Sowing Seeds of Doubt

By Nichelle Harriott

Addressing Industry Myths on Pollinator Decline

The accumulated studies and data have found that honey bees and other pollinators, such as wild bees, butterflies and birds, are in decline. So concerning is this phenomenon that the White House in June, 2014 issued a Presidential Memorandum directing federal agencies to form a Pollinator Health Task Force to reverse the trend and find solutions to protect the nation's pollinators. Scientists studying the issue have identified several factors that are contributing to bee decline, including parasites, improper nutrition, stress, and habitat loss. However, they have also identified pesticides as a major contributing factor, with the neonicotinoid (neonics) chemical class singled out as a major suspect due to its widespread use as a seed treatment, high toxicity to bees, systemic nature, and persistence.

Neonicotinoids are undoubtedly highly toxic to honey bees, and the U.S. Environmental Protection Agency (EPA) acknowledges this fact. However, little is being done at the federal level to protect bees and other pollinators from these pesticides. And while the report from the federal Pollinator Health Task Force is pending, industry –the pesticide manufacturers, landscaping, horticultural and agricultural trade groups, have all come out to deflect attention away from pesticides as a major culprit in pollinator decline.

With unlimited resources behind them, the chemical industry has developed a well-oiled public relations team to dismiss the science and sow seeds of doubt that its products and practices are contributing to pollinator losses. Although not a new occurrence, the pollinator issue has seen an increase in the intensity and aggressiveness of industry misinformation campaigns. In fact, industry groups have inserted themselves at the federal, state, and even local/municipal levels to influence decision makers and attack any science demonstrating that pesticides are associated with bee decline. The industry is also devoted to having its representatives take to the various forms of media (television, radio, online, print) to mislead the public on the wide-reaching impacts of its products.

The perpetuation of the myths sowed by industry jeopardizes efforts to understand the science behind pollinator decline, find long-term sustainable solutions, and stymies the efforts of local communities to protect themselves and their environment from pesticide contamination. The stakes are high, and industry has a billion dollar business that it is not ready to transition to least-toxic, organic-compatible products, but the public must be able to distinguish between myth and fact when it comes to pollinator decline.

Myths vs Facts:

Myth #1: Bees are not in decline.

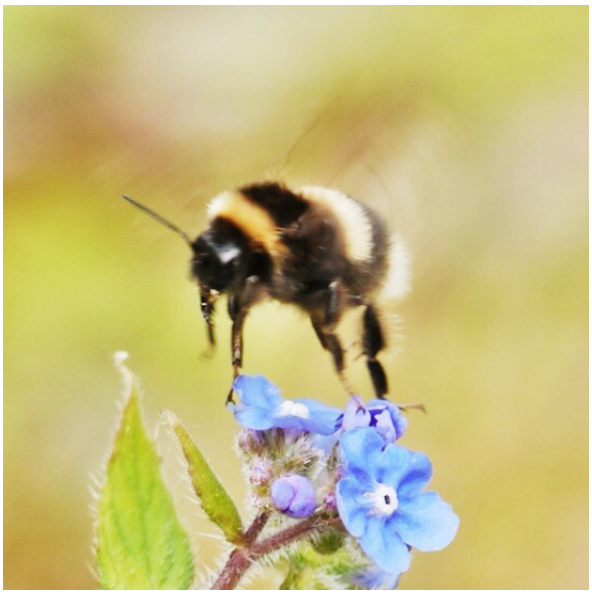
You may also hear: Managed honey bee colonies worldwide have increased. The loss of bee colonies is not a new phenomenon. Periodic increases in colony losses have been observed for centuries. Honey bee populations are stable.

Fact 1: Beekeepers are reporting honey bee and hive losses. According to government survey results, in the U.S., losses for the 12-month period (between April 1, 2012 and March 30, 2013) were 45.2%.[1] For the winter of 2013/14, 23.2% of managed honey bee colonies in the U.S. died and nearly two-thirds of the respondents (65.4%) experienced winter colony loss rates greater than the average acceptable winter mortality rate of 18.9%. Previous survey results document total colony overwinter losses as follows: 2012/2013–30.5%; 2011/2012–21.9%; 2010/2011–30%; 2009/2010–34%; 2008/2009–29%; 2007/2008–36%; and 2006/2007–32%.

In Europe, trends are similar. According to the OPERA Research Center,[2] high losses had been reported in Ireland, the Netherlands and Switzerland, and moderate losses were seen in Germany, Denmark and Northern Ireland. The average winter losses per country where data was available for the period 2008-2012 varied between 7% and 30%. EPILOBEE, an epidemiological surveillance program on honey bee colony mortality in 17 member European States, finds that European winter colony mortality rates ranged from 3.5 % to 33.6% with a south-north geographical pattern.[3] In Canada, overwinter losses for the 2013/14 season ranged from 15% in British Columbia to 58% in Ontario.[4] For the 2012/13 season, losses ranged from 17% to 46% across the provinces.[5]

Wild bee populations, including bumble bees, are also seeing reductions in populations and geographic range,[6] however, data on wild bee species are harder to come by. While the chemical industry may dismiss these numbers, beekeepers experiencing 20-30% reduction in their livestock is unsustainable and is a concern. Consider this: a

20-30% annual loss of cattle or dairy livestock in the U.S. would result in swift emergency action. Thus, action must be taken to protect creatures that are responsible for every one in three bites of food we eat.



Myth #2: Pesticides are important tools for pest management.

You may also hear: Only neonics can treat certain pests effectively. Neonics are needed to protect plants. Nursery plants will sustain losses without pesticides. Banning neonics will do nothing except devastate North American agriculture.

Fact 2: The pesticide industry argues that effective pest prevention and control systems cannot be achieved without toxic inputs. When lawn, landscape and cropping systems are highly dependent on specific chemical inputs, the health of both the soil and the plant suffers, leading to an increased insect susceptibility to disease and pests.[7] For chemical-dependent systems in transition, an effort must be made to rebuild soil health, beneficial microbial life in the soil, and beneficial insects. Growers who reestablish soil health in combination with least-toxic pest management tools can find success in transition from chemical dependency, resulting in less disease and pest problems and increased productivity. When it comes to agriculture, there is an existing model in organic agriculture's growing billion dollar industry that has been successful in managing pests and growing crops without toxic inputs. Organic methods, which focus on a 'feed the soil' approach, utilizes least-toxic inputs, crop rotation and cover cropping, among others, clearly provides evidence that growing without neonicotinoids and other toxic pesticides can be profitably accomplished.

In the horticultural sector, several nurseries and retail outlets have already begun to transition from using systemic neonicotinoids to grow their plants. For instance, Behnke Nurseries Co. in Maryland has issued a policy statement to their stores that prohibits the application of neonicotinoids to its plants and recommends using least-toxic alternatives. Bachman's 21 locations in Minnesota are eliminating neonicotinoid use on their nursery stock and outdoor plants. Local hardware stores, like Eldredge's Lumber and Hardware, ME, are looking for nursery stock that is neonic-free, selling organic seeds, and stocking their shelves with products that are compatible with organic systems. Cavano's Perennials, MD, Blooming Nursery, OR, North Creek Nurseries, PA, Suncrest Nurseries, CA, Desert Canyon Farm, CO, among others have either discontinued or never used neonicotinoid pesticides in their nursery operations. Additionally, BJ's Wholesale Club (over 200+ locations) is asking its vendors to discontinue neonicotinoid use. As these companies have shown, having a viable and productive growing system is possible and alternatives are available.

Myth #3: Factors other than pesticides are to blame.

You may also hear: The varroa mite remains the single most destructive source of infection that bees face. Colonies are not declining in Australia where there is not a varroa mite problem. Transportation of managed hives puts enormous unnatural stress on colonies. Commercial migratory beekeeping is spreading bee diseases, parasites and bee predators domestically and internationally.

Fact 3: While diseases, insect pests (such as the varroa mite), and loss of forage and habitat have all been identified as factors in bee decline, the science is demonstrating that neonics are a central contributor that reduces the ability of bees to function with normal stressors. The varroa mite is a parasite that attaches to bees, sucking bodily fluids, and eventually introduces disease. While these mites pose a threat to bees, beekeepers have been combating varroa mites since the 1980s and have had various levels of success. According to beekeepers, recent bee losses have been too high to attribute to varroa mite. In fact, many dead hives have been reported to have low or manageable varroa presence, indicating that mites were not a factor in hive loss.

The industry also points to Australia as having healthy bee populations in the presence of neonic use, and attribute this to a lack of varroa mite in that country. Luckily, Australia is one of the last remaining regions in the world still free of varroa. In fact, Australia, with its warm climate and abundance of nectar-rich plants is a haven for wild pollinating bees. As a result, Australian agriculture mostly relies on free pollination services from wild bees, and this reliance on native bees means there has been a relatively low demand for managed honey bee hives.[8] As a consequence, Australia's managed pollination industry is only in the early stages of development, which will explain a lack of information on whether bees are at risk in Australia. According to the Australian Pesticides and Veterinary Medicines Authority, "[A]s Australian beekeepers move away from traditional chemical-free sources of nectar and pollen (native scrub and forest) into providing agricultural and horticultural pollination services, there is a commensurate increase in the risk of exposure to agricultural chemicals."[9] Additionally, as of the writing of the report, one of the major neonicotinoids, clothianidin, was not registered for use as a seed treatment in Australia. Therefore, there may be enough different factors to account for the differences in bees' exposure patterns to neonics and other pesticides

to account for differences in bee declines. Better information would be available to ascertain these after the government establishes a monitoring program.

Other cited sources of bee decline include *Nosema* –another parasite that attacks bees, improper nutrition (e.g., dependence on sugar solution for managed bees, and loss of habitat for wild bees), and stressors incurred from migratory beekeeping practices. While these factors do play a role in overall bee health, consider the decades of experience beekeepers have had dealing with these stressors and maintained viable bee colonies (and operations) until recently. While industry has begun to attack beekeeping practices, bee losses above the accepted historical threshold cannot be suddenly attributed to improper beekeeping. It must be noted that elevated bee losses began to be reported in the U.S. in the early to mid-2000s, around the same time neonicotinoid pesticides were registered and begun widespread use as seed treatment (circa 2003).

Exposure to pesticides also weakens bees allowing them to be more susceptible to disease and parasites. Studies from USDA researchers and others find that parasitic infections increased significantly in bees from pesticide-treated hives when compared to bees from pesticide-free hives, demonstrating an indirect effect of pesticides on pathogen growth in honey bees.[10,11,12] Thus, bee colonies that suffer high infection rates of pathogens, most times also have high exposures to pesticides.

Myth #4: EPA registers and evaluates pesticides, and ensures they meet safety standards.

You may also hear: Neonics are safer than older pesticides and are "reduced risk" pesticides. There is no compelling evidence that neonics are any more harmful than other insecticides currently in use. EPA-approved product labels include use requirements that will protect bees.

Fact 4: Data gaps have historically plagued EPA's assessment of pesticides under the *Federal Insecticide, Fungicide and Rodenticide Act,* which establishes the pesticide registration process under a risk assessment and risk-benefit process. Oftentimes, pesticides are allowed on the market without all the required data to support a proper safety finding. In one instance in 2010/2011, the herbicide Imprelis killed large numbers of spruce trees before it was pulled from the market, after which it was determined that EPA did not have sufficient ecological information to register the chemical in the first place under a "conditional registration." In the case of neonicotinoids, long-term field studies for honey bees were not submitted for review at the time the pesticides were granted registration. This means that bees were put at risk because EPA did not have a full understanding of the long-term toxicity of the pesticides to bees.

Due to the systemic nature of the neonic pesticides (they translocate through the plant and express contaminated pollen and nectar), product label directions amended by EPA in June, 2014 do not adequately protect bees. Label warnings, such as 'do not spray when bees are foraging,' do not take into account that residues of these systemic pesticides remain toxic long after initial application, even in pollen and nectar. There is a growing scientific database that shows that neonics are highly toxic to honey bees, with studies finding that even at low levels, neonics can impair foraging, navigational, and learning behavior in bees, as well as suppress their immune system.

In 2014, an international meta-analysis of approximately 1,121 peer-reviewed studies on the impact of systemic pesticides, conducted by the International Union for the Conservation of Nature (IUCN), known as the Task Force on Systemic Pesticides (IUCN Task Force)[13] found that: (i) Neonics are present in the environment "at levels that are known to cause lethal and sublethal effects on a wide range of terrestrial (including soil) and aquatic microorganisms, invertebrates and vertebrates;" (ii) The active ingredients persist, particularly in soils, with half-lives of months and, in some cases, years, and they accumulate. This increases their toxicity by increasing the duration of exposure to non-target species; and, (iii) The weight of the published evidence is very strong that the acute and chronic effects pose a serious risk of harm to colonies/populations of honey bees, bumblebees and other pollinators.

The European Food Safety Authority determined that the most widely used neonics –imidacloprid, clothianidin and thiamethoxam, pose unacceptable hazards to bees, prompting the European Union to suspend their use on agricultural crops in 2013.

Endnotes

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BEYOND PESTICIDES

701 E Street, SE ■ Washington DC 20003
202-543-5450 phone ■ 202-543-4791 fax
info@beyondpesticides.org ■ www.beyondpesticides.org