

# WILL NALED KILL MY BEES? AND OTHER FREQUENTLY ASKED QUESTIONS ABOUT MOSQUITO CONTROL AND BEES



## Is Naled going to kill all of my bees?

When used according to the label recommendations, Naled should have minimal risks to bees. The risks posed to honeybees and other beneficial insects are influenced both by how toxic the pesticide is and whether the bees are exposed. When sprayed according to the label (two hours after sunset up to two hours before sunrise), Naled is highly effective at controlling adult mosquitoes that transmit harmful diseases. However, the chemical dissipates and breaks down very quickly in the environment. Thus, by the time bees begin foraging, the chemical is no longer present in the environment. Bee kills being attributed to Naled spraying are likely due to improper application of the chemical, such as poor timing, or by killing off bearding bees.

## Why does mosquito control use Naled?

Mosquito control must make difficult decisions when it comes to protecting both public health and the environment. Naled is a product that has been shown to be extremely effective at killing mosquitoes. When applied according to the label instructions, it should have minimal impact on non-target organisms such as bees.

## Why use Naled if less harmful pesticides can be used?

Mosquito control programs rotate products to minimize the potential for insecticide resistance. Adult mosquito control products, called adulticides, are generally grouped into two categories: pyrethroids and organophosphates. These two groups are different in their chemical structures and therefore affect the mosquitoes through different modes of action. Common pyrethroids used in Louisiana include Resmethrin, d-Phenothrin and Permethrin. The most commonly used organophosphate used in Louisiana is Naled.

## Why does mosquito control spray so many pesticides?

Mosquito control is much more than the use of pesticides. It is actually a multi-layered approach involving both non-chemical and chemical control methods. This approach is called Integrated Mosquito Management (IMM). In most cases, the use of pesticides

is a last resort. This happens when there is a public health threat or when mosquitoes can no longer be controlled using non-chemical means.

## What is Integrated Mosquito Management (IMM)?

IMM is a multi-layered approach that includes conducting source reduction, trapping and surveillance, and using products that target either immature mosquitoes in water or flying mosquito adults. Many of the products used to control immature mosquitoes are considered biorational, meaning they are often derived from natural sources and are designed to specifically kill mosquitoes and no other organisms. Most mosquito control programs use biorational control products as a first line of defense against mosquitoes. Targeting the adult flying mosquitoes is the final means of control, and is extremely important during times of active mosquito-borne virus transmission and high levels of nuisance mosquitoes.

## Why did Naled kill the bees in South Carolina?

When applied according to label instructions, Naled should have minimal impact to bees. This is because mosquito control is done at night when bees are in the hive. Naled will not go into a hive. The greatest risk to bees is when they are exposed during either foraging or bearding behavior. To minimize exposure to bees, the label states it should be applied at least two hours before sunrise. Based on news reports, the application of Naled in South Carolina may have occurred after sunrise.

## Doesn't any dose of a pesticide cause harm to humans or animals?

There is an old saying credited to Paracelsus that it is the dose that makes the poison. Any compound, including table salt, caffeine, aspirin and sugar, can be toxic at the right concentration. The reality is that most of the pesticides used in mosquito control are less toxic than table salt. It is also important to note that the amount of actual pesticide applied is so small that it is like spreading a tablespoon of product over an entire football field. Therefore, it is highly unlikely that humans and animals would be impacted from these pesticides.

## **What steps are taken to minimize harm to the environment?**

Mosquito control products are designed to have the smallest impact on the environment as possible. Mosquito control selects products that break down quickly — within a few hours — and choose products that are specific so they only kill mosquitoes. They also utilize techniques such as IMM that incorporate both chemical and non-chemical strategies in control.

## **Honeybee populations are on the decline. Don't public health pesticides contribute to this?**

There is no single cause for honeybee declines. LSU AgCenter research has shown that varroa mites as well as pathogens have a much greater impact on honeybee health than pesticides. Research has also shown that, when done correctly, mosquito control has minimal impacts on bees.

## **What can I do to minimize hive exposure to mosquito sprays?**

The most important thing that beekeepers can do to minimize exposure is to communicate with their local mosquito control programs. Unless there is a public health emergency, mosquito control is most often able to turn off their spray trucks when passing beehives. "Bee aware" flags can also be used, but should be done in addition to communicating with mosquito control. If mosquito control must be done in an area with bees, it is usually done in the evening. Beekeepers can prevent exposure by improving ventilation within hives to prevent bearding behavior or by covering the hives during the spray events.

## **Do mosquito sprays linger on vegetation overnight?**

Mosquito control products are selected because they break down rapidly, within hours. When Naled is applied at night, it will not be lingering on vegetation in the morning when bees exit the hive.

## **Will aerial sprays contaminate the water sources bees use?**

Studies have shown that Naled breaks down rapidly on soil, on plants and in water.

## **Can I be put on a list to be notified before spraying occurs?**

Beekeepers should communicate with their mosquito control programs. In most cases, they can be added to either a no-spray list or a notification list.

## **What symptoms indicate that bees have been poisoned?**

If bees have been exposed to pesticides, then acute mortality will likely occur within hours. The most obvious sign will be a pile of dead bees in front of the hive. If this occurs, report it right away so pesticide testing will be more conclusive.

## **What are mosquito dunks and do they kill bees?**

A mosquito dunk is a biorational mosquito control product (*Bacillus thuringiensis israeliensis*, or BTI) that is designed to kill immature mosquitoes. The LSU AgCenter has been working with the U.S. Department of Agriculture bee lab to evaluate BTI against bees. In these studies, both immature and adult bees have been exposed to extremely high levels of BTI and do not die. The reason for this is that BTI works at a very specific pH of the mosquito gut. A bee's gut is far too acidic and ends up digesting the BTI instead.

## **Is Zika a threat in Louisiana?**

While there have been no reported local transmissions of Zika in Louisiana, there have been more than 26 imported cases in the state. The majority of these cases have been in regions where there are active populations of the mosquito vectors. Mosquito control programs are therefore using all of the knowledge on Zika cases and mosquito populations to assess risk to the public. If there is even a slight risk of transmission of Zika, mosquito control programs may respond with various control efforts.

## **Hasn't Zika been around for a while?**

While Zika virus has contributed to local outbreaks in Africa and Asia since 1947, it only recently appeared in the Western Hemisphere in 2015. Since then, it has rapidly spread throughout Central, South and North America. It is also resulting in local transmission in Florida. Because it is new to the area, there are many new things being discovered about the virus. This includes new and conclusive links between the virus and neurological deficits, including microcephaly in newborns. Because Zika was not a global threat prior to 2015, there had not been very many studies evaluating this virus. Rather, research focused on other immediate threats at the time.

## **Is there really a link between microcephaly and Zika?**

Yes, and it has been conclusively shown. Prior to 2015, there was very little known about Zika, as it has only recently become a global threat. This past spring, a causal link between Zika virus and microcephaly was

conclusively determined. The United States is already seeing cases of microcephaly in infants born to mothers that had contracted Zika virus. Unfortunately, several of those babies have died, and those that have survived will have long-term neurological problems.

### **Do pesticides cause microcephaly?**

There is absolutely no evidence to suggest that pesticides or repellents cause microcephaly.

### **Why should I care about Zika?**

The Centers for Disease Control and Prevention reports that there are more than 624 pregnant women in the U.S. with Zika virus. This year, there have already been at least 17 babies born with Zika-related birth defects in the U.S., and at least five of those babies have died from Zika virus. Those that survive will have neurological deficiencies throughout their lives. Given the importance of mosquitoes in the transmission of Zika virus, mosquito control is an extremely important tool to prevent more cases in babies, children and adults.

### **Wouldn't we be better off not spraying public health pesticides at all?**

Prior to organized mosquito control, hundreds of thousands of individuals lost their lives in the United States from mosquito-transmitted pathogens, including yellow fever and malaria. West Nile virus, which continues to be an annual risk in the United States, has contributed to more than 1,900 deaths in the United States since 1999, according to the CDC website. New and emerging mosquito-borne pathogens, such as chikungunya and Zika viruses, also pose threats. Most people don't realize that all heartworms are transmitted to pets from mosquitoes. Lastly, without mosquito control, livestock and wild animals would be at risk from exsanguination from excessive mosquito bites. Therefore, mosquito control is the most effective way at protecting our family, friends and pets from mosquito-borne pathogens in Louisiana.

### **How can I help control mosquitoes without putting bees at risk?**

The vectors of Zika virus lay their eggs in backyard containers. One bucket in a backyard produces enough standing water to produce more than a 100,000 mosquitoes in the course of a season. The public can help reduce these mosquitoes by checking their yards weekly for standing water. Remove trash and debris. Pull tarps tight to eliminate puddling of water after rainfall. Empty water in birdbaths weekly. Cover trashcans or drill holes in the bottom to prevent water from collecting.

### **I am afraid that pesticides will kill my bees. What do I do?**

The most important thing you can do is communicate with your local mosquito control programs. You can learn about what products they use and when. You can be added to a "no spray" list. And you can learn what to do if mosquito control needs to spray your community.

### **Why should I care if a few babies die from Zika when my bees are dying from pesticides?**

Organized mosquito control has existed for more than 100 years. Over time, the products that are used have gone from more toxic products to very specific products that have the smallest possible impact on the environment. In fact, honeybees were thriving in the U.S. even when DDT was sprayed in millions of homes to eradicate malaria. Supporting local mosquito control programs is actually supporting good science that makes decisions that benefit both public health and the environment. If you love your bees, then supporting good mosquito control programs and communicating with them will ensure that your bees are not exposed unnecessarily in the future.

---

#### **Author**

Kristen Healy, Assistant Professor

Visit our website: [www.LSUAgCenter.com](http://www.LSUAgCenter.com)

Pub. 3560 (Online Only) 9/16

William B. Richardson, LSU Vice President for Agriculture

Louisiana State University Agricultural Center, Louisiana Agricultural Experiment Station, Louisiana Cooperative Extension Service, LSU College of Agriculture  
The LSU AgCenter and LSU provide equal opportunities in programs and employment.

---