CALIFORNIA DEPARTMENT OF FOOD AND AGRICULTURE

OFFICIAL NOTICE
FOR THE COMMUNITY OF WESTCHESTER
PLEASE READ IMMEDIATELY

NOTICE OF TREATMENT FOR THE MALAYSIAN FRUIT FLY

On January 8, 2016, two Malaysian fruit flies (MAFFs), *Bactrocera latifrons* (Hendel), were trapped in the community of Westchester, Los Angeles County. Based on the survey data, pest biology, information from the California Department of Food and Agriculture (CDFA) *Bactrocera* Science Advisory Panel (BacSAP), the United States Department of Agriculture (USDA) Action Plan for Malaysian Fruit Fly, and recommendations provided to me by the CDFA Primary State Entomologist, the CDFA concludes that an infestation of MAFF exists in the area.

A Program Environmental Impact Report (PEIR) has been certified which analyzes the MAFF treatment program methods in accordance with Public Resources Code, Sections 21000 et seq. The PEIR is available at http://www.cdfa.ca.gov/plant/peir/. The treatment activities described below are consistent with the PEIR.

In accordance with integrated pest management principles, the CDFA has evaluated possible eradication methods and determined that there are no cultural or biological methods available to eradicate MAFF. The CDFA will employ chemical control as the primary tool, and will use physical control via host fruit removal when there is evidence that a breeding population exists on a property.

The treatment plan for the MAFF infestation will be implemented as follows:

- Foliar-bait treatments will be used within 200 meters of each detection site in order to eliminate adults. Foliar-bait ground treatments are a protein bait spray that contains an organic formulation of the pesticide spinosad (GF-120 NF Naturalyte® Fruit Fly Bait), and are repeated every seven to 14 days for two life cycles of the fly (typically four to six months, dependent on temperature). Please visit the CDFA website to learn more about the treatment process at http://www.cdfa.ca.gov/plant/videos/spinosad/.

- If evidence that a breeding population exists on a property (i.e., immature stages, mated female, or multiple adults), all host fruit from each detection site and all properties within a minimum of 100 meters of each detection site may be removed and disposed of in a landfill in accordance with regulatory protocols. Fruit removal will occur once at the beginning of the project, but may be repeated if additional flies are detected.

Public Notification:
Any resident whose property will be treated via foliar-bait sprays or host fruit removal will be notified in writing at least 48 hours in advance of any treatment, in accordance with FAC Section 5779. Following the treatment, completion notices are left with the residents detailing precautions to take and post-harvest intervals applicable to any fruit on the property. Treatment and other information is posted on the CDFA website http://www.cdfa.ca.gov/plant/PDEP/treatment/malalysian_ff.html. Information will also be conveyed directly to concerned local and State political representatives and authorities via letters, emails, and/or faxes. Press releases, if issued, are prepared by the CDFA information

officer and the county agricultural commissioner, in close coordination with the project leader responsible for treatment. Either the county agricultural commissioner or the public information officer serves as the primary contact to the media.

For any questions related to this program, please contact the CDFA toll-free telephone number at 800-491-1899 for assistance. This telephone number is also listed on all treatment notices.

Enclosed are the findings regarding the treatment plan, MAFF work plan, map of the treatment area, integrated pest management analysis of alternative treatment methods, and a pest profile.

Attachments

FINDINGS REGARDING A TREATMENT PLAN FOR THE MALAYSIAN FRUIT FLY

On January 8, 2016, two Malaysian fruit flies (MAFFs), *Bactrocera latifrons* (Hendel), were trapped in the community of Westchester, Los Angeles County. Based on the survey data, pest biology, information from the California Department of Food and Agriculture (CDFA) *Bactrocera* Science Advisory Panel (BacSAP), the United States Department of Agriculture (USDA) Action Plan for Malaysian Fruit Fly, and recommendations provided to me by the CDFA Primary State Entomologist, I have determined that an infestation of MAFF exists in the area.

The MAFF is an exotic insect originating in tropical Asia and has been recorded from Brunei, China, India, Lao, Malaysia (peninsular), Pakistan, Singapore, Sri Lanka, Taiwan, Thailand, and Vietnam. In recent years it has invaded Africa, having been found in Kenya and Tanzania. It was also found in Hawaii in 1983, and its current U.S. distribution is restricted to these islands. Important California crops at risk include cucumber, eggplant, guava, peppers, pomegranate, tomato, and watermelon. Damage occurs when the female lays eggs in the fruit. These eggs hatch into larvae, which tunnel through the flesh of the fruit, making it unfit for consumption. This pest presents a major threat to a wide variety of California produce, with the combined 2013 gross value of these commodities of over $2 billion. The permanent establishment and spread of this pest would result in increased production and postharvest costs to safeguard commercial fruit from infestation, increased pesticide applications on both production agriculture and residential properties to mitigate damage, and lost economic activity and jobs from trade restrictions imposed by the USDA and foreign trade partners.

This decision to proceed with treatment is based upon a realistic evaluation that it will be possible to eliminate MAFF from this area and prevent its spread using currently available technology in a manner that is based on an action plan developed in consultation with the California Agricultural Commissioners and Sealers Association, the USDA, and scientists on the BacSAP. Due to the size of the infested area and the number of flies detected, the consensus is that eradication is possible. The only California detection was a single male in Los Angeles County in 1998. In making this decision, the CDFA has evaluated possible treatment methods. In accordance with integrated pest management principles, the following is the list of options that I have considered for the treatment of this MAFF infestation: 1) physical controls; 2) cultural controls; 3) biological controls; and 4) chemical controls.

Based upon input from my professional staff and outside experts familiar with MAFF, I have concluded that there are no cultural or biological control methods that are effective to treat the MAFF that allow the CDFA to meet its statutory obligations. To eradicate MAFF, I am ordering that foliar-bait spray treatments will be applied to host and landscape trees using ground-based equipment; additionally host fruit removal will occur. Descriptions of these options are below. The options selected are a chemical-control measure that involves the use of insecticides targeting the adult stage, and a physical-control measure targeting the eggs and larvae. These options were selected based upon biological effectiveness, minimal public intrusiveness, cost, and minimal impacts to the environment.

A Program Environmental Impact Report (PEIR) has been prepared which analyzes the MAFF treatment program in accordance with Public Resources Code (PRC), Sections 21000 et seq. The PEIR was certified in December 2014, and is available at http://www.cdfa.ca.gov/plant/peir/. The PEIR addresses the treatment of the exotic fruit flies such as MAFF at the program level and provides guidance on future actions against the MAFF. It identifies feasible alternatives and possible mitigation measures to be implemented for individual MAFF treatment activities. The

MAFF program has incorporated the mitigation measures and integrated pest management techniques as described in the PEIR. In accordance with PRC Section 21105, this PEIR has been filed with the appropriate local planning agency of all affected cities and counties. No local conditions have been detected which would justify or necessitate preparation of a site specific plan. The MAFF program may also deploy paper delta Jackson traps baited with the attractants latilure and cade oil to enhance the detection of male MAFFs, as an emergency action under Section 21080(b)(4) of the California Environmental Quality Act.

Sensitive Areas

The treatment area has been reviewed by consulting the California Department of Fish and Wildlife's California Natural Diversity Database for threatened or endangered species. The CDFA also consults with the United States Fish and Wildlife Service, the National Marine Fisheries Service and the California Department of Fish and Wildlife when rare and endangered species are located within the treatment area. Mitigation measures will be implemented as needed. The CDFA will not apply pesticides to bodies of water or undeveloped areas of native vegetation. All treatment will be applied to residential properties, common areas within residential development, non-agricultural commercial properties, and right-of-ways.

Work Plan

The treatment program area encompasses those portions of Los Angeles County which fall within 1.5 miles around each property on which an MAFF has been detected and any subsequent detection sites within the program boundaries. A map of the project boundaries is attached. The work plan consists of the following elements:

1. Delimitation. McPhail traps will be placed throughout the project area to delimit the infestation and to monitor post-treatment MAFF populations. The McPhail trap is an invaginated glass flask baited with Torula yeast and borax in water. The McPhail trap is attractive to both sexes of the fly. McPhail traps will each be placed at a density of 80 per square mile within a 0.5-mile radius of each detection site. If available, 100 paper delta Jackson traps baited with the attractants latilure and cade oil will also be deployed in the core square mile. Additional McPhail traps will be placed at a density of 40-20-10-5 traps per square mile in a surrounding four-square mile radius, forming a 4.5-mile radius trapping grid around each detection site. Additional traps may be added to further delimit the infestation and to monitor the efficacy of treatments. These traps will be serviced on a regular schedule for a period equal to three MAFF generations beyond the date of the last MAFF detected. In addition, host fruit may be sampled for the presence of eggs and larvae in a 200-meter radius around each detection property.

2. Treatment. Any MAFF detections within the original and/or expanded eradication area(s) will be treated according to the following protocol.

    - Spinosad foliar-bait treatments will be used to eliminate MAFF adults. The foliage of host trees and shrubs within 200 meters of each detection site will be treated with an organic formulation of spinosad bait spray (GF-120 NF Naturalyte® Fruit Fly Bait) using hand spray or hydraulic spray equipment. Treatments are repeated every seven to 14 days for two life cycles of the fly (typically four to six months, dependent on temperature). Life cycle durations are dependent on temperature.

- If evidence that a breeding population exists on a property (i.e., immature stages, mated female, or multiple adults are detected), all host fruit from each detection site and all properties within a minimum of 100 meters of each detection site will be removed and disposed of in a landfill in accordance with regulatory protocols. Fruit removal will occur once at the beginning of the project, but may be repeated if additional flies are detected.

Public Information

Any resident whose property will be treated via foliar-bait sprays or host fruit removal will be notified in writing at least 48 hours in advance of any treatment, in accordance with FAC Section 5779. Following the treatment, completion notices are left with the residents detailing precautions to take and post-harvest intervals applicable to any fruit on the property. Treatment and other information is posted on the CDFA website http://www.cdfa.ca.gov/plant/PDEP/treatment/malaysian_ff.html. Information will also be conveyed directly to concerned local and State political representatives and authorities via letters, emails, and/or faxes. Press releases, if issued, are prepared by the CDFA information officer and the county agricultural commissioner, in close coordination with the project leader responsible for treatment. Either the county agricultural commissioner or the public information officer serves as the primary contact to the media.

For any questions related to this program, please contact the CDFA toll-free telephone number at 800-491-1899 for assistance. This telephone number is also listed on all treatment notices.

Duty to Act

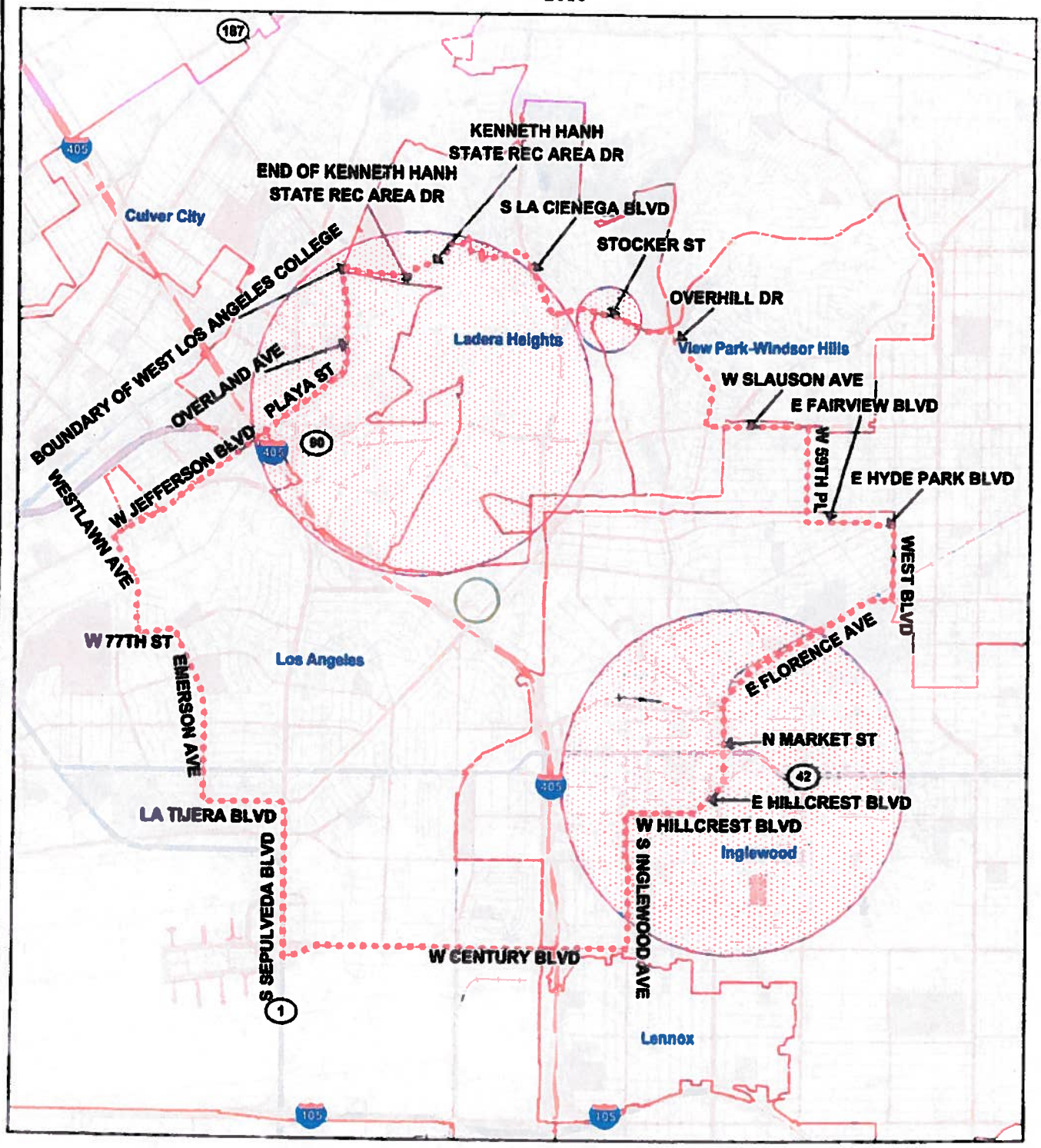
Under my statutory authority, as Secretary of the California Department of Food and Agriculture, I have decided, based upon the likely environmental and economic damage that would be inflicted by an established infestation of the MAFF in this area, that it is incumbent upon me to attempt to address this threat.

My duty to act, and this decision, is based upon authority set forth in Sections 24.5, 401.5, 403, 407, 408, 5401-5405, and 5761-5764 of the FAC, authorizing and mandating the Secretary to: thoroughly investigate the existence of the pest; determine the probability of the pest spreading to other areas; adopt regulations (Title 3 of the California Code of Regulations, Section 3591.26) as are reasonably necessary to carry out the provisions of this code; abate a pest from the established treatment area; and, to prevent further economic damage. The project work plan above describes the CDFA's actions that are necessary to mitigate the effects of this pest.

Karen Ross
Karen Ross, Secretary

2-9-16
Date

Malaysian Fruit Fly Eradication Project
Westchester, Los Angeles County
2016



cdfa

MAXIMUM PROGRAM BOUNDARY

PROPOSED 200M TREATMENT BOUNDARY

SENSITIVE ENVIRONMENTAL AREA / TREATMENT MITIGATIONS IN PLACE

ERADICATION PROJECT WORK PLAN FOR MALAYSIAN FRUIT FLY (*Bactrocera latifrons*)

DETECTION

1. Detection Trapping

The California Department of Food and Agriculture (CDFA) maintains a cooperative State/County trapping program for various fruit flies to provide early detection of any infestation in the state. Traps are serviced by either County or State personnel and funded by the Department. The program uses the McPhail trap for Malaysian fruit fly, which is an invaginated glass flask baited with yeast or protein hydrolysate in water that is attractive to both sexes of the fly. Traps are hung from branches of host trees and poles in vegetable gardens at specified densities in susceptible areas of California. County or State employees inspect these traps weekly or bi-weekly throughout the year in southern California, and from April or May through October or November in northern California, depending on the area.

2. Intensive Trapping

Intensive trapping is triggered after a single fly is caught. Following confirmation of the specimen, trap densities will be increased over an 81-square-mile area (9 miles x 9 miles). Within the next 24 hours, 80 McPhail traps are placed in the core square mile around each find and serviced every day for a week. If available, 100 paper delta Jackson traps baited with the attractants latilure and cade oil will also be deployed in the core square mile. McPhail trap densities in the remainder of the trapping area will be increased from the core outward in a 40-20-10-5 array. Traps in the eight-square miles around the core are serviced every two days for the first week, and other traps are checked at least once within the first week. All traps are then serviced weekly for three life cycles of the fly beyond the last fly detected. This time period is determined by a temperature-dependent developmental model run by the Pest Detection/Emergency Projects Branch. Traps may be relocated to available preferred hosts as practical. The size of the intensive trapping zone may increase as trap catches warrant.

3. Post-Treatment Monitoring

The success of the eradication program is monitored by intensive trapping levels for three life cycles of the fly after the last fly has been detected. If no flies are caught during that time, trap densities return to detection levels.

4. Larval Survey

Fruit on a property where a fly has been trapped may be inspected for possible larval infestation. Fruit on properties adjacent to a trap catch may also be inspected. If two or more flies are trapped in proximity, fruit cutting may be extended to all properties within a 200-meter radius of the detections, concentrating on preferred hosts. Favored larval hosts are solanaceous and cucurbitaceous fruits.

TREATMENT

1. Foliar Sprays

The foliage of host trees and shrubs within 200 meters of each detection site will be treated with an organic formulation of spinosad bait spray (GF-120 NF Naturalyte® Fruit Fly Bait) using hand spray or hydraulic spray equipment. Treatments are repeated at seven to 14 day intervals for two life cycles of the fly (typically four to six months, dependent on temperature).

3. Host Fruit Removal

If evidence that a breeding population exists on a property (i.e., immature stages, mated female, or multiple adults are detected), host removal (fruit stripping) may be used in conjunction with other treatment options. All host fruit will be removed from all properties within a minimum of a 100-meter radius around the detection sites. The fruit is taken to a landfill for burial using regulatory compliance protocols. Fruit removal will occur once at the beginning of the project, but may be repeated if additional flies are detected.

PUBLIC INFORMATION

Any resident whose property will be treated via foliar-bait sprays or host fruit removal will be notified in writing at least 48 hours in advance of any treatment, in accordance with FAC Section 5779. Following the treatment, completion notices are left with the residents detailing precautions to take and post-harvest intervals applicable to any fruit on the property. Treatment and other information is posted on the CDFA website http://www.cdfa.ca.gov/plant/PDEP/treatment/malaysian_ff.html. Information will also be conveyed directly to concerned local and State political representatives and authorities via letters, emails, and/or faxes. Press releases, if issued, are prepared by the CDFA information officer and the county agricultural commissioner, in close coordination with the project leader responsible for treatment. Either the county agricultural commissioner or the public information officer serves as the primary contact to the media.

INTEGRATED PEST MANAGEMENT ANALYSIS OF ALTERNATIVE TREATMENT METHODS TO ERADICATE MALAYSIAN FRUIT FLY
February 2016

The treatment program used by the California Department of Food and Agriculture (CDFA) for control of Malaysian fruit fly (MAFF), *Bactrocera latifrons* (Hendel), employs a targeted foliar bait spray treatment using an organic pesticide, accompanied by host fruit removal as needed.

Below is an evaluation of alternative treatment methods for MAFF which have been considered for eradication programs in California.

A. PHYSICAL CONTROL

Mass Trapping. This method involves placing a high density of traps baited with an attractive lure in an area in an attempt to physically remove the adults before they can reproduce. For MAFF, there is no known lure that is attractive enough to attract all of the adults in a biologically relevant time period, so mass trapping is not considered to be an effective alternative.

Physical Removal. Physical removal of one or more life stages of MAFF could reduce the population. Adults are mobile daytime fliers, and adults could be netted or collected off of plants. However, due to their ability to fly when disturbed, and the laborious and time prohibitive task of collecting flying insects from numerous properties by hand, it would be highly improbable that all of the adults could be captured and removed. Larvae live inside the fruit, so all potentially infested fruit in the entirety of the eradication area would have to be removed and disposed of in order to eliminate the larvae from the environment. Larvae drop from fruit and enter the soil for pupation, where they are impossible to detect, so soil would need to be removed from beneath trees as well. For these reasons, active removal is not considered to be an effective alternative.

Fruit Bagging. Fruit bagging involves individually enclosing each developing fruit in a bag which prevents fruit flies from laying eggs. In order to be effective, frequent monitoring of the bagged fruit is needed to identify and repair damage to the bags before female flies can enter and lay eggs. Fruit bagging is considered an economically inefficient option for area-wide treatment because it is so labor intensive. It is also intrusive to residents, who may oppose having their home grown produce confined inside bags. Additionally, this method may possibly promote the dispersal of female flies in search of egg laying sites, thus spreading the infestation if other treatments are not used outside the fruit bagging area. For these reasons, fruit bagging is not considered to be an effective alternative.

Host Fruit Removal. Removal of host fruits involves the physical removal of all suitable fruit from both the host plant and from the surrounding ground, in order to eliminate developing eggs and larvae. The fruit is collected and double-bagged before being buried in a landfill. CDFA's MAFF program performs host fruit removal within a minimum 100-meter radius of detection sites which are indicative of an active breeding area, such as those with immature stages, a mated female, or multiple adults, as a measure to reduce populations within that area and to prevent spread of flies. Fruit removal is not considered an economically efficient option for area-wide treatment because it is so labor intensive. It is also intrusive to residents, who may oppose losing their home grown produce. Additionally, this method may possibly promote the dispersal of female flies in search of egg laying sites, thus spreading the infestation if other treatments are not used outside the fruit removal area. For these reasons, fruit removal is most useful as a complimentary treatment to one or more other treatments.

Host Plant Removal. Removal of host plants involves the large scale destruction of plants by either physical removal or phytotoxic herbicides. Host plant removal is not considered an economically efficient option for area-wide treatment because it is so labor intensive. It is intrusive to residents, who may oppose losing their plants. Additionally, this method may possibly promote the dispersal of female flies in search of egg laying sites, thus spreading the infestation if other treatments are not used outside the host plant removal area. And finally, because only the fruit becomes infested, there is no need to remove the entire plant during a temporary eradication project as long as the fruit can be removed.

B. CULTURAL CONTROL

Cultural Control. Cultural controls involve the manipulation of cultivation practices to reduce the prevalence of pest populations. These include crop rotation, early harvest (i.e., harvesting green fruit before it is suitable for oviposition), using pest-resistant varieties, and intercropping with pest-repellent plants. None of these options are applicable for MAFF eradications in an urban environment with multiple hosts, and may only serve to drive the flies outside the treatment area, thus spreading the infestation.

C. BIOLOGICAL CONTROL

Microorganisms. No single-celled microorganisms, such as bacteria, have been shown to be effective at controlling MAFF.

Nematodes. No nematodes have been shown to be effective at controlling MAFF.

Parasites and Predators. Parasites and predators are not considered an effective stand alone eradication method because their success is density dependent; they are more effective against dense prey populations than against light populations, so their effectiveness decreases as the prey populations decline. Although several organisms, such as parasitic wasps, have been investigated as potential biological control agents against exotic fruit fly species, they have only been used in suppression programs and not in eradication programs. Since there is insufficient research documenting their efficacy in an eradication program, using these organisms could lead to the ineffectiveness of the program.

Sterile Insect Technique (SIT). SIT is currently used by CDFA to eradicate medfly and Mexican fruit fly infestations. It involves the release of millions of reproductively-sterilized flies by air in order to breed out pest populations. However, SIT protocols have not been worked out for MAFF, and there are no MAFF rearing facilities available to supply the millions of sterile flies that would be needed weekly for an active eradication effort in California, so SIT is not a viable option at this time.

D. CHEMICAL CONTROL

Male Attractant Technique. The use of male attractant technique (MAT) (formerly male annihilation technique) has been successfully employed over the years in California and Florida to eradicate introduced populations of several exotic fruit fly species. MAT makes use of small amounts of an attractant mixed with a pesticide and incorporated into time-release matrix to lure the male flies to bait stations. However, there is no known attractant for MAFF which is sufficiently powerful enough to use for MAT, and thus this is not a viable technique.

Foliar Bait Treatment. Foliar bait treatments use an insecticide mixed with a food attractant in order to kill adults, and particularly females which feed more than males. The bait makes the treatment selective for flies, and therefore biological control agents for other pests are not affected. The CDFA's MAFF program uses this treatment in a 200-meter radius around each detection location. The foliage of host trees and shrubs is treated with an organic formulation of spinosad bait spray (GF-120 NF Naturalyte® Fruit Fly Bait) using hand spray or hydraulic spray equipment. This treatment is repeated at seven to 14 day intervals to kill new adults as they emerge from pupae in the soil for two life cycles beyond the last fly detected. Foliar bait treatments are a vital component of the MAFF eradication program.

Foliar Cover Spray Treatment. Foliar cover spray treatments use a contact insecticide in order to kill adults. This treatment is non-selective and will affect any insects which come into contact with it, including biological control agents for other pests. In order to sufficiently cover an area, much more pesticide must be applied per area than with foliar bait sprays. For these reasons, cover sprays are not used for this program.

Soil Treatment. Contact insecticides drenched into the soil have been used against exotic fruit flies in the past. The goal is to directly kill larvae entering the soil to pupate, pupae in the soil, and adults emerging from pupae by drenching the soil surrounding host plants. The insecticide previously used for this purpose contains the organophosphate insecticide diazinon. However, this treatment has not been used since 2001 in California because of its environmental toxicity, difficulty in removing all ground clutter and debris, and a potential lack of effectiveness in the varied soil types found in urban environments.

E. RESOURCES

California Department of Food and Agriculture. 1993. The Exotic Fruit Fly Eradication Program Utilizing Male Annihilation and Allied Methods. Final Programmatic Environmental Impact Report. State of California, Department of Food and Agriculture, Sacramento, California. State Clearinghouse Number 90021212, April 1993. 572 pp. http://www.countyofsb.org/agcomm/fruitfly/ExoticFFEIR.pdf

United States Department of Agriculture. 2001. Fruit Fly Cooperative Control Program. Final Environmental Impact Statement 2001. 385 pp. http://www.aphis.usda.gov/plant_health/ea/downloads/fffeis.pdf

MALAYSIAN FRUIT FLY PEST PROFILE

Common Name: Malaysian Fruit Fly

Scientific Name: *Bactrocera latifrons* (Hendel)

Order and Family: Diptera, Tephritidae

DESCRIPTION

The adult Malaysian fruit fly is somewhat larger than a housefly, about 8 mm in length. The adult has two black spots on the face. The thorax is brown to black on top with paired yellow stripes at the wing bases, while the abdomen is yellow-orange without any dark markings. The clear wings have a dark stripe along the front edge that is swollen at the wing tip and one directed toward the back edge of the wing at the base. The female has a pointed slender ovipositor to deposit eggs under the skin of host vegetables and fruit. Eggs are minute and banana-shaped, and are laid in batches. The maggots (larvae) are creamy white, legless, and may attain a length of 10 mm inside host fruit. When mature, the maggots leave the host fruit and burrow into the ground, where they form rice-grain shaped brown puparia, from which the adults will eventually emerge.

HISTORY & ECONOMIC IMPORTANCE

Malaysian fruit fly is native to Asia, and was first found in the U.S. in Hawaii during 1983, and by 1994 had spread throughout the state. There, it has emerged as a pest of solanaceous and cucurbitaceous fruit. A number of crops in California are threatened by the introduction of this pest including cucumber, eggplant, guava, peppers, pomegranate, tomato, and watermelon. The combined 2013 gross values of these commodities was over $2 billion. The permanent establishment and spread of this pest would result in increased production and postharvest costs to safeguard commercial fruit from infestation, increased pesticide applications on both production agriculture and residential properties to mitigate damage, and lost economic activity and jobs from trade restrictions. Malaysian fruit fly has been detected only twice in California, with one fly in 1998 and two in 2016.

DISTRIBUTION

Malaysian fruit fly is widespread through much of the mainland of Southern Asia and neighboring islands, including Sri Lanka and Taiwan. It has spread to Kenya, Tanzania, and the Hawaiian islands.

LIFE CYCLE

Females lay eggs under the skin of host fruits, and females may lay more than 500 eggs in their lifetime. The time taken for development depends on the ambient temperature. Maggots tunnel through the fruit feeding on the pulp, shed their skins twice, and emerge through exit holes in approximately 10 days under warm temperatures. The larvae drop from the fruit and burrow into the soil to pupate. After about 10 days adults emerge from the puparia. The newly emerged adult females need 5 to 14 days to mature sexually prior to egg laying. Breeding is continuous, with several annual generations possible. Adults live 70 days on average and feed

on honeydew, decaying fruit, plant nectar, bird dung, and other substances. The adult is a strong flyer, and this ability allows the fly to infest new areas very quickly.

HOSTS AND DAMAGE

More than 50 fruits and vegetables have been attacked, primarily in the families Solanaceae and Cucurbitaceae (see list below). Fruit that has been attacked will be unfit to eat as the maggots tunnel through the flesh as they feed. Decay organisms enter, leaving the interior of the fruit a rotten mass.

Scientific Name	Common Name
Baccaurea motleyana (Mull. Arg.) Mull. Arg.	Rambai
Benincasa hispida (Thunb.) Cogn.	Ash gourd
Capsicum annuum L.	Chili Pepper
Capsicum annuum L. var *annuum*	Bell Pepper
Capsicum baccatum	Barpeppar
Capsicum chinense Jacq.	Bonnet Pepper
Capsicum frutescens L.	Bird Pepper
Capsicum spp.	Pepper
Citrullus lanatus (Thunb.) Matsum. & Nakai	Watermelon
Coccinia grandis (L.) Voigt	Ivy gourd
Coffea arabica L.	Arabian coffee
Cucumis dipsaceus Ehrenb. Ex Spach	Hedgehog cucumber
Cucumis melo L. subsp *agrestis* (Naudin) Pangalo var *conomon* (Thunb.) Makino	Oriental pickling melon
Cucumis sativus L.	Cucumber
Diplocyclos palmatus (L.) C. Jeffrey	Lollipop-climber
Gmelina philippensis Cham.	
Lagenaria siceraria (Molina) Standl.	Bottle gourd
Lagerstroemia indica L.	Crape myrtle
Linociera parkinsoni	
Linociera xanthocarpum	
Lycianthes biflora (Lour.) Bitter	Da chi hong si xian
Momordica trifoliolata Hook.f.	
Murraya paniculata (L.) Jack	Chinese boxwood
Passiflora foetida L.	Wild passionfruit
Physalis peruviana L.	Cape-gooseberry
Psidium guajava L.	Guava
Punica granatum L.	Pomegranate
Sapindus rarak DC.	
Solanum aculeatissimum Jacq.	Dutch eggplant
Solanum aethiopicum L.	Chinese scarlet eggplant
Solanum americanum Mill.	American nightshade
Solanum anguivi Lam.	
Solanum donianum Walp.	

Solanum granulosoleprosum Dunal	
Solanum incanum L.	Bitter apple
Solanum lanceifolium Jacq.	
Solanum lasiocarpum Dunal	Indian nightshade
Solanum linnaeanum Hepper & P.-M.L. Jaeger	apple-of-Sodom
Solanum lycopersicum L. var. *cerasiforme* (Alef.) Fosberg	Cherry tomato
Solanum lycopersicum L. var. *lycopersicum*	Tomato
Solanum macrocarpon L.	African eggplant
Solanum mammosum L.	Macawbush
Solanum melongena L.	Eggplant
Solanum nigrescens M. Martens & Galeotti	Divine nightshade
Solanum nigrum L.	Black nightshade
Solanum pimpinellifolium L.	Currant tomato
Solanum pseudocapsicum L.	Jerusalem-cherry
Solanum scabrum Mill.	Garden huckleberry
Solanum spp.	
Solanum sisymbriifolium Lam.	Sticky nightshade
Solanum stramoniifolium Jacq.	
Solanum torvum Sw.	Devil's fig
Solanum trilobatum L.	Purple-fruited pea eggplant
Solanum viarum Dunal	Tropical soda apple
Solanum violaceum Ortega	Ci tian qie
Terminalia catappa L.	Indian almond
Ziziphus jujuba Mill.	Common jujube
Ziziphus nummularia (Burm.f.) Wight & Arn.	