



HAWAII POLLINATORS & PESTICIDES

ONE OF EVERY THREE BITES of food we eat is from a crop pollinated by bees. Yet, over the past decade, honey bee and other pollinator populations have severely declined around the world. During the winter of 2014/15, two-thirds of U.S. beekeepers experienced hive losses greater than the established acceptable winter norm,¹ and many beekeepers continue to report above average annual losses, with some as high as 100%.² Hawaii has also experienced its share of hive losses – in the past 10 years some Hawaiian beekeepers have unofficially reported losing 100% of their hives.³ Bees and other pollinators are increasingly jeopardized by pesticides and other human-influenced factors. We must act now to protect pollinators because if they disappear our food security and ecosystem health will also diminish greatly.

HAWAII POLLINATORS & PESTICIDES

- An overwhelming number of scientific studies link bee declines to pesticide use and illustrate the far reaching impacts that these harmful chemicals have on a wide range of environments.⁴
- Honey bees are not the only pollinators at risk. Numerous peer-reviewed studies indicate pesticides also have significant adverse effects on many species of native bees, butterflies, other beneficial insects, and birds.
- Hawaii boasts a variety of native pollinators including Honeycreeper birds, Hawaiian yellow-face bees, and the Kamehameha butterfly. Unfortunately, these iconic species are in peril. In the recent past, 20 species of Honeycreepers have gone extinct and the Blackburn's Sphinx Moth has been put on the endangered species list.⁵
- The first bees to be proposed for protection under the Endangered Species Act are seven species of Hawaiian yellow-faced bees.⁶

FOOD SECURITY AT RISK

- Food security is directly linked to the health of pollinators. The majority of the fruits, vegetables, and nuts we eat every day are reliant upon pollinators for their production. Without pollinators, 70% of plants would be unable to reproduce or provide food.⁷
- According to the United Nations Environment Programme, of the 100 crop varieties that provide 90% of the world's food, 71 are pollinated by bees.⁸

DID YOU KNOW?

The Hawaii Department of Agriculture's voluntary registration program reports that there are over 230 Hawaiian beekeepers with over 19,000 hives.

- The Hawai'i Department of Agriculture estimates that nearly 70 percent of Hawai'i's food crops depend on pollination by bees.⁹ Pollination services are a core component of the global agricultural economy, valued at over \$125 billion annually.¹⁰
- In Hawai'i, pollinators are critical to valuable specialty crops, including melons, watermelons, cucumbers, squash, lychee, mango, macadamia nut, coffee, eggplant, avocado, guava, herbs and flowers.
- These critical pollinators are declining at alarming rates. The number of managed honey bee colonies in the U.S. dropped from roughly 6 million in 1947 to less than 2.5 million today.¹¹

PESTICIDES LINKED TO POLLINATOR DECLINE AND ENVIRONMENTAL CONTAMINATION

- The main pesticides linked to pollinator declines are a group of nicotine-based systemic insecticides called neonicotinoids. Neonicotinoids are the most widely used insecticides in the world and are systemic—meaning they are absorbed and transported through all parts of the plant tissue after application—rendering the entire plant toxic.
- Modeled after nicotine, neonicotinoids interfere with the nervous system of insects, causing tremors, paralysis, and eventually death.
- Neonicotinoids are also shown to have both additive and synergistic effects when combined with other pesticides, such as fungicides and herbicides. While

toxicity testing typically accounts only for exposure to isolated concentrations of one neonicotinoid, realistic field conditions expose pollinators to an assortment of chemicals.

- Most neonicotinoid-coated seeds are also coated with fungicides or other pesticides—the combination of which has been shown to increase the toxicity of both chemicals to honey bees.¹²
- Neonicotinoids are not only toxic but also persistent and mobile. In one nationwide study, neonicotinoids were found in 63% of the streams sampled across the United States.¹³ One study demonstrated that a single corn kernel coated with a neonicotinoid is toxic enough to kill a songbird.¹⁴
- Hawai'i's wildlife is not immune to the effects of pesticides. This beautiful state has been unofficially labeled as the 'extinction capitol of the world.' Hawai'i has over 435 protected species under the Endangered Species Act¹⁵ and the U.S. Fish and Wildlife Service recently proposed to protect the previously stated seven rare bee species and 42 other plant and animal species.¹⁶ Due to lack of regulation in Hawai'i, there is no way of knowing the exact extent of neonicotinoid use. Toxic pesticides undoubtedly play a role in the demise of our pollinators, and they are one threat that we can address immediately to help these critical species.
- Although pollinator decline is a complicated issue with various compounding factors, a wealth of peer-reviewed scientific literature¹⁷ demonstrates that the heavy use pesticides—primarily systemic insecticides, like neonicotinoids—used both in agriculture and home landscaping, is a leading culprit in our current pollinator crisis.

WHAT YOU CAN DO

- Eliminate pesticide use in your home
- Plant pollinator-friendly plants
- Testify and support legislation to protect pollinators

More information here:
www.HawaiiCFS.org

1. Wilson, M. (2015). Colony Loss 2014-2015: Preliminary Results. Bee Informed Partnership.
 2. Wines, M. (2013). Mystery Malady Kills More Bees, Heightening Worry on Farms. New York Times.
 3. Kubota, G. (2011). Beekeepers Blame Dead Hives on State. Honolulu Star Advertiser.
 4. Van der Sluis, J.P. et al. (2015). Conclusions of the worldwide integrated assessment on the risks of neonicotinoids and fipronil to biodiversity and ecosystem functioning. Environmental Science and Pollution Research International.
 5. The Xerces Society for Invertebrate Conservation. (2014). Habitat Planting for Pollinators Pacific Island Area.
 6. The Xerces Society for Invertebrate Conservation. (2015). Seven Native Hawaiian Pollinators Proposed as Endangered Species: First bees to be proposed for listing under the Endangered Species Act.
 7. United Nations Environmental Program (UNEP). (2010). Emerging Issues: Global Honey Bee Colony Disorder and Other Threats to Insect Pollinators.
 8. United Nations Environmental Program (UNEP). (2010). Emerging Issues: Global Honey Bee Colony Disorder and Other Threats to Insect Pollinators.
 9. State of Hawai'i Department of Agriculture. (2012). Beehive Pest Found on Kauai.
 10. Environmental Protection Agency (EPA). (2013, May 2). USDA and EPA Release New Report on Honey Bee Health.
 11. United States Department of Agriculture. (2012). Report on the National Stakeholders Conference on Honey Bee Health.
 12. Iwasa, T., Motoyama, N., Ambrose, J.T., Roe, R.M. (2004). Mechanism for the differential toxicity of neonicotinoid insecticides in the honey bee, *Apis mellifera*. Crop Protection.
 13. Hladik, M., Kolpin, D.W. (2015). First national-scale reconnaissance of neonicotinoid insecticides in streams across the USA. Environmental Chemistry.
 14. Mineau, P., Palmer, C. (March 2013). The Impact of the Nation's Most Widely Used Insecticides on Bird.
 15. ECOS Environmental Conservation Online System. (2016). U.S. Fish & Wildlife Service
 16. Platt, J.R. (2015). Endangered Hawaiian Bees and Other Species Proposed for Protection. Scientific American
 17. Center for Food Safety. (2016). Mythbusting Neonicotinoids: Industry's favorite talking points, debunked.

