to verify that captured moths are native as opposed to sterile “escapes” from the rearing facility. In this regard, USDA-APHIS should also coordinate the development and transfer of this technology.

VII MINIMUM STANDARDS WHEN PINK BOLLWORMS ARE DETECTED

When a suspect moth is trapped, a certified identifier must quickly confirm that it is a pink bollworm. **If the capture is in or near non-Bt cotton**, within 24 hours, trapping will be increased to at least the density used during the first full year of active eradication in that area (1-10 Acres nonBt: 1-40 Acres Bt). Traps within this intensively trapped field of find and adjacent fields will be inspected daily for at least three days, then weekly until crop termination.

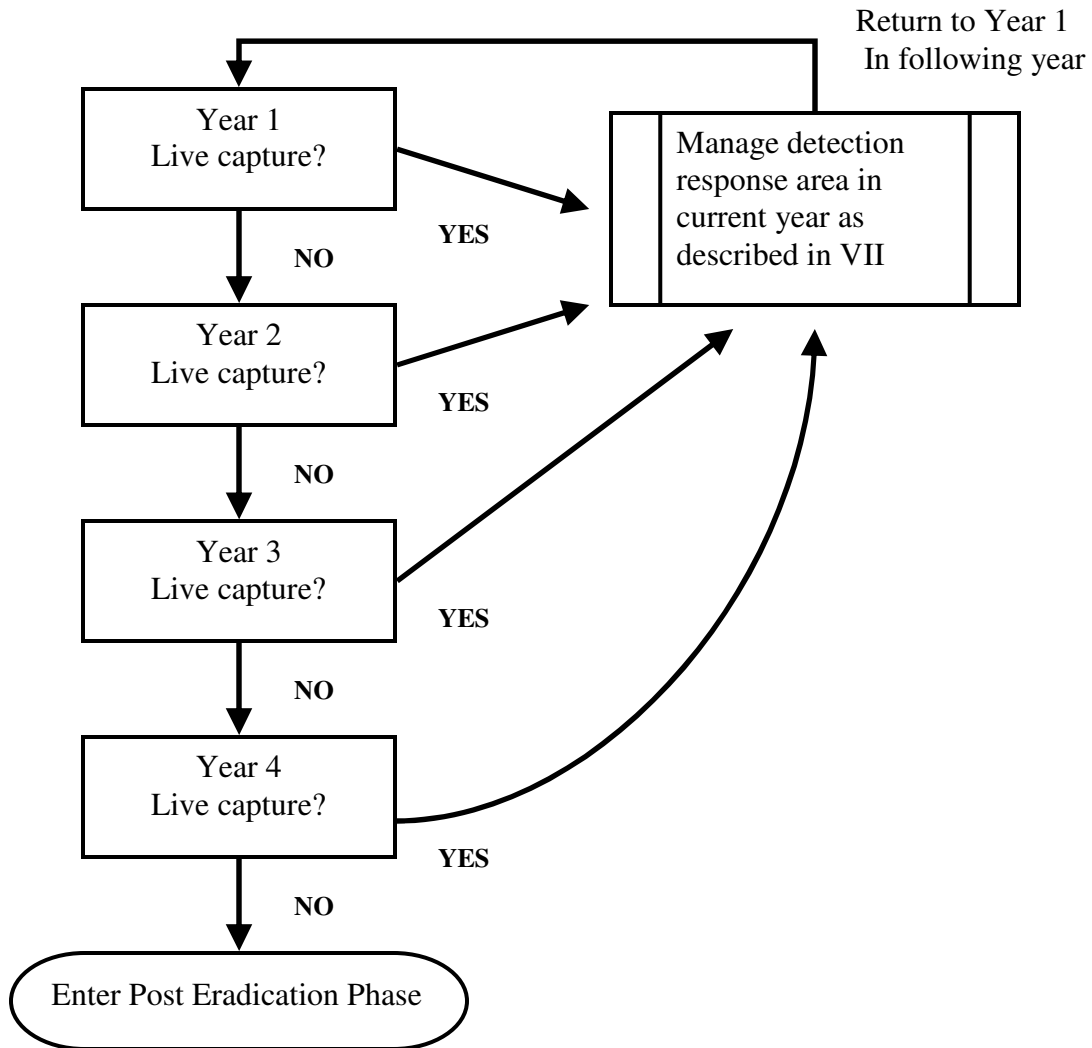
Capture of 1 or more native moths will trigger at minimum the following actions:

- 1 In the field where the capture occurred, steriles will be released within 48 hours.

- 2 The 9 square mile area, with a capture at it's center, will be a "detection response area". The following actions will be taken, at a minimum, in all response detection areas:
 - a. Sterile releases
 - b. Insecticide / Pheromone treatments
 - c. If a and b are not completed during the season when captured, then Pheromone treatments and sterile release actions will be initiated the following year on this detection response area.

The minimum response treatment for a field in which one confirmed native pink bollworm moth is captured is a release in the capture field within 48-hours. Within seven days, steriles should be released over the nine square mile area with the capture field as the center. The sterile moth release rate should be the same as the individual area's original non-Bt eradication program rate. Releases will continue until native captures zero out for a minimum of eighty days. Captures occurring equal to or less than 80 days before a crop is completely defoliated will require resumption of release for a minimum of 80 days post-pin head square the following season.

In effect, this produces the following:



Presence of larvae or captures of more than one adult suggesting existence of a reproductive population will immediately trigger at least two spray treatments separated by 5-7 days. Each spray treatment will include a pheromone and conventional insecticide component (or acceptable alternative for organic production). After two or more spray treatments are completed, a high rate pheromone rope system will be applied on the infested field and all non-Bt cotton within a one-mile radius of the infestation. Additionally, SIT releases will be maintained on all cotton within the nine square miles containing the infested epicenter season long until defoliation. In this case, in the following season, to confirm eradication, all cotton fields in the nine square mile area will be trapped at eradication program levels season long with SIT releases season long.

Any evidence of over-wintering population survival would also trigger high rate pheromone treatments on all non-Bt cotton within the nine square mile area.

Year Four and Beyond – Post-Eradication

Single isolated confirmed pink bollworm captures in or near non-Bt cotton will trigger SIT releases at non-Bt rate on all cotton within a one-mile radius of the capture epicenter. If reproduction is indicated (larvae or generational captures), year one protocols will be implemented.

VIII SUPPLIES

Program managers and APHIS staff will maintain regular contract with suppliers of pheromone for traps and mating disruption, delta traps, and stakes to ensure that adequate supplies of these critical program components are available each year. Also needed are sources for elisa test kits, and sterile moth strip test supplies. It will also be necessary to maintain the sterile moth production facility for a multi-year period with the capacity to maintain production of at least 500,000 sterile moths per day and the ability to expand as needed.

IX POST ERADICATION FUNDING

Continued programmatic review is of the utmost importance. This review will be needed to keep all post-eradication activities at critical levels. It is anticipated that some level of cost share between states and USDA-APHIS will be necessary to ensure the maintenance of minimum detection and response standards post-eradication. Each state or entity should establish and maintain a contingency fund at a level of sufficiency to be able to address the immediate response costs associated with pink bollworm reintroductions. Further details are beyond the scope or authority of the Technical Advisory Committee.

Reserve funding should be based on reaction to one epicenter and the subsequent nine square mile release of sterile moths and treat with pheromone.

Assumption:

- 9 square miles at 50% cotton (non-Bt) = 2,880 acres
- at 400 steriles/day/acre = 1,150,000 = \$16,000/week
- for 12 week period = \$192,000
- release cost 1 hour/day x 80 at \$350/hour = \$28,000
- Rope on 320 acres x \$25 = \$8,000
- Traps, stakes, lure, and trapper(s) = \$45,000
- Total = \$323,000

Attachment: Map indicating the areas of the Pink Bollworm Eradication Program.

Pink Bollworm Eradication

