

Finding of No Significant Impact
Treatment Program for Light Brown Apple Moth in Santa Cruz and Northern Monterey
Counties, California
Environmental Assessment
September 2007

The U.S. Department of Agriculture (USDA), Animal and Plant Health Inspection Service (APHIS), has prepared an environmental assessment (EA) that analyzes potential environmental consequences of treating the light brown apple moth (*Epiphyas postvittana*) (LBAM) in Santa Cruz and northern Monterey Counties, California. LBAM is a destructive pest that attacks a wide variety of plants, including over 250 agronomically important crops and many other non-crop plant species. Should it become established, it has the potential to cause many millions of dollars in damage annually. The EA, incorporated by reference in this document, is available on the APHIS Web site at www.aphis.usda.gov/plant_health/plant_pest_info/lba_moth/index.shtml and from:

U.S. Department of Agriculture
Animal and Plant Health Inspection Service
Plant Protection and Quarantine
Emergency and Domestic Programs
Emergency Management
4700 River Road, Unit 134
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The EA analyzed two alternatives: (1) no action (maintaining the Federal quarantine order without further action by APHIS), and (2) treatment (continuation of the Federal quarantine order along with treatments of the area with insect pheromone). Female insects produce pheromones to attract males. The males sense the presence of a female by detecting the pheromone. Insect pheromones can be used to disrupt mating by reducing the likelihood for a male to find a female because of the additional sources and levels of pheromone in areas where moths are present. Pheromones are insect-specific, only attracting males of the same or a closely related species. There are two different pheromones that can be used to target LBAM: the LBAM-specific pheromone and the omnivorous leaf-roller pheromone. The LBAM-specific pheromone attracts only LBAM males and generally will have no effect on other organisms, although a few individuals of closely related moth species may be confused by it incidentally. This is the preferable pheromone, and will be used whenever it is available. The omnivorous leaf-roller pheromone attracts LBAM males; however it will also attract other members of the Tortricid family (leaf-rolling Lepidopterans). This pheromone will be used if the LBAM-specific pheromone is unavailable.

The initial treatment area is anticipated to consist of three blocks totaling approximately 60,000 acres located in the Soquel, Prunedale, and north Salinas areas. Over time, however, the entire infested area within the Santa Cruz–northern Monterey population center will receive treatment. Any one area within this population center is likely to receive at least two, and probably several, pheromone treatments over the next several years until it is determined that LBAM has been eradicated from the site. Complete eradication within the Santa Cruz and northern Monterey area is expected to take several years.

Due to the size of the initial areas to be treated, it is anticipated that aerial application of the microencapsulated pheromone will be the method used. Adequate buffers will be put in place prior to any aerial spraying to reduce the possibility of spray material being deposited in water bodies (lakes and rivers) and the ocean. Pheromone can also be applied by hand in a dispenser suspended from the ground, or in a microencapsulated formula by ground equipment. The dispensers are used at a rate of 250 dispensers per acre, and are effective for 90 days before they need to be replaced.

The microencapsulated pheromone, whether applied by air or ground equipment, is effective for 30 days. Normally, at least two applications, and probably more, will be required to eradicate LBAM in an area when using the mating disruption technique.

The EA evaluated the potential impacts from treating the subject area (see attached map of the treatment area, attachment A) with pheromone. Due to the rapid breakdown and volatilization of pheromone in both terrestrial and aquatic environments, the insolubility of the pheromone in water, and the low toxicity of the pheromones to aquatic and terrestrial organisms, as well as humans, adverse impacts to human health and the environment are not expected at the proposed low application rates.

A notice of availability of the EA was placed in local newspapers on September 21 and 22, 2007, which initiated a 30-day public comment period. The EA was also posted on the APHIS Web page. The public comment period closed on October 21, 2007. No comments were received as a result of these actions; however, the California Department of Food and Agriculture (CDFA) and APHIS jointly hosted five public meetings on the issue specifically for residents of the northern Monterey and Santa Cruz County areas. CDFA and APHIS also provided briefings and a question and answer session for the City Council of Santa Cruz, the County Board of Supervisors of Santa Cruz, the City Council of Scotts Valley, and a meeting of Salinas and other city and county officials of Monterey and Santa Cruz Counties. Considerable public interest was displayed at these meetings. The main concerns of the public were similar to those of the Monterey County public meetings (see attachment B). Attachment B also includes an extensive list of questions asked by California Assemblyman Laird on behalf of his constituents and CDFA's responses to those questions. One of the key issues in the Santa Cruz public meetings, which was not a key issue in the Monterey meetings, was the disclosure and testing of the inert ingredients, which is also addressed in attachment B. On October 20, 2007, Governor Schwarzenegger directed CDFA to make public the list of all ingredients in Checkmate® (the pheromone-containing product to be used in Santa Cruz and northern Monterey). The University of California at Davis–Marine Pollution Studies Laboratory and other scientists at Davis, conducted independent laboratory tests of the pheromone product used in the eradication project in October, and confirmed that the formulation would not be injurious to nontarget freshwater and marine species that were tested (see attachment C).

The purpose of preparing an EA is for an agency to determine whether a significant environmental impact is likely to occur as a result of the proposed action and, therefore, require the preparation of an environmental impact statement (EIS) concerning the proposed action. The EA need not provide a compendium of information; however, the EA must provide enough information to make this determination. The EA, incorporated by reference herein, has provided adequate information and analysis to clearly demonstrate that the pheromone will not cause a significant impact to the environment, based on the available toxicity and environmental fate information.

APHIS is responsible for taking actions to exclude, eradicate, and/or control plant pests under the Plant Protection Act (7 United States Code 7701 et seq.). Therefore, it is important that APHIS take the steps necessary to eradicate LBAM from areas in California to prevent its spread to susceptible agronomic and non-agronomic host plants throughout the United States. The Technical Working Group (TWG), an international team of scientific experts on LBAM and pest eradication methods, was assembled in May, 2007, to provide advice and recommendations to APHIS regarding LBAM control and eradication. APHIS, in cooperation with CDFA, has relied upon TWG recommendations to develop the mating disruption strategy and eradication efforts proposed for use in the Santa Cruz-northern Monterey area. TWG's advice has been central to eradication efforts, thus far, and is expected to remain central as eradication efforts in other parts of California continue to develop.

In addition to pheromone treatments in the Monterey and Seaside area, and the proposed efforts in Santa Cruz and northern Monterey Counties, CDFA and APHIS have begun treatment of small isolated populations of LBAM (less than 10 moths per trap). This is believed to be a desirable strategy to limit the spread of the moth until an eradication program can be implemented. APHIS prepared an EA that evaluated the potential impacts from eradication of small, isolated populations of LBAM. The eradication of small, isolated populations should begin before LBAM can multiply and spread to other areas, thus making eradication more problematic.

TWG advised that an important aspect for containing LBAM populations and eliminating range expansion is to treat the southern population centers in the Seaside, Monterey, and Santa Cruz areas. Because several generations of LBAM can occur annually, it is important to begin this action before the populations expand to the point where mating disruption would not be effective to control LBAM growth. CDFA and APHIS treated the Monterey and Seaside areas in early September, with a second treatment in late October. Treatments in Santa Cruz and northern Monterey Counties are anticipated to begin in early November, and have been analyzed in this EA.

Consultation with the Monterey Bay National Marine Sanctuary

The Monterey Bay National Marine Sanctuary (Sanctuary) is adjacent to the proposed treatment area. This is a federally protected marine area offshore of California's central coast. It stretches from Marin County to Cambria County, and encompasses a shoreline length of 276 miles and 5,322-square miles of ocean. It supports a diverse marine ecosystem and is home to numerous mammals, seabirds, fish, invertebrates, and plants in a remarkably productive coastal environment. The Sanctuary was established for the purposes of resource protection, research, education, and public use. Sanctuary staff and some members of the public were concerned about potential impacts to marine resources from the aerial application of pheromone in areas adjacent to the shoreline. CDFA and APHIS have consulted with the Sanctuary and have obtained a permit that recognizes a potential for inadvertent contamination of Sanctuary waters from treatment of areas in Santa Cruz County that are adjacent to the Sanctuary. Any off-site movement of the material into the Sanctuary will not cause injury to aquatic resources, based on available toxicity and environmental fate information and use patterns for the pheromone formulation. CDFA is also obtaining a permit for conducting flight operations in a flight restricted area of the Sanctuary.

Endangered Species Act Compliance

CDFA and APHIS have consulted with the U.S. Fish and Wildlife Service (FWS) and National Marine Fisheries Service (NMFS), as required by the Endangered Species Act, for the proposed eradication program. Both FWS and NMFS have concurred (we are awaiting written receipt of concurrence) with CDFA that the proposed action is not likely to adversely affect listed species in the Santa Cruz-northern Monterey area, including the endangered tidewater goby (*Eucyclogobius newberryi*), brown pelican (*Pelecanus occidentalis*), Ohlone tiger beetle (*Cicindela ohlone*), Zayante band-winged grasshopper (*Timertropis infantillis*), Robust spinyflower (*Chorizanthe robusta* var. *robusta*), Yadon's rein orchid (*Piperia yadonii*), the threatened southern sea otter (*Enhydra lutris nereis*), western snowy plover (*Charadrius alexandrinus nivosus*), California red-legged frog (*Rana aurora draytonii*), California tiger salamander (*Ambystoma californiense*), Coho salmon- central California ESU (*Oncorhynchus kisutch*), steelhead -central California coast ESU (*Oncorhynchus mykiss irideus*), Santa Cruz tarplant (*Holocarpa macradenia*), and Monterey spinyflower (*Chorizanthe pungens* var. *pungens*). These findings were based on a lack of toxicity of the pheromone, specificity of the pheromone to LBAM, that no spraying will be conducted over water, and the pheromone's rapid degradation.

Other Concerns, Consultations, and Compliance with Relevant Executive Orders

CDFA has consulted with the Central Coast Water Quality Control Board to ensure that water quality standards are not jeopardized by the proposed program. The Central Coast Water Board has provided an email to CDFA indicating that as long as the material is applied in accordance with the restrictions of the Section 18 pesticide label, and direct applications to water are avoided, they have no objections to the proposal and will not require a permit.

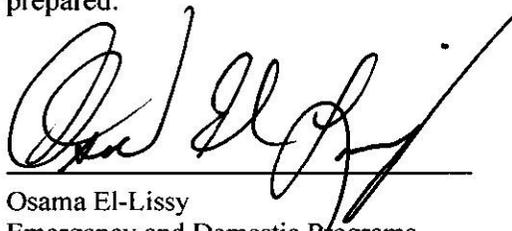
The USDA National Organic Program approved the use of the Checkmate® pheromone (the product to be used in the LBAM program) in organic agriculture. This has prompted the California Certified Organic Farmers, one of the oldest and largest organic certification agencies in North America, to announce its support of aerial spraying of a pheromone to control LBAM in a statement on August 31, 2007.

Congregations of overwintering monarch butterflies are found at more than 200 sites along the California coast, from Mendocino County in the north to San Diego in the south. The monarch butterfly makes massive, southward migrations beginning in August until the first frost. Female monarchs deposit eggs for the next generation during these migrations. The treatment blocks contain several monarch congregation sites, most notably in the Santa Cruz area; however, the monarch butterfly will not be affected with the use of pheromone. As noted in the EA, the pheromone is specifically formulated to only affect LBAM, and possibly some closely related moth species, by preventing the males from finding a mate.

Due to the nature of the proposed actions described herein, there should be no disproportionate adverse effects to minorities, low-income populations, or children in accordance with Executive Order 12898, "Federal Actions to Address Environmental Justice in Minority Populations and Low-income Populations," and Executive Order 13045, "Protection of Children from Environmental Health Risks and Safety Risks."

Conclusion

APHIS' finding of no significant impact from treatment in this area is based upon the expected limited environmental consequences, as analyzed in the EA, and as further described in the attachments hereto. An EIS must be prepared if implementation of the proposed action may significantly affect the quality of the human environment. I have determined that there would be no significant impact to the human environment from the implementation of the treatment alternative and, therefore, no EIS needs to be prepared.

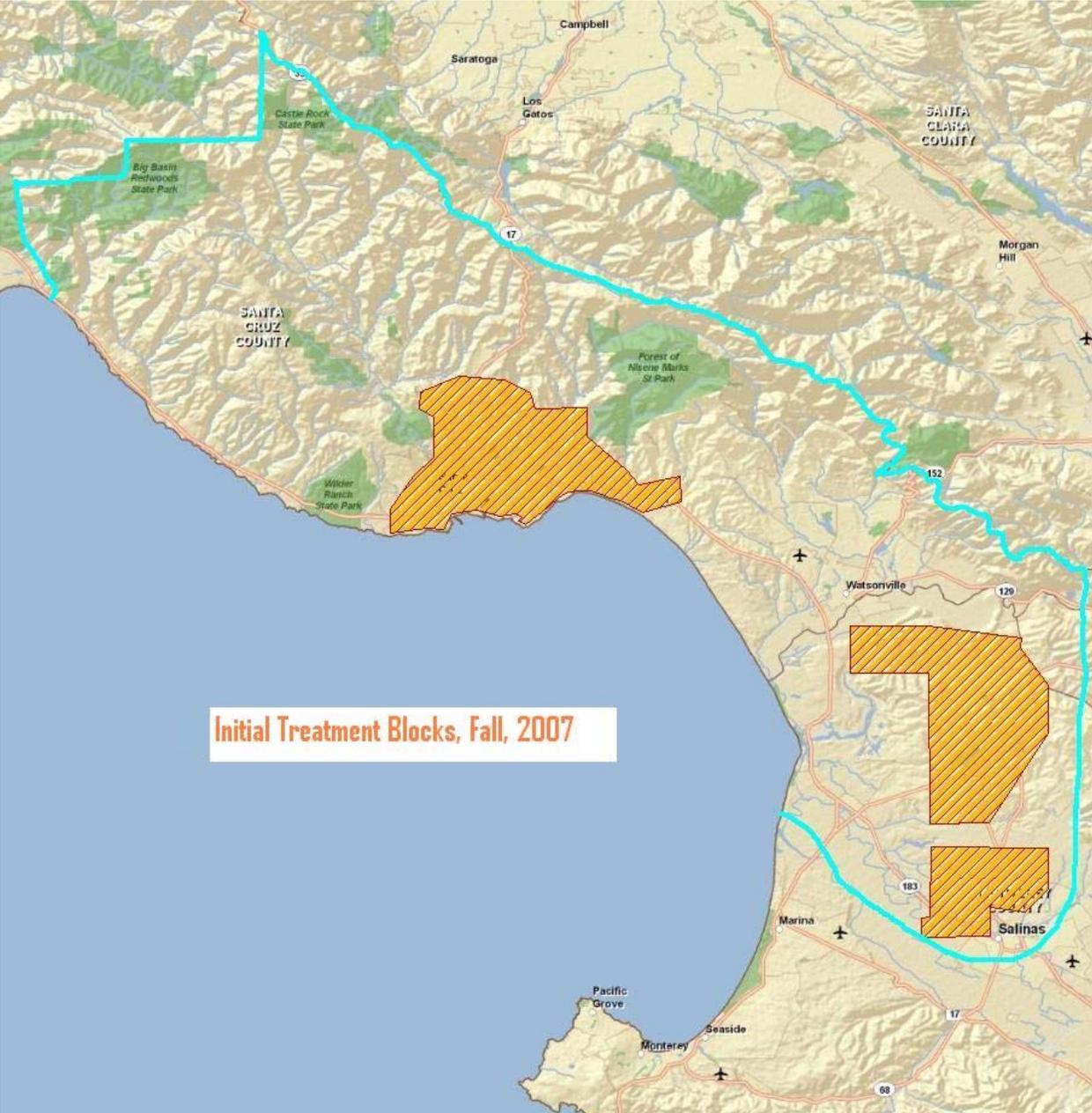

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Emergency and Domestic Programs
Plant Protection and Quarantine
Animal and Plant Health Inspection Agency

Nov. 2, 2007
Date

- Attachment A: Treatment Area Map
- Attachment B: Light Brown Apple Moth Questions and Answers
- Attachment C: Response to Inert and Toxicity Concerns for Pheromone Products Used in LBAM Control and Eradication

Attachment A. Proposed Treatment Area





Attachment B. Light Brown Apple Moth Questions and Answers

Light Brown Apple Moth (LBAM) Questions and Answers

Including information about pheromones, aerial treatment plans and other elements of the eradication effort.

Is the aerial application of this pheromone safe?

The pheromone materials Checkmate OLR-F and Checkmate LBAM-F have been reviewed and approved for aerial application by the federal Environmental Protection Agency (EPA) and the state Department of Pesticide Regulation (DPR). These pheromones and many others like them are present in our environment every day as many insects use them to attract mating partners or signal other behaviors. Humans and other mammals do not use these insect pheromones and cannot detect them. Studies of this pheromone in particular and about the interaction of pheromones and mammals in general have shown no evidence for concern about exposure to pheromones, even at much higher levels than proposed for the aerial treatment of the Monterey Peninsula.

The EPA does not permit long-term human studies for any type of pesticide. Instead, the possibility of chronic effects is typically addressed by animal studies. Testing of the active ingredient on animals did not demonstrate any signs of poisoning. Proposed aerial treatments would apply a small fraction of the amount used for testing, indicating a large margin of safety for even the most sensitive groups.

The EPA has established that this is a very low toxicity material applied in a very dilute concentration. No illnesses related to the use of these materials have ever been reported, even by people handling concentrated forms of Checkmate or similar pheromone products used to control other insects. The State of California and US EPA have long maintained systems for tracking illness reports related to treatments. In addition, the USDA has certified this product and other pheromones for use on organic crops.

Related resources:

The EPA provides an online summary of its quarantine exemptions for LBAM pheromones. At the bottom of this web page, several additional references and resources are provided:

http://www.epa.gov/pesticides/local/region9/lbam_quarantine.htm

The online Federal Register includes an informative page summarizing EPA's determinations about lepidopteran (moth) pheromones:

<http://www.epa.gov/fedrgstr/EPA-PEST/1995/August/Day-30/pr-388.html>

Are the planes, treatment equipment and flight plans safe?

The contractor Dynamic Aviation, their planes and the individual pilots are required to be reviewed and licensed/approved by the Federal Aviation Administration (FAA). CDFA has contracted with this company for many years for aerial release of sterile Mediterranean fruit flies in the Los Angeles basin, and their safety record is unblemished. Detailed flight plans are submitted to local aviation authorities for review in advance. To ensure that no contamination of the pheromone product occurs, the mixing, loading and treatment equipment is required to be new and dedicated to this project. We will conduct

sampling of the pheromone mixtures and follow a strict chain-of-custody procedure in the delivery of these materials for testing. Strict protocols are also in place for the purchase, transport, storage, mixture and loading of the material to be used in the treatment.

If the proposed application is safe, why does your literature and the product label mention precautions?

The EPA requires precautionary statements on every product it approves. The precautions on the label are relatively minimal when compared to the precautions typically seen on labels for conventional pesticides. Based on review and approval of this product by the EPA and the California Department of Pesticide Regulation (DPR), there is no human or animal health risk from exposure to the material during treatment. However, as we do with any aerial treatment, we advise those who wish to avoid unnecessary exposure to take simple precautions such as staying indoors or under cover, closing windows, removing laundry from outdoor lines, etc.

A complicating factor in this discussion is that a label for “Checkmate OLR-F” that has been circulated by members of the public is not the correct label for the product that will be used. The label that has been disseminated in error is appropriate only for treatments in agricultural areas where higher concentrations of the active ingredient are prescribed. The warnings and precautions on this label are intended for trained workers who routinely and repeatedly handle concentrated, undiluted pesticide ingredients while they are being mixed and prepared for treatment. This information does not apply to those who may be exposed to a diluted form of the material to be used during an aerial treatment.

Why is this eradication project an emergency?

Data from our statewide insect trapping efforts shows that this infestation is a recent arrival to California. The populations of LBAM are still relatively small and are considered by an international panel of expert scientists to be eradicable if significant action is taken promptly. These moth populations can grow exponentially, going through approximately five generations per year with each female moth laying hundreds of eggs. Failure to act quickly could result in uncontrolled spread and substantial environmental and economic impacts.

Who decides whether or not aerial applications are necessary? How is that decision made?

At the direction of federal and state law, agricultural officials with the USDA and CDFA are responsible for eradicating invasive pests. Agency policy requires that we choose the most environmentally sensitive approach that will be effective against the infestation. For a project such as the eradication of the light brown apple moth, the agency secretaries are the primary decision-makers who rely on the scientific knowledge of staff as well as on consultations with their counterparts in health and environmental agencies and other experts. For the LBAM eradication project, CDFA and USDA appointed a technical working group of expert scientists to establish whether eradication is possible and, if so, to recommend the most environmentally friendly means of eradication. The proposed aerial treatment is a central element in that plan.

How long will the treatment project take?

Each aerial treatment would take approximately three nights to apply the treatment over the entire eradication area. Wind or other inclement weather could delay or extend the treatment schedule. A second, identical treatment is proposed approximately one month after the first treatment. Depending upon subsequent trapping data, additional treatments may be necessary.

How do you protect against drift?

The airplanes use pre-programmed GPS guidance systems to ensure even application of the treatment. The programming includes automatically turning the treatment off over bodies of water. The protocols call for treatment to occur only if wind and other weather conditions are within established limits.

How will these applications affect the environment, including the ocean?

Pheromones are among the most environmentally friendly treatments ever used to eradicate a pest infestation in California. While conventional pesticides kill insects directly, the pheromones applied in this effort will simply confuse the male moths so that they cannot locate a mating partner, and the infestation eventually collapses as breeding subsides. Pheromones also have the distinct advantage of affecting only a very limited number of closely related insects while leaving beneficial insects and endangered species unaffected.

Concerns have been expressed about exposure of fish and other aquatic species to the treatment. However, the treatments will not be applied over bodies of water, including the ocean. The pheromone breaks down in water and all of the ingredients are biodegradable, so runoff is not a concern.

How would/does the light brown apple moth affect the environment?

Because the LBAM feeds on hundreds of different kinds of plants, it presents a threat to trees and plants in the natural environment as well as in crops and landscaping. Cypress and redwood trees, Monterey pine, oaks, lupines and many other native species are included on the extensive "host list" for this pest.

If the infestation is not eradicated, another important environmental effect would likely be an increase in the use of conventional insecticides by many residents, businesses and public entities acting to protect the plants in their gardens, landscaping, parks and other areas.

Will the pheromone harm the monarch butterfly? Are other moths affected by the pheromone?

Although moths and butterflies are similar insects, the pheromones used by separate species are different. Monarch butterflies are not attracted to the light brown apple moth pheromone and will not be confused or otherwise affected by it. The pheromone treatment is water-based and contains no oils or other materials that would pose a threat to the Monarch population.

In the pheromone-based traps that we use to detect LBAM, we have trapped only limited numbers of five closely related moth species, further indicating the highly specific nature of this pheromone. Two of the five other moth species are also invasive, unwanted pests, although they do not pose the same level of threat as the LBAM. Because these other moths are permanently established in the surrounding region beyond the limits of the LBAM treatment area, any reduction in these populations would be expected to rebound after LBAM eradication treatments subside.

How would/does the light brown apple moth affect the economy?

The current LBAM infestation has already caused the nations of Canada and Mexico to impose onerous restrictions on exports of crops and plants from the infested areas of California. China also has begun the kind of information gathering that frequently leads to such trade restrictions. As businesses are forced to delay, reduce or abandon exports to these nations, employment, investment and tax levels are all adversely impacted. Internally, restrictions are also imposed by CDFA and USDA on businesses such as plant nurseries in the infested areas so that their counterparts outside of the area can be protected from the infestation. These businesses must comply with strict regulations that limit or delay the companies' ability to export their plants outside the area. If the infestation is not eradicated, these regulations and trade restrictions would continue indefinitely and other countries would likely adopt similar measures.

What are the inert ingredients in the treatment? Are they safe?

The inert ingredients in the formulation are water and biodegradable elements used to delay the release of the active ingredient so that the treatment will be effective for an extended period of about one month. The basic biodegradable "building block" is urea, a normal constituent of the human body that is derived from the breakdown of proteins that we eat.

How will I be notified about the treatment?

As required by state law, CDFA notifies all known residents of a treatment area by first-class mail in advance of an emergency treatment.

How will you notify homeless people and others without a permanent address?

In addition to sending the required first-class mailings to residents, we will work with local news media and elected officials and staff at the city and county levels to get the message out about the treatment schedule and other elements of the project. We also share information about the treatments in advance with local homeless shelters, farm worker organizations and other groups that have been brought to our attention by local officials or have requested information.

Why are Pebble Beach and Carmel not included in the proposed treatment area?

Portions of both Pebble Beach and Carmel are included in the proposed treatment area, while other portions of these communities are not. The treatment area is based on two factors: the biology of the pest (i.e., the distance it is capable of moving during its life cycle) and the location of the trap sites where moths were detected. Traps are distributed

at a consistent ratio throughout the entire region so that the infested area can be determined with a high degree of accuracy. CDFA staff generate a GPS-driven map based on these factors, then draw a final boundary using the closest available roads or other physically identifiable lines.

How have you communicated with environmental regulators? What have you communicated?

We have provided details of our proposed treatment to a number of local, regional, state and federal groups including the United States Fish and Wildlife Service, the California Coastal Commission, the National Marine and Fisheries Service, the Monterey Bay National Marine Sanctuary and the Central Coast Regional Water Quality Control Board. Communications have included meetings, e-mail, telephone and mail. We also work with local news media and elected officials and staff at the city and county levels to get the message out about the treatment schedule and other elements of the project. The information includes details about the program components, treatment schedule, the affected area, the pheromone, and the availability of a toll-free number for further information.

When will you develop an Environmental Impact Report (EIR)?

This pest has the biological ability to multiply and disperse quickly, so eradication efforts can only be successful if the efforts begin immediately. CDFA has declared an emergency to allow the eradication to begin under a temporary exemption from environmental analysis, with the understanding that a full environmental assessment of the project, including these emergency treatments, will be required. That assessment will likely take more than a year to complete, and will begin in the next few months.

Why not just let the apple moth be?

If we do not eradicate this infestation, the moth would eventually multiply and spread to other areas of California, the United States and beyond. Farmers, residents, municipalities and other entities would repeatedly use pheromones and other, more toxic pesticides to suppress the infestation and protect their crops, landscaping and habitat. Populations of threatened and endangered species could be severely impacted should this moth adapt to feeding on them or competing with them for food or habitat. The impact on agricultural production of crops that are hosts of the LBAM could reach \$160 to \$640 million annually in the currently infested counties in California (source: USDA). Additionally, California would likely be placed under perpetual quarantine by neighboring states and trading partners around the world, restricting our ability to export crops and plants. Canada and Mexico have already imposed such restrictions, resulting in delays, added expenses and reduced export business for local growers.

Should I be worried about my pets?

EPA's review of this pheromone product indicates it is highly specific for the apple moth and does not affect mammals. Pheromones are used by insects to trigger behaviors such as mating, but mammals do not use these same signaling systems. The pheromone is undetectable to humans, pets and other mammals.

Should I take any precautions inside my home?

The treatment will be applied as a mist in a mixture that is mostly water, which carries the pheromone down to the surface (trees, rooftops, plants, ground, etc.). This method of treatment makes it unlikely that the material would directly enter homes or other buildings. However, if it were to do so, health officials have established that this is a very low toxicity material applied in a very dilute concentration. The State of California and US EPA have long maintained systems for tracking illness reports related to treatments and no illnesses have been reported, even in people handling concentrated forms of Checkmate or similar pheromone products used to control other insects. Based on this lack of reported illnesses, no precautions are necessary inside the home. Residents who wish to take precautions may close doors and windows to further minimize exposure.

Will the paint on my car be damaged? Should outdoor play equipment be hosed down after applications?

Testing performed by the United States Department of Agriculture and decades of experience with aerial pheromone treatments in the U.S. and other nations has resulted in no reports of damage to automotive paint, outdoor furniture or other common outdoor surfaces. Based on this information no action is suggested to protect these items.

What about outdoor public gatherings on the night of applications?

CDFA is in contact with local officials, school districts, etc. and has been made aware of evening and night events in the treatment area. The treatments on these nights are scheduled so that the specific sites in question are to be treated in the morning hours toward the end of the shift, after the activities have ended.

Should people stay away from public parks and schools the morning after applications?

It is not necessary to stay away from treated areas after the treatment. Health officials have established that this is a very low toxicity material applied in a very dilute concentration. The State of California and US EPA have long maintained systems for tracking illness reports related to treatments, and no illnesses have been reported, even in people handling concentrated forms of Checkmate or similar pheromone products used to control other insects.

Why can't twist ties be used instead?

Application of twist ties infused with the pheromone is effective in very small areas, such as the 200-meter radius around an individual moth find or a similar area around a handful of tightly contained finds. In such a case, 40-50 staff require about four days to apply an average of about 30-40 twist ties to the trees and plants on each property. Extending such an effort over the proposed 60-square-mile treatment area along the Monterey Peninsula would require 62,000 staff and more than 9 million twist ties. The idea was considered and rejected primarily because of the insufficient supply of twist ties available for use—it would take a minimum of several months for the manufacturers to produce the necessary supply of twist ties, by which time the moths would have multiplied through several additional generations and the infestation would no longer be considered eradicable. The

extraordinary staffing and budgetary elements of an operation of this magnitude were also considerations in rejecting this alternative.

Why is Monterey being treated before Santa Cruz?

Experts within the USDA, CDFA and a Technical Working Group of moth and eradication experts from around the world have recommended a progressive series of steps toward eradication of this infestation. The general principle of the eradication effort is to work from the outer edges of the infestation inward toward the core. The specific treatment recommendations began in the summer of 2007 with the deployment of pheromone twist-ties around a number of “outlier” sites where single moths or small numbers of moths were detected in traps that were in relatively isolated locations. Working inward from these fringes of the infestation, the next recommended step is aerial pheromone release over the Monterey peninsula. The series of treatments would be followed by continued trapping to determine the rate of success of the treatments and to indicate what additional steps may be necessary.

Who is paying for this?

The USDA has provided the bulk of the funding for treatment as well as for the other activities in this program, including plant and crop inspections, traps, outreach and other elements. CDFA and local agricultural officials have also contributed to the project.

What if the pheromone treatment doesn't work?

The pheromone treatments are a central part of a multi-year project that will require multiple tools to be successful. We have already contained the infestation by imposing quarantine restrictions and inspections on plant and crop shipments, and we have suppressed the infestation by deploying pheromone twist-ties in several locations around the fringes of the infested areas. The proposed aerial treatments are the next step in the eradication process. Based on the history of pheromone treatments for this pest in Australia and New Zealand and for similar pests here in the U.S., we have confidence in the success of the proposed treatments. However, if the overall eradication project is not successful, we would have to reconsider whether eradication of the pest is possible under the circumstances. If not, the goal would then become suppression and containment of the infestation over the long term in order to minimize the environmental and economic impact of the infestation.

Are pheromone treatments effective in New Zealand, Australia and Hawaii?

Pheromones are a reliable method of treatment to control LBAM in New Zealand and Australia. In Hawaii treatments have not been attempted because of a number of factors, including the fact that the infestation is relatively small and restricted to higher elevations. Pheromone treatments in general have an excellent track record against moths and other insect pests.

SEPTEMBER 2007

Prepared by the California Department of Food and Agriculture. For the most current version of this document, please visit the department's LBAM web site at www.cdfa.ca.gov/phpps/PDEP/lbam/lbam_main.html

Light Brown Apple Moth Eradication Program

Key Questions and Issues

Presented by Assemblymember John Laird, October 16, 2007

Response by the California Department of Food and Agriculture, October 26, 2007

1. INERT INGREDIENTS

1.1 How will CDFA and USDA resolve the controversial issue of the inert ingredients being part of a trade secret in advance of further spraying?

On October 19, Monterey County Superior Court Judge Robert O'Farrell lifted a restraining order after determining that the ingredients used in the pheromone Checkmate LBAM-F did not contain chemicals known to be harmful to the public.

On October 20, Governor Schwarzenegger directed CDFA to make public the list of all ingredients in the Checkmate product.

All the ingredients in Checkmate LBAM-F are:¹

- 1) Water—the main ingredient.
- 2) (E)-11-Tetradecen-1-yl Acetate—the pheromone.
- 3) (E,E) -9,11 Tetradecadien-1-yl Acetate—the pheromone.
- 4) Ammonium phosphate—commonly used in "crystal growing" kits for children and as a plant nutrient.
- 5) 1,2-benzisothiazol-3-one—used as antibacterial and antifungal agents in a variety of products.
- 6) 2-hydroxy-4-n-octyloxybenzophenone—used in sunscreen and in lots of products made of plastics, including food containers; useful for its UV-blocking properties.
- 7) Crosslinked polyurea polymer—commonly used in manufacturing of plastics such as polyurethane foam production, waterproofing, insulation, and micro encapsulation agent for pesticides.
- 8) Butylated Hydroxytoluene—common food preservative.
- 9) Polyvinyl Alcohol—Odorless, non-toxic polymer commonly used in shampoos and cosmetics, feminine hygiene and incontinence products, children's play putty, glue, lubrication drops for hard contact lens wearers and other products.
- 10) Tricaprylyl Methyl Ammonium Chloride—commonly used in the manufacture of various pesticides and pharmaceuticals; contributes to product purity.
- 11) Sodium Phosphate—a sodium salt, naturally occurring substance important in every cell in the human body, helps regulate pH. Sodium phosphate is also an additive in egg products and is a prescribed laxative prior to procedures such as colonoscopy.

¹ Note: One point of controversy has been a news report—now established as erroneous—that the chemical polymethylene polyphenyl isocyanate (PPI) was an inert ingredient in the Checkmate formulation. The U.S. EPA has confirmed that this chemical is not a part of the products being used in the eradication project. The U.S. EPA further clarified that all of the actual ingredients "have been evaluated for safety and have been found to meet the agency's requirements for the protection of human health and the environment."

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As Secretary Kawamura has stated, “The Governor supports the public's right to know every ingredient in the product and is confident that full disclosure will confirm what my Department, the California Environmental Protection Agency and California Department of Pesticide Regulation established before treatment began—that Checkmate LBAM-F poses no risk to human health, plants, animals and insects.”

California has what is considered the strictest and most comprehensive state pesticide regulatory program in the nation. The Department of Pesticide Regulation will continue to perform further analysis and monitoring to ensure that the community's concerns are fully considered.

1.2 Is CDFA and USDA considering review of the ingredients by an independent third party?

U.S. EPA has stated that, “Based on low toxicity in animal testing, and expected low exposures to humans, no risk to human health is expected from the use of these pheromones.” DPR concurs with this conclusion. These agencies are third-party reviewers and are independent of CDFA and USDA. Further, they are charged with the evaluation of products, such as Checkmate, and have the authority to require all information to conduct a complete review. This includes all the confidential details of the materials that go into the manufacturing process. CDFA and USDA do not have such authority.

Since the list of all the ingredients was made public, the local media has asked several chemists and toxicologists to comment on the nature of the ingredients. None of these outside reviewers have indicated any concern for the safety of the product. In the October 23, 2007, [Santa Cruz Sentinel](#), Harry Elston, a chemist with Midwest Chemistry Safety, stated that, “These compounds have a long history of safe use in this and many other applications.”

CDFA and the Monterey Bay National Marine Sanctuary agreed to an independent laboratory test of the pheromone used in the eradication project, Checkmate LBAM-F. The UC Davis Marine Pollution Studies Laboratory conducted this test in early October and confirmed that the pheromone would not be injurious to sea life. Beyond this study, neither CDFA nor USDA is currently considering another third-party review.

2. HEALTH COMPLAINTS

2.1 When and how will results of the Department of Pesticide Regulation-led taskforce analyzing the epidemiology be reported? Will it be before the next round of spraying?

It is a misconception that the Department of Pesticide Regulation-led group is, in fact, a formal task force. This ad hoc group of state scientists, led by DPR, is tasked with developing a scientific consensus of DPR and the Office of Environmental Health Hazard Assessment, with

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input from scientists from the Department of Public Health, on the available health and safety data of the pheromone products and on the health complaints taken as a whole. This document is not intended to be a detailed human health risk assessment, an epidemiological study of exposed individuals, nor an analysis of alternative approaches. This group will be issuing a "white paper" presenting their conclusions and recommendations for the signatures of the appropriate executives. The next round of spraying is not dependent on these deliberations.

2.2 Will CDFA implement a long-term study of health effects before, during and after spraying, as suggested by a number of health and elected officials?

The conduct of health studies is not within CDFA's sphere of operational capacity. Instead, the department relies on experts in the public health sector for such studies. CDFA is working with the public health community and fully supports their efforts to establish appropriate health monitoring aimed at the detection of possible unforeseen adverse health events as a consequence of the LBAM eradication program. The department is doing—and will continue to do—all it can to facilitate studies that public health authorities regard as appropriate for evaluation of potential health impacts resulting from the LBAM eradication program.

2.3 Will CDFA be ready to commence this study in advance of any further spraying?

The determination that spraying the LBAM pheromone does not pose a health threat to the public or environment is based on thorough evaluations done by the U.S. EPA and California Department of Pesticide Regulation. For the past decade, there have been no indications of adverse environmental or human health incidents from past uses in which exposures occurred. Further spraying is not dependent on this study.

2.4 In light of the more than 200 health complaints in Monterey County, do you believe it is accurate to state there are no reported adverse effects to humans when DPR's epidemiological analysis is ongoing and the possibility of undertaking a long-term study is being considered?

Complaints are not the same as a medical determination based on objective criteria. CDFA is making every effort to keep track of all such complaints and continues to work with the public health community so that all illness complaints can be properly analyzed within the overall assessment of LBAM eradication activities. All toxicity data objectively developed to date strongly indicate that the probability that these complaints are pharmacologically linked to a toxic exposure is very unlikely.

3. ERADICATION PLAN AND ENVIRONMENTAL REVIEW

3.1 When will the eradication plan be available?

An overall programmatic eradication plan is currently being developed. CDFA is targeting late-December for completion. When completed it will be promptly made available to the public.

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3.2 When will the CEQA review be completed?

CDFA has now a signed contract for development of the environmental impact report. A draft should be available for public review by mid-summer 2008. It is targeted for completion in December 2008.

4. ENVIRONMENTAL ADVISORY TASK FORCE

4.1 Who will serve on the Environmental Advisory Task Force (EATF)?

The Environmental Advisory Task Force is currently being formed. Letters inviting participants were mailed on October 25, 2007.

Task force invitations were sent to the following:

Alliance for Food and Farming
Cal Poly San Luis Obispo
California Association of Winegrape Growers
California Department of Fish and Game
California Department of Forestry and Fire Protection
California Department of Pesticide Regulation
California Department of Public Health
California Farm Bureau Federation
Citrus Research Board
Environmental Defense
Monterey Bay National Marine Sanctuary
Monterey County Resource Conservation District
Natural Resources Defense Council
Nature Conservancy
Organic Farming Research Foundation
Pesticide Action Network of North America
Santa Clara University Environmental Studies Institute
Sierra Club-Ventana Chapter
Sustainable Conservation
University of California Aquatic Toxicology Research Group

4.2 When will their work be underway?

The first meeting of the Environmental Advisory Task Force will be held in mid-November.

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4.3 What can we expect in terms of results?

The goals of the Environmental Advisory Task Force are to:

- Foster two-way communication between CDFA and environmental stakeholders.
- Discuss environmental issues and make recommendations.
- Provide third-party participation in the CEQA process.
- Recommend future research strategies.
- Provide recommendations regarding environmental issues.

5. PHEROMONE MATING DISRUPTION EFFICACY

5.1 Can you provide information on the effectiveness of PMD to eradicate, not just control, an invasive species?

Pheromone mating disruption is a proven insect control technique. The recommendation to use PMD as a primary tool for LBAM eradication in California came from the USDA-Technical Working Group. This recommendation is a direct result of their first-hand knowledge of the available scientific literature, personal research experience and the efficacy of mating disruption in field applications in Australia and New Zealand when used in control programs. The TWG recommended an overall strategy of containment, suppression and eradication using an integrated approach, primarily employing pheromone release for mating disruption.

The TWG's overriding recommendation is that the CDFA and USDA adopt a long-term goal of eradicating LBAM from the U.S. This is based on the available knowledge of the current distribution and population levels in California and the likely impacts to agricultural and natural systems. LBAM has a continuous life cycle with no true dormancy. Projections made with developmental data from Australia suggest that the moth could complete four to five generations annually along the Central Coast and San Francisco Bay Area.

Because this is a newly introduced pest, overall population levels are still relatively low. Low population levels are critical to the success of the PMD strategy. Another critical factor is that the LBAM population in California is isolated and not prone to continual reestablishment.

Allowing these densities to build up by not maintaining pheromone levels could necessitate insecticide use. The intent is to keep the LBAM population down to a point more responsive to mating disruption.

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5.2 Can you specifically describe and assess the damage currently being inflicted in Santa Cruz County (where the infestation is most acute) in terms of both nurseries/crops and non-commercial/public/backyard areas?

In Santa Cruz County, the primary damage has been economic in nature due to the LBAM quarantine. The quarantine is in place to protect the rest of California and the nation. Since this infestation is in its early stages, the pest is just beginning to establish itself. More larval feeding damage, both in the environment and in food crops, will be apparent as the population builds.

In Australia, when insecticides are not applied, typically between 5 percent to 20 percent of fruit is damaged, but this can exceed 30 percent. In New Zealand, damage to unsprayed crops commonly reaches 50 percent (Wearing et al., 1991). More information regarding potential economic impact in California may be found in the environmental assessment prepared by USDA at www.aphis.usda.gov/plant_health/ea/downloads/lbam_ea_sc.pdf.

In 10 of California's affected counties², it is estimated that LBAM could cause \$160 to \$640 million in losses. These estimates were derived from the agricultural impacts in Australia and New Zealand.

5.3 With regard to the sanctuary permit, how will LBAM be eradicated within the "buffer zone" along the coastline?

CDFa maintains protocols designed to prevent drift movement into the Monterey Bay National Marine Sanctuary. In recognition of these protocols, the sanctuary provided CDFa with a permit allowing treatment activities in the Monterey/Seaside area.

The protocols include use of specially designed nozzles, wind speed application restrictions and buffer zones. Aerial applications will be made with the following buffer zones designed to prevent drift out of the treatment area:

- 100 meters at average wind speeds of zero miles per hour (mph).
- 200 meters at average wind speeds of four mph.
- 300 meters at an average wind speed of eight mph.
- No applications will be made at average wind speeds of 10 mph or higher.

CDFa and USDA will develop ground-based alternatives limited to use within the buffer zones.

5.4 When and how frequently will CDFa report on the efficacy of spraying?

The Light Brown Apple Moth Act of 2007 (SB 556, Wiggins) requires CDFa to report to the Legislature on January 10, 2008, and annually thereafter while the program is ongoing, regarding its expenditures, progress and priorities in combating LBAM in California.

² Alameda, Contra Costa, Marin, Monterey, Napa, San Francisco, San Mateo, Santa Clara, Santa Cruz and Solano.

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In preparation of this reporting requirement, the USDA and CDFA will meet in late-December 2007 with the USDA's Technical Working Group to review the trapping data following each round of aerial pheromone releases.

5.5 When will the results of the first Monterey County spraying be released?

It will take time to evaluate the effectiveness of pheromone mating disruption as monitored by trapping. LBAM is a new introduction to North America, and we are learning more about the moth's biology in this new environment. CDFA will continue to collect and analyze the trapping data to help determine the efficacy of the spraying program, with results available in spring 2008.

5.6 What would constitute a successful "eradication" of LBAM (e.g., zero captures over a certain period)?

As we anticipate that this will be a multi-year program, success will be evidenced by fewer and fewer trap catches. Ultimate success is declared after no insects are trapped for a prescribed number of life-cycle generations.

5.7 What is your "Plan B" if PMD fails to eradicate LBAM?

Please see question 7.4 for a description of the LBAM research plan. CDFA will continue to fast-track research into additional eradication options. Any "Plan B" would involve a reassessment of the eradication methodologies based on the tools that we have available.

5.8 If rain or other weather/seasonal conditions impede your ability to spray, how will CDFA respond?

If rain or other seasonal conditions impede CDFA's ability to apply the pheromone by air, then we will reschedule the application for the next fair-weather evening.

5.9 Under what circumstances (i.e., what, when, where, how) would CDFA use insecticides in residential areas in conjunction with or following PMD or instead of PMD?

Except as described in 5.3, the program will reevaluate its efficacy and options during the winter. In addition, the USDA's Technical Working Group will meet again in December 2007 to evaluate the program.

5.10 Would insecticide applications be conducted under the department's existing emergency authority?

Yes, as described in the Proclamation of an Eradication Project. The following is a list of options for eradication of LBAM: 1) foliar application of an organic pesticide by ground; 2) foliar application of an organic pesticide or a pheromone by air; 3) mating disruption using pheromone-infused plastic twist ties; 4) mass trapping; and 5) quarantine measures.

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6. THIRD-PARTY REVIEW

6.1 When will specific and detailed information on the third-party data that exists be available in a format understandable and accessible by the general public?

The joint USDA/CDFFA LBAM program is in the process of contracting with the U.S. Geological Survey (USGS) to provide third-party review of existing environmental data relevant to the use of pheromones. The USGS should have a review ready for the public by summer 2008. CDFFA public affairs staff will work to ensure the report's readability.

A report of third-party analysis on aquatic toxicity from the UC Davis Marine Pollution Studies Laboratory and the UC Davis Department of Environmental Science should be available by mid-November 2007.

7. ALTERNATIVES TO AERIAL SPRAYING

7.1 Can you be more specific on why implementing a twist tie approach is "impossible" with respect to efficacy, labor and funding?

CDFFA, in conjunction with USDA and TWG, have evaluated alternatives to aerial release of the LBAM pheromone in this area and believe this is the most effective strategy for application of mating disruption over such a large area. Mass trapping is not known to be effective, and ground release of the pheromone using the available twist-tie technology is not logistically feasible in the Monterey and Santa Cruz areas. These moths mate where there is tree foliage for egg laying. We estimate for an area the size of the Monterey/Seaside zone (38,000 acres) it would require four-to-five days, 9.5 million twist ties and 62,000 people. The large area requiring treatment in Santa Cruz, along the Central Coast and San Francisco Bay Area precludes the use of this approach.

7.2 Under what circumstances could CDFFA move from aerial spraying to twist ties?

A decision to employ twist ties or other pesticides will be made based on moth population levels and proximity to sensitive and buffer areas.

7.3 While waiting for alternatives such as sterile moths, could a "contain and control" program be implemented?

CDFFA believes that we currently have viable tools for eradication. Waiting until sterile moth technology is available would guarantee permanent establishment and spread of LBAM in California.

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7.4 Has the department developed an LBAM research plan with clear objectives and timelines?

California Department of Food and Agriculture staff is undertaking a research program on alternative methods to eradicate LBAM from California. The principle CDFA investigator has been in contact with LBAM researchers in Australia, New Zealand and Hawaii (USDA). Last month, in order to assess the feasibility for release of sterile male LBAM, researchers looked at the Pink Bollworm Sterile Insect Technique in Phoenix, Arizona. In addition, CDFA staff will keep the Environmental Advisory Task Force updated and apprised as to the status of this research as well as work with them to develop any new research ideas.

In particular, CDFA staff has started the following projects:

1) Use of Trichogramma wasps as a biocontrol agent

CDFA scientists are working with USDA scientists in Albany, California, to develop an LBAM colony as the first step in conducting this research. The initial collections of suspect LBAM larvae have been made, and these larvae have developed into moths that are laying eggs. Tests will be started as soon as sufficient eggs are available to continue the colony and provide “excess” eggs for testing. Trichogramma wasps will be procured to determine if the wasps will attack LBAM eggs and, if so, whether the wasp larvae can complete their development in the LBAM eggs and produce viable adults. Our initial plan is to release large numbers of the Trichogramma wasps in areas to reduce LBAM numbers either alone or in conjunction with pheromone disruption or attract and kill treatments. We hope to have this technology, if feasible, available by summer 2008.

2) “Attract and kill” technology

USDA Agricultural Research Service (ARS) scientists will work with their colleagues in Australia and New Zealand to evaluate an attract and kill technology for use against LBAM male moths. This would involve depositing large numbers of spots of LBAM pheromone mixed with a carrier and a contact insecticide throughout an area. The male moths would be attracted to the spots and killed as they moved over the pheromone spot looking for the female moth they believe is there. Attract and kill has been used to control other moths in the eastern United States. Attract and kill technology could be used in conjunction with the release of Trichogramma wasps. If feasible, it is anticipated that this technology might be available in late 2008.

3) Use of sterile male moths

USDA ARS scientists will work with their colleagues in Australia and New Zealand to continue efforts to develop sterile moth technology for LBAM. At present this technology is at least two to three years away. The technology lacks a mechanized diet mixing and dispensing system, larval rearing system and moth sterilizing system as well as a mechanized system to disperse the sterile moths. Both the Australian and New Zealand governments are moving forward on this front. The USDA ARS and CDFA scientists are bringing their expertise on the mass rearing and release of fruit flies and moths to bear on this effort.

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4) Classical biological control

CDFA scientists are working University of California researchers and LBAM scientists in Australia and New Zealand to import LBAM parasites to evaluate their ability to attack LBAM and their preference for LBAM compared to native or naturalized leafroller moth larvae. These tests require a colony of LBAM and colonies of native leafrollers. CDFA and USDA scientists are developing the necessary colonies in Sacramento and Albany. USDA requires the preference tests before they will approve the release of exotic wasps in the United States. It is anticipated that no releases of these wasp will occur before spring 2009.

7.5 Have any of the USDA funds been designated for LBAM research in California or the U.S.?

Yes, see question 7.4.

8. ERADICATION ZONES

8.1 What are the protocols for expanding the spray area when there are new LBAM finds beyond, but in proximity to, the existing perimeter?

Treatment areas are expanded as new moths are identified. The expansion is generally based on a 1.5-mile radius from the new find, but the proximity to prior finds and other treatment zones may influence the determination of the new boundary.

8.2 If the spray area is expanded, how and when will residents be notified?

All residents in the affected area will be notified by first-class mail, followed by an informational open house.

9. MONITORING

9.1 When will the DPR monitoring data from Monterey County (September 9-12) be available?

Under DPR supervision, CDFA's Center for Analytical Chemistry has completed the analysis of the samples. DPR is still evaluating the data. There has been a delay in issuing a report because DPR staff have been in the field and have not met to correlate field and analytical data. The report should be issued in November.

9.2 What was the methodology?

The Department of Pesticide Regulation has performed tests on samples that were taken from all treatment equipment used for the aerial application operations (tanks, pumps, hoses, valves, spray booms, water trucks, etc.). Specific tests were:

- A pesticide screen test was performed at the Center for Analytic Chemistry. This test detects pesticides or contaminants prior to the commencement of treatment.

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- Following the mixing and loading of the pheromone into the aircraft, a tank sample was taken from each nozzle on the spray boom.
- Deposition cards were placed in various situations, such as schools, public areas, tops of hills and private property. These cards indicate the quantity of pheromones that reach the ground. These cards are under the control of DPR for use in any analysis it might conduct. These results are used to make any calibration changes to the aircraft equipment, buffer areas or flight lines, if necessary.
- Each sample was tagged with a unique number and an associated chain of custody form.

Samples from these tanks and equipment were directly taken by DPR and were tested by CDFA's Analytical Chemistry laboratory under DPR supervision for the presence of any other pesticides. All tests were negative. Further, DPR took tank samples of the Checkmate product mix during aircraft loading procedures to test for the proper concentrations of active ingredients. These samples were taken and processed under a strict chain of custody, under the supervision of DPR. The results were reported to both CDFA and DPR.

During each spray application, monitoring dye cards were placed throughout the application area to ensure evenly distributed coverage throughout the area, and if any spray droplets are observed outside target areas.

9.3 Will all future applications be monitored by DPR?

Yes, testing and monitoring are standard operating procedures for all CDFA eradication programs.

10. LBAM ECONOMIC IMPACTS

10.1 What do we know today about actual economic losses caused directly by the pest itself?

See answer to question 5.2.

10.2 How are LBAM-related economic losses being monitored and reported?

There is no process to monitor LBAM-related losses.

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11. NURSERY INDUSTRY IMPACTS

11.1 What research is being fast tracked?

CDFA requested that USDA fast track research to identify alternatives to organophosphates, such as chlorpyrifos, that are effective against the LBAM eggs.

Specifically, we requested that the research trials fast track horticultural oils, since preliminary screening results showed that many oils were as effective, if not more effective, as chlorpyrifos against LBAM eggs. The preliminary screening results did not provide sufficient data for the USDA to authorize this use as an alternative. However, because these oils showed early promise, CDFA requested that USDA follow-up with additional trials to determine their usefulness as an alternative.

11.2 What monitoring and reporting requirements does CDFA or growers have with respect to the use of chlorpyrifos?

The Department of Pesticide Regulation (DPR) oversees a multi-tiered enforcement program. The U.S. Environment Protection Agency enacts laws covering minimum pesticide requirements that are enforced at the state and county levels through cooperative agreements. Over the years, the California Legislature has passed more stringent laws covering pesticide registration, licensing, the sale and use of pesticides, and worker protection.

DPR has primary responsibility to enforce pesticide laws and regulations in California. The Enforcement Branch oversees compliance with pesticide use requirements, has overall responsibility for pesticide incident investigations, administers the nation's largest state monitoring program for analyzing domestic and imported produce for pesticide residues, and ensures compliance with pesticide product registration and labeling requirements.

County agricultural commissioners enforce federal and state pesticide laws and regulations at the local level. Agricultural commissioners issue site-specific local permits for the use of restricted materials, conduct on-site application inspections, administer full pesticide use reporting, conduct worker safety inspections, and investigate pesticide incidents. More information is available at the department's Web site:

www.cdpr.ca.gov/docs/enforce/enf_auth.htm.

11.3 What are the potential "downstream" impacts on the region's water quality and the sanctuary?

Due to increased regulated and nonregulated pesticide use, the potential for negative downstream impact increases if eradication is not successful.

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- 11.4 Local nursery owners are spending considerable funds to implement regulations requiring the spraying and quarantines of infected stock. Has CDFA set aside funds from the USDA monies to provide financial assistance to the nursery industry (and other growers) impacted or potentially impacted by LBAM?**

Not at this time. USDA funding for LBAM is approved for the following: eradication operations, research into alternative eradication methods and public outreach.

- 11.5 What is CDFA's plan to work with the retail and wholesale nursery industry to expeditiously implement greener and less costly alternatives?**

CDFA plans to continue to cooperate with the USDA and Australian researchers working on the organophosphate alternatives research. We intend to review all data with the USDA as soon as it is available to determine if new products can be incorporated into our current list of authorized treatment options.

Treatment options available to infested wholesale nurseries are the same as they have been since the infested nursery protocols were developed. They are available for review in our Online regulatory procedures manual. There is one extra treatment/systems approach option available to retail nurseries that is not available to wholesale nurseries, because retail nursery stock is not as likely to leave the quarantine area as is wholesale nursery stock.

- 11.6 What is the process for growers and nursery owners to provide input that could impact CDFA/USDA protocol?**

There is an LBAM Nursery Task Force in Santa Cruz County comprised of nursery growers, UC Cooperative Extension specialists and Natural Resource Conservation Service staff. Nursery stakeholders in Santa Cruz developed the task force for the purpose of providing input to CDFA and USDA regarding regulatory protocols. CDFA intends to continue working with this group until we have developed a mutually agreeable program.

Attachment C. Response to Inert and Toxicity Concerns for Pheromone Products Used in LBAM Control and Eradication

Inert Concerns

While no comments were received on the EA regarding the toxicity of the ingredients other than the pheromone, meetings with the public after the release by the U.S. Environmental Protection Agency (EPA) of the EA suggest concerns over the potential safety of these materials to human health. Part of this concern was due to the erroneous release by EPA of information regarding an ingredient that was stated as part of the list of other materials in the Checkmate® OLR-F formulation. The chemical, polymethylene polyphenyl isocyanate (PPI), does not occur in the Checkmate® OLR-F formulation as was stated by EPA in a followup press release. The correction was reported in the press, as well as posted at the EPA Region 9 Web site at their LBAM information link, http://www.epa.gov/pesticides/local/region9/lbam_quarantine.htm. PPI also does not occur in the Checkmate® LBAM-F formulation. The Checkmate® formulations contain approximately 97% deionized water and pheromone. Other ingredients are less than 3% of the formulation, and much of that is the polymer microcapsule. Beyond that, no other ingredient occurs in concentrations greater than 0.70 percent.

The ingredients, which have recently been released to the public by the registrant, have been evaluated for safety by multiple government agencies in the United States, as well as other countries. Additionally, in the United States, approximately six State agencies have evaluated the Checkmate® ingredients, including California, and found that the products are considered safe. These results are reflected in the lack of a re-entry interval after Checkmate® applications, as well as the lack of a postharvest interval for any crops treated with these products. The products can also be used as part of a program for organic growers in the United States. The lack of human health risk is related to a combination of low toxicity and/or exposure for the pheromone, as well as any of the other ingredients in either formulation.

Additional Aquatic Toxicity Testing

After the release of the Santa Cruz EA, additional aquatic toxicity studies were conducted to address some of the uncertainty regarding the potential toxicity of the formulated material to nontarget aquatic organisms. The Marine Pollution Laboratory associated with UC-Davis, as well as other researchers at the university, conducted additional toxicity studies using the formulated material. In marine environments, the marine mussel, *Mytilus galloprovincialis*, was tested under conditions that simulated direct application to water at rates four to five times above the recommended application rate. Both these conditions would be inconsistent with the label and illegal under the Federal Insecticide, Fungicide and Rodenticide Act of 1972 (FIFRA); however, in testing this

conservative dose, there were no effects on the mussel. Similar studies have recently been completed using *Ceriodaphnia dubia*, a cladoceran, and the fathead minnow in standardized 7-day studies. Preliminary results from these studies show no effects on either test organism using the LBAM-F formulation.

Additional Toxicity Concerns

In addition to the other toxicity concerns that are addressed in Attachment B and in the above, in Attachment C, we have become aware of and reviewed a toxicological review conducted by Dr. Richard Philp, Emeritus Professor, University of Western Ontario. That report was submitted by the county of Santa Cruz in connection with its litigation against CDFA.

The author concludes in general that chronic toxicity studies (of 90 to 180 day duration) are needed to fully evaluate the potential effects of pheromone applications in daily aerosol exposure to Checkmate®. He bases this assertion on the fact that the studies he reviewed show that daily exposure to the product can continue for a number of days. Available environmental fate data stated in materials the author reviewed, but failed to mention, as well as from other sources show that this is not the case. The pheromone is very sensitive to oxidation and ultraviolet light once it enters the environment. This is a major reason that EPA and other regulatory agencies have waived the requirement for chronic studies for this pheromone. From a biological perspective it is counterproductive for a moth to naturally produce a compound that is persistent since it would not allow the male moth to locate the female. The author also suggests that a long term study be done using daily aerosol exposures. The pheromone applied as a microcapsule is not an aerosol but is applied within large water droplets (app. 1,000 micrometers). Once the microcapsule is applied aerially and reaches the ground, the levels of pheromone that would occur (exposure) are similar to those that would occur using dispensers or ground application of the microcapsules.

Philp appears to support ground applications and the use of dispensers. However this will not change the overall exposure to the pheromone that is applied, or levels that are already occurring due to the presence of LBAM. The reason for the additional application of microcapsules compared to dispensers has to do with the persistence of the dispensers. The dispensers are plastic and not as degradable as the microcapsules, which biodegrade much quicker in the environment. This also supports the above-stated fact that the pheromone has a very short half life in the environment. Without a delivery mechanism that can persist in the environment the pheromone is not effective. The author states in his conclusions that toxicity studies testing at much higher exposure levels are required. However, the studies that are available to date use test concentrations orders of magnitude above doses that could occur under legal applications. These studies have not shown adverse effects at doses well above those expected from the proposed application. Studies conducted at higher test concentrations than those that have been tested would provide little additional information in the assessment of risk and would be inconsistent with mammalian testing requirements to support registration of these types of products.

Regarding Philp's concern for environmental toxicity, the data he cites do not support the conclusion that there is any "increased environmental risk." The formulated material (Checkmate LBAM-F®), as well as the technical pheromone material, have been tested at UC-Davis on freshwater and marine test organisms. Study results to date have shown that concentrations that would occur from a direct application to a shallow closed water system would not have an impact on aquatic invertebrates and fish. This is consistent with additional data that have been generated for supporting the registration of acetate based pheromones. In addition to their lack of toxicity to aquatic fauna, the pheromones have a short half life in water and in this case are insoluble, therefore dramatically reducing the potential for exposure to water column fauna. A lack of toxicity at high doses and the extremely low exposure levels due to the environmental fate, and low application rates, greatly reduces the possibility of risk to aquatic fauna. The author's reference to a paper testing the effects of a pheromone antagonist to *Daphnia magna* and the statement that it has "moderate toxicity," fails to consider exposure, a fundamental aspect of environmental risk assessment and toxicology. While every chemical, natural or synthetic, has a dose that can cause an adverse effect, it is the level of the dose which defines whether it poses a significant risk to the environment. As mentioned above the toxicity profile for these types of pheromones coupled with the low exposure suggests a lack of risk. This is not only true for environmental risk but also human health.

In conclusion, we do not believe that the material in Dr. Philp's report provides any new information warranting us to change our conclusion that aerial spraying of Checkmate® is safe at the permitted doses and in the permitted manner.