

June 5, 2020

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**RE: AGR-Pesticide-Literature-Review-FY20**

Dear Director Lascola-Miner,

On behalf of the undersigned organizations, we wish to express our appreciation to the Department for its laudable execution of its 2019 Neonics Scientific Literature Review.

Specifically, the Review found that the broad majority of impact-based studies reviewed (42 of 43) cited neonics as a reason for deleterious impact on pollinators. Further, the Review also found that the only studies that had mixed results were industry-funded. As we had expected for an independent investigation, this Literature Review is consistent with a number of global studies which found adverse impacts of neonicotinoids on pollinators.

Given that it was beyond the scope of the review to provide policy recommendations with respect to neonicotinoids, we appreciate this opportunity to underscore concerns stated in the report, provide additional concerns beyond the scope of pollinator impacts, and to provide specific policy recommendations for your consideration. Rather than waiting for pending legislation, we urge the Pesticide Board Subcommittee and the Massachusetts Department of Agricultural Resources to impose significant restrictions on the use of neonicotinoids in the Commonwealth of Massachusetts as a matter of priority.

Both the summary of the results and the results themselves make it clear that Massachusetts regulators and legislators must institute protections from neonicotinoids that are stronger than those proposed by the U.S. Environmental Protection Agency (EPA) .

Many of the studies analyzed in the Literature Review have also been used to inform EPA risk assessments over the past five years. The Literature Review highlights a number of extremely concerning findings of these studies, including:

- “Dinotefuran ‘is classified as very highly toxic to adult honey bees.’ ‘For dinotefuran all crops and application methods where on-field exposure is expected, the [modeled] exposure concentrations resulted in exceedances of the risk levels of concern for bees...”
- “Statistically significant decreases in food consumption were observed [after consuming clothianidin] in all concentrations
- “Our major finding was that chronic exposure of honey bee colonies to high environmental doses of neonicotinoids decreased colony weight gain by 30% compared to controls”

Despite this small sampling of the wide-ranging negative effects EPA has reviewed in peer-reviewed studies during the risk assessment process, the EPA continuously recommends woefully insufficient countermeasures. As the federal government refuses to take meaningful action, Massachusetts must act, without further delay, to protect pollinators and wildlife.

The situation is dire. A recent study found that U.S. Agriculture is 48 times more toxic to insect life than it was in the early 1990s; neonicotinoids account for more than 90% of that increase.[i] This is particularly concerning given evidence that neonicotinoid-treated corn and soybean seeds make up the vast majority of uses, yet provide little to no benefits to farmers.[ii] New research showing they may actually *decrease* yields in some cases by killing pollinators or pest predators.[iii]

Another recent ground-breaking study estimates that over 40 percent of insect species face extinction in coming decades and that insects are declining at a rate of extinction eight times faster than other organisms. This comprehensive global meta-analysis concluded that if no action is taken and current rates of insect decline continue, we could face “catastrophic ecosystem collapse” which will have a devastating impact on our food system.[iv]

And while EPA has failed to take significant action to curb the use of neonicotinoids, the European Union has instituted a full ban. Most significantly, research from the European Union shows that banning neonicotinoids has not negatively impacted crop production and that it helps bee populations to recover.[v] In 2008, Italy instituted a ban on use of neonicotinoids as seed treatments for corn. In an evaluation five years later, researchers found a “clear and dramatic improvement” in the number of bees and colonies in the region.[vi]

The findings of this Literature Review are consistent with a number of global studies, and in the face of a broader ecological collapse, restrictions on neonicotinoid use in Massachusetts is warranted.

However, while not a fault of the authors, the Literature Review provides only one aspect of why restricting neonicotinoid use is so important in the Commonwealth. Neonicotinoids pose a severe threat to other wildlife, including mammals.

Neonics are a suspected contributor to the massive North American bird population losses over the last several decades.[vii] Neonic-coated crop seeds blanket agricultural areas—a single seed can contain enough active ingredient to kill a quarter-million bees or more [viii]—and eating just one such seed is enough to kill some songbirds.[ix] Even at low doses, neonics can harm birds’ immune systems, fertility, and navigation, and cause rapid weight loss, thereby reducing birds’ chances of surviving in the wild.[x]

Recently, scientists in South Dakota and Montana released a study showing how exposure to neonicotinoids caused deformities in white tail deer, one of the first studies showing impacts on mammals.[xi]

Other research suggests that people exposed to neonics may similarly be at increased risk of developmental or neurological damage, including malformations of the developing heart and brain, memory loss, and finger tremors.[xii] These results raise special concern given that neonic exposure is often difficult or impossible to avoid. Conventional drinking water treatments generally do not remove neonics from contaminated water,[xiii] and neonic residues have been

found to commonly contaminate produce and baby food.[xiv] Because neonics permeate foods, they cannot be washed off.

While the Department of Agricultural Resources Literature Review was limited to impacts on pollinators, the evidence for why we need strong regulations that go well beyond the actions of EPA is much, much broader.

Given the ecological and public health harms of neonicotinoids, we urge that the Department take the following actions:

- Ban the use of neonicotinoids by unlicensed individuals.
- Ban the use of neonic-coated corn and soybean seeds.
- Prohibit applications of all neonicotinoid products on bee-attractive crop plants during bloom
- Require labeling of plants and plant materials that have been treated with neonicotinoids.
- Stop the use of neonicotinoids on state and local property.
- Significantly increase buffer zones for use near waterways.
- Ban aesthetic-only uses of neonicotinoids.
- Track the use of all neonicotinoid applications within the Commonwealth.
- Ban any other uses the Department deems to cause unreasonable adverse effects on the environment or pollinators.

As representatives of advocacy organizations consisting of Bay State residents who share concerns about the impacts of pesticides on our ecosystems and our health, we are again grateful to see the Department taking a much needed look at the impacts of neonicotinoids. We hope to see a similar review of other pesticides of emerging concern, such as glyphosate and chlorpyrifos, and will continue to support action commensurate with subsequent findings. Given the clear need to fill a gap in federal regulation in a time of ecological collapse, we are counting on the Department of Agriculture to protect the health and ecological integrity of our Commonwealth.

Sincerely,

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[i] See DiBartolomeis M, Kegley S, Mineau P, Radford R, Klein K. *An assessment of acute insecticide toxicity loading (AITL) of chemical pesticides used on agricultural land in the United States*. PLoS ONE 14(8): e0220029. <https://doi.org/10.1371/journal.pone.0220029> (2019)

[ii] See Spyridon Mourtzinis et al., *Neonicotinoid Seed Treatments of Soybean Provide Negligible Benefits to US Farmers*, Sci. Reports (Sep. 9, 2019), <https://go.nature.com/2p5leCP>; Christian Krupke et al., *Planting of Neonicotinoid-Treated Maize Poses Risks for Honey Bees and Other Non-Target Organisms Over a Wide Area Without Consistent Crop Yield Benefit*, J. of Applied Ecol. (May 22, 2017), <https://bit.ly/36aMZtD>.

[iii] See Purdue University, *Don't Just Spray – Survey*, <https://on.nrdc.org/2m0a9Bt>; Margaret Douglas et al., *Neonicotinoid Insecticide Travels Through a Soil Food Chain, Disrupting Biological Control of Non-Target Pests and Decreasing Soya Bean Yield*, Journal of Applied Ecology (Dec. 4, 2014), <https://bit.ly/2IRr4MF>; Rui Catarino et al., *Bee Pollination Outperforms Pesticides for Oilseed Crop Production and Profitability*, (Oct. 9, 2019), <https://bit.ly/2OUw0Xu>; Dara A. Stanley et al., *Neonicotinoid Pesticide Exposure Impairs Crop Pollination Services Provided by Bumblebees*, Nature (Nov. 18, 2015), <https://bit.ly/2qnhWLW>; Claire LaCanne & Jonathan Lundgren, *Regenerative Agriculture: Merging Farming and Natural Resource Conservation Profitably*, PeerJ (Feb. 28, 2018), <https://bit.ly/2YNxiop>.

[iv] See Francisco Sánchez-Bayo and Kris A.G. Wyckhuys. *Worldwide decline of the entomofauna: A review of its drivers*. Biological Conservation 232: 8-27 (January 31, 2019). <https://www.sciencedirect.com/science/article/abs/pii/S0006320718313636>

[v] See David Goulson. *Letter to Governor Andrew Cuomo RE: The European Ban on Neonicotinoids Has Not Harmed Crop Production* (January 28, 2020). <https://www.nrdc.org/sites/default/files/letter-goulson-01282020.pdf>

[vi] See Phys.org, *Lessons from the Italian ban on pesticides* Sergio Pistoï, May 3, 2010. <https://phys.org/news/2013-05-lessons-italian-pesticides.html>

[vii] See Stephen Leahy, *Huge Decline in Songbirds Linked to Common Insecticide*, Nat. Geo. (Sep. 12, 2019), <https://on.natgeo.com/2mpTQy1>; John Fitzpatrick & Peter Marra, *The Crisis for Birds Is a Crisis for Us All*, New York Times (Sep. 19, 2019), <https://nyti.ms/2kTTnrc>.

[viii] See, e.g., European Food Safety Authority, *Conclusion on the Peer Review of the Pesticide Risk Assessment for Bees for the Active Substance Thiamethoxam*, 9 (Mar. 14, 2013), <https://bit.ly/2IR7Xfo> (listing the acute oral honeybee “LD50”—the dose of imidacloprid expected to kill half a population of exposed honeybees when ingested—as 0.005 µg per bee); EPA, *Amended Label to Increase Soybean Rates + Supplemental Label for Soybean Cruiser® Insecticide* (amended and approved Feb. 23, 2009), <https://bit.ly/2kGCgW3> (allowing up to 1.25 mg of thiamethoxam per corn seed); EPA, *Registration for Imidacloprid (NTN 33893)*, 7 (Mar. 10, 1994) <https://bit.ly/2K36Bbl> (listing the honeybee LD50 as 0.0039 µg per bee); EPA, *Pesticide Label for Gaucho 600 Flowable*, 5 (Feb. 27, 2019), <https://bit.ly/34FL8x2> (allowing up to 1.34 mg of imidacloprid per corn seed).

[ix] See Pierre Mineau & Cynthia Palmer, Am. Bird Conservancy, *The Impact of the Nation’s Most Widely Used Insecticides on Birds*, 3 (2013), <https://bit.ly/1jmQ7u0>.

[x] See; Ana Lopez-Antia et al., *Imidacloprid-Treated Seed Ingestion Has Lethal Effect on Adult Partridges and Reduces Both Breeding Investment and Offspring Immunity*, Env'tl. Research (Jan. 2015), <https://bit.ly/2kwUdWS>; Margaret Eng et al., *A Neonicotinoid Insecticide Reduces Fueling and Delays Migration in Songbirds*, Science (Sep.

13, 2019), <https://bit.ly/2kGS1MA>; Margaret Eng et al., *Imidacloprid and Chlorpyrifos Insecticides Impair Migratory Ability in a Seed-Eating Songbird*, Scientific Reports (Nov. 9, 2017), <https://go.nature.com/2my5OW4>.

[xi] See Elise Hughes Berheim et al., *Effects of Neonicotinoid Insecticides on Physiology and Reproductive Characteristics of Captive Female and Fawn White-tailed Deer*, Scientific Reports (March 14, 2019), <https://www.nature.com/articles/s41598-019-40994-9>

[xii] A. Cimino et al., *Effects of Neonicotinoid Pesticide Exposure on Human Health: A Systematic Review*, 125 *Envtl. Health Persp.* 155-62 (2017), <https://bit.ly/2NVA1LR>.

[xiii] Kathryn L. Klarich et al., *Occurrence of Neonicotinoid Insecticides in Finished Drinking Water and Fate During Drinking Water Treatment*, *Envtl. Sci. and Tech. Letters* (Apr. 2017), <https://bit.ly/2PMRunk>.

[xiv] See, e.g., H. A. Craddock et al., *Trends in Neonicotinoid Pesticide Residues in Food and Water in the United States, 1999-2015*, *Envtl. Health* (Jan. 11, 2019), <https://bit.ly/30GxV5D>; Olga Naidenko, *Neonic Pesticides: Banned in Europe, Common on U.S. Produce, Lethal to Bees*, *Envtl. Working Grp.* (Jul. 26, 2018), <https://bit.ly/2EejbSx>; Friends of the Earth, *Toxic Secret*, <http://bit.ly/2IIE26V> (visited Oct. 9, 2019).

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