

Contra Costa County Agriculture and Weights & Measures Newsletter



Spring 2010

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This is a part of a series of quarterly newsletters designed to inform growers in Contra Costa County about issues important to the Agricultural community. We welcome your questions and comments about any topics in this newsletter as well as suggestions for future newsletters. Contact us at:

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Sterile LBAM Adult Male Releases

Reprinted from the United States Department of Agriculture Animal and Plant Health Inspection Service (USDA APHIS) website, News for States December 2009.

This November, APHIS' Plant Protection Quarantine (PPQ) Center for Plant Health Science and Technology (CPHST) moved one step closer to a new technique for the area-wide control and/or eradication of the light brown apple moth (LBAM) from California with the first evaluative tests of a Sterile Insect Technique (SIT) release in Napa and Sonoma counties.

LBAM is an invasive moth that was first detected in California in February 2007. Native to Australia, LBAM is a significant threat to

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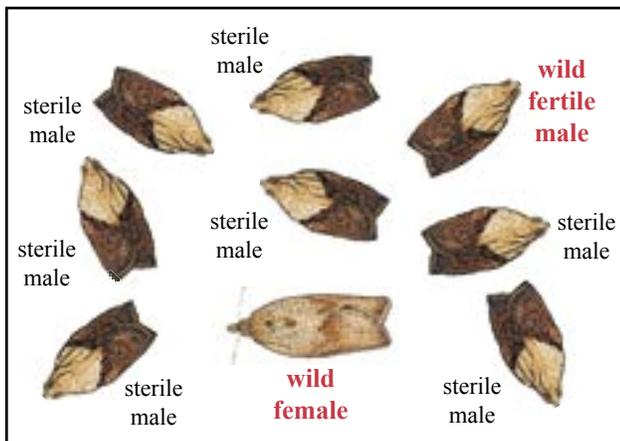


The first test releases of sterile LBAM male moths occurred in Napa and Sonoma county vineyards in November 2009.

agricultural commodities and is capable of adversely impacting more than 2,000 plants including native tree species, horticultural crops and food crops.

The 2007 LBAM find was the first detection in the United States and triggered an eradication response that initially focused on the use of pheromones, but later led to the development of a long-term strategy focusing on SIT. The SIT involves the colonization and mass-rearing of the target pest species; sterilization of the insects using radiation treatment methods (gamma or x-ray radiation) similar to those used in medical, dental and food-processing applications; and the release of sterile insects into the field on a sustained basis and with sufficient numbers to achieve a high enough ratio of sterile-to-wild insects to “over-flood” the wild population. Because there are many more sterile than fertile insects in the population, the pest insect will most often mate with a sterile insect, resulting in no offspring being produced. Due to the absence of offspring, the pest population will decrease.

The use of SIT, as a component of area-wide integrated pest management, has many advantages, including species specificity (e.g., only LBAM mate with LBAM, so no other species are affected) and compatibility with the use of other control tactics such as biological



SIT works by flooding the area with sterile male insects so wild females are less likely to find and mate with wild fertile males.



Sterile male insect releases have been used to control many types of insect pests such as mosquitoes, tsetse flies, and pink bollworm.

control, cultural control, mating disruption, and the use of softer and pest species-specific pesticides. It is an environment-friendly technology that can greatly assist in efforts to address many of the world’s most severe and difficult-to-control pests.

The LBAM SIT process now under development is being led by the CPHST LBAM team located in Moss Landing, CA. This November, the project took a major step forward with the first field evaluation releases of sterile moth tests in vineyards in Napa and Sonoma counties. To date over 35,000 sterile moths have been released.

The evaluation project is designed to estimate how far moths will fly, the recapture rate of sterile moths, and how long they live in the field. Using several replicated releases on a trapping grid, the test will provide data that will be used to estimate how far the moths can fly as well as to determine the field survival rate. These are key moth performance characteristics needed to determine a sterile moth release strategy, which includes factors such as how many to release, how often to release per week, and the release pattern.

More releases are expected this December until the weather becomes too cold for moth activity. The releases are expected to resume in late March or early April 2010. Once the results from the evaluative releases are compiled, this data will be used to determine if SIT could be included as part of an operational area-wide, integrated control program.

Pesticide Drift Prevention

Drift is the airborne movement of pesticide spray droplets, vapors, or dust particles away from the intended treatment site. Drift can harm target crop production by causing uneven spray coverage, poor control of pests, illegal residues, and crop damage. Drift onto neighboring crops, wetlands, and other wild areas can lead to expensive lawsuits and fines. When fieldworkers and other people are exposed, they may become ill. Drift can kill pollinators, biocontrol organisms, and other beneficials. If the use of a particular pesticide creates too many problems, it might even be banned, causing growers to lose it as a pest control tool.

Almost every type of pesticide application has the potential to produce at least some drift. How much will depend on the pesticide, application equipment, weather conditions, and site. One of the most important factors affecting drift is the size of the spray particles.

Wind moves smaller particles farther than larger ones. Droplets measuring one millimeter in diameter will travel only about five feet when dropped from a ten foot height in a three mile per hour wind. Droplets that are 0.005 millimeters can go three miles under the same conditions. Vapors from evaporated pesticide droplets may



Pesticide drift is not only creates a risk to crops and the environment, but it also wastes pesticides, time, and money.



Proper selection of spray nozzles can reduce drift by producing larger droplets.

move even further. For this reason, a coarse spray of large droplets will drift less than a fine spray of small droplets. Some pesticides have an optimum droplet size range that produces the best pest control effect. For these, the pesticide label will list specific instructions as to the required equipment, nozzle type, and pressure. However, the efficiency of many pesticides will not be affected by droplet size within a normal range.

Since higher spray pressure tends to produce smaller droplets, set equipment at lower pressures. Use special drift reduction spray nozzles or nozzles with larger orifice sizes. Nozzles that produce solid cones or fan sprays will produce larger droplets than hollow cone nozzles. Applicators can also use special drift reduction tank additives that work by increasing spray thickness to create larger droplets.

Equipment can play an important part in preventing drift. Keep sprayers properly serviced and calibrated. Check lines and nozzles for leaks since small leaks under pressure can lead to a spray of very small droplets. Regularly inspect nozzles to ensure good spray coverage and deposition pattern. Reducing the height of nozzles above the target gives droplets less chance to be caught by the wind so set boom height only high enough to provide

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the proper nozzle pattern overlap. Spray skirts, hoods, or shrouds over booms or nozzles can also help prevent droplets from being blown away.

Air blast sprayers in orchards can pose a significant risk for creating drift. Be sure to adjust the equipment to spray only into the tree canopy and not up above it. Whenever possible, only use the nozzles that actually deliver spray to the trees. Cut off the nozzles on one side when spraying orchard edges. Also, turn off nozzles for any missing trees in the rows.

Most pesticide applications are affected by wind and weather. When it is windy, more droplets will be carried away from the treatment site and will travel further. Since wind conditions vary depending on the site and time of day, use a wind meter to determine wind speed and direction before and during every application. Winds in our area are often interspersed with strong wind

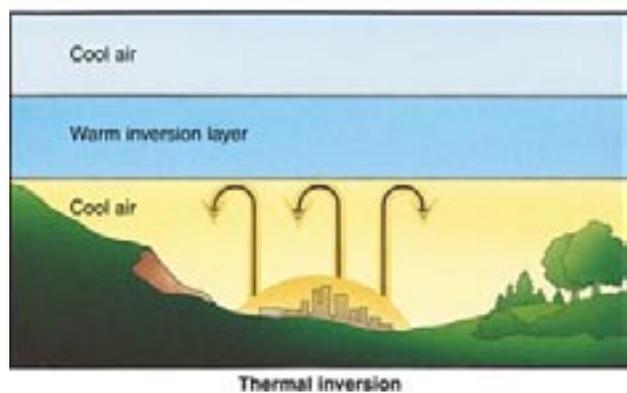
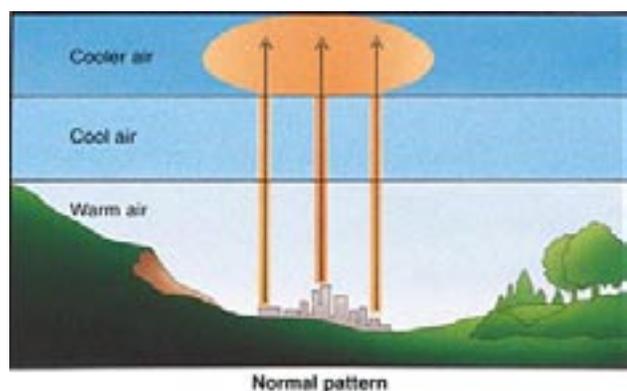


Use equipment that will apply spray only where it is needed. Pesticides sprayed too high above the canopy will be wasted.

gusts. If either the wind or gust speed is high, it may be better to delay the application until the wind is calmer.

Air conditions also affects the probability of drift. Applications made when the relative humidity is low or temperatures are high causes droplets to evaporate and shrink more quickly as they travel between the nozzle and the target. Smaller droplets are also more likely to evaporate completely and become pesticide vapors.

Temperature inversions greatly increase the chances of drift damage. Normally, air gets colder at higher altitudes so warm air at the surface tends to rise and the cooler air above sinks, providing vertical mixing. This air flow carries spray droplets and vapor that may be suspended in the surface air up and away from the treatment site. During a temperature inversion, a layer of warmer air creates a cap on cooler surface air, blocking vertical mixing. This layer traps droplets and vapor in a concentrated cloud near the ground. Temperature inversions are very common in the Central Valley during the summer and tend to occur on sunny, hazy days with little or no wind. If smoke or dust moves across the sky in a cloud rather than moving upwards and dispersing, a temperature inversion is likely to be present.



Temperature inversions cause pesticide vapors and droplets to be trapped near the ground, increasing the chance of drift.

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Be aware of any potentially sensitive sites near the field.

When planning a pesticide application, it is best to stay away from certain types of pesticides. Lightweight particles, especially dusts, are easily carried by the wind. Fumigants and volatile pesticides may produce vapors. Some pesticide formulations are more likely to cause harmful vapors than others (such as 2,4-D esters vs. amines). Although water based sprays can evaporate faster than oil based ones, the oil based spray droplets are smaller and can drift farther, especially when temperatures are high.

Be aware of nearby sensitive sites such as schools, surface waters, bee colonies, organic and other susceptible crops, etc. If the wind is blowing toward a sensitive site, use all possible drift control techniques. Spray the downwind edge of a field only when wind speeds are low. Use buffer zones when needed.

California law requires applicators to perform all pest control in a careful and effective manner, exercise reasonable precautions to avoid contamination of the environment, and prevent substantial drift to nontarget areas. Although for most pesticides, California law doesn't set specific wind speed limits, applicators must monitor weather conditions before and during applications and alter their spray jobs accordingly. The costs of drift to the applicator can include not only fines, but also expensive lawsuits and higher insurance premiums.

Where To Buy Biological Control

Biological control works by using a pest's natural enemies to keep pest population levels in check. When pest numbers increase, the natural enemies have more prey to eat. They respond by reproducing more, bringing the pest population down. For this reason, biological control is both cost and labor efficient.

Biological control natural enemies include predators, parasites, and pathogens. Predators are organisms that attack and feed on pests. Some predators are specialized but the majority will eat a variety of prey. Although most commercially available biological control predators eat insects and mites, there are also ones that will eat weeds or weed seeds.

Parasites are organisms that feed on or inside the bodies of their hosts, weakening or killing them. Parasites usually specialize on only one or just a few kinds of hosts. The most common biological control parasites are species of wasps and flies.

Most pathogen biological control organisms are viral, bacterial, or protozoan diseases specific to a particular pest. A common commercial example are various strains of *Bacillus thuringiensis* used to control caterpillars and mosquitoes. Other fungal and bacterial strains can even be used to help protect against plant diseases. They act by producing antibiotics or by inhibiting the growth of disease causing microorganisms.



A Walnut Aphid mummy showing an exit hole where an adult parasitic wasp emerged.

Although ladybugs and preying mantis eggs are available in many nurseries, it can be hard to find the specialized types of biological control organisms useful for producing crops. The following are some companies that sell biological control organisms. Remember to check the quantity and quality of the organisms when they arrive and make sure they were shipped properly. Learn how to store them until they will be released and only release them when conditions are right.

Rincon-Vitova Insectaries

P.O. Box 1555, Ventura, CA 93002-1555
800 248-2847
www.rinconvitova.com

Rincon-Vitova Insectaries has over fifty different types of biological control organisms. Predators include: ladybugs and lacewings (for general pests); Mealybug Destroyer beetles (mealybug, scale, and aphids); Pirate Bugs (aphids and thrips); Lindorus beetles (scale); Delphastus beetles (whiteflies); Amblyseius and Hypoaspis mites (mites and thrips); Spiny Soldier Bug (caterpillars and beetle larvae); and predatory nematodes (soil living caterpillars such as cutworms). Parasites include many different species of wasps to control various types of aphids, scale, whitefly, leafminer, flies, and caterpillars. Various microbial inoculants are available which help prevent diseases such as fusarium, rhizoctonia, scab, powdery mildew, and fire blight.

Arbico

P.O. Box 8910, Tucson, AZ 85738-0910
800 827-2847
www.arbico-organics.com

Arbico carries general predators such as ladybugs and lacewings, Mealybug Destroyer, Pirate Bugs, Lindorus, Delphastus, predatory mites, Soldier Bug, and predatory nematodes as well as parasitic wasps for caterpillars, aphids, leafminer, whitefly, and scale. Arbico sells some types of microbial biological control.



The Mealybug Destroyer beetle (left) and larvae (right) eat mealybugs, scale, and aphids. Adults are 1/6 inch, larvae 1/2 inch.

Evergreen Growers Supply

17592 S. Palmer Rd., Oregon City, OR 97045
530 522-0879
www.evergreengrowers.com

Evergreen Growers Supply carries ladybugs and lacewings, Mealybug Destroyer, Pirate Bugs, predatory mites, and parasitic wasps for aphids and whiteflies.

Sterling Insectary

30787 Perkins Ave., McFarland, CA 93250
661 792-6810
www.sterlinginsectary.com

Sterling Insectary sells Mealybug Destroyer, a species of thrip and two types of mites that eat pest mites, and a parasitic wasp for Vine Mealybug.

Biological Control of Weeds, Inc.

1418 Maple Dr., Bozeman, MT 59715
800 334-9363
www.bio-control.com

Biological Control of Weeds sells insects that feed on weeds such as Yellow Starthistle and knapweeds.

For more information and additional suppliers of biological control organisms, please visit the website of the Association of Natural Biocontrol Producers at www.anbp.org and click on "Members and Products".

Detector Dog Team Update

Every day, exotic plant pests in unmarked shipments of plant material are brought into California by package delivery services such as UPS, Fed-Ex, and others. These shipments are undetectable by human inspectors and could lead to serious exotic pest infestations, costly eradications, and the loss of our export markets due to international quarantines.

California's Agricultural Commissioners, CDFA, and USDA, established a detector dog pilot program to help find these shipments before they could threaten California agriculture. The pilot program consisted of three teams, two in Contra Costa County and one in San Bernadino County. During 2007, the first full year of the pilot program, the three detector dog teams found 673 unmarked plant shipments, leading to 95 pest interceptions.

The success of the detector dog team pilot program led to additional teams going to work in San Diego, Sacramento, and Fresno counties. In 2008, the detector dog team program found 972 unmarked shipments of plant material leading to 195 pest interceptions. In 2009, the program was expanded yet again, adding teams in Los Angeles and Santa Clara counties. Now, this vital protection to California agriculture may be increased further with the addition of up to four more detector dog teams.



A Contra Costa detector dog team finds an unmarked package containing a tree.

Contra Costa County Yesterdays

In the mid 19th century, an important landmark in east Contra Costa County was Point of Timber, southeast of Knightsen. Point of Timber got its name from the oak trees that grew along the delta of Kellogg Creek, trees that were the first timber found for 200 miles north of the four creeks area. Point of Timber Road, named for the landmark, is still in the area today.

Before the Union Pacific railroad line was built, local growers had to use barges and other shallow draft cargo ships to transport their crops to the deep water ports in San Francisco Bay. Point of Timber was the site of one of these shipping points, Babbe's Landing, which provided a connection to the Delta via Indian Slough.



A cargo ship around 1910 near Knightsen, probably at Babbe's Landing.

During the wheat boom of the 1870's, growers fell victim to market manipulators who fixed prices to maximize their own profits. In April of 1873, California growers met in San Francisco at a State Farmers' Union Convention to discuss how to fight this. At the meeting, the growers decided to join the National Grange, a grassroots farmers organization formed in 1867. By October of 1873, there were 104 Granges in California including Point of Timber Grange #14. The new California Granges worked to negotiate lower freight and port charges; establish a cooperative system of trade; and organize banks that would make loans to farmers at reasonable rates.

In Memory Of

The Agriculture Department wishes to recognize the loss of the following members of the Agricultural Community in Contra Costa County and to express our condolences to their families.

Sam Carr



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