

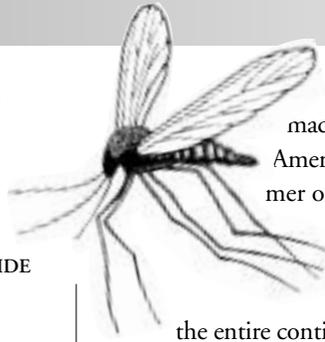


## MOSQUITOES AND WEST NILE VIRUS

ORGANICALLY ALLOWABLE CONTROL METHODS AND THE NEED FOR AN ORGANICALLY ALLOWABLE ADULTICIDE

By Joshua Carman & Gregory Gilbert

IMPORTED TO THE EAST COAST, it has taken the West Nile (WN) virus four years to travel across country and show up in California, confirmed by recent infections in Imperial, Riverside, and San Diego counties. So far, the infections have occurred only in surveillance test chickens and mosquito pools. Three people in California have tested positive for WN infection, having picked up the virus while visiting other infected states, but as of early September no human infections have occurred as a direct result of the presence of WN virus in this state. In preparation for this, public health officials and mosquito abatement districts have been shifting surveillance and monitoring operations into high gear. Talk of response resonates in the air. But talk is not all that may be found in the air in months to come. The California Mosquito-Borne Surveillance and Response Plan, drafted by the Department of Health Services, Vector Control Association of California and the University of California, outlines the expected actions to be taken. Included is the possibility of large-scale pesticide campaigns. The aerial spraying of synthetic pyrethroids and malathion pesticides will be of most concern to organic farmers because, if exposed to high enough levels, decertification of their crop could occur. Additionally, certain mosquito abatement districts require farmers to pay the difference between conventional mosquito larvacides and organically allowable brands. For smaller operations, this extra expense will be a hardship. While the Response Plan and the way that abatement districts operate have the potential to cause economic loss to organic farmers, there are steps that can be taken to reduce this possibility.



West Nile virus made its debut in North America in the late summer of 1999 in Queens, New York. Since then, the virus has nearly encompassed the entire continental U.S., as well as parts of Canada. The virus, which causes flu-like symptoms in most, is transmitted by the bite of a mosquito. Birds serve as a reservoir and allow for the virus to persist.

The control methods used in response to WN will be the decision of the regional abatement districts. In speaking with nearly all of the California districts, many explicitly said that they did not want to affect organic farmers' certification status, and that they will avoid adulticide spraying at all costs. However, spraying may be mandatory in an outbreak of WN. To make every effort to avoid spraying, these districts use Integrated Pest Management to reduce mosquito populations without the use of pesticides, or when determined necessary, the least-toxic methods. Acceptable adult mosquito population thresholds are established, and factors such as a mosquito population's proximity to an urban (or suburban) area are weighed in guiding a district's response.

Of the practices, several are organically allowable.

### 1) SOURCE REDUCTION

Source reduction involves the modification of the biological environment, and is practiced to reduce sites that are conducive to mosquito breeding. There are many practical ways that farmers can practice proactive source reduction and assist in mosquito control in their community. Rice farmers can flood their fields late in the season when mosquito populations have diminished. The control of algae in the rice field reduces the amount of organic material that mosquito larvae can feed on. In irrigated pastures, dairy, and apple processing, for example, wastewater lagoons are the prime breeding sources for mosquitoes that prefer a highly polluted home.

Farmers should take steps to get rid of these water sources. This can be done by using drip irrigation systems instead of channel irrigation, which can create the stagnant water that mosquitoes love. Additionally, turning over containers (trash lids, unused wheelbarrows and drums, and any other containers around the farm), discarding old tires, recycling aluminum cans, and cleaning rain gutters can all be used as effective proactive methods of water source reduction.

### 2) BIOLOGICAL CONTROL

Mosquitofish are given away for free at most abatement districts. These topminnows feed on mosquito larvae, reducing numbers before they become the problematic biting and flying adults. They will eat upwards of 500 mosquito larvae a day. Mosquitofish are highly adaptable to extreme conditions, surviving in water temperatures ranging from 33°F to 104°F. If they run out of larvae to munch on, farmers can just give them some dog food; they're not picky. Their amazing resilience makes them competitive to some native fish and amphibians though, so mosquitofish should only be used in closed systems. Farmers should use them in rice fields, horse troughs, ornamental bird baths and fountains.

### 3) BACTERIAL CONTROL

Commercial formulations of *Bacillus thuringiensis israelensis* (Bti) and *Bacillus thuringiensis sphaericus* can be purchased in "dunk" form. Farmers should make sure VectoBac (for use in rice) and VectoLex (for use in water with a high organic content) are used. These two products are organically allowable and do not contain the prohibited inerts found in the Bt's generally used by abatement districts.

### 4) PHYSICAL CONTROL

Carbon dioxide traps are expensive but can be effective for up to one acre. Carbon dioxide is what naturally draws mosquitoes to humans.

Besides control methods, organic growers and the general public can also take these personal preventative measures:

- ✓ Try to limit your time outside around dusk and dawn. These are the times mosquito activity is the highest.
- ✓ Wear long sleeves and long pants (particularly at these times).
- ✓ Repair any broken screens on doors or windows.
- ✓ Use citronella or other repellants. If you feel like you have to use repellents with DEET, do not apply them to children's faces or hands.

*Culex tarsalis* is a regular resident in rice fields and also happens to be one of the most competent vectors of WN. *Culex pipiens* is a mainstay in polluted water sources such as dairy lagoons and irrigated pastures. The presence of competent vectors of WN on an organic farm has implications for possible mandatory treatment of organic fields, as well as for potential health risk to those on the farm. The farmer's proximity to urban or suburban populations will be important in the district's assessment of the risk that the farm constitutes. Butte County, for example, will require organic farmers to pay \$9.60/acre per application of organically allowable Bti. There has to be another way.

While there is reason for concern about the organically prohibited materials that districts may use, there are measures that farmers can take to promote communication with districts. This communication is crucial since Colusa, for example, was not even aware that there were organic farmers in its

district. We would suggest visiting your district manager in person to meet face to face.

Organic growers can:

- ✓ Note their proximity to any urban or suburban areas. This distance will be key in a district's response.
- ✓ Take steps to reduce avoidable mosquito sources. Showing the districts that realistic preventative measures are already being taken will promote understanding, flexibility, and compromises between the districts and organic farmers.
- ✓ Find out the boundaries and jurisdictions of the district. Not all districts cover the whole county, so it is possible that a given organic farm may not be covered by any district. In the case of a WN outbreak, however, the Surveillance and Response Plan sets up means for the treatment of areas not presently covered through emergency relief.
- ✓ Inquire about the control practices that are normally carried out within the district, and what their likely response to WN in the area will be.
- ✓ In the event that larvicide treatments are deemed necessary on the farm, try to convince them to use VectoBac or VectoLex.
- ✓ Whatever the district's answer is, the farmer should be sure to get it in writing in order to avoid disagreements and misunderstanding later.

PyGanic and Diatect V have been reported to be effective adulticides against mosqui-

toes, and they do not include prohibited inert piperonyl butoxide. They are just the natural ingredients derived from the chrysanthemum, making them organically allowable. While they may be effective, mosquitoes are not listed as one of the targets on the pesticide label. Perhaps, with some influence, the EPA will broaden the label so that abatement districts will have organically allowable tools to use if they decide that spraying adulticides is necessary.

In the meantime, there are realistic and effective measures that organic growers can take to protect themselves and their community from West Nile virus and from organically prohibited materials. To find out what district your operation is in, check the Mosquito and Vector Control Association of California website and go talk to the district manager today. 🐞

Mosquito and Vector Control Association of California

[www.mvcac.org/agencies.htm](http://www.mvcac.org/agencies.htm)

California State West Nile Virus Homepage

[www.westnile.ca.gov](http://www.westnile.ca.gov)

*This article does not constitute legally binding agricultural production advice. Growers should consult their Pest Control Advisor (PCA) before using any growing method or material discussed in this article. Information and data in this article were obtained from sources considered reliable. Their accuracy or completeness is not guaranteed and the giving of the same is not to be deemed a solicitation on CCOF's part with respect to the production or sale of commodities.*



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