



Clear, Present, Significant, & Imminent Danger

Questions for the California Light Brown Apple Moth (*Epiphyas postvittana*) Technical Working Group

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In California, on 7 September 2007, the Light Brown Apple Moth (LBAM) Act of 2007 became law. With its passage, the state legislature declared that “the introduction of the light brown apple moth represents a *clear, present, significant, and imminent danger* [our italics] to California’s natural environment and agricultural industry.” This law provided the legal opportunity for the California Department of Food and Agriculture (CDFA) and the U.S. Department of Agriculture (USDA) to establish an eradication program for LBAM affecting largely populated areas of the entire Monterey and San Francisco Bay areas, with the goal of completely eliminating this presumed dangerous lepidopteran pest from California. The justification for developing and implementing an eradication program was based on warnings by CDFA and the USDA that LBAM could potentially cost the state \$2.4 billion annually if it was not eliminated (CDFA 2008a; El-Lissey 2008). For perspective, this is \$650 million greater than the estimated inflation-adjusted impact of establishment of the Mediterranean fruit fly, *Ceratitis capitata* (Siebert and Cooper 1995). The core component of the eradication strategy was the use of mating disruption technology in a five- to seven-year program in which pheromone would be released aurally every month for nine months per year over urban areas in which 8 million people resided.

Because of the ever-increasing frequency of exotic pest outbreaks in the U.S. and the continued practice by state and federal agencies of using entomological committees for advice on intervention policies, we felt that seeking answers to a series of questions of the 10-member LBAM Technical Working Group (TWG) that formulated, affirmed, supported, advised and enabled the LBAM eradication program (TWG, 2008, 2007) would shed important light on the policy underlying this ongoing \$76 million program. As stated in a CDFA press release (CDFA 2009): “Comprised of 10 scientists, the TWG was appointed by the U.S. Department of Agriculture (USDA) to evaluate California’s LBAM infestation. The USDA/CDFA eradication program was based on the TWG’s recommendations. Its members, from Australia, New

Zealand, California and the USDA, are considered the world’s foremost experts in the biology of the pest.”

These are our specific goals: (1) acquiring a better understanding of the decision-making processes and scientific underpinnings for the LBAM eradication program; (2) gaining deeper insight into how CDFA and the USDA used TWG’s advice and recommendations in the agencies’ protocols, policies, and strategies; (3) identifying ways in which advice and support for institutional policy offered by panelists and advisory committees can be improved and conflicts of interest eliminated; and (4) increasing the likelihood that entomologists who serve on future advisory panels are held accountable for their individual and collective recommendations.

Advisory Panels

Often entomologists and other scientists are asked to serve as experts on advisory panels to provide guidance in addressing insect pest invasions and designing eradications. In the case of LBAM, the TWG was established and their recommendations led to the establishment of the goals and objectives of the LBAM eradication program. Serving on an advisory panel is seen as a privilege and part of a scientist’s public responsibility. Empanelled members use this experience as recognition of expertise within their field and undoubtedly derive status from being chosen to serve. Any specialist and panel has an obligation to represent the science and, as a publicly funded entity, an obligation to protect the public and its interests.

As run today, advisory panels seldom share records of the deliberations (either confidential or open access), the panels often do not feel obligated to respond to challenges by credible authorities from outside, and there is virtually never any accountability for decisions that were made. These facts in themselves have raised public concern over transparency in advisory panels and their roles (Anonymous 2009). This raises the question: Why do entomologists remain largely silent when eradication programs cause potential detriment to the public good? Some

possible answers are that there is fear of speaking out against a source of research support (i.e. “biting the hand that feeds them”) and possibly jeopardizing their funding, reputation, and career (especially for members employed by the sponsoring agencies); a belief that a fellow entomologist should not be critical of colleagues in public; a mandate from administrators that we need to speak only positively and work with “institutional friends”; concern of becoming the victim of a “whispering campaign” designed to undermine one’s professional credibility, or of caving to pressure from industry. Often, recommendations of these panels are implemented without any opposition or constructive feedback from others in the field.

We know of no previous examples other than the series of papers by Carey (1996, 1992, 1991) in which an entomologist openly, systematically, and persistently challenges the conclusions of an eradication program (more recently see Papadopoulos et al 2013). In the case of the LBAM eradication program, unlike past and ongoing eradication programs in which entomologists remained mute on the sidelines, a number of preeminent entomologists spoke out against the wisdom of some of the decisions of the LBAM TWG. These included a letter to USDA Secretary of Agriculture Edward Schafer authored and signed by UC-Davis entomologists James Carey, Frank Zalom, and Bruce Hammock, stating: “We submit that: (1) the data supporting the argument that LBAM will become a pest that is more economically important than the species of tortricid leafrollers that are already in California is unconvincing; and (2) there is no scientific evidence that using the method of mating disruption via pheromones either alone or with augmentative methods (e.g. release of natural enemies) is capable of eradicating any insect population” (Carey et al., 2008).

In sworn testimony at a legislative hearing in Sacramento, retired USDA/ARS entomologist Derrell Chambers stated, “It is my judgment that: 1) Mating disruption alone is not appropriate for California’s situation, and probably never will be. 2) Mating disruption for eradication of LBAM, even with the recommended supporting tactics is unlikely, and certainly has not been adequately tested...”; and 3) The political and social sensitivities of an unconvincing project are not being adequately addressed” (Chambers, 2008).

A published Letter Report on reclassifying LBAM as a non-actionable pest prepared by a 10-person committee (comprised mostly of entomologists) appointed by the National Research Council and chaired by entomologist May Berenbaum was critical of a number of aspects of the LBAM program. In her letter dated 31 August 2009 to Dr. David Kaplan, Assistant Deputy Administrator, Director, Emergency & Domestic Programs, USDA/APHIS/PPQ, Berenbaum stated:

In response to its statement of task, the committee found that APHIS did not “fully consider and address the specific arguments” and did not “conduct a thorough and balanced analysis” supporting the conclusions in its Response. Full consideration would have included a more detailed economic analysis and a more complete response to the argument against eradication. Overall, the committee found that the APHIS Response would greatly benefit from the use of more robust science to support its position. In responding to the petitions, APHIS would be well served by articulating the justification for its actions to the public clearly, and the Response should be revised accordingly (page x; Berenbaum 2009).

Background and Context

Biology. The light brown apple moth, *Epiphyas postvittana* (Walker), typically referred to as LBAM (Fig. 1), is a polyphagous species of lepidopteran in the leaf roller family Tortricidae, closely related to several native tortricid pests currently in California (e.g., orange tortrix). Although indigenous to Australia, probably Tasmania, LBAM has been introduced and is now naturalized in New Zealand, Hawaii, and the United Kingdom (UK) and is found intermittently in various European countries (Suckling and Brockhoff 2010). True to its polyphagous nature, LBAM is recorded from over 250 host plant species and reported to be a pest in New Zealand and Australia, but it is not considered a serious pest in Hawaii or UK (Rubinoff et al. 2011). Its life cycle is typical of most tortricids and completes two to four generations per year over much of its range. It is presently labeled an actionable pest of quarantine by the USDA (and a Class A pest by the state of California), so its presence initiates programs to eradicate, contain, and/or suppress it.

Discovery. In 2006, Jerry Powell, professor emeritus of entomology from the University of California, Berkeley, reported two blacklight captures of LBAM (on July 19 and November 19) (Brown et al. 2010). In January 2007, identification was confirmed by M. Horack of the Australian National Collection, Canberra, and this information was relayed to CDFG and the USDA. Pheromone trap surveys were immediately conducted and results revealed that LBAM was established across 11 counties, within a roughly 25,000 km² contiguous area from Monterey through Marin and Napa Counties with isolated populations in Los Angeles County (Fig. 2). Although CDFG had at least one previous record of LBAM in California, from the 1990s, there had been no systematic or meaningful trapping regimen to survey for its presence.

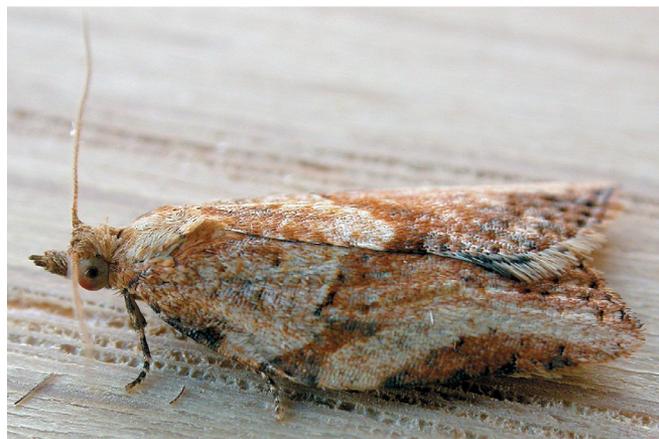


Fig. 1, Light brown apple moth adult and larva. (Top photograph by Donald Hobern; bottom photograph by C. Turner.)

Timelines. Following the 2006 discovery of LBAM in Berkeley (6/19/06; 11/19/06) and the CDFA confirming the identity in February 2007, A.G. Kawamura, the CDFA secretary, made a finding of emergency and adopted emergency regulations on 23 April and began to select members for the 10-member LBAM Technical Working Group (TWG). By 8 July 2007, the TWG released their recommendations (links in the references) to the public with this prime objective: “The U.S. Department of Agriculture’s (USDA) Animal and Plant Health Inspection Service (APHIS) and the California Department of Food and Agriculture (CDFA) should adopt a long-term goal of eradicating light brown apple moth (LBAM), *Epiphyas postvittana* (Walker), from the continental United States.” They also stated that “The TWG [Technical Working Group] envisions mating disruption as the primary strategy for LBAM suppression.”

On 7 September, the Light Brown Apple Moth Act of 2007 became law. That same day, Monterey and surrounding areas were sprayed and re-treated at the end of October. In early November, areas in Santa Cruz County were sprayed, including the city of Santa Cruz. In December 2007, the CDFA held a meeting at the Berkeley CA Health Department to inform local government staff about aerial spraying of the San Francisco Bay Area for LBAM, expected to start as early as February 2008. In January 2008, the USDA announced that \$74.5 million in funding was available to support the LBAM eradication program (USDA 2008). The following month, the CDFA released the 2008-09 LBAM Action Plan (Lyle 2008).

Due to public opposition, on 29 April 2008, the Superior Court ruled that the CDFA needed to complete and file a comprehensive environmental impact report (EIR) in compliance with California environmental law before any further spraying. In mid-June 2008, Secretary Kawamura announced that the CDFA would not continue aerial application of mating-disruptive pheromone. In February 2009, the National Research Council/National Academy of Sciences (NRC/NAS) report was released, and in March 2010, the CDFA and the USDA announced that eradication was no longer the goal. In 2012, the LBAM rearing facility that was created in 2008 at Moss Landing for production of sterile moths was closed. This facility employed nearly 100 people and had an operating budget of \$1 million. In September 2012, the Sacramento Superior court ruled that aerial application could not be deployed in the LBAM eradication strategy, yet all other eradication tools were still available to be used for an initial 7-year period, after which additional environmental review would be required if the program were to continue.

Crisis Exemption Request. There are four types of United States Environmental Protection Agency (U.S. EPA) exemptions allowing use of pesticide and pesticide products in emergency circumstances: specific, quarantine, public health, and crisis. A quarantine exemption “may be authorized in an emergency condition to control the introduction or spread of any pest that is an invasive species.” A crisis exemption “may be utilized in an emergency condition when the time from discovery of the emergency to the time when the pesticide use is needed is insufficient to allow for the authorization of a specific, quarantine, or public health exemption” (EPA 2007; Anonymous 2011).

On 6 June 2007, the USDA/Animal and Plant Health Inspection Service (APHIS) requested, and the U.S. EPA approved, a crisis exemption to use CheckMate OLR-F, a micro-encapsulated, flowable product containing the monoane pheromone, over areas

where LBAM was detected. The argument was that USDA/APHIS had a critical need for a product to be used immediately for aerial application over wide areas. CheckMate OLR-F, formulated for the oriental fruit moth, was the only registered product available that the USDA expert review panel believed fit the need at that time. The product contains one of two components that make up the LBAM pheromone and was deemed sufficiently efficacious to be used as mating disruption treatment if applied at twice the maximum rate published on the current CheckMate label.

Treatments. Aerial applications of a microencapsulated form of mating disruption pheromone were made on four consecutive nights (beginning on the night of 9 September and ending in the early morning hours of 13 September 2007) to treat the Seaside, Marina, Sand City, Del Rey Oaks, Monterey, and Pacific Grove areas of Monterey County, California. The total treatment area was approximately 36,500 acres. A second treatment of the microencapsulated pheromone was applied to the same treatment site and concluded on 27 October 2007. The northern Santa Cruz area of Santa Cruz County and the North Salinas, Boronda, Prunedale, and Royal Oaks areas of northern Monterey County also received one aerial application of the microencapsulated pheromone in November. These applications concluded on 11 November 2007. The total treatment area was approximately 52,000 acres (El-Lissey 2008).

Questions for LBAM Technical Working Group

Issue #1: LBAM Emergency Order and Act. On 23 April 2007, the CDFA Secretary made a finding of emergency, and adopted emergency regulations for immediate action to avoid serious harm to public peace, health, safety, or general welfare. The emergency regulations for the affected counties describing the threat posed by LBAM included economic impacts and damage to the natural environment: “the foregoing amendment of a regulation is necessary for an immediate action to avoid serious harm to the public health, safety or general welfare.” The Secretary also determined that this emergency clearly posed such an immediate, serious harm that delaying action to allow public comment would be inconsistent with the public interest; and that the Office of Administrative Law providing five calendar days advance notice to allow public comment would also be consistent with the public interest.

Questions: Did the TWG as a group or any of its members support, contribute to, and/or in any way enable the Emergency Order that led to the Light Brown Apple Moth Act of 2007? Did the TWG or any member openly question in any meeting the wisdom and/or validity of the conditions underlying the Emergency Order and Act? Considering the wording in this Order, did TWG members consider and was there overwhelming agreement that LBAM (1) had spread 25,000 km² in only a few years (i.e. suddenly); (2) was a surprise invasive even though it was classified as a Class A pest and had been frequently intercepted along pathways (i.e., unexpected); (3) was an imminent threat even though at least 14 months had gone by since it was first detected with no reported damage; and (4) required immediate action using an aerial program of pheromone release?

Issue #2: Public Concerns. There was considerable public outcry over the policy recommendations for LBAM eradication. More than 30,000 people signed petitions against aeri ally releasing LBAM pheromone over the proposed infestation area, which

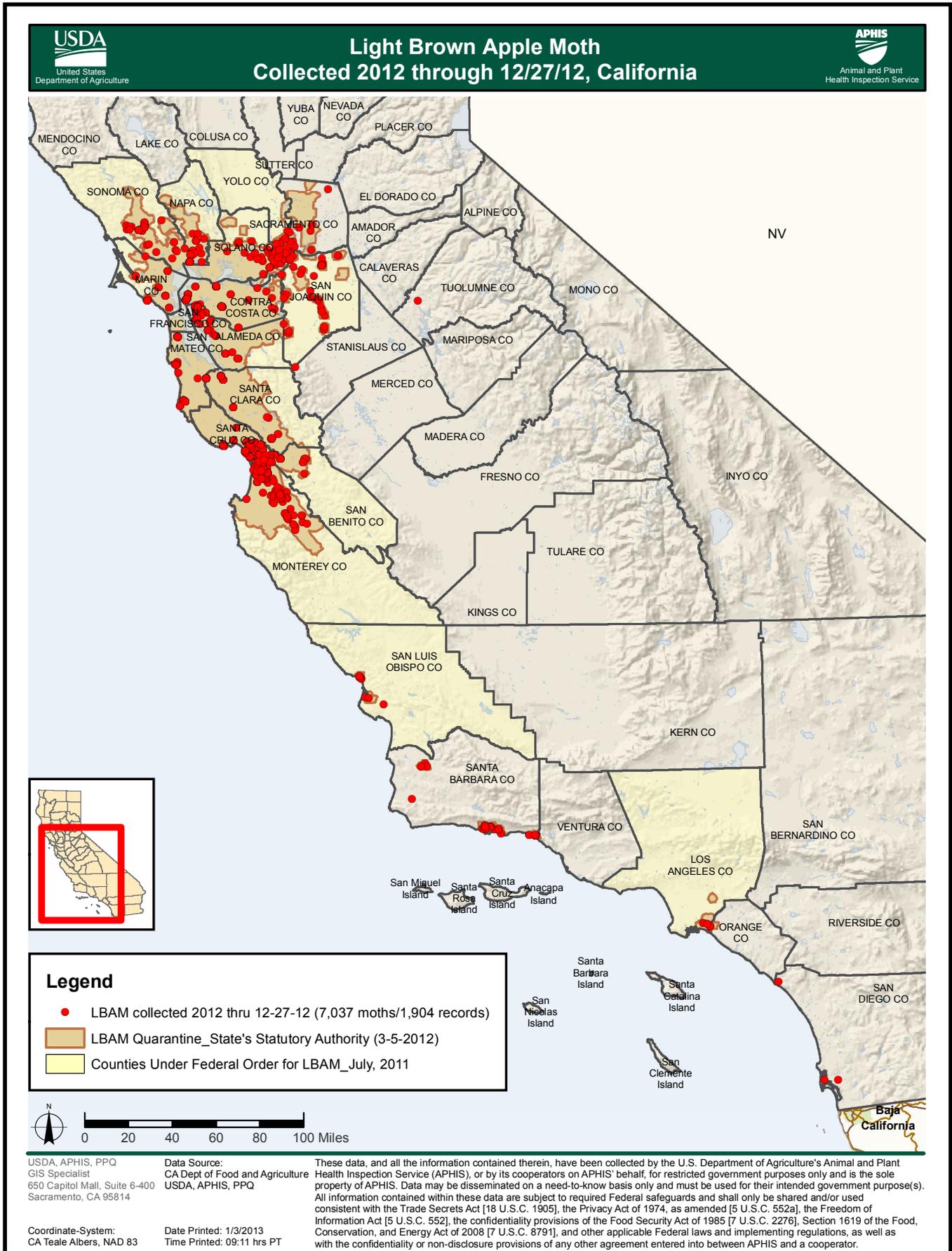


Fig. 2. Light brown apple moth collections in California from 2007 through 2011 (CDFA Web site).

included densely populated cities and regions. Thirty-two city/county resolutions representing 2.5 million citizens were proposed, as well as seven pieces of legislation (two of which were passed) opposing various aspects of the LBAM eradication program. Three lawsuits were filed against the CDFA opposing proceeding with the program before environmental review in compliance with California law was complete; two of the lawsuits were successful. Two additional lawsuits challenging the environmental review document were filed. A lower court ruling was issued in the two suits in September 2012; the ruling is expected to be appealed. Politicians, including mayors of San Francisco and Albany, spoke out in response to plans for the release of pheromone over populated areas. Gavin Newsom, Mayor of San Francisco, said, "Moral authority always is the strongest weapon. People are not going to sit back and watch as planes go overhead and start dumping potentially toxic substances that could have long-term or immediate term health effects — it won't happen, can't happen" (CBS 5 News; 4/24/08). Robert Lieber, Mayor of Albany, stated that "California Department of Food and Agriculture (CDFA) Secretary Kawamura's recent emergency declaration enabling the Light Brown Apple Moth (LBAM) aerial pesticide spraying of the Bay Area relies on blatant misrepresentations of the truth, fear-mongering, and outright lies. I am ashamed of Secretary Kawamura's disgraceful public deception campaign to sell a hopeless, dangerous and likely unneeded 'eradication' program to the people" (Lieber 2008).

Particularly noteworthy was the outrage that aerial spraying provoked among many of the faculty and military personnel at the U.S. Department of Defense-funded Naval Postgraduate School (NPS) in Monterey. "My child nearly died from the first round of spraying. He now has asthma from exposure to this chemical cocktail," said U.S. Air Force Major Timothy Wilcox (2008). "As a proud member of the armed forces I can honestly say that this is not what I fight for...I do not fight for the right of special interests to poison my family. This is CRIMINAL and needs to be stopped." Professor John Arquilla (Chair, Department of Defense Analysis, Naval Postgraduate School, Monterey) stated, "As a former director of the Department of Defense's Information Operations Center, I have little doubt that an arbitrary decision by the military to spray chemicals over populated areas in a foreign theater of operations—similar to the decision made by the USDA and CDFA to spray residents in Monterey and Santa Cruz—would have resulted not only in an international public relations debacle, but probably also in the dismissal of some senior decision makers." Inasmuch as 100% of the students and the vast majority of professors at NPS were either retired or active military officers, their indignation and worry about aerial spraying laid to rest notions that concerns were restricted to and hyped by environmental extremists.

Due to the outcry and opposition to the aerial application of pheromone, the CDFA expanded its options for the eradication despite the recommendation by the TWG that mating disruptive pheromone was to be the primary tool. An experimental technique using radioactively sterilized LBAM was initiated, including the establishment of a multi-million dollar rearing and sterilization facility at Moss Landing in Monterey County. At that time, Secretary Kawamura remarked, "SIT [sterile insect technique] has been successful for more than 30 years in California and around the globe against a variety of insects—most famously the Medfly. Scientists had expected to need 5-7 years to adapt SIT

to the apple moth, but their work has progressed much more rapidly than expected. We now plan to begin limited releases of the sterile moths in 2009, with a full-scale program up and running in 2011. This is exactly the kind of effort and innovation that Californians deserve from their public servants" (CDFA, 2008b).

Questions: What was the basis for the assumption the 8 million people residing in the Bay Area and nearby regions would accept aerial release of pheromone during nine months of each year for up to five or more years? Was it the belief of TWG members that the program would—or should—go forward despite public disapproval and outcry? In September 2007 at a meeting in Santa Cruz County, CDFA Information Officer Steven Lyle stated, "The authority lies with the State. There is no vote. You will be sprayed." Did the TWG believe that pheromones posed no risk to the public? Did the TWG believe that the public would welcome the approach as "enlightened," as was the view of one prominent federal entomologist and the head of the CDFA? Do you believe that the members of the military and faculty at NPS who spoke out did so because, like other members of the general public, they too were unenlightened and emotional?

Do most TWG members believe that, had there been no public protest and/or critical comments by any scientists (including us) and the five-year aerial spray plan for releasing pheromone monthly would have gone forward in 2007 as planned, LBAM would now be eradicated from the state? Do TWG members generally believe that there should be no public commentary by entomology peers about state and federal programs such as LBAM? Did TWG members believe that, had the SIT program continued, that SIT would have successfully eradicated LBAM had the program continued? If not, why not? If so, what evidence did you have that it would work, given that no lepidopteran has ever been eradicated using SIT? If TWG members were confident in the ability of SIT to eradicate, why didn't TWG press CDFA for its continuation, since the public is generally accepting of this technology? If TWG members were not confident in this technology, why did you recommend its development in the first place?

Issue #3: Programmatic Precedent. In response to a question posed by one of us (JRC) at the annual national meeting of the Entomological Society of America in San Diego on 14 December 2010 regarding published scientific evidence that pheromones had been used in previously successful eradication efforts, TWG member Dr. Max Suckling stated that there was a solid scientific literature on which their recommendations for the use of aerially sprayed pheromone for eradication were based. In an e-mail exchange following the meetings, Dr. Suckling informed JRC that the literature he was referring to was a seven-page article published in the glossy Australian trade magazine *Good Fruits & Vegetables* (Woods et al. 2001). This non-scientific article describes a series of unsuccessful, small-scale (several trees to several orchards) eradication programs undertaken against the codling moth from 1903-98 in Australia, involving tree burning, fruit removal, bark scraping, and intensive insecticide applications. Surprisingly, the article contained virtually nothing about the effectiveness of pheromones in eradication. Although there is a precedent for suppressing lepidopteran pest populations with aerial release of pheromone (e.g. gypsy moth), these programs have been conducted mostly in rural areas and were

not implemented with the goal of eradication. We know of no example in which any program worldwide had previously had a goal of eradication using pheromone mating disruption strategy. The recommended action of the LBAM TWG was without any precedent, successful or unsuccessful.

Questions: Did the TWG and Dr. Max Suckling rely on the information contained in the above referenced magazine article as the precedent and foundation for the LBAM eradication program? If true, as stated by Dr. Suckling, please explain why this was used, despite the fact that it is not a scientific publication, contains almost no information on the role of pheromones, describes unsuccessful programs that were extremely small scale and relied on heavy-handed pest reduction interventions. If this is not the literature upon which the LBAM program was based, what was the scientific and technical precedent for the eradication strategy for using the aerial release pheromones? If there was no precedent, what then was the basis for the TWG's recommendation?

Issue #4: Health Considerations. A total of approximately 450,000 acres were scheduled to be continuously treated in northern California, including areas of Marin, Alameda, San Francisco, and Monterey Counties using the synthetic pheromone Checkmate® at the recommended rate of 3 oz./acre/release. The LBAM strategic plan that the CDFA developed in consultation with TWG members called for pheromone releases each month for nine months/yr for five to seven years. Based on the application rate, this meant that 27 ounces/acre/yr would be released with a sum total of 95,000 gallons/yr of Checkmate® or nearly half a million gallons of this product would be released over a five- to seven-year period throughout the greater Bay Area.

Questions: Were the calculations done on the required amount of pheromone, and were health considerations regarding human exposure to the pheromone discussed? Were objections or concerns raised by TWG members about the use of mating disruptive pheromone in an application outside of the testing parameters of the pheromone manufacturer? Was concern voiced as to the health effects or lack of testing of these substances on human populations? Did any TWG member know that the pheromone was not tested on humans and never tested in the application recommended (large heterogeneous areas of farmlands, urban, and natural areas)? In October 2007, when the California Office of Environmental Health Hazard Assessment (OEHHA) and two sister state agencies released an analysis of the use of aerial pheromone applications (the "Consensus Statement on Human Health Aspects of the Aerial Application of Microencapsulated Pheromones to Combat the Light Brown Apple Moth"), which stated that the federal conclusions about the safety of the product applied to use over agricultural areas rather than populated areas, did any TWG member retrospectively raise concerns about the applicability or safety of the strategy the CDFA chose to pursue?

Issue #5: LBAM Program as Funding Source. LBAM program research funding through USDA/APHIS/PPQ/CPHST totaled approximately \$4 million for 2009-10, including \$550,000 that went to the laboratory of the TWG chair, \$2.1 million appropriated to CPHST for LBAM demonstrations of SIT, and another \$200,000 for "fast tracking SIT and mobile mating disruption." We also know

that several other TWG members received substantial amounts of state and federal funding for research on LBAM as a direct outcome of the decision to attempt LBAM eradication although we do not have hard sources for the amounts and the specific recipients.

Questions: Given that funds are being received from a source to which members are presumed to be offering independent and objective scientific advice, do you believe that this arrangement constitutes a conflict of interest? If not, please describe how you would explain to a layperson how you or anyone in your position could remain objective given that there are rules in many other areas (e.g., medicine, business, and law) that consider this a conflict of interest? Did the CDFA use the opportunity presented by the LBAM program to support the CDFA during a time when state funds were being limited due to the economy? Were LBAM funds directed to contractors (the pheromone manufacturer) in ways that represent less than independent and open solicitation? Do you believe entomology should be the exception to the rules concerning conflicts of interest in panel membership?

Discussion

In their recent paper on the role of science in government policy-making in the context of the great earthquake, tsunami, and nuclear accident in Japan, Arimoto and Sato (2012) noted that public confidence in the impartiality of scientists faltered when people suspected that some of them were too easily endorsing government views. To remedy this problem for future policy making, they formulated a number of principles, several of which we believe are not only relevant to the role of science and scientists involved in the LBAM program, but also to virtually all programs directed against invading insects:

1. *Independence of scientific advisors.* As a means to ensure objectivity and fairness, scientific advisors shall declare their own conflicts of interest.
2. *Awareness of responsibility as scientific advisors.* Scientists shall always provide scientific advice for the public welfare and with the awareness of the large influence scientific advice has on the process of public policy formulation.
3. *Achieving broad perspectives and balance.* Government should strive to secure the participation of scientists with appropriate insight and experience matched to the nature of the issues, and to obtain balanced advice based on broad perspectives.
4. *Free and transparent disclosure of scientific knowledge.* Scientific advisors are free to make their scientific knowledge public. Government must not approach scientific advice with any preconception, distort scientific knowledge when making it public, or intentionally add wrong interpretations when using scientific advice. Government shall ensure transparency of the scientific advice process.

From our perspective as scientists, LBAM program outsiders, and California citizens, one of the most disquieting aspects of the original LBAM program was the astronomical difference between what the 10 entomologists who served on the TWG either thought the public would accept or felt that the law would permit, and what the public and politicians were willing to tolerate (i.e. no aerial spraying). Indeed, six years after the LBAM program was launched, we are still astonished that the aerial

spray program involving the release of pheromone over 8 million people monthly for up to five years was even considered. We are also still puzzled by and thus would like answers as to why TWG members would recommend a program of mating disruption for which there is no scientific precedent for eradication success on any scale, much less for an invasive insect that is distributed over many thousands of square kilometers, as was the case in 2007-08 when the TWG was formed.

It is interesting that the on-going LBAM program coincides with the 50th anniversary of the publication of Rachel Carson's *Silent Spring*, which spawned the environmental movement worldwide. It is thus ironic that the TWG recommendations for pheromone spraying may have been motivated by their misplaced belief that this strategy would be embraced by environmentalists. That this strategy was met with outrage should be a wake-up call that many entomologists, particularly those serving on committees dealing with invasive pests, are still out of touch.

Unfortunately, there are indications that a number of influential entomologists, including two TWG members, are not only still out of touch, but reject outright the concept of a wake-up call. For example, a prominent U.S. Forest Service entomologist stated at an entomological society meeting that he considered aerial spraying of synthetic pheromone over urban areas "progressive" and that "public hysteria" trumped good science in the LBAM eradication program (Liebhold 2010). Similarly, a recent paper coauthored by two TWG members contained the statement: "a large well-organized public campaign of opposition [to LBAM] successfully halted further aerial applications in California, in spite of the lack of scientific evidence of human health or eco-toxicology problems. This antispray campaign suggests... lack of understanding of pests by urban dwellers distant from agricultural production." (p. 1005; Suckling et al. 2011).

History discourages the notion that entomologists who patronize the public on both health and the environment issues as well as the scientific foundations for programs will be effective (historical perspectives on *Silent Spring*; see Krupke et al. 2007; Anelli et al. 2006). Indeed, the sentiment expressed by these entomologists is disturbingly close to the oft-quoted remarks by the director of the New Jersey Department of Agriculture in his review of *Silent Spring* 50 years ago in *Conservation News*: "In any large scale pest control program we are immediately confronted with the objection of a vociferous, misinformed group of nature-balancing, organic-gardening, bird-loving, unreasonable citizenry that has not been convinced of the important place of agricultural chemicals in our economy" (Soraci, F. A. (1962) quoted on p 10 in: Winston, 1997).

Six years have passed since the emergency order was issued claiming that LBAM was a *clear, present, significant, and imminent danger*. Along with members of the lay public in northern California, many of whom we came to know and respect as citizens deeply concerned with health and environmental issues and who demand that policy decisions affecting their lives are transparent and based on sound scientific principles, we believe that the panel now has not only a responsibility but an opportunity to explain to the public and their entomology peers how these decisions were made and the science upon which they were based.

We very much look forward to TWG's response as a first step in opening up a broader dialogue within the entomology profession, involving public and professional openness, accountability, and independence of entomologists serving on panels, especially for those involving invasive pests.

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