ENVIRONMENTAL MONITORING PLAN

For Applications of
CHLORPYRIFOS & PERMETHRIN

PINK BOLLWORM ERADICATION PROGRAM
Arizona, New Mexico, and Texas
2007

United States Department of Agriculture

Animal and Plant Health Inspection Service

Plant Protection and Quarantine

Prepared by the Environmental Compliance Team

Human Health
&
Endangered and Threatened Species

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The methods and procedures described in this Environmental Monitoring Plan (EMP) are designed to ensure compliance with various statutes including the National Environmental Policy Act, the Endangered Species Act, Federal Insecticide Fungicide and Rodenticide Act, as well as APHIS policy. Each program organizational unit (e.g. work unit, zone, region, etc.) should implement this plan in full during the 2007 pink bollworm eradication season.

The Southwest Pink Bollworm Eradication Program (Program) is a cooperative endeavor involving APHIS, various southwestern states (TX, NM, AZ and CA), the Republic of Mexico, and organized cotton grower groups. This EMP is the result of a 2002 Environmental Assessment (EA) developed in compliance with the National Environmental Policy Act. The monitoring requirements are derived also from consultations with the U.S. Fish and Wildlife Service regarding endangered and threatened (E&T) species that might be near program areas.

The EMP is designed to validate assumptions made in the EA and to ensure that protective measures are effective. This is accomplished by monitoring the environment for residues of pesticides used by the Program near areas that might be of human health concern or areas that are habitats for E&T species. This Plan also provides guidance for selecting sampling sites, collecting environmental samples, and determining sampling frequency.

Several pink bollworm (PBW) control methods are available for use by the Program. These include cultural practices, mating disruption with pheromone, Bt transgenic cotton, sterile moth releases, and minimal insecticide applications. Controls that use insecticides are covered by this monitoring plan, which include mating disruption and chemical control.

Mating Disruption

Aerial, ground, or hand application of pheromone can be made to conventional cotton fields (non-transgenic) or to Bt transgenic cotton fields imbedded with conventional cotton. A single application of NoMate-PBW® sprayable pheromone, at a rate of 15 gm/ac (1.05 gm [AI]/ac of gossyplure), mixed with polybutene sticker (Bio-Tac) at a rate of 5.3 oz/ac and the insecticide permethrin at a rate of 0.5 fl oz/ac (0.08 lb. [AI]/ac), is made by air when a field meets the treatment threshold. Fields meet the treatment threshold beginning at the six-node growth stage (prior to pinhead square) and when trap captures average more than zero but less than one moth per trap per night. (Hand applications of pheromone using PB-Rope or PB-Rope*L will not require monitoring since pesticides are not used in association with the rope.)

The insecticide chlorpyrifos, at a rate of 24 fl oz/ac (0.75 lb. [AI]/ac), may be added to the pheromone application as a dual aerial treatment, but only if the average trap capture equals or exceeds one moth per trap per night.

Chemical Control

Aerial or ground applications of the insecticide chlorpyrifos at a rate of 24 fl oz/ac (0.75 lb. [AI]/ac), may only be made to prevent economic loss in fields that exhibit larval infestations of 5 percent or greater.

Conventional vs. Bt Transgenic Cotton

The methods listed below to protect human health and E&T species apply to cotton fields that may receive pesticides (permethrin or chlorpyrifos) via mating disruption or chemical control. This generally applies to conventional cotton fields or Bt transgenic cotton fields imbedded with conventional cotton. When “cotton fields” are referred to in the remainder of the monitoring plan, this means conventional cotton fields or Bt transgenic cotton fields imbedded with conventional cotton. This applies to both the Human Health and the Endangered and Threatened Species sections below. Implementation of the monitoring plan in Bt transgenic cotton fields without imbedded conventional cotton is not required unless chemical treatments occur in those fields.

HUMAN HEALTH

OBJECTIVES

Monitoring for potential human exposure is designed to:

1. Demonstrate the effectiveness of Program operational procedures in excluding or minimizing public exposure to Program-applied pesticides;
2. Collect data which can be used to evaluate whether the assumptions used in the EA and Chemicals Risk Assessment are valid estimates of potential exposure of the public to Program-applied pesticides by:
   a. monitoring for any aerial spray drift using dye cards to investigate the overall potential for exposure; and,
   b. testing crops and water bodies that might be used for human consumption to investigate the potential for exposure to pesticides through ingestion;
3. Ensure that quality assurance and quality control procedures were followed; and,
4. Respond to Program-related complaints or reports of adverse effects on public health, worker safety, environmental quality, or non-target species.

METHODS

Contact Information

Note that the APHIS Environmental Monitoring Team is now called the Environmental Compliance Team (ECT). This is only a name change as their function with the Program will not change. Should any field programs have any changes in their contact information, please notify Environmental Compliance of those changes to ensure continued communication.

Sensitive Site Inventory

Prior to the start of pesticide treatments, each zone or Program area will make a list of sensitive sites that are within 300 feet of cotton fields. Computer models indicate that no pesticide should be deposited beyond 300 feet from a treatment area. A site is considered sensitive if it is an area of potential human congregation or habitation, or if the site provides a potential route of pesticide exposure to humans (i.e. potable water, consumable crops, etc.) Sensitive sites include (but are not limited to) residential communities, public buildings, hospitals, medical clinics, day care centers, nursing homes, parks, churches, schools, surface water bodies used for human consumption, and backyard gardens. Crops that will be consumed unprocessed are considered sensitive sites just before and during harvest, if they are within 300 feet of cotton. A list of identified sensitive sites including field numbers, locations, and site descriptions will be sent to:

Dr. Robert Baca, USDA-APHIS-PPQ, 4700 River Rd., Unit 150, Room 5A-04.6
Riverdale, MD 20737
or via email to: Robert.M.Baca@aphis.usda.gov

Monitoring with Dye Cards

Conduct dye card monitoring for drift at all sensitive sites that are within 300 feet of a Program-treated cotton field that requires aerial or ground treatment with chlorpyrifos. Since very few fields are expected to receive pesticide treatments, be sure to monitor all treatments within 300

feet of a sensitive site. Do not use dye cards to monitor the application of NoMate fiber, whether impregnated with permethrin or chlorpyrifos; however, be sure that Program personnel observe these applications to ensure proper placement of fiber, with such observations documented in Program-maintained databases or on APHIS 2060 Environmental Monitoring Forms.

Water-sensitive dye cards are used to monitor potential drift of chlorpyrifos reaching a site. Before leaving for the field to set-up dye cards, hang a clean dye card from the rear-view mirror of the Program vehicle used during sampling (see SOP EM-10, *Preparation of Control Samples and Collection of Pesticide Samples*. If you do not have a copy of this or any other standard operating procedure mentioned in this EMP, contact the Environmental Complaince Team (ECT) or download it at http://www.aphis.usda.gov/ppq/pdmp/emt/support.html.) This is a control card and should remain in place throughout the day. If any of the non-control cards show spots after treatments, send the control card to the USDA-APHIS Analytical and Natural Products Chemistry Laboratory (ANPCL) for analysis along with an APHIS 2060 form for the control dye card. Send this dye card to the laboratory for analysis *regardless of whether it is spotted or not*. The control dye card does not need to be submitted for analysis if all of the non-control cards for the day are unspotted, but document the use of the control card on the APHIS 2060 Form that you send to the ECT.

Before treatment begins, place a dye card between the cotton field and the sensitive site, one at the edge of the sensitive site, and a third card approximately 30 feet between cards (see SOP EM-01, *Collection of Dye Card Samples*). Draw a diagram (either on the APHIS 2060 form or on a separate sheet) of the card positions relative to the field and the sensitive site, indicating the distance and direction of the dye cards and sensitive site from the cotton field. Identify and label each card individually on the diagram. Place each dye card so that surrounding vegetation does not create an obstruction that could interfere with the deposition of chlorpyrifos on the card. It is acceptable to place the cards under a tree or other cover if this situation is representative of the area between the treatment site and the sensitive site. Two hours after the treatment is completed, collect the dye cards. Label each sample according to its location on the diagram. **DO NOT** write on the dye card, but rather on the plastic bag in which the dye card is shipped. Writing on the dye card will ruin its analysis for chemical residue.

Check each dye card for any visible spotting.

- *If **none** of the dye cards has a visible spot*, then record this information on a single APHIS 2060 form, providing the other information on the sheet as well. Make a note of the total number of dye cards without spots. Send the yellow copy of the form and all diagrams, maps, etc. to the ECT (Riverdale, MD). These cards do not have to be sent to the laboratory for analysis, but should be kept in local program files. Work units, districts, and program areas should occasionally submit a set of unspotted dye cards and the control dye card used during monitoring for laboratory analysis for quality control purposes.

-*If **any** of the dye cards in a set has visible spotting*, then submit **all** of the cards (even those without spots and including the control dye card) to ANPCL for analysis. Complete a separate APHIS 2060 form for each individual dye card (i.e. submit four forms and four dye cards to ANPCL.) Fill out all of the information on each APHIS 2060 form, being sure to record if that particular dye card was spotted or not. Ship the samples as described below. Submit the yellow copy of the APHIS 2060 forms and supporting documents to the ECT.

Monitoring Drinking Water

Monitor all treatments if surface water bodies used for human consumption are within 300 feet of cotton fields. Each work unit, district, or program will make a list of the reservoirs, cisterns, or other water bodies used for human consumption that are within 300 feet of cotton fields. Provide a description to the ECT of each site and its relation to nearby cotton fields before Program treatments begin. If there are no such sites, state this in a brief note to the ECT.

Collect two water samples from each such water body at least one week **before** the first Program application of pesticides to any nearby field (do not combine these into a single sample). These are pre-*program* samples. Refer to SOP EM-03, *Collection of Water Samples*.

When a pesticide treatment is scheduled for a cotton field within 300 feet of a water body that is used for human consumption, collect two pre-*treatment* water samples from different locations at the edge of the water (do not combine these into a single sample) within 24 hours of each application to the field. These are a separate set of pre-*treatment* samples from those described in the previous paragraph. Collect two *post-treatment* samples from different locations 2 to 4 hours after each application. Monitor these water bodies with pre- and post-treatment samples during every application of pesticides within 300 feet of the water body. Ship the samples as described below.

Monitoring Vegetation

Fields growing edible commodities, including backyard gardens, within 300 feet of cotton fields are considered sensitive sites. Collect vegetation samples whenever a pesticide treatment occurs within 300 feet of a site with an edible commodity. Following SOP EM-7, *Collection of Vegetation Samples*, collect pre- and post-treatment vegetation samples from the edges of those crops or backyard gardens on the day of treatment. Draw a diagram (on the APHIS 2060 form, on a separate sheet, or on the map of the site) of the position relative to the spray zone and the sensitive site where the vegetation was collected, indicating the distance and direction of the sensitive site from the cotton field.

Occupational Health Monitoring

Field personnel who might be exposed to malathion should be monitored for serum acetyl cholinesterase (AChE) activity. Monitoring should include pre-Program baseline blood samples collected before exposure to malathion, followed by samples collected periodically throughout the season. At termination of employment or several weeks after all malathion applications have ended, a post-Program blood sample should also be collected.

Specifics for serum AChE monitoring can be found in the *APHIS Safety and Health Manual*. The manual is available online at www.aphis.usda.gov/mrpbs/ safety_health_wellness.html. Blood test results should be reviewed by a licensed health care professional and appropriate action taken should a significant inhibition of serum AChE be detected or if clinical signs and symptoms of pesticide exposure appear. At the end of the treatment season, results of the serum AChE monitoring program should be sent to the ECT in such a way that the anonymity of the employees is preserved.

Monitoring in Response to Incidents or Complaints

Priority sampling will be conducted to investigate incidents of unknown origin involving mortality of non-target species (fish, bees, etc.) or other unintended environmental or human health impacts possibly associated with Program-applied chemicals. Program personnel will also conduct priority sampling to address a specific public complaint or concern. Information about priority samples can be found in SOP EM-09, *Priority (Emergency) Sampling*. Collect priority samples as soon as possible after the complaint, request, or problem is reported. Contact the ECT at (301) 734-7592 or 734-8247 to collaborate on a sampling plan, sampling methods, and types of samples to collect in order to optimize the investigation. If the incident occurs on a weekend, commence your investigation and sampling without delay, and contact the ECT as soon as possible on Monday.

Proper documentation of the incident, investigation, and samples is extremely important. GPS maps showing the site, location where samples were collected, the cotton field, and spray lines of recent pesticide applications are critical for investigating incidents and should be sent to the ECT. Completely fill out all information on a 2060 form for each sample, being sure to check the box noting that these are "priority" samples, which will expedite their analysis. Provide an incident/complaint report to the ECT, along with any other information that will be helpful in resolving the incident (i.e. photos, observations at the site, etc.). The ECT will write a formal report documenting the incident and interpreting the residues detected in the samples. Any reports that involve the potential exposure of people to Program-applied pesticides should be forwarded to the appropriate state agency involved with public health issues (e.g. Texas Department of State Health Services, New Mexico Department of Health, etc.)

Monitoring for Spills

Pesticide spills (whether from accidents, improper disposal, or aircraft crashes) may be monitored, depending on the nature of the incident, contractual arrangements, Program guidelines, or local and state procedures. Call ECT personnel immediately so that proper procedures and samples may be taken, if necessary. Sampling is usually similar to that described above for incidents or complaints, but be aware that you may be sampling materials contaminated with concentrated pesticide, and take appropriate safety precautions.

Samples containing pesticide from spills or accidents can contain enough chemical to ruin shipping containers and analytical equipment. Contact ANPCL for information on shipping

these samples. Mark each sample and accompanying APHIS 2060 form as a "possible spill sample," so that ANPCL personnel may properly process the sample.

Quality Assurance and Quality Control (QA/QC)

A QA/QC checklist can be found on pages A1-2. The checklist describes all of the QA/QC measures to be conducted by each program organizational unit to assure adherence to Program operating procedures, protection measures, and mitigations. **At the end of the treatment season**, the checklist must be signed by the State Program Manager, State EMS, or other appropriate personnel indicating that all of the QA/QC activities were followed. Record any deviations along with an explanation and any corrective actions taken. Attach this information to the checklist. After the conclusion of Program operations for the season, promptly submit the signed checklist to the ECT. Sampling of neat chemical (concentrated, in the shipping container) is not required for QA/QC purposes, since the chemicals are obtained on an "as needed" basis from commercial sources and are not stored in a manner which might result in degradation of the chemical.

ENDANGERED AND THREATENED SPECIES

OBJECTIVES

Monitoring near endangered and threatened (E&T) species habitat is designed to provide data which can be used to evaluate the effectiveness of protection measures established for those species. Each year, zones, districts, or programs must reassess the presence of E&T species and their habitats. If a species is found in or near a Program area, and it has not been addressed in this document or the current Biological Assessment, contact the ECT immediately at (301) 734-8247. Take action to assure that Program operations do not disturb the species or habitat in question until further guidance is obtained from the U.S. Fish and Wildlife Service. This monitoring plan lists all protected and proposed species known to occur in AZ, NM, and TX, as of the writing of this document and their associated protection measures on pages B1-8. The U.S. Fish and Wildlife Service has not issued its concurrence with the protection measures yet. But no changes are expected and the Program should use the protection measures as listed below. If any changes occur, the Program will be notified so that the correct protection measure can be implemented. If any of the listed species is found near Program cotton, the protection measure for that species must be implemented.

METHODS

Inventory

A complete inventory of all E&T sites near Program cotton fields is needed to fully evaluate the Program's ability to protect E&T species. Before the first treatments are made, each work unit, district, and program staff **shall** contact the local FWS office concerning *listed* E&T species and the location of their habitats in all counties that **may** receive treatments during 2007. Note that *proposed* species are also shown on pages B1-8 for information purposes only. No monitoring is required with these proposed species, but if they become listed as threatened or endangered, is it likely that the proposed protection measures will come into effect. If proposed species are in an area under your jurisdiction, we strongly advise that you implement the corresponding protection

measures. Please note that this document does not consider state protected species (some of which may not be federally protected), and we suggest that you contact the state Departments of Wildlife or other appropriate agencies regarding such species that might exist near cotton fields.

Even if you do not expect to treat any fields this year with pesticides, is it recommended that you contact FWS for the location of protected species that may be near cotton fields. Should any fields require treatments, such treatments cannot begin until protected species locations are known. Since it can take some time for FWS to respond with the location of the protected species, it is in the Program's best interest to identify those locations ahead of time rather than potentially delay possible unexpected treatments.

Prior to the start of treatments, contact the local FWS field office for a list of endangered and threatened species, species proposed for listing, and critical habitat designations in the counties under your Program jurisdiction. Then compare this list to the species listed below on pages B1-8. If a protected species is listed within a Program area and has a protection measure on pages B1-8, contact the FWS field office again to determine the location of that species and its relation to Program cotton fields. If any portion of a cotton field falls within the listed distance for a protection measure, implement that measure with guidance provided by the ECT. Document this process and report it to the ECT, including the names and affiliations of those contacted, a list of E&T species in Program counties, a list of fields by field number where potential treatments would require protection measures for E&T species, and any other details regarding specific protection measures to be implemented.

Page B-9 is the "Endangered and Threatened Species Site Reporting Form." This form is to be used by each work unit, district, or program to document the presence and location of each E&T species or habitat as part of the reporting described above. Use additional paper if needed. The list should include any proposed species found near cotton and whether or not the protection measures for them will be implemented. If an organizational unit has protected species in its jurisdiction that do not require the implementation of a protection measure (i.e. they are very far away from cotton fields), those species should also be listed on the form with a note in the comments section stating that the species are beyond the given limits requiring protection measures. The completed form must be returned to the ECT before treatments begin for the year. Send the completed form to Dr. Robert Baca at the address listed on page B-9.

Protection measures include buffer zones, observational monitoring, dye card monitoring, water monitoring, and run-off monitoring. If a protected species is located near Program-treated cotton, the listed protection measures **must** be fully implemented. Note that many species are excluded from monitoring since it was determined that the program will have no effect on the species. These species are listed on pages B1-8 with an "NE" (for "no effect") under the protection measures.

Several protection measures do not require monitoring. For example, the measure for the Mexican long-nosed bat states that "To protect the Mexican long-nosed bat from aerial and ground application of permethrin and chlorpyrifos, a 60 foot ground buffer and a 300 foot aerial

buffer will be used at the edge of any entrance of an occupied roost or potential roost site of the Mexican long-nosed bat." There are no monitoring requirements for this species, but the buffer zones must be implemented and documented in writing on the "Endangered and Threatened Species Site Reporting Form."

When monitoring is required, the type of monitoring is specified in the protection measures. The distance from a cotton field to a protected habitat that requires monitoring is listed in the protection measures. For example, if a protection measure states, "No use within 60 feet of identified aquatic habitat. Monitor for run-off," then any cotton field that might receive Program treatments that extends up to or within 60 feet of the habitat in question would require run-off monitoring. In this example, if **any portion** of a cotton field extended into the 60-foot no-treatment buffer area, monitoring would be required even though no pesticide would be applied within the buffer area.

Monitoring for Drift

When a protection measure notes to "Monitor for drift," dye cards are to be used. Dye cards should be placed at the edge of habitat of the species. Do not place the dye cards next to the cotton field, but rather adjacent to the protected habitat. Use the methods described in the Human Health section above and in SOP EM-01, *Collection of Dye Card Samples*.

Monitoring of Run-off and Water Bodies

No sampling of aquatic locations is required at this time. Should updated protection measures require aquatic sampling, instructions and training will be provided to the Program.

Monitoring by Observation and Field Notes

Note-taking is required for most monitoring. Most often a sentence regarding general procedure is sufficient (for example: "nothing unusual noted during or after spray"). In addition, note the time of treatment, and any wildlife activity in or around the field at E&T species sites. Refer to SOP EM-12 *Using a Field Log Book*. Photocopies of field log books should be submitted, or the notes can be made directly into the "remarks" section of the APHIS 2060 form submitted to the ECT. In the case of monitoring eagle nests, see note-taking recommendations in SOP EM-18 *Observing Bald Eagles at Nest Sites*. Documented observations are required as per the protection measures, and these notes should be submitted to the ECT.

GENERAL MONITORING ISSUES

DISCRETIONARY MONITORING

At the discretion of program managers or environmental monitoring staff, additional monitoring samples can be collected. Although the monitoring outlined in this plan should be adequate to meet the objectives noted above, the program manager may decide that additional sampling may be necessary around particular sensitive sites. Examples might include sites that are highly visible to the public or are politically sensitive sites where environmental monitoring might help prevent future conflicts, and sites of proposed protected species.

To ensure that sampling equipment is not accidentally exposed to pesticides, work units or program areas may periodically submit an unused dye card, distilled/deionized water in Program containers, or gauze wipes of sampling equipment in storage for analysis for permethrin or chlorpyrifos. Individual APHIS 2060 forms must be included, as with any sample submitted for analysis.

To independently verify the analyses of the USDA laboratory, work units or program areas may periodically follow procedures for taking, documenting, and submitting split samples for analysis. Split sampling involves taking a single sample and dividing it in half, with each half analyzed by a different laboratory. If a work unit or program area chooses to take split samples of any type, they must first contact the ECT at (301) 734-8247 to discuss the precise procedures required for taking proper split samples.

DOCUMENTATION

A clear diagram of the sensitive site and where each sample is collected will be drawn either on a Geographic Information System (GIS) map, on a separate piece of paper, or on the 2060 forms associated with the samples. If a series of samples is collected from the same site, the map and diagram need only be submitted once, as long as the site and each sample are clearly indicated on the map and in the appropriate sections of each APHIS 2060 form.

For each sample collected, a separate APHIS 2060 form must be completed. This is especially true for dye cards, where each dye card must be submitted using a separate 2060 form. Instructions for completing the 2060 forms may be found on the back of each form. For each sample: the blue copy of the APHIS 2060 form should be submitted to ANPCL physically accompanying the sample; the white copy of the form submitted to ANPCL in the sample shipping container but separate from the sample; and the yellow copy of the form (and any maps, photos, etc.) submitted to the ECT. The APHIS 2060 form for any samples that are not sent to the laboratory for analysis (i.e. unspotted dye cards) should be sent only to the ECT. Pink copies of the form are retained by the staff that collected the sample.

Samples must be properly identified as routine or priority. An incorrect identification regarding the nature of the sample creates confusion in those who must interpret the data and delays the processing of samples that are incorrectly marked. Samples should be checked "priority" only in instances where a fast turnaround of samples is required. This applies to **all** complaint investigations, spill incidents, potential human health issues, and other samples considered to be of very high importance. Otherwise, the sample should be marked as "routine."

SHIPPING OF SAMPLES

All samples, including dye cards, must be shipped using some form of overnight delivery. See SOP EM-17, *Packaging and Shipping of Samples* for details. This applies to all samples, whether they are priority or routine. Samples must not be shipped using USPS Priority Mail or standard ground service with other carriers. Overnight delivery allows the sample to stay frozen or at least cold. Shipping any other way will take no less than 2-3 days, causing the ice and sample to melt, which can ruin the sample.

With the exception of neat (pure) chemical, all samples **must** be frozen, shipped in a cooler box (not a regular cardboard box), and kept frozen during shipment. To keep samples cold, the use of dry ice is recommended since it does not turn to liquid when warmed and will therefore not ruin any forms or samples. However, if **water** samples are shipped, **do not** use dry ice, since it will cause the sample containers to crack or break. Since dry ice may not be available in all areas, regular ice can be used for shipping any samples, but only if the ice is placed in a separate sealed container. Either use "blue ice" containers (the reusable plastic containers with the blue liquid/gel inside) or contained regular ice (that is, seal the ice in zip-loc bags). Unsealed ice will melt and leak during shipment and cause great concern when received at the laboratory.

SUPPLIES

Supplies for monitoring are ordered through the APHIS Analytical and Natural Products Chemistry Laboratory (ANPCL). A checklist for ordering supplies is located on pages C1-2. ANPCL prefers that supply orders be faxed to them using the numbers listed on the checklist rather then leaving a voice message for orders.

RESPONSIBILITIES

USDA-APHIS Environmental Compliance Team

In addition to preparing the EMP, ECT personnel in Riverdale, MD, will:

1. Review and interpret field data and pesticide residue data as they arrive from the sample collectors and the laboratory. Contact the sample collector for clarification as soon as possible if any field data is incomplete or unclear. Notify the Program Director and Manager immediately if any residue data indicates the possibility of excessive exposure to pesticide.
2. Provide training, clarification, and interpretation on how to implement the Environmental Monitoring Plan.
3. Submit a comprehensive interpretive report to the Program Director and the National Coordinator, within 60 working days of receiving all of the Program's field data and the results of all residue analyses for environmental monitoring. Following review of the information, the ECT will provide a copy of the annual report to the Environmental Protection Agency and U.S. Fish & Wildlife Service.

USDA-APHIS Analytical and Natural Products Chemistry Laboratory

Personnel at the ANPCL in Gulfport, MS, will:

1. Prepare and ship sampling containers and other material required for collection, stabilization, and shipping of environmental monitoring samples.
2. Provide training on methods for collecting, handling, preserving, and shipping samples.
3. Respond to requests for additional information by field personnel when special sampling requirements occur.
4. Analyze monitoring samples according to standard operating procedures for malathion.
5. Complete analyses and report results on the following schedule:

a. Within 23 working days after receipt, complete analyses of all routine samples and send results to the ECT.
b. Within 5 working days after receipt, complete analyses of all priority/emergency samples and send results to the ECT.

6. Contact ECT if the projected completion schedules need to be extended due to sample load or instrument problems on site.
7. Forward copies of all environmental monitoring forms and any attached documentation to the ECT each week via overnight mail.

Program/Foundation/Organization Employees, PPQ Field Service Personnel or Cooperators, Under the Direction of the Program Director

Personnel in work unit, district, and program areas will:

1. Ensure that sufficient resources from the Program are allocated for completing the monitoring activities described in the Environmental Monitoring Plan (EMP).
2. Coordinate with Federal and local wildlife officials to identify E&T species and habitats near or within areas that may be affected by Program activities, inform the ECT of these species and locations, and implement the required protection measures.
3. Identify all sensitive sites near cotton fields as described in the EMP.
4. Select sufficient monitoring sites for the collection of samples. Follow instructions in this EMP and referenced SOPs to develop a compliant local work plan for sample collection and documentation, including:
   a. Collection of the type and number of environmental samples recommended in the EMP.
   b. Completion of a separate APHIS 2060 form for each sample that is collected.
   c. Providing all the information necessary (as described above) to document the samples. Following each treatment, send all supporting documentation, including a copy of the appropriate APHIS 2060 forms to the ECT. Send all samples and appropriate APHIS 2060 forms to ANPCL. Ship all samples and supporting documentation as soon as possible after collection.
   d. Notification of ANPCL prior to shipping any priority, spill, or unusual (i.e. other than water, dye card, soil, or vegetation) samples.

2007 Operational Procedures/Mitigation Measures Checklist
Pink Boll Worm Eradication Program

(Modify as needed for each work unit, district, or program area)

_____ Retain a copy of all the pesticide certifications for Program personnel who are applying or supervising the application of pesticides. Certificates were reviewed annually.

_____ Contractors' pesticide application certificates were available and recorded prior to the initial pesticide application.

_____ Copies of all APHIS Form 2060's submitted to the USDA analytical laboratory were retained at the work unit, district, or program area as documentation of the environmental monitoring program.

_____ A printout, or electronic file, of all trapped cotton fields, and the dates traps were checked and fields were treated, was retained as documentation for meeting all trapping and treatment criteria.

_____Operational Procedures and Recommended Mitigation Measures as defined in the Southwest Pink Bollworm Eradication Program - 2002 Environmental Assessment (see below, pages A1-7), were reviewed with all appropriate Program personnel and copies were distributed as appropriate. Measures for chemicals not used by the Program may be ignored.

_____ Sensitive areas as defined in Table 2-1 in the Environmental Impact Statement (attached) were identified in each field unit. Appropriate Program supervisory personnel are familiar with all sites and have applied appropriate protective measures to avoid negative impact. Program personnel have reviewed these areas with field unit supervisors each spring prior to pesticide application, assessed the sites for environmental monitoring sampling, and provided appropriate seasonal review.

_____ The following was issued to each employee as appropriate and serve as instructions for operational procedures:

_____ a. Trapper Guide and Trapper Agreement
_____ b. Mist-Blower Operational Guide
_____ c. Hi-Boy Operational Guide
_____ d. Airplane Observer Duties
_____ e. Airport Recorder Duties
_____ f. BWEP Safety Manual

_____ Mist-blower and hi-boy operator training was conducted. Each employee signed a statement that they have received appropriate operational and safety training. This statement is retained in their personnel folder.

_____ Each employee involved with pesticide use was tested for blood acetyl cholinesterase levels as necessary. Copies of all cholinesterase tests were retained in each employee's folder.

_____ Two-way radio contact was maintained to allow communication between pilots and ground observers, to enhance safety and the effectiveness of each treatment.

_____ Wind and weather conditions were recorded to document meteorological conditions during treatments.

_____ Airplane check-in procedures certified nozzle type, size and number, spray system pressure, nozzle orientation, etc. This check-in list and subsequent seasonal inspections were retained in the work unit, district, or program area office for each aircraft used in the Program.

_____ Correct operational and safety procedures for mist-blowers and hi-boys were monitored weekly by Program supervisory personnel and documented in the mist-blower log. Program supervisory personnel checked at least one mist-blower operator or hi-boy operator each week during the control season.

_____ A minimum of one aerial application operation was monitored by Program supervisory personnel each week for each contractor. This monitoring procedure was noted on flight records.

_____ Pesticide labels were carried in the vehicle of all persons involved with application, i.e. mist-blower operators, hi-boy operators, airplane observers, field supervisors, and Program supervisory personnel.

_____ Dye cards were labeled as to field numbers, date, and time of application. These cards were inspected by Program supervisory personnel and retained in the work unit or program area office or sent to the USDA laboratory for analysis as described in the Environmental Monitoring Plan.

_____ Initiation of Program operations was preceded by a notification to the following agencies:

_____ a. State Department of Agriculture or similar agency;
_____ b. State Conservation and National Resources Agency or similar agency;
_____ c. State Forestry Commission or similar agency;
_____ d. State Department of the Environment or similar agency; and
_____ e. Local governmental and county agencies (provide listings below).

Included in the notification letters was a request for assistance in identification of potential sensitive sites near cotton fields.

_____ A safety equipment check-off list was signed by each employee involved in pesticide application. This was retained in the employee's personnel folder.

_____ Safety procedures dealing with exposure to pesticides were inserted into the Program safety manual and made available to all employees handling pesticides.

_____ Empty pesticide containers were returned to the distributor.

_____ All complaints were documented, thoroughly investigated, and resolved. Those involving alleged pesticide misuse were referred to the appropriate state authority. Copies of complaints and actions taken were maintained on file. Copies of any state investigative reports were retained in the work unit or program area and copies submitted to the USDA-APHIS Environmental Compliance Team.

_____ Local contacts with U.S. Fish and Wildlife Service concerning endangered and threatened species habitat and mitigation measures were documented.

The above procedures and measures were performed in the _____ work unit, district, or program area during the 2007 season. Any minor deviations in such were corrected when observed. Deviations and/or pesticide incidents and corrective actions taken have been documented and are described as follows:

_____
_____
_____
_____
_____
_____
_____
_____
_____

_____ _____
Signature Date

NOTE: The following two pages are copied from the 2002 Environmental Assessment (EA) section called "Additional Protective Measures." These are the most current measures that have undergone the National Environmental Policy Act (NEPA) review process. The measures are "in addition" to those listed on pages A4-7 below, although several are redundant so that the EA would be more comprehensive in scope than the EIS that it references.

Southwest Pink Bollworm Eradication Program
Environmental Assessment - April 2002
Additional Protective Measures

Comprehensive routine operational procedures and mitigation measures that have been followed in previous cotton control programs (USDA, APHIS - see pages A4-7 below) will be adhered to in this program. The following additional protective measures, recommended for the proposed Pink Bollworm Eradication Program, may further reduce the potential for adverse environmental effects from this program.

Pesticide Applications

1. Program personnel overseeing applications of organophosphate and synthetic pyrethroid (chlorpyrifos and permethrin) pesticides are required to wear protective clothing or remain inside a closed vehicle with re-circulating air, depending on the circumstances of the application.

2. Unprotected workers will be advised of the respective reentry periods following treatment.

3. Program personnel shall immediately cease spraying operations if members of the public are observed within 100 feet of a cotton field being sprayed with chlorpyrifos or permethrin.

4. Aerial applications will not be made to sensitive areas (residences, public buildings, water bodies, hospitals, primary and secondary schools, day care centers, in-patient clinics, nursing homes, parks, churches); program treatments will be applied only to cotton fields.

5. Aerial applications will be made at a height of 5-12 feet above the cotton canopy, unless precluded by obstructions.

6. Program personnel will familiarize aerial applicators with applicable operational procedures, mitigation measures, and protection measures.

7. Before initiating operations, APHIS will obtain concurrence from the U.S. Department of the Interior's Fish and Wildlife Service on protection measures that are required for endangered and threatened species, or their critical habitats.

8. Program personnel will be present during all treatments near sensitive areas; they will use dye cards along field edges to detect off-site drift of pesticides.

9. The program will report any incident of pesticide poisoning to the local Department of Health; information about the validity and probable cause will be used to develop additional protective measures, as necessary.

Notification Procedures

1. Program personnel will provide advance written or telephonic notification of the approximate times and dates of treatments to area residents who reside within 3 miles of treatments and who formally request (providing their name, address, and telephone number) special notification.

2. Program personnel will publish public notices of the availability of the environmental assessment (EA) for this program in local newspapers; copies of the EA will be provided to local libraries.

3. Growers participating in the program will be notified of treatment dates so that they may provide timely and appropriate notice of treatments and protective measures to persons in their employ or residing on properties who could be exposed to chemical pesticides.

4. Residents who are registered with the local state department of agriculture as having multiple chemical sensitivity will be notified in writing or by telephone of the time of any program treatments to be made within 3 miles of their residence.

5. Before beginning treatment with chlorpyrifos or permethrin, program personnel shall notify all registered apiarists in or near the treatment area of the date and the approximate time of treatment.

Operational Procedures and Mitigation Measures
National Boll Weevil Cooperative Control Program

NOTE: These operational procedures and mitigation measures have been adopted for, and are an integral part of, the cooperative Boll Weevil Eradication Program. They were printed originally in the programmatic Environmental Impact Statement of 1991, and were revised as necessary in 2005.

Table 2-1 Operational Procedures
All Methods of Control

1. All applicable Federal, State, and local environmental laws and regulations will be followed during boll weevil control operations.
2. Sensitive areas (water bodies; parks; and occupied dwellings, such as homes, schools, churches, hospitals, and recreation areas) that may be adjacent to cotton fields will be identified. The program will be adjusted accordingly to ensure that these areas are not negatively affected.
3. Environmental monitoring of the program will be in accordance with the current environmental monitoring plan.
4. All cotton fields will be trapped. During the initial diapause year of the program, all fields will be treated from “ten percent cracked boll” until there is no hostable material remaining. In

subsequent years, only hostable fields from which boll weevils have been caught will be treated.

5. All program personnel involved in chemical applications will be instructed on the safe use of malathion, the safe use of equipment, and on operational procedures. Field supervisors will train Field Technicians, mist blower operators and high-clearance sprayer operators on operational procedures, and monitor their conduct during working hours.

Aerial Applications

1. All materials will be applied in strict accordance with EPA- and State-approved label instructions.
2. Aircraft, spray equipment, and pilots that do not meet all contract requirements will not be allowed to operate.
3. All USDA, APHIS, Plant Protection and Quarantine employees who plan, supervise, recommend or perform pesticide treatments must be certified under the APHIS pesticide certification plan. They are also required to meet any additional requirements of the State where they perform duties involving pesticide use. All Foundation personnel involved in pesticide application must maintain State pesticide applicator certification as required by state law.
4. Upon notification by program personnel, growers will advise workers of the re-entry period following treatment.
5. Two-way radios or aircraft radio frequencies will be provided to program personnel who direct, coordinate, or observe pesticide applications, to facilitate communication with the pilot.
6. All APHIS field personnel will have baseline cholinesterase tests before the first application and each spring and fall thereafter. It is recommended that contract, State, and private personnel also participate in this testing program.
7. Only certified aerial applicators who have been familiarized with local conditions will be used by the program.
8. To minimize drift and volatilization, applications will not be made when any of the following conditions exist in the treatment area: wind velocity exceeds 10 miles per hour (or less if required by State law); prevailing wind is blowing toward a nearby residence or other sensitive site; rain is falling or is imminent; fog is present, or air is turbulent enough to seriously affect the normal spray pattern; or temperature inversions exist that could lead to offsite movement of applied material.
9. Nozzle types and sizes, spray system pressure, and nozzle orientation will be specified in the program's aerial application contract or as otherwise directed by program personnel.

Ground Applications

1. Mist Blowers
   - Operators will be certified applicators, or will be in constant radio or cell phone contact with certified applicators.
   - Units will be operated from closed truck cabs with operators using re-circulated air.
2. High-Clearance Sprayers
   - Operators will be certified applicators, or will be in constant radio or cell phone contact with certified applicators.
   - Spray operations will be conducted from closed cabs using re-circulated air.

Table 2-2. Recommended Mitigation Measures

All required State and local authorities will be notified upon initiation of the program. The notification will advise State and local authorities of the need for any assistance in identifying sensitive areas in proposed treatment areas.

Protection of Workers

All program personnel will be instructed on emergency procedures to follow in the event of insecticide exposure. Equipment necessary for immediate washing procedures must be available for application personnel.

Aerial Applications

1. Pilots, loaders, and other personnel handling insecticides will be advised to wear safety equipment and protective clothing.
2. Program personnel observing applications of malathion are required to wear protective clothing or remain inside a closed vehicle with re-circulating air, depending on the circumstances of the application.
3. Application operations will be postponed in fields in which people are working. These fields will not be treated when workers are present.
4. GPS systems are required on all contract aircraft. They will be used for pilot guidance, mapping fields to be treated, and assistance in locating fields and marking swaths.

Ground Applications

1. Mist Blowers
   - Operators will be certified applicators, or will be in constant radio or cell phone contact with certified applicators.
   - Operators will wear appropriate safety equipment when loading or servicing the unit, and will be specially trained by program personnel.
   - Mist blower units will be operated from closed truck cabs with operators using re-circulated air.
2. High-Clearance Sprayers
   - Operators will be certified applicators, or will be in constant radio or cell phone contact with certified applicators.
   - Operators will wear appropriate safety equipment and protective clothing when loading or servicing the unit.
   - High-clearance sprayers will be operated from closed cabs with operators using re-circulated air.

Pesticide Handling Precautions

1. Insecticides will be delivered and stores in sealed totes (mini-bulk tanks) or drums and then pumped directly into the spraying equipment.
2. All insecticides will be stored in accordance with Federal, State, and local regulations and label instructions.

3. All loading and unloading of insecticides will be within a containment area where an accidental spill will not contaminate a stream or other body of water.
4. In the event of an accidental spill, procedures set forth in the PPQ Treatment Manual, chapter 7, pages 7-3-1 through 7-3-18, entitled, "Guidelines for Managing Pesticide Spills" will be followed.
5. All empty insecticide totes (mini-bulk tanks) and drums will be returned to the distributor for reconditioning.

Protection of the Public

1. Application aircraft shall avoid direct spraying of residences, garden plots and adjacent crops at all times.
2. Program personnel shall immediately cease spraying operations if members of the public are observed within 100 feet of a cotton field being sprayed with malathion.

Protection of Bees

Before beginning treatment with malathion, program personnel shall notify all registered apiarists in or near the treatment area of the date and approximate time of chemical treatment.

Protection of Wildlife

1. All control operations will be conducted with appropriate concern for their potential impact on endangered, threatened, and proposed species identified in this document.

APHIS has prepared a biological assessment for federally listed endangered, threatened and proposed species found within all U.S. cotton-producing counties from species information provided by the U.S. Department of the Interior, Fish and Wildlife Service (FWS) and State wildlife agencies.

Adequate protection measures are developed for federally listed endangered, threatened and proposed species through the Endangered Species Act, section 7, formal and informal consultations with FWS. Specific biological and distributional data for species is gathered in discussions between APHIS, Plant Protection and Quarantine, local FWS offices, State wildlife agencies and the Foundation before operations begin.

Species and habitats protected by State laws are addressed in site-specific assessments as needed.

2. Oil-sensitive dye cards are used to regularly monitor application efficacy. Spray deposition in the target area and droplet size are critical concerns.

Protection Measures
for Endangered, Threatened, and Proposed Species as part of the
2007 Pink Bollworm Eradication Program in New Mexico, Arizona, and Texas

CHLORPYRIFOS AND PERMETHRIN

KEY

STATUS: E=Endangered, T=Threatened, CH=Critical Habitat, PE=Proposed Endangered, PT=Proposed Threatened, PCH=Proposed Critical Habitat, EXPN=Experimental Population.

PROTECTION MEASURES: NE=APHIS determines that the Pink Bollworm Program will have No Effect on populations of this listed species.

Changes from last year's Program are highlighted in gray.

COMMON NAME	SCIENTIFIC NAME	STATUS	PROTECTION MEASURES
MAMMALS			
Bat, Mexican long-nosed	*Leptonycteris nivalis*	E	To protect the Mexican long-nosed bat from aerial and ground application of permethrin and chlorpyrifos, a 60-foot ground buffer and a 300-foot aerial buffer will be used at the edge of any entrance of an occupied roost or potential roost site of the Mexican long-nosed bat.
Bat, lesser long-nosed	*Leptonycteris curasoae (=sanborni) yerbabuenae*	E	To protect the lesser long-nosed bat from aerial and ground application of permethrin and chlorpyrifos, a 60-foot ground buffer and a 300-foot aerial buffer will be used at the edge of any entrance of an occupied roost or potential roost site of the lesser long-nosed bat.
Ferret, black-footed	*Mustela nigripes*	E, EXPN	NE – Excluded by habitat.
Jaguar	*Panthera onca*	E	To protect the jaguar from aerial and ground application of permethrin and chlorpyrifos, the program will monitor insecticide drift at habitat edge if field is within 300 feet of known occupied habitat. Known occupied habitat is defined as areas where jaguars have been observed within the last year.
Ocelot	*Leopardus (=Felis) pardalis*	E	To protect the ocelot from aerial and ground application of permethrin and chlorpyrifos, the program will monitor insecticide drift at habitat edge if field is within 300 feet of known occupied habitat. Known occupied habitat is defined as areas where ocelots have been observed within the last year.
Pronghorn, Sonoran	*Antilocapra americana sonoriensis*	E	NE – Excluded by habitat.
Squirrel, Mount Graham red	*Tamiasciurus hudsonicus grahamensis*	E,CH	NE – Excluded by habitat
Vole, Hualapai Mexican	*Microtus mexicanus hualpaiensis*	E	NE – Excluded by habitat
Wolf, gray	*Canis lupus*	E, CH, EXPN	NE – Excluded by habitat.
BIRDS			
Bobwhite, masked	*Colinus virginianus*	E	To protect the masked bobwhite, the Service should be consulted before implementation of a pesticide program adjacent to the Buenos Aires National Wildlife

COMMON NAME	SCIENTIFIC NAME	STATUS	PROTECTION MEASURES
	ridgwayi		Refuge in Pima Co., AZ.
Condor, California	*Gymnogyps californianus*	AZ=EXPN	NE – Excluded. Experimental nonessential pop.
Crane, whooping	*Grus americana*	E,CH, EXPN	To protect whooping cranes from aerial and ground application of permethrin and chlorpyrifos, the program will check fields for cranes before application. Fields with cranes must not be sprayed until cranes have left the field (without inducement).
Eagle, bald	*Haliaeetus leucocephalus*	T	To protect the bald eagle from aerial and ground application of permethrin and chlorpyrifos, the following measures will be applied. Permethrin: No aerial use within ¼ mile from currently occupied nests. Chlorpyrifos: No aerial or ground use within ½ mile from currently occupied nests. Aerial pesticide applications should be made in swaths parallel to a nest and its aerial buffer zone. If aerial flight over a nest is necessary, an elevation of 500 feet should be maintained over the nest. To protect the aquatic food sources of the bald eagle, an 80-foot ground buffer and 500-foot aerial buffer for both permethrin and chlorpyrifos will be used to protect fish in small water bodies for up to 1 mile both up- and downstream from an active eagle nest.
Falcon, northern aplomado	*Falco femoralis septentrionalis*	E	To protect the northern aplomado falcon and its prey from aerial and ground application of permethrin and chlorpyrifos, the following measures will be applied. Permethrin: No aerial or ground applications within ¼ mile of a currently occupied nest. Chlorpyrifos: No aerial or ground applications within ½ mile of known occupied habitat. Aerial pesticide applications should be made in swaths parallel to a falcon nest and its aerial buffer zone. Applicators should watch for falcons in the area of application and not make any pesticide application until after falcons have left.
Flycatcher, southwestern willow	*Empidonax traillii extimus*	E,CH	To protect the southwestern willow flycatcher and its prey from aerial and ground applications of permethrin and chlorpyrifos, the following protective measures will be used. Permethrin: No ground use within 30 feet and no aerial use within 150 feet of species habitat. Chlorpyrifos: No ground use within 60 feet or aerial use within 300 feet of species habitat.
Owl, Cactus ferruginous pygmy-	*Glaucidium brasilianum cactorum*	Delisted	None – delisted taxon
Owl, Mexican spotted	*Strix occidentalis lucida*	T,CH	NE – Excluded by habitat
Pelican, brown	*Pelecanus occidentalis*	E	NE – Excluded by habitat
Rail, Yuma clapper	*Rallus longirostris yumanensis*	E	To protect the Yuma clapper rail and its prey from aerial and ground applications of permethrin and chlorpyrifos, the following protective measures will be used. Permethrin: No aerial use within 200 feet and no ground use within 80 feet of water bodies or wetlands inhabited by this species. Chlorpyrifos: No ground use within 100 feet or aerial use within 350 feet of water bodies or wetlands inhabited by this species. Buffers apply to all of the habitat area and at least ½ mile upstream from the habitat in any contributing channel, tributary or spring run. The buffer zones should also be applied to 300 feet downstream from species habitat.
Tern, least (Interior)	*Sterna antillarum*	E	Permethrin: No aerial use within ¼ mile and no ground use within 300 feet around nesting colonies. Chlorpyrifos: No ground use within 300 feet or aerial use within ¼ mile around nesting colonies. Aerial applications should be made parallel to a colony and its aerial buffer zone. The following buffers will be applied at the edge of the closest water body (stream, river, lake, reservoir, etc.) to the colony, but apply only to lakes and reservoirs less

COMMON NAME	SCIENTIFIC NAME	STATUS	PROTECTION MEASURES
			than 100 surface-acres or streams and rivers that are less than 300 feet wide. These buffers are: for both chlorpyrifos and permethrin, no ground treatments within 80 feet and no aerial treatment within 200 feet from water's edge for 2 miles up- and downstream from the colony's closest point to the water body.
Vireo, black-capped	*Vireo atricapilla*	E	To protect the black-capped vireo and its prey from aerial and ground applications of permethrin and chlorpyrifos, the following protective measures will be used. Permethrin: No ground use within 30 feet and no aerial use within 150 feet of species habitat. Chlorpyrifos: No ground use within 60 feet or aerial use within 300 feet of species habitat.
REPTILES			
Rattlesnake, New Mexican ridge-nosed	*Crotalus willardi obscurus*	T,CH	NE – Excluded by habitat.
Tortoise, desert	*Gopherus agassizii*	T,CH	To protect the desert tortoise from aerial and ground application of permethrin and chlorpyrifos, a 600-foot ground buffer and a ¼-mile aerial buffer will be used at the edge of habitat of the desert tortoise. These protection measures will be implemented if information indicates that desert tortoises are occupying habitat adjacent to a cotton field.
AMPHIBIANS			
Frog, Chiricahua leopard	*Rana chiricahuensis*	T	To protect the Chiricahua leopard frog from aerial and ground application of permethrin and chlorpyrifos, a 400-foot ground buffer and a ⅛-mile aerial buffer will be used when these insecticides are applied above the high water line of Chiricahua leopard frog habitat. These insecticides should not be applied below the high water line of Chiricahua leopard frog habitat.
Salamander, Sonora tiger	*Ambystoma tigrinum stebbinsi*	E	To protect the Sonora tiger salamander from aerial and ground application of permethrin and chlorpyrifos, a 400-foot ground buffer and a ⅛-mile aerial buffer will be used at the edge of known occupied habitat (including stock ponds or watering tanks) of the Sonora tiger salamander. Buffer zones will be applied to land adjacent to water bodies and wetlands that serve as species habitat. Buffers will be used for (1) all of the habitat area and (2) at least 1 mile upstream and 300 feet downstream from the habitat area in any contributing channel, tributary, or spring run.
FISH			
Catfish, Yaqui	*Ictalurus pricei*	T,CH	To protect the Yaqui catfish from aerial and ground application of permethrin and chlorpyrifos, a 100-foot ground buffer and a 350-foot aerial buffer will be used at the edge of aquatic habitat. Buffer zones should be used for (1) all of the habitat area and (2) at least 1/2 mile upstream and 300 feet downstream from the habitat area in any contributing channel, tributary, or spring run.
Chub, bonytail	*Gila elegans*	E,CH	To protect the bonytail chub from aerial and ground application of permethrin and chlorpyrifos, a 100-foot ground buffer and a 350-foot aerial buffer will be used at the edge of aquatic habitat. Buffer zones should be used for (1) all of the habitat area and (2) at least ½ mile upstream and 300 feet downstream from the habitat area in any contributing channel, tributary, or spring run.
Chub, Gila	*Gila intermedia*	E,CH	To protect the Gila chub from aerial and ground application of permethrin and chlorpyrifos, a 400-foot ground buffer and a ⅛-mile aerial buffer will be used at the edge of aquatic habitat. Buffer zones should be used for (1) all of the habitat area and (2) at least 1 mile upstream and 300 feet downstream from the habitat area in any contributing channel, tributary, or spring run.
Chub, humpback	*Gila cypha*	E, CH	To protect the humpback chub from aerial and ground application of permethrin and chlorpyrifos, a 100-foot ground buffer and a 350-foot aerial buffer will be used at the

COMMON NAME	SCIENTIFIC NAME	STATUS	PROTECTION MEASURES
			edge of aquatic habitat. Buffer zones should be used for (1) all of the habitat area and (2) at least ½ mile upstream and 300 feet downstream from the habitat area in any contributing channel, tributary, or spring run.
Chub, Virgin River	*Gila seminuda (=robusta)*	E, CH	To protect the Virgin River chub from aerial and ground application of permethrin and chlorpyrifos, a 100-foot ground buffer and a 350-foot aerial buffer will be used at the edge of aquatic habitat. Buffer zones should be used for (1) all of the habitat area and (2) at least ½ mile upstream and 300 feet downstream from the habitat area in any contributing channel, tributary, or spring run.
Chub, Yaqui	*Gila purpurea*	E,CH	To protect the Yaqui chub from aerial and ground application of permethrin and chlorpyrifos, a 400-foot ground buffer and a ⅛-mile aerial buffer will be used at the edge of aquatic habitat. Buffer zones should be used for (1) all of the habitat area and (2) at least 1 mile upstream and 300 feet downstream from the habitat area in any contributing channel, tributary, or spring run.
Gambusia, Big Bend	*Gambusia gaigei*	E	NE – Excluded by habitat.
Gambusia, Pecos	*Gambusia nobilis*	E	To protect the Pecos gambusia from ground and aerial application of chlorpyrifos and permethrin in Jeff Davis, Reeves, and Pecos Counties in Texas, the following protection measures will be used. No ground treatments within 400 feet and no aerial treatment within ⅛ mile of the spring outlet for Phantom Lake Spring (Jeff Davis County), the spring outlets for San Solomon Spring, Giffin Spring, and East Sandia Spring (Reeves County), or the area covered by Leon Creek, Diamond Y Draw, Diamond Y Spring, Gonzales Spring, and their associated wetlands or spring runs up to 2 miles east of the crossing of States Highway 18 over Diamond Y Draw (Pecos County).
Minnow, Devils River	*Dionda diaboli*	T	To protect the Devils River minnow from aerial and ground application of permethrin and chlorpyrifos, a 400-foot ground buffer and a ⅛-mile aerial buffer will be used at the edge of aquatic habitat. Buffer zones should be used for (1) all of the habitat area and (2) at least 1 mile upstream and 300 feet downstream from the habitat area in any contributing channel, tributary, or spring run.
Minnow, loach	*Tiaroga cobitis*	T,CH	To protect the loach minnow from aerial and ground application of permethrin and chlorpyrifos, a 100-foot ground buffer and a 350-foot aerial buffer will be used at the edge of aquatic habitat. Buffer zones should be used for (1) all of the habitat area and (2) at least ½ mile upstream and 300 feet downstream from the habitat area in any contributing channel, tributary, or spring run.
Minnow, Rio Grande silvery	*Hybognathus amarus*	E,CH	To protect the Rio Grande silvery minnow from aerial and ground application of permethrin and chlorpyrifos, a 100-foot ground buffer and a 350-foot aerial buffer will be used at the edge of aquatic habitat. Buffer zones should be used for (1) all of the habitat area and (2) at least ½ mile upstream and 300 feet downstream from the habitat area in any contributing channel, tributary, or spring run.
Pupfish, Comanche Springs	*Cyprinodon elegans*	E	To protect the Comanche Springs pupfish from ground and aerial application of chlorpyrifos and permethrin, the following protection measures will be used. No ground treatments within 400 feet and no aerial treatment within ⅛ mile of the spring outlet for Phantom Lake Spring (Jeff Davis County) or the spring outlets for San Solomon Spring, Giffin Spring, and East Sandia Spring (Reeves County).
Pupfish, desert	*Cyprinodon macularius*	E,CH	To protect the desert pupfish from aerial and ground application of permethrin and chlorpyrifos, a 400-foot ground buffer and a ⅛-mile aerial buffer will be used at the edge of aquatic habitat. Buffer zones should be used for (1) all of the habitat area and (2) at least 1 mile upstream and 300 feet downstream from the habitat area in any contributing channel, tributary, or spring run.
Pupfish, Leon	*Cyprinodon bovinus*	E,CH	NE – Excluded by habitat.

COMMON NAME	SCIENTIFIC NAME	STATUS	PROTECTION MEASURES
Springs			
Shiner, beautiful	*Cyprinella formosa*	T,CH	To protect the beautiful shiner from aerial and ground application of permethrin and chlorpyrifos, a 400-foot ground buffer and a ⅛-mile aerial buffer will be used at the edge of aquatic habitat. Buffer zones should be used for (1) all of the habitat area and (2) at least 1 mile upstream and 300 feet downstream from the habitat area in any contributing channel, tributary, or spring run.
Spikedace	*Meda fulgida*	T,CH	To protect the spikedace from aerial and ground application of permethrin and chlorpyrifos, a 100-foot ground buffer and a 350-foot aerial buffer will be used at the edge of aquatic habitat. Buffer zones should be used for (1) all of the habitat area and (2) at least ½ mile upstream and 300 feet downstream from the habitat area in any contributing channel, tributary, or spring run.
Sucker, razorback	*Xyrauchen texanus*	E,CH	To protect the razorback sucker from aerial and ground application of permethrin and chlorpyrifos, a 100-foot ground buffer and a 350-foot aerial buffer will be used at the edge of aquatic habitat. Buffer zones should be used for (1) all of the habitat area and (2) at least ½ mile upstream and 300 feet downstream from the habitat area in any contributing channel, tributary, or spring run.
Topminnow, Gila (incl. Yaqui)	*Poeciliopsis occidentalis*	E	To protect the Gila topminnow from aerial and ground application of permethrin and chlorpyrifos, a 400-foot ground buffer and a ⅛-mile aerial buffer will be used at the edge of aquatic habitat. Buffer zones should be used for (1) all of the habitat area and (2) at least 1 mile upstream and 300 feet downstream from the habitat area in any contributing channel, tributary, or spring run.
Trout, Apache	*Oncorhynchus apache*	T	To protect the Apache trout from aerial and ground application of permethrin and chlorpyrifos, a 400-foot ground buffer and a ⅛-mile aerial buffer will be used at the edge of aquatic habitat. Buffer zones should be used for (1) all of the habitat area and (2) at least 1 mile upstream and 300 feet downstream from the habitat area in any contributing channel, tributary, or spring run.
Trout, Gila	*Oncorhynchus gilae*	Downlisted from E to T	To protect the Gila trout from aerial and ground application of permethrin and chlorpyrifos, a 400-foot ground buffer and a ⅛-mile aerial buffer will be used at the edge of aquatic habitat. Buffer zones should be used for (1) all of the habitat area and (2) at least 1 mile upstream and 300 feet downstream from the habitat area in any contributing channel, tributary, or spring run.
Woundfin	*Plagopterus argentissimus*	E, CH EXPN	To protect the woundfin from aerial and ground application of permethrin and chlorpyrifos, a 100-foot ground buffer and a 350-foot aerial buffer will be used at the edge of aquatic habitat. Buffer zones should be used for (1) all of the habitat area and (2) at least ½ mile upstream and 300 feet downstream from the habitat area in any contributing channel, tributary, or spring run.
SNAILS			
Snail, Pecos assiminea	*Assiminea pecos*	E,CH	To protect the Pecos assiminea snail from ground and aerial application of chlorpyrifos and permethrin in Reeves and Pecos Counties in Texas, the following protection measures will be used. No ground treatments within 400 feet and no aerial treatment within ⅛ mile of the spring outlets for San Solomon Spring, Giffin Spring, and East Sandia Spring (Reeves County), or the area covered by Leon Creek, Diamond Y Draw, Diamond Y Spring, Gonzales Spring, and their associated wetlands or spring runs up to 2 miles east of the crossing of States Highway 18 over Diamond Y Draw (Pecos County).
PLANTS			
Arizona agave	*Agave arizonica*	Delisted	None – delisted taxon
Arizona	*Purshia*	E	To protect pollinators of the Arizona cliff-rose from aerial and ground application of

COMMON NAME	SCIENTIFIC NAME	STATUS	PROTECTION MEASURES
cliff-rose	*(=Cowania) subintegra*		permethrin and chlorpyrifos in cotton fields, an 80-foot ground buffer and a ¼-mile aerial buffer from occupied species habitat will be used during the flowering period (late March to early May) if the application is made in early dawn (no later than one hour after sunrise) or early evening (6 p.m. or later). For applications made in cotton fields outside the flowering period, applications may be applied beyond the 80-foot ground or ¼-mile aerial buffer zone at any time during the day.
Bunched cory cactus	*Coryphantha ramillosa*	T	NE – Excluded by habitat.
Canelo Hills ladies' tresses	*Spiranthes delitescens*	E	To protect pollinators of the Canelo Hills ladies'-tresses from aerial and ground application of permethrin and chlorpyrifos in cotton fields, an 80-foot ground buffer and a ¼-mile aerial buffer from occupied species habitat will be used during the flowering period (summer) if the application is made in early dawn (no later than one hour after sunrise) or early evening (6 p.m. or later). For applications made in cotton fields outside the flowering period, applications may be applied beyond the 80-foot ground or ¼-mile aerial buffer zone at any time during the day.
Chisos Mountain hedgehog cactus	*Echinocereus chisoensis var. chisoensis*	T	To protect pollinators of Chisos Mountain hedgehog cactus from aerial and ground application of permethrin and chlorpyrifos in cotton fields, an 80-foot ground buffer and a ¼-mile aerial buffer from occupied species habitat will be used during the flowering period March to July) if the application is made in early dawn (no later than one hour after sunrise) or early evening (6 p.m. or later). For applications made in cotton fields outside the flowering period, applications may be applied beyond the 80-foot ground or ¼-mile aerial buffer zone at any time during the day.
Cochise pincushion cactus	*Coryphantha robbinsorum*	T	To protect pollinators of Cochise pincushion cactus from aerial and ground application of permethrin and chlorpyrifos in cotton fields, an 80-foot ground buffer and a ¼-mile aerial buffer from occupied species habitat will be used during the flowering period March to May) if the application is made in early dawn (no later than one hour after sunrise) or early evening (6 p.m. or later). For applications made in cotton fields outside the flowering period, applications may be applied beyond the 80-foot ground or ¼-mile aerial buffer zone at any time during the day.
Davis' green pitaya	*Echinocereus viridiflorus var. davisii*	E	To protect pollinators of Davis' green pitaya from aerial and ground application of permethrin and chlorpyrifos in cotton fields, an 80-foot ground buffer and a ¼-mile aerial buffer from occupied species habitat will be used during the flowering period (February to May) if the application is made in early dawn (no later than one hour after sunrise) or early evening (6 p.m. or later). For applications made in cotton fields outside the flowering period, applications may be applied beyond the 80-foot ground or ¼-mile aerial buffer zone at any time during the day.
Gypsum wild-buckwheat	*Eriogonum gypsophilum*	T,CH	NE – Excluded by habitat, no insect pollination
Hinckley oak	*Quercus hinckleyi*	T	NE – No insect pollination
Holmgren milk-vetch	*Astragalus holmgreniorum*	E, CH (CH new as of 12/06)	To protect pollinators of Holmgren milk-vetch from aerial and ground application of permethrin and chlorpyrifos in cotton fields, an 80-foot ground buffer and a ¼-mile aerial buffer from occupied species habitat will be used during the flowering period (April to May) if the application is made in early dawn (no later than one hour after sunrise) or early evening (6 p.m. or later). For applications made in cotton fields outside the flowering period, applications may be applied beyond the 80-foot ground or ¼-mile aerial buffer zone at any time during the day.
Huachuca water-umbel	*Lilaeopsis schaffneriana var. recurva*	E,CH	To protect pollinators of the Huachuca water-umbel from aerial and ground application of permethrin and chlorpyrifos in cotton fields, an 80-foot ground buffer and a ¼-mile aerial buffer from occupied species habitat will be used during the

COMMON NAME	SCIENTIFIC NAME	STATUS	PROTECTION MEASURES
			flowering period (summer) if the application is made in early dawn (no later than one hour after sunrise) or early evening (6 p.m. or later). For applications made in cotton fields outside the flowering period, applications may be applied beyond the 80-foot ground or ¼-mile aerial buffer zone at any time during the day.
Jones cycladenia	*Cycladenia jonesii(=humilis)*	T	NE – No insect pollination
Kearney's blue-star	*Amsonia kearneyana*	E	To protect pollinators of Kearney's blue-star from aerial and ground application of permethrin and chlorpyrifos in cotton fields, an 80-foot ground buffer and a ¼-mile aerial buffer from occupied species habitat will be used during the flowering period (April to June) if the application is made in early dawn (no later than one hour after sunrise) or early evening (6 p.m. or later). For applications made in cotton fields outside the flowering period, applications may be applied beyond the 80-foot ground or ¼-mile aerial buffer zone at any time during the day.
Little Aguja pondweed	*Potamogeton clystocarpus*	E	To protect pollinators of Little Aguja pondweed from aerial and ground application of permethrin and chlorpyrifos in cotton fields, an 80-foot ground buffer and a ¼-mile aerial buffer from occupied species habitat will be used during the flowering period (March to April) if the application is made in early dawn (no later than one hour after sunrise) or early evening (6 p.m. or later). For applications made in cotton fields outside the flowering period, applications may be applied beyond the 80-foot ground or ¼-mile aerial buffer zone at any time during the day.
Lloyd's Mariposa cactus	*Echinomastus mariposensis*	T	To protect pollinators of Lloyd's mariposa cactus from aerial and ground application of permethrin and chlorpyrifos in cotton fields, an 80-foot ground buffer and a ¼-mile aerial buffer from occupied species habitat will be used during the flowering period (February to July) if the application is made in early dawn (no later than one hour after sunrise) or early evening (6 p.m. or later). For applications made in cotton fields outside the flowering period, applications may be applied beyond the 80-foot ground or ¼-mile aerial buffer zone at any time during the day
Nellie cory cactus	*Coryphantha minima*	E	To protect pollinators of Nellie cory cactus from aerial and ground application of permethrin and chlorpyrifos in cotton fields, an 80-foot ground buffer and a ¼-mile aerial buffer from occupied species habitat will be used during the flowering period (March to June) if the application is made in early dawn (no later than one hour after sunrise) or early evening (6 p.m. or later). For applications made in cotton fields outside the flowering period, applications may be applied beyond the 80-foot ground or ¼-mile aerial buffer zone at any time during the day.
Nichol's Turk's head cactus	*Echinocactus horizonthalonius var. nicholii*	E	To protect pollinators of Nichol's Turk's head cactus from aerial and ground application of permethrin and chlorpyrifos in cotton fields, an 80-foot ground buffer and a ¼-mile aerial buffer from occupied species habitat will be used during the flowering period late April to mid-May) if the application is made in early dawn (no later than one hour after sunrise) or early evening (6 p.m. or later). For applications made in cotton fields outside the flowering period, applications may be applied beyond the 80-foot ground or ¼-mile aerial buffer zone at any time during the day.
Pecos (= puzzle) sunflower	*Helianthus paradoxus*	T	To protect pollinators of Pecos sunflower from aerial and ground application of permethrin and chlorpyrifos in cotton fields, an 80-foot ground buffer and a ¼-mile aerial buffer from occupied species habitat will be used during the flowering period (August to May) if the application is made in early dawn (no later than one hour after sunrise) or early evening (6 p.m. or later). For applications made in cotton fields outside the flowering period, applications may be applied beyond the 80-foot ground or ¼-mile aerial buffer zone at any time during the day.

COMMON NAME	SCIENTIFIC NAME	STATUS	PROTECTION MEASURES
Pima pineapple cactus	*Coryphantha scheeri var. robustispina*	E	To protect pollinators of Pima pineapple cactus from aerial and ground application of permethrin and chlorpyrifos in cotton fields, an 80-foot ground buffer and a ¼-mile aerial buffer from occupied species habitat will be used during the flowering period (June to August) if the application is made in early dawn (no later than one hour after sunrise) or early evening (6 p.m. or later). For applications made in cotton fields outside the flowering period, applications may be applied beyond the 80-foot ground or ¼-mile aerial buffer zone at any time during the day.
Siler pincushion cactus	*Pediocactus (=Echinocactus, =Utahia) sileri*	T	To protect pollinators of Siler pincushion cactus from aerial and ground application of permethrin and chlorpyrifos in cotton fields, an 80-foot ground buffer and a ¼-mile aerial buffer from occupied species habitat will be used during the flowering period (spring) if the application is made in early dawn (no later than one hour after sunrise) or early evening (6 p.m. or later). For applications made in cotton fields outside the flowering period, applications may be applied beyond the 80-foot ground or ¼-mile aerial buffer zone at any time during the day.
Sneed pincushion cactus	*Coryphantha sneedii var. sneedii*	E	NE – Excluded by habitat
Terlingua Creek cat's-eye	*Cryptantha crassipes*	E	To protect pollinators of Terlingua Creek cat's-eye from aerial and ground application of permethrin and chlorpyrifos in cotton fields, an 80-foot ground buffer and a ¼-mile aerial buffer from occupied species habitat will be used during the flowering period (March to May) if the application is made in early dawn (no later than one hour after sunrise) or early evening (6 p.m. or later). For applications made in cotton fields outside the flowering period, applications may be applied beyond the 80-foot ground or ¼-mile aerial buffer zone at any time during the day.
Texas snowbells	*Styrax texanus*	E	NE – Excluded by habitat
Tobusch fishhook cactus	*Ancistrocactus tobuschii*	E	To protect pollinators of Tobusch fishhook cactus from aerial and ground application of permethrin and chlorpyrifos in cotton fields, an 80-foot ground buffer and a ¼-mile aerial buffer from occupied species habitat will be used during the flowering period (late January to early April) if the application is made in early dawn (no later than one hour after sunrise) or early evening (6 p.m. or later). For applications made in cotton fields outside the flowering period, applications may be applied beyond the 80-foot ground or ¼-mile aerial buffer zone at any time during the day.
Todsen's pennyroyal	*Hedeoma todsenii*	E,CH	NE – Excluded by habitat

2007 Endangered and Threatened Species Site Reporting Form - Pink Bollworm Eradication Program

Work unit/District/Zone/Program:_____State:_____

Species	Field Number(s)	Acres	GPS Coordinates	Distance to Field	Comments

Use additional copies as needed. Prior to the start of applications of pesticides, return the completed form to:
Dr. Robert Baca, USDA-APHIS-PPQ, 4700 River Road, Unit 150, Room 5A-04.6, Riverdale, MD 20737

ENVIRONMENTAL MONITORING SUPPLIES CHECKLIST

SUPPLIES TO BRING EACH TIME YOU GO TO A SAMPLING SITE					
Monitoring plan/SOP's		Obtain from ECT	Thermometer		
Field log notebook			Ice chest/wet or blue ice		Obtain locally
Compass			Baby wipes		
Wind gauge			2060 monitoring forms		
Indelible marker			Packing/strapping tape		

A.R.S.E. (Run-off Sampling)			Dye Cards		
Plexiglas cover			Oil sensitive dye cards		
8"x 8" mesh screen			Water sensitive dye cards		
Tent pegs/nails			5' bamboo poles/stakes		
Funnels attached to caps			Paper/binder clips		
500 ml bottles			Tacks		
4" PVC pipe, 14" long			4" x 4" plastic bags		
Post hole digger			12" x 12" plastic bags		
Pea gravel			Tweezers/forceps		
Large rocks/bricks			disposable gloves		
Bamboo pole/flagging tape			**Water Samples**		
collapsible cubitainer			Dissolved oxygen kit		
Sodium sulfate (small vials)			collapsible cubitainer		
pH paper/pH meter			Sodium sulfate (small vials)		
Sulfuric acid (squeeze bottle)			pH paper/pH meter		
Styrofoam 'coffin'			Sulfuric acid (squeeze bottle)		

Vegetation/Fish Samples			Sediment Samples		
Pruning sheers/scissors			Dredge tied to strong rope		
Aluminum foil envelopes			3 gallon galvanized pail		
Strapping tape			Hand trowel		
			3" mesh screen		
			Aluminum foil envelopes		

Soil Samples			Swab/Wipe Samples		
Soil core sampler			3” x 3” sterile cotton pads with resealable plastic bag		
3 gallon galvanized pail			Metric ruler		
Hand trowel			Pencil		
3" mesh screen			Disposable gloves		
Aluminum foil envelopes			Isopropyl alcohol		Obtain locally
Baby wipes					

Neat (Pure) Chemical Formulations			Miscellaneous Supplies		
Amber glass bottle			Labels		
Parafilm			Styrofoam coolers/mailers		
Small mailing tubes			Freezer		Obtain locally
Cat litter/packing material			Dry ice		Obtain locally
Disposable pipette			Resealable plastic bags:		
Pipetting bulb			4" x 4"		
Disposable gloves			6" x 6"		
Protective eyewear			8" x 8"		
			12" x 12"		

Program: _____ **Requested by:** _____

Date: _____ **Phone:** _____

Address: _____

_____

_____

To order supplies, indicate the quantity of each items needed. Fax a copy of this form to ANPCL at 228-822-3209 or 228-822-3137. If fax machines are not working, leave a message with the ANPCL supplies manager at 228-822-3106. Please realize that it may be difficult to completely fill order for large quantities of materials.

Note: This is not an exhaustive supply list…items that are not listed here may be available through ANPCL.