cdfa CALIFORNIA DEPARTMENT OF FOOD & AGRICULTURE
A. G. Kawamura, Secretary

October 4, 2007

The Honorable John Laird
California State Assembly
Sacramento, CA 95814

Dear Assemblyman Laird:

Thank you for your letter dated September 24, 2007, regarding the federal/state eradication plan to address the light brown apple moth (LBAM) infestation.

As you rightly state in your letter, this matter is very serious, and I deeply appreciate your counsel on how best to move forward from here. We both want to do what is right for the people and environment in the affected communities as well as for all Californians.

You raise many important issues across a number of disciplines: communications, public and environmental health, science, research and technology. Each of these disciplines contributes to the overall success of a program. Your letter was a key factor in recent enhancements we are making in this program, and I believe it has greatly improved staff communication, teamwork and interagency collaboration.

In the area of communications, you state, "It is critically important CDFA take immediate and meaningful action to ensure there is good public process..." In response, this week I personally undertook an informational tour of the affected communities in Monterey and Santa Cruz counties where I met with newspaper editorial boards and reporters, plus local officials and the public. I also participated in a radio talk show and another radio call-in program to further address the local health and environmental concerns. Participating with me in these meetings and newspaper visits was Dr. Peter Kurtz, Senior Medical Coordinator with the California Department of Food and Agriculture and Helene Wright, State Plant Health Director for California, Animal and Plant Health Inspection Service, U.S. Department of Agriculture.

As I am now winding down this week's tour, I am already looking ahead to future meetings with the local communities and their elected leaders. I have committed to present before the Santa Cruz City Council on Tuesday, October 9, and also before the Santa Cruz Board of Supervisors at their meeting on Tuesday, October 16, 2007.

Regarding public outreach and response, we are currently developing or have completed the following:

- The department website now has a direct link to LBAM information at www.cdfa.ca.gov/LBAM.
- The department is currently developing and testing an LBAM email subscription service from our website where anyone can receive real-time updated information. This will be especially useful for residents looking for treatment times and plans in their areas.
- The department now has a separate email account at LBAM@cdfa.ca.gov that will be monitored daily, in addition to the hotline at 1-800-491-1899, ext. 0.
- The department hotline is equipped to log health complaints. The department's medical toxicologist is actively compiling and analyzing the collected data.
- Fact sheets that address the health and science issues are currently being developed for distribution and posting on our website.
- Community meetings are being scheduled for Santa Cruz, Prunedale and Salinas from October 22 to 25, 2007, two weeks prior to the scheduled treatments in these areas on November 4-9. We will use a professional facilitator with background in community and government relations to assist us, and residents will have the opportunity for comment as well as receive information from our panel. Notices (written in both English and Spanish language) for the community meetings will be mailed to all homes in the affected communities on October 11.
- Notices (written in both English and Spanish language) for the November 4-9, 2007, treatments will be mailed to all homes in the affected area on October 26. The three treatment zones are:
    - North Santa Cruz (Aptos, Soquel, Capitola, Live Oak and Santa Cruz)
    - North Salinas/Boronda
    - Prunedale/Royal Oaks
- Aerial treatment maps will be posted on our website showing the previous night's path used by the planes as they cover these three zones. The maps will present a schematic showing each path that the planes made. To evenly cover the area, each pass is 100 feet in width. Each pass will receive a single spray of treatment, and nozzles are turned on and off using a computerized system guided by GPS technology.
- Additional media opportunities are also being planned to explain the various aspects of this program.

One question we are frequently asked is, "Just how serious is this pest?" LBAM, which is not native to California, is an extremely serious insect that threatens our state's natural environment and food systems. Entomologists tell us the larvae of this prolific moth can feed on more than 2,000 different types of native and ornamental plants and trees, including 250 different food crops. It reproduces at an alarming rate with females laying clutches of more than 500 eggs. This insect can go through three to five life cycles per year. The moths' larvae would severely impact plants ranging from native redwoods and cypress to fruits and vegetables to endangered species like the saline clover.

Not surprisingly, there is significant concern from other counties, states and nations as to how rapidly we move to eradicate this pest, since ours is the only known infestation in North America. The USDA's LBAM Technical Working Group (TWG)[1] has strongly recommended that California treat the LBAM infestations as quickly as possible. The TWG is comprised of internationally recognized scientific experts in the fields of LBAM biology and entomology, pheromone technology and control methodologies. They come from New Zealand, Australia, the USDA and University of California. This group of highly respected experts on this insect have advised us that the longer we delay treatment, the more time the population has to increase in density and spread to new areas. If the populations are allowed to go unchecked, we may well lose our ability to eradicate this pest from our environment.

Californians are justifiably proud and protective of the natural beauty and sensitive environment along our state's Central Coast. Further, the health of every resident along the coast is as important and valued as that of anyone living in our great state. For these reasons, it was important that we find a method of fighting LBAM that would be effective and safe for the environment and health of people in affected communities.

In your letter, you encourage the department to arrange for third-party literature review of the "scientific studies on the human health and environmental safety of pheromones." Your point is well taken, and this is an area where we fortunately have a wealth of studies done by third-party entities to draw upon. To respond to this, I'd like to start by mentioning how we arrived at our current treatment protocols.

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[1] LBAM Technical Working Group members are: **Victor Mastro**, USDA-APHIS-PPQ-CPHST-PSDEL, Massachusetts; **David Lance**, USDA-APHIS-PPQ-CPHST-PSDEL, Massachusetts; **Ring Carde**, UC Riverside, California; **Marshall Johnson**, UC Kearney Research & Extension Center, California; **Ken Bloem**, USDA-APHIS-PPQ-CPHST, North Carolina; **Donald McInnis**, USDA-ARS-PBARC, Hawaii; **David Suckling**, HortResearch Canterbury, New Zealand; **Eckehard Brockerhoff**, Ensis, New Zealand; and **William Woods**, Department of Agriculture Western Australia, Australia.

Initially, the third-party entities we reached out to were the USDA's LBAM Technical Working Group, U.S. Environmental Protection Agency and California Department of Pesticide Regulation (DPR) for their assessments of eradication options. Each of these agencies reviewed and approved releases of this pheromone based on the overwhelming scientific data showing that it does not constitute a threat to either human or animal health. Additionally, the Office of Environmental Health Hazard Assessment has stated that, "there is minimal health risk from the proposed application of Checkmate, the light brown apple moth pheromone."

In researching the topic of pheromones as an integrated pest management tool, third-party data exists showing that this technique has been in use for many years and has undergone thorough laboratory evaluations required by governmental regulatory bodies. The U.S. Environmental Protection Agency is quoted by the USDA in the California Environmental Assessment for the LBAM treatment program as saying: "During more than 10 years of use of lepidopteran pheromones as pesticides, no adverse effects have been reported. The safety record for lepidopteran pheromones has allowed the Agency to conclude that consumption of food containing residues of the pheromones presents no risk. Adverse effects on non-target organisms (mammals, birds, and aquatic organisms) are not expected because these pheromones are released in very small amounts to the environment and act on a select group of insects."

None of these previous third-party studies indicate that pheromones have a propensity to induce toxicity in people, animals or the environment. In fact, they are biologic products produced by insects, in this case the light brown apple moth. Pheromones are attractive to certain members of the species that trace the plume of the scent to its source so they can mate. They are not harmed in the process.

There are no third-party cases identified in the world literature in which humans or animals with certain exposure (e.g., producers, handlers, users, environmental and laboratory exposure, etc.) have been adversely impacted by contact with a pheromone. There are no biological markers that identify physiological changes in association with pheromone exposure, or associated with toxicity. While an individual illness may not be able to be attributed to an exposure with any degree of certainty (due to a general lack of probability), the department is performing due diligence in working with the health care community to scientifically gather information that will be subjected to epidemiological analysis.

Because of this clear and convincing third-party evidence, both environmental and organic farming groups support this program. We were gratified that executive director of the California Certified Organic Farmers complimented our efforts in the Monterey area saying we were "responsive and considerate of the community's concerns, protective of the area's special environmental circumstances, and respectful of the needs of organic farmers."

Dr. Carl Winter, director of the Foodsafe program at UC Davis backs up these judgments saying that "as humans, our bodies are unable to recognize and/or even react to [scents] produced by insects."

It may be worth noting that, although the Monterey city council voted to oppose our operation, the council acknowledged that no "credentialed individuals or analyses" believed that the operation would be harmful. Monterey County's health officer, Dr. Hugh Stallworth stated that, "This material does not appear to be toxic to people, pets or plants."

Nor, in fact, is it toxic to insects. Dr. Orley Taylor, a University of Kansas entomology professor and monarch butterfly specialist who is director of the conservation group, Monarch Watch, concluded, "the spraying is not an immediate threat to the monarchs at Pacific Grove."

Moving forward with more third-party analysis, we have asked for a reevaluation of all health- and environmental-related issues surrounding the use of pheromones from DPR, the Office of Environmental Health Hazard Assessment, California Department of Health Services and California Department of Public Health.

Additionally, I have begun the appointment process for an Environmental Advisory Task Force to provide the department with third-party advice regarding LBAM. This body will be comprised of representatives from environmental organizations, public regulatory and health agencies, organic and conventional agricultural entities as well as university researchers and scientists. They will be responsible for 1) analyzing information regarding program decisions and operations; 2) suggesting eradication measures and alternatives that are both environmentally sensitive and responsible while effectively and expeditiously eradicating this pest threat; 3) advising the department as we complete our review under the California Environmental Quality Act; and 4) communicating program information to their constituencies.

Because of the concerns that have been expressed, we are also contracting with third-party UC Davis scientists to reconfirm that there are no effects of this pheromone on fresh water and marine fish and invertebrates. This work will begin within the next two weeks, just as soon as contract terms are in place. Results of this effort are expected by the end of this year.

Regarding the method of release, the pheromone is encapsulated using a minute amount of inert ingredients. The manufacturer, Suterra, provided information on the inert ingredients directly to the U.S. Environmental Protection Agency and DPR for a full health and environmental safety evaluation and approval, which was completed prior to those agencies granting registration of this product. The inert ingredients are water and biodegradable elements used to delay release of the active ingredient so that treatment will be effective. 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 and is ubiquitous in the environment.

Pheromones have been aerially released in rural environments with no reports of adverse effects to humans or the environment. Taken together with the pre-use evaluations and experience gained from prior programs that used aerial applications here in California, the department is confident that this treatment is the most environmentally friendly and sensitive eradication program in the history of the state.

In your letter, you point out the need for more research into LBAM treatment options. This is an area into which we are putting a great deal of collaborative effort with our research partners at the University of California, USDA as well as with LBAM researchers in Australia and New Zealand.

In response, the department is already working with LBAM researchers in Australia, New Zealand and Hawaii (USDA-Agricultural Research Service) to investigate alternative methods to address LBAM, including use of Trichogramma wasps to attack the moth's eggs, "attract and kill" technology for male annihilation of LBAM adults, classical biological control of LBAM, and the use of sterile male moths.

Department 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. As soon as Trichogramma wasps can be procured, we will begin to determine if the wasps will attack the LBAM eggs. If so, we need to determine whether the wasp larvae can complete their development in the LBAM eggs and produce viable adults. Our plan is to release large numbers of the Trichogramma wasps in areas to reduce LBAM numbers, in conjunction with pheromone disruption treatments. We hope to have this technology, if feasible, available by summer 2008.

The department will work with 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 eggs, larvae or pupae. The USDA requires these tests before they will approve the release of exotic wasps in the United States. It is anticipated that no releases of these wasps will occur before spring 2009.

USDA-Agricultural Research Service 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 spots of LBAM pheromone mixed with an inert carrier and a contact insecticide throughout an area. The male moths would be attracted to the spots and killed as they move over the pheromone as they look for the female moth they believe to be there. If feasible, it is anticipated that this technology might be available in late 2008.

USDA-Agricultural Research Service 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, or longer, 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-Agricultural Research Service and department scientists are bringing their expertise on the mass rearing and release of fruit flies and moths to bear on this effort.

In your letter, you point out an "apparent discrepancy" regarding the need for environmental monitoring. As you note, the California Department of Food and Agriculture stated in our community forum on August 29 that we have asked DPR to conduct environmental monitoring in Monterey County even though they had previously stated in a memorandum that no such monitoring was necessary. We asked for this in order to ensure additional program quality. Monitoring data from the September 9-12 treatments is currently undergoing analysis, and we expect to have information shortly.

Another point of confusion centers around the UC IPM Report, "Light Brown Apple Moth in California: Quarantine, Management and Potential Impacts." UC published two versions of this report and the July version states that, "Research is needed to determine if LBAM mating disruption would be successful and feasible in California." This sentence was deleted from the September version, which now states, "Mating disruption currently is the primary tool being used by the CDFA for the eradication effort in California." After contacting the university for clarification of this point, we learned that the "revision of the statement from the UC report was basically to update the activities that were on-going in the CDFA / APHIS program." To clarify this point further, what changed over the summer was the fact that a mating disruption product was developed that could be used in area-wide applications. Product availability is what made the treatment feasible.

Clearly, there are undetermined environmental consequences should this exotic pest be allowed to remain in North America. According to Ruth Coleman, Director of the California Department of Parks and Recreation: "LBAM is a generalist defoliator with a long host list, including such important native conifers as coast redwood, Douglas fir, grand fir, pine, spruce and cypress species... In the absence of its native predators and parasites, LBAM could easily explode through California forests causing yet another wave of dead trees and shrubs and the associated costs." With California's Central Coast already feeling pressure from drought, one more stress on these trees could weaken them with devastating consequences for our forests.

In addition to an environmental impact from this pest on the coast and all of California, we must also note the impact of infestation on our economy, particularly to our agricultural and horticultural sectors. Both our domestic and international trading partners have already placed quarantine restrictions on the movement of host plants out of the infested areas of California. Without the local quarantine efforts—and the efforts of our nursery industry in the area—to prevent LBAM's spread the entire state would fall under similar quarantine restrictions.

Since our goal is to eliminate this pest, the quarantine measures must be commensurate with that goal. Live stages of light brown apple moth must not leave the area. For the nursery industry, this means that plants cannot carry viable life stages, including eggs. Existing quarantine requirements already provide local growers with alternatives to the use of broad-spectrum pesticides. And, nursery owners that market exclusively within the quarantine zone are not affected by our movement restrictions. Nurseries may use the "softer" alternatives, but that will lead to shipping delays given the length of time needed to ensure egg-free status. We understand the hardship these measures impose, particularly on the nursery industry, and that is why we had previously initiated—and are fast tracking—research in Australia to identify alternative treatments that will allow the movement of nursery products in a more timely manner while maintaining an effective barrier to the movement of LBAM.

Doing nothing will not free the local nursery growers and farmers of these quarantine restrictions. In fact, these businesses will be permanently burdened with these treatments in order to ship out of the area. Moreover, a decision to abandon this program will also mean a quarantine of the entire state. In all likelihood countries that, to date, have accepted our restrictions will then impose their own. Instead, it is our intent to eliminate this moth so that these businesses can resume normal operations as soon as possible.

Given the severity of the LBAM consequences if left to live in our environment, it is important to maintain a flexible eradication plan that encompasses a variety of strategies to combat the moth. These strategies will always be informed by the best scientific evidence available plus strong consideration of public health and community input.