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## What Farmers Need to Know About Neonicotinoid Pesticides

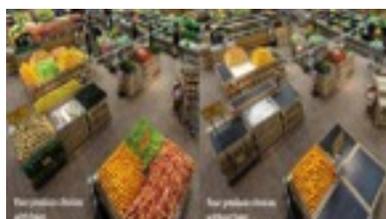
Farmers play an important role in helping to protect the bee populations on which we all rely for a major part of our food supply.



Most farmers have heard about the bee crisis of recent years, that has seen annual alarming bee colony losses in Maryland and the throughout the world. Indeed, 70 out of the top 100 crops that produce 90% of our food relies on bees and other pollinators. In Maryland, for example, bee colony die-offs during the winter/spring of 2014-15 were 61%, with substantial losses now happening in the summer, too.<sup>1</sup> In 2013-2014 losses were nearly 50% and in 2012-13, losses were nearly 60%.<sup>2</sup> Maryland's produce farmers are reliant on pollinators and share the concerns of beekeepers and the public about our local food supply.

### Neonicotinoids

Neonicotinoid pesticides - "neonics" - have been identified as a significant cause of this crisis in a large and growing body of scientific research. Neonics are understandably popular with farmers because of their effectiveness against leaf-chewing and sap-sucking insects. While originally thought to be largely harmless, more than 1100 scientific studies - reviewed by 30 scientists around the globe - now indicate that neonics play a significant role the ongoing die-off by harming bees' ability to pollinate, reproduce, navigate and maintain general health. Neonics weaken pollinator immune systems, making them more susceptible to diseases including the varroa mite. Neonics are systemic insecticides - seeds are frequently treated with them (except for organic seeds). Neonics are also used as topical applications for insect control. Produce farmers may be unaware whether the seeds they purchase have been treated with neonics.



The scientific evidence has mounted so quickly that in April 2015 the US EPA effectively declared a moratorium on approving new uses of neonics while awaiting new research. EPA's decision did, however, leave 100 existing uses of neonics in place. It also is important to note that the European Union has a moratorium on several neonic pesticides considered most harmful to pollinators.

In October 2014, the EPA's Assistant Administrator for Chemical Safety, Jim Jones, summarized the findings regarding neonic-treated seeds, saying: "These seed treatments provide little or no overall benefits to soybean production in most situations." The report also noted, "In comparison to the next best alternative pest control measures, neonicotinoid seed treatments likely provide \$0 in benefits to growers..."

### What Can Farmers Do?

<sup>1</sup> Baltimore Sun 05.14.2014. "Mysterious bee die-off continues; extends beyond winter" ([http://articles.baltimoresun.com/2014-05-15/features/bal-mysterious-bee-dieoff-continues-nearly-half-maryland-hives-lost-20140515\\_1\\_bee-informed-partnership-honey-bee-beekeepers](http://articles.baltimoresun.com/2014-05-15/features/bal-mysterious-bee-dieoff-continues-nearly-half-maryland-hives-lost-20140515_1_bee-informed-partnership-honey-bee-beekeepers))

<sup>2</sup> Baltimore Sun 05.07.2013. "Winter honeybee deaths devastate keepers, puzzle scientists" ([http://articles.baltimoresun.com/2013-05-07/features/bs-md-honey-bees-killed-20130507\\_1\\_honey-bee-population-beekeeper-mortality-rate](http://articles.baltimoresun.com/2013-05-07/features/bs-md-honey-bees-killed-20130507_1_honey-bee-population-beekeeper-mortality-rate))

There are alternatives that are less harmful to pollinators. Significant research and advice exists on both chemical and non-chemical alternatives to neonics. For example:

1. **A major scientific report**<sup>3</sup> that reviewed case studies from agriculture and forestry advises farmers to (<http://1.usa.gov/1GROStl>):
  - Diversify crop rotations - this has been found to be an effective substitute for neonics in protecting corn crops.
  - Alter the timing of planting, tillage and irrigation, especially for corn crops.
  - Use less sensitive crops in infested areas.
  - Apply biological control agents
  - Turn to alternative reduced-risk insecticides “that pose lower risk to environment and human health.”

This study emphasizes there is a need for low-cost strategies, time-effective tools and economically and environmentally sustainable pesticides or other control methods.

2. **Other cost-effective Integrated Pest Management strategies** include (<http://bit.ly/1I20yfm>)<sup>4</sup>:

- Select more suitable crop varieties
- Do pesticide applications based on careful monitoring
- Reduce field plot size to improve biological control
- Reduce seeding density & nitrogen inputs
- Shift sowing dates - sowing varietal mixtures
- Alternate winter and spring cropping
- Use stale seedbeds and green manure cover crops

3. **Detailed list of chemical and non-chemical alternatives to neonics** can be found here: <http://www.mdpestnet.org/wp-content/uploads/2016/01/Chem-and-sust-alt-to-neonics.pdf>.<sup>5</sup> Chemical names for neonic pesticides include: Acetamiprid, Clothianidin, Dinotefuran, Imidacloprid, Nitenpyram, Thiamethoxam, Thiocloprid.

4. **To make well informed choices**, farmers should ask their seed suppliers if the seeds have been treated with neonics, so they you can make educated choices. Chemical names for neonic pesticides include: Acetamiprid, Clothianidin, Dinotefuran, Imidacloprid, Nitenpyram, Thiamethoxam, Thiocloprid.

5. **Organic strategies.** In addition to IPM strategies, farmers should consider implementation of organic strategies. Many farmers would be surprised to learn that a 30-year side-by-side comparison of organic and conventional agricultural systems - done by the

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<sup>3</sup> Alternatives to neonicotinoid insecticides for pest control; case studies in agriculture and forestry. Furlan and Kreuzweiser. Environ Sci Pollut Res Int 2015. <http://www.ncbi.nlm.nih.gov/pmc/articles/PMC4284368/>

<sup>4</sup> What Could Farmers Do to Rely Less on Neonicotinoids? Pesticide Action Network UK, p.4 ([http://bees.pan-uk.org/assets/downloads/Bee\\_factsheet6.pdf](http://bees.pan-uk.org/assets/downloads/Bee_factsheet6.pdf))

<sup>5</sup> Alternatives for Neonicotinoids in a Range of agricultural Crops (collected from national extension services in Italy, UK and Netherlands). Pesticide Action Network Europe 2014 ([http://savehoneybees.info/images/documents/Chemical\\_and\\_non-chemical\\_alternatives\\_to\\_neonicotinoids.pdf](http://savehoneybees.info/images/documents/Chemical_and_non-chemical_alternatives_to_neonicotinoids.pdf))

respected Rodale Institute - found that organic systems match, or even outperform, convention systems in terms of yield, profitability and energy efficiency, which positively impacting on soil health and water quality (<http://bit.ly/1zdlxZy>).<sup>6</sup>

- 6. Regenerative Organic Agriculture & Climate Change.** Rodale Institute also conducted a comprehensive scientific study that found 100% of current carbon dioxide emissions could be sequestered by using widely available and inexpensive organic management practices<sup>7</sup> -- helping to reduce climate change and its impacts on farming.

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<sup>6</sup> “Organic trumps conventional across the board: highlights from the Rodale Institute’s 30-year report” (<http://foodtank.com/news/2015/04/organic-trumps-conventional-across-the-board>)

<sup>7</sup> “Regenerative Organic Agriculture & Climate Change” Rodale Institute. (<http://rodaleinstitute.org/regenerative-organic-agriculture-and-climate-change/>)