From: Helvi Johnson
To: LaScola, Taryn (AGR)
Subject: Fwd: Returned mail: see transcript for details
Date: Thursday, December 10, 2020 5:24:07 PM

Hello, I hope this time my comments will reach, you I spelled your name wrong, Thank you
Anneli Johnson

---------- Forwarded message ---------
From: **Mail Delivery Subsystem** <MAILER-DAEMON@sdc-ppmailsec-004.state.ma.us>
Date: Thu, Dec 10, 2020 at 3:23 PM
Subject: Returned mail: see transcript for details
To: <helvianneli14@gmail.com>

The original message was received at Thu, 10 Dec 2020 15:15:19 -0500
from sdc-ppmailsec-004.state.ma.us [127.0.0.1]

----- The following addresses had permanent fatal errors -----
<taryn.lascala@mass.gov>
(reason: 550 5.0.0 <taryn.lascala@mass.gov>... User unknown)

----- Transcript of session follows -----
... while talking to sdc-ppmta-004.state.ma.us.:
>>> DATA
<<< 550 5.0.0 <taryn.lascala@mass.gov>... User unknown
550 5.1.1 <taryn.lascala@mass.gov>... User unknown
<<< 503 5.0.0 Need RCPT (recipient)

---------- Forwarded message ---------
From: Helvi Johnson <helvianneli14@gmail.com>
To: taryn.lascala@mass.gov
Cc:
Bcc:
Date: Thu, 10 Dec 2020 15:15:12 -0500
Subject: Nionics. hearing testimony/comments

Dear Taryn,
I commend you and your pesticide board for organizing the hearing. I was so moved almost to tears for the number of participants, more than 135 .The testimony was compassionate, knowledge based on evidence, indicators and on facts, There is now enough information to band the neonics..

I was, however, disappointed that the Farm Bureau members and the pesticide applicators came against the legislative proposal.
It is no longer ok to state, "We understand that they want to protect their industries and their jobb," That statement no longer is valid. It is a time that the pesticide industry and conventional farmers, using neonics, step up to the plate and endorse this well researched scientific proposal. In the long run it benefits their industry as well, in many ways: particularly in their marketing, their concern for the environment, and protecting their helpers/workers, neighborhoods,. I was disappointed to hear Jim Ward of Sharon , whom I have had the greatest respect until now, and Nathan Norse and other members of the Farm Bureau who did not endorse the proposal. But they were only four the most.

Npw, my question for you and the PB is this : If your proposal is now, after all the testimony is compiled, and the your proposal is then sent to Beacon Hill for the legislators to move on , who is going to "walk" this through the many steps of the bureaucracy. If this is going to be left for the Farm Bureau Lobbyist, it has the danger of lingering in some committee for indefinitely or at least for a long time.? Could the Bayer Pharmaceutical fingers reach Beacon Hill Legislators.?

Case in point, When I had the privilege to work at MDAR one of my initiatives was to have official signs for the farmers on the State Roads, farmers who had , for example, U-pic or B&B operations, or other tourism oriented businesses.

Brief history: When I implemented the signs program for the farmers I worked closely with the Mass. Highway Head Engineers, and asked how we could get the signs up on the highways for the farmers, do we need a legislative action or how The answer was no, "all you do is draft us the MOU, because we already had a sign program in place , called TOD, Tourist oriented signs, and all you ghave to do is send us a MOU and we sign it." I had that MOU signed by the Commissioners, of three branches of businesses, Mass office of tourism, Commissioner of Agriculture and Mass, Highway Commissioner . That program went into effect in less than 2 months. And, I hope it is being used as new farmers enter the tourism industry to access more touring business. As a result, tour busses now stop at many of the farm stands, which are listed in the tourism directory. Now, even during the virus time, the pick your own business has been excellent this season, according to interviews with the farmers.

Thank you for reading this. The reason I am telling you is because I learned afterward when the TOD sign program was already running , that the Farm Bureau had tried to have that program in place for years, and it never happened; it lingered on Beacon Hill in some sub-committee. I don't normally talk about my former accomplishment and being Finnish it is our nature not to talk about our accomplishments.
Finally, you perhaps know, that EU has placed a moratorium on nionics, to learn if it is detrimental for the honey bees. I must find out where that reseach is presently. In the Republic of Moldova, where beekeeping is a big industry, they do not use neonics, perhaps due to lack of resources. I worked there in the Honey Industry Marketing for couple of stints. And use the word organic in developing their label.

Thank you again and the Bureau for the excellent hearing
Sincerely,

Anneli Johnson

Accredited Environmental Consultant, NGC, Inc.
Formerly with MDAR
Member of Wollaston garden Club
SWQ Neighborhood Associa Chair

From: artsmart@charter.net
To: LaScola, Taryn (AGR)
Subject: State Review of Neonicotinoids
Date: Thursday, December 17, 2020 4:59:31 PM

Dear Director Lascola-Miner,

We are a group of citizens deeply concerned about the impact of pesticides upon our waterways, upon our soil and as they impact our food pollinator and human health. Now that the Science is in, we can confirm the grave impact of PFAS forever chemicals, and know they were part of aerial spraying in our pristine state of Massachusetts. PFAS is a national issue which requires attention, but right now, we have the opportunity to be a leader in addressing this national environmental mistake and the health crisis of PFAS. As it stands, Massachusetts already has one of the lowest rates of pollinators in the nation. It is no secret how vital our pollinators are to our own existence. Right now, other states are fighting to reverse the harmful impact of PFAS by way of remediation. While the science confirms our greatest fears about PFAS, we still have time in Massachusetts to act preventively and avoid getting to the point of remediation of chemicals which we know present a serious detriment to the health of our citizens and communities across our great state. Just a few of the health hazard to humans such harmful chemicals are linked to include certain cancers, damage to both reproductive health and our immune system health.

It seems more vitally important now during the Covid Pandemic, that we consider a less harm, cautionary approach to anything which serves to impact our human immune system, over profit. Here is a bit of important and compelling information regarding the PFAS & Severe Covid connection. We hope you find our testimonial and the research on the connection to Covid severity and elevated exposure to perflourinated alkylates worthy of consideration.
https://www.medrxiv.org/content/10.1101/2020.10.22.20217562v1?fbclid=IwAR1qEcblz3qRuVLAD4la96cztHmbef7nZunwdDprVAJTHYqBphdbgOT7-XE

Sincerely,
We the People Oppose Toxic Spraying

Astrid Munte Peisch
90 North Main St
Cohasset, MA 02025

July 6th, 2020

Taryn Lascola-Miner
Director, Crop and Pest Services
Massachusetts Department of Agricultural Resources
251 Causeway St Suite 500
Boston, MA 02114-2151

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

Dear Director Lascola-Miner,

I am writing to comment on the results of 2019 Neonics Scientific Literature Review that was mandated in the FY20 budget. The review determined that 42 of 43 of the impact-based studies reviewed cited neonicotinoid insecticides as a major contributor to pollinator declines. The review also specifically states that the only studies that had mixed results were industry-funded. These findings are consistent with the overwhelming body of peer reviewed scientific research, worldwide, showing that neonicotinoids are clearly implicated in the unsustainable losses of managed bees and native pollinators.

Therefore, rather than waiting for pending legislation, I would like ask the Pesticide Board Subcommittee and the Massachusetts Department of Agricultural Resources to prioritize the implementation of the restrictions on the use of neonicotinoids in the Commonwealth of Massachusetts that are detailed in Representative Carolyn Dykema's bill, H.763 – An Act to protect Massachusetts Pollinators. 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).

It is alarming that

- A recent study found that U.S. Agriculture is 48 times more toxic to insect life than it was in the early 1990 and that neonicotinoids account for more than 90% of that increase.

- 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.

- While the EPA has failed to take significant action to curb the use of neonicotinoids, the European Union has instituted a full ban.

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

- 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 mammalian wildlife.

- Other research suggests that people exposed to neonicotinoids may similarly be at increased risk of developmental or neurological damage, including malformations of the developing heart and brain, memory loss, and finger tremors.

Given the ecological and public health harms of neonicotinoids, I would like to urge that the Department take immediate action to implement the restrictions on the use of neonicotinoids in the Commonwealth of Massachusetts that are detailed in Representative Carolyn Dykema's bill, H.763 – An Act to protect Massachusetts Pollinators.

Sincerely,

Astrid Munte Peisch

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

December 11, 2020

Massachusetts Pesticide Board Subcommittee
Taryn LaScola-Miner
251 Causeway Street, Suite 500
Boston, MA 02114

Neonicotinoid Scientific Literature Review

Spoken Statement:

Good morning, thank you for the opportunity to speak.

I am Drew Toher, Community Resource and Policy Director at the national nonprofit Beyond Pesticides. I am here representing our members and supporters in Massachusetts.

The last four years has seen a significant weakening of EPA. The consolidated literature reveals that the agency, even when it adequately identifies risk, is not effectively acting upon that information. Under federal pesticide law, state agencies are empowered to fill in these gaps. While EPA sets a floor, states have the ability to go beyond this standard and establish restrictions in ways that best protect health and the environment.

In the case of neonicotinoid insecticides, we urge the state to exercise its authority. The literature review initiated by lawmakers found that the vast majority of studies show neonics are contributing to pollinator declines. Only research funded by the pesticide industry showed mixed results.[1]

Other reviews have made similar determinations. The Task Force on Systemic Pesticides, consisting of 242 scientists from across the world, penned in 2018 an open letter to regulators and policymakers at every level, calling for restrictions on neonic insecticides. The scientists indicate that, "the balance of evidence strongly suggests that these chemicals are harming beneficial insects and contributing to the current massive loss of global biodiversity."[2]

[1] Van Geel et al. 2019. Pesticide literature compilation approach and results. https://www.mass.gov/doc/neonics-scientific-literature-review-december-2019/download
[2] Goulson, David. 2018. Neonicotinoids: An open letter to policy makers and regulators. http://www.tfsp.info/wp-content/uploads/2018/06/Open-letter-on-neonicotinoids-signatories.pdf

EPA's own review identified hazards to human health, pollinators, birds, and aquatic wildlife.[3] Yet the agency is only requiring limited label changes around application timing and amounts. It eliminated use of imidacloprid on residential turf for grubs, and will be requiring "language on the label advising homeowners not to use neonicotinoid products."

That is correct. EPA approved a product for sale it does not wish people to use. With clear evidence on the dangers of these chemicals, it is incumbent upon state regulators to act meaningfully. We urge MDAR and the Massachusetts Pesticide Board to finish the job EPA has been unwilling to do – do not repeat its mistakes, protect health and the environment, and restrict the use of neonicotinoids.

Supplemental Written Comments:

Chemically similar to nicotine, neonicotinoids (neonics) are nicotinic acetylcholine (nACh) receptor agonists that activate neuronal receptors and disrupt many sensory and cognitive processes in invertebrate organisms. The binding of neonicotinoids to the nicotinic acetylcholine receptor is irreversible in arthropods.[4] Thus, they are highly toxic to pollinators and other invertebrates.

Since 2006, honey bees and other pollinators in the U.S. and throughout the world have experienced ongoing and rapid population declines. The continuation of this crisis threatens the stability of ecosystems, the economy, and our food supply, as one in three bites of food are dependent on pollinator services. Pollination services are valued at over $125 billion globally. According to a 2014 Presidential Memorandum, pollinators provide $24 billion annually to the US economy.[5]

In the US, the states of Connecticut, [6] Maryland, [7] and Vermont[8] have placed restrictions on their use out of concern for pollinator populations. Due to pollinator impacts, these chemicals are now banned in the European Union.[9] Due to impacts to pollinators and aquatic life, these chemicals are now banned in Canada.[10] The state models set a minimum for action on this

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[3] Environmental Protection Agency. 2020. Proposed Interim Registration Review Decision for Neonicotinoids. https://www.epa.gov/pollinator-protection/proposed-interim-registration-review-decision-neonicotinoids

[4] Zhang, A., Kayser, H., Maienfisch, P., & Casida, J. E. (2000). Insect Nicotinic Acetylcholine Receptor: Conserved Neonicotinoid Specificity of [3H]Imidacloprid Binding Site. Journal of Neurochemistry, 75(3), 1294-1303. Retrieved from http://onlinelibrary.wiley.com/ doi/10.1046/j.1471-4159.2000.751294.x/pdf ceptibility of five cladoceran species to two systemic insecticides, imidacloprid and fipronil.

[5] White House Blog: New Steps to Protect Pollinators, Critical Contributors to Our Nation's Economy http://www.whitehouse.gov/blog/2014/06/20/new-steps-protect-pollinators-critical-contributors-our-nation-s-economy.

[6] Connecticut General Assembly. 2016. SB 231- An Act Concerning Pollinator Health. https://www.cga.ct.gov/2016/TOB/s/2016SB-00231-R02-SB.htm

[7] Maryland General Assembly. 2016. HB0211 - Neonicotinoid Pesticides - Restrictions on Sales and Use (Pollinator Protection Act of 2016). http://mgaleg.maryland.gov/webmga/frmMain.aspx?pid=billpage&tab=subject3&id=hb0211&stab=01&ys=2016RS

[8] Goswami, Neal. 2019. Scott signs pollinator bill; supporters continue push for pesticide ban. WCAZ3 https://www.wcax.com/content/news/Scott-signs-pollinator-bill-supporters-continue-push-for-pesticide-ban--510675811.html

[9] Carrington, D. 2018. EU agrees total ban on bee-harming pesticides. *The Guardian.* https://www.theguardian.com/environment/2018/apr/27/eu-agrees-total-ban-on-bee-harming-pesticides

[10] CBC Radio. 2018. Canada bans neonic pesticides implicated in bee declines. https://www.cbc.ca/radio/quirks/august-18-2018-canada-bans-neonics-tracking-animals-from-space-and-more-1.4786729/canada-bans-neonic-pesticides-implicated-in-bee-declines-1.4786738

important issue; we urge Massachusetts to follow the examples of the EU and Canada in eliminating all outdoor uses of neonicotinoids.

As the literature review initiated by the legislature indicates, there is a significant gap between claims by industry proponents that these chemicals are safe for pollinators, and what the independent literature says -- confirming the refrain from pollinator protectors that these chemicals pose unreasonable risks.

Several concerning studies have been released since the review was published, adding weight to the results.

- A March 2020 study published in *The Proceedings of the Royal Society B* found impacts on the development of baby bumblebees' brains after being fed neonic-contaminated food. Exposures resulted in abnormal brain growth in some parts of the bees' brains, significantly impairing learning ability compared to bees who were not exposed.[11]
- A September 2020 study published in *Proceedings of the National Academy of Sciences* finds that the neonic imidacloprid binds to insect brain receptors, triggering oxidative stress, reducing energy levels, and causing neurodegeneration.[12]
- An October 2020 study published in *Proceedings of the Royal Society B* finds that additive stress of pesticide exposure and food scarcity leads to significant declines in wild pollinator populations. Female mason bees exposed to Admire Pro (imidacloprid) were 10% less likely to nest, and when they did, produced 42% fewer offspring. Those with access to limited food supplies produced 26% fewer offspring than those with abundant resources. These stressors were additive, with pesticide exposure and limited floral resources combining to reduce reproduction by 57%, compared to the unexposed group.[13]
- A November 2020 study published in *Scientific Reports* finds that neonics inhibit honey bee sleep cycles, leading to stress and population declines. "It stands to reason that if a bee's internal sense of time is disrupted or altered it could affect learning, memory and foraging efficiency—even outside of reduced capacity from sleep disruptions," said study coauthor Michael Tackenberg, PhD.

The pesticide industry urges inaction. But we cannot continue to wait; as with any crisis, the problem is not miraculously getting better – reports consistently show managed pollinator losses over an unsustainable 30% (47% for the 2019-2020 winter in MA),[14] and the die off of wild pollinators impacting agricultural production.[15]

The crisis is not limited to pollinators. Beneficial soil dwelling insects, benthic aquatic insects, and grain-eating vertebrates like songbirds are also at risk from neonicotinoids. A 2015 review finds that neonicotinoid concentrations detected in aquatic environments pose risks to aquatic

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[11] Smith et al. 2020. Insecticide exposure during brood and early-adult development reduces brain growth and impairs adult learning in bumblebees. Proceedings of the Royal Society B. https://royalsocietypublishing.org/doi/10.1098/rspb.2019.2442

[12] Martelli et al. 2020. Low doses of the neonicotinoid insecticide imidacloprid induce ROS triggering neurological and metabolic impairments in Drosophila. https://www.pnas.org/content/117/41/25840

[13] Stuligross, Clara and Williams, Neal. 2020 Pesticide and resource stressors additively impair wild bee reproduction. https://royalsocietypublishing.org/doi/abs/10.1098/rspb.2020.1390

[14] Bee Informed Partnership. 2020. Colony Loss Map. https://research.beeinformed.org/loss-map/

[15] Reilley et al. 2020. Crop production in the USA is frequently limited by a lack of pollinators. Proceedings of the Royal Society B. https://royalsocietypublishing.org/doi/10.1098/rspb.2020.0922#d1e951

invertebrates and the ecosystems they support.[16] Two studies published in 2020 together find that neonics adversely effects shrimp and oyster health, decreasing their nutritional value.[17] "These two studies indicate both crustaceans and molluscs are vulnerable to insecticides, weakening their immune system and leaving them susceptible to disease," said co-author Kirsten Benkendorff, PhD.

There is also evidence of adverse effects moving up the food chain. One study demonstrates that a single corn kernel coated with a neonicotinoid is toxic enough to kill a songbird.[18] Research published earlier this month in the esteemed journal Science found songbirds that feed on neonicotinoid-contaminated seeds during their migration route display reduced weight, delayed travel, and low rates of survival. The author of that study, ecotoxicologist Dr. Chrissy Morrisey said, "Our study shows that this is bigger than the bees — birds can also be harmed by modern neonicotinoid pesticides which should worry us all."[19] Data from the Netherlands has showed that the most severe bird population declines occurred in those areas where neonicotinoid pollution was highest.[20] This data is alarming in the context of a recent *Science* study finding 3 billion birds (30% total) lost since 1970 in part due to pesticide use.[21]

The good news is that elimination neonicotinoids will not cause any major disruptions to pest management or the pest service industry. Not only are there viable, readily available less-toxic alternatives for neonics, there is significant scientific evidence that current uses are either not needed or are ineffective due to growing pest resistance.[22] A 2019 study published in *Scientific Reports* found negligible benefit to farmers from neonic-coated seeds.[23] The paper notes, "throughout most soybean-producing regions of the U.S., the period of pest protection provided by [use of neonic-treated seeds] does not align with [the presence of] economically significant pest populations. Absent economic infestations of pests, there is no opportunity for this plant protection strategy to provide benefit to most producers."

The argument put forward by the opposition - that it would be preferable to endanger the future of Massachusetts's beekeepers, native pollinators, and songbirds, rather than encourage an already necessary shift towards safer pest management practices, should give regulators

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[16] Morrissey, C. et al. 2015. Neonicotinoid contamination of global surface waters and associated risk to aquatic invertebrates: A review. *Environment International.* doi:10.1016/j.envint.2014.10.024.

[17] Butcherineet al. 2020.. Impact of imidacloprid on the nutritional quality of adult black tiger shrimp (Penaeus monodon). Ecotoxicology and Environmental Safety 198: 110682. https://doi.org/10.1016/j.ecoenv.2020.110682 ; Ewere et al. 2020 The neonicotinoid insecticide imidacloprid, but not salinity, impacts the immune system of Sydney rock oyster, Saccostrea glomerata. Science of the Total Environment 742: 140538 https://doi.org/10.1016/j.scitotenv.2020.140538

[18] Mineau P, Whiteside M. 2013. Pesticide Acute Toxicity Is a Better Correlate of U.S. Grassland Bird Declines than Agricultural Intensification. PLoS ONE 8(2): e57457.

[19] Bienkowski, Brian. 2019. Common insecticide threatens survival of wild, migrating birds. EHN. https://www.ehn.org/common-insecticide-threatens-survival-of-wild-migrating-birds-2640322064.html

[20] Hallmann CA, et al. 2014. Declines in insectivorous birds are associated with high neonicotinoid concentrations. *Nature* doi:10.1038/nature13531.

[21] Rosenberg et al. 2019. Decline of North American avifauna. Science. https://science.sciencemag.org/lookup/doi/10.1126/science.aaw1313

[22] Furlan and Kreutzweiser. 2015. Alternatives to neonicotinoid insecticides for pest control: case studies in agriculture and forestry. Environmental Science and Pollution Research International. https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4284368/

[23] Mourtzinis et al. 2020. Neonicotinoid seed treatments of soybean provide negligible benefits to US farmers. Scientific Reports. https://www.nature.com/articles/s41598-019-47442-8

pause. The committee has the opportunity to stop and reverse bird and pollinator declines by following the model of the EU and Canada and eliminating all outdoor neonic uses. We urge action by Massachusetts regulators and and remain available for any questions on this important issue.

Drew Toher,
Community Resource and Policy Director
Beyond Pesticides

From: Cecily Miller
To: LaScola, Taryn (AGR)
Subject: Regulation of Neonics
Date: Thursday, December 17, 2020 12:54:52 PM

To the members of the Pesticide Board Subcommittee:
Thank you for taking the step to organize a Literature Review regarding the impact of neonic pesticides on the ecosystem. I attended your public hearing regarding the results and am encouraged that you now have scientific grounds to restrict, if not suspend, the use of these chemicals.

I urge you to take the next step and draft strong regulations to protect public health and the environment.

I urge you to ban the use of neonics entirely, as did the European Union in 2003. I was disheartened to hear so many industry representatives justifying the use of these dangerous chemicals on everything from golf courses to strawberries to wooly adelgid on Hemlocks. We need to find safe and sustainable alternatives. These pesticides enter the food chain through plants, they persist in soil, they accumulate in water. They are broad spectrum, not targeting specific pests but affecting all insects. Insect populations are down by as much as 80% in many parts of the world (New York Times), and bird populations have decreased by 29% in the last 50 years in the US (Cornell Lab of Ornithology). Similar impacts could be measured in any animals that depend on insects for food. I understand that habitat loss and climate change are factors, but so are pesticides and we have the power to reduce the introduction of POISON into the world.

Please take the threat to life on our planet, and in Massachusetts, seriously and be good stewards to our environment. Please:

- ban all uses of neonics near schools and playgrounds
- ban all uses of neonics in lawn and turf maintenance, as well as ornamental plantings
- ban all uses of neonics near waterways
- ban all neonics from retail sale to anyone without a license, and take training those with licenses seriously

Please:

- take steps to educate pesticide applicators and landscape maintenance people -- both professionals and workers -- on the dangers of pesticides in general and neonics in particular. Check job sites to ensure that safety procedures are being followed and fine sites where they are not.
- develop a path for "just transition" -- train people on alternative processes so that they don't lose their livelihood.
- Support the creation of incentives and subsidies for organic methods
- educate the public on why pesticides are dangerous, and why neonics should not be used on lawns and other spaces; explain why it is necessary to invest in organic and other

safe methods of caring for land and growing food for the long term health of the planet.

- Encourage industry to innovate and find the least toxic methods possible, even if these are "less effective". We can live with less effective; indeed, we need to in order to survive.

Thank you for your consideration.

Cecily

Cecily Miller
108 Pleasant Street, Cambridge MA 02139
15 Meetinghouse Road, Truro MA 02666
617.331.1715

From: clazar@charter.net
To: LaScola, Taryn (AGR)
Subject: Please support Bill H.763
Date: Thursday, December 17, 2020 6:16:48 PM

A Massachusetts state-funded study has confirmed that neonics are harmful to pollinators. These insecticides have been shown to harm honeybee populations and lower resistance to parasites and mites. Studies going back to 2014 from among others Harvard School of Public Health had suspected that these new insecticides are harming pollinators. Please support Bill H.763.

Thank you,

-Christine Lazar
10 Rockdale Hill Circle
Upton, MA 01568
508-397-9136

From:	Riley Titus
To:	LaScola, Taryn (AGR)
Cc:	kgrant@thekarolgroup.com; Jon Gaeta
Subject:	CLA / RISE Neonic Literature Review Comments
Date:	Thursday, December 17, 2020 3:42:59 PM
Attachments:	CLA RISE MA Neonic Literature Assessment Response 12 17 2020.pdf

Taryn,

Thank you for the opportunity to speak at the Pesticide Subcommittee hearing last week and submit comments on the neonicotinoid literature review conducted by the Massachusetts Department of Agricultural Resources.

Please find attached joint comments from CropLife America and RISE (Responsible Industry for a Sound Environment) on the neonicotinoid literature review. In addition to those formal comments, we have included as a footnote, industry analysis and information by the Growing Matters Coalition on Cornell University's recent report, "Neonicotinoids in New York State – economic benefits and risk to pollinators".

If you have questions, please don't hesitate contacting myself, Jon Gaeta (RISE), or Kevin Grant, our lobbyist (both copied here).

Thanks again for the Department's undertaking and efforts on this matter, and happy holidays!

Riley Titus | Director, Government Affairs
CropLife America
1156 15th Street NW, Suite 400 | Washington, DC 20005
Office: (202) 872-3856 | Cell: (239) 398-0992
Email: rtitus@croplifeamerica.org
www.croplifeamerica.org

Note: CropLife America is moving!

As of January 1, 2021, our new address will be:
4201 Wilson Boulevard
Suite 700
Arlington, VA 22203

Our phone numbers and email addresses remain the same.

CLA and RISE comment on: "Pesticide Literature Compilation Approach and Results" (AGR-Pesticide-Literature-Review-FY20) conducted by Industrial Economics, Inc.

Introduction

CLA (CropLife America) and RISE (Responsible Industry for a Sound Environment) appreciate the opportunity to comment on the "Pesticide Literature Compilation Approach and Results" (AGR-Pesticide-Literature-Review-FY20) conducted by Industrial Economics, Inc. (IEc). The authors state the goal of the assessment: *"This compilation may assist MDAR with identifying, planning, and managing future research and policy efforts related to neonicotinoids and pollinators but does not provide any policy recommendations with respect to the management, regulation, or use of neonicotinoids."* We seek to provide the MDAR (Massachusetts Department of Agriculture and Resources) with additional studies, information, and perspectives on how data may be assessed and integrated with ongoing activities related to the use of neonicotinoids.

Since their introduction in the mid-1990s, neonicotinoids have become the most widely used class of insecticides globally due to their high level of efficacy against sucking insects that transmit plant diseases; flexibility in application methods; and generally favorable safety profiles compared to the older classes of chemistry that they have replaced. From their introduction, the potential hazard to bees has been known; neonicotinoids must be used with appropriate precautions to ensure that they do not pose unreasonable risk. Much attention has been placed over the years on improvements in formulation technology, application methodology, labeling restrictions, stewardship, and best management practices or BMP.

The IEc authors note the tremendous growth of the literature on neonicotinoids, as would be expected for the most widely used global insecticides. The authors prioritized recent reviews and meta-analyses (2015 and later), supplemented with additional documents from 2017 which were published after the comprehensive reviews. They characterized 70 documents in systematic detail in a tabular form, covering a wide range of lab and field exposure scenarios, with honey bee and bumble bee being the predominant species tested. The authors also provided a narrative overview which included comments on the U.S. EPA Registration Review process; highlighted a few pre-2017 studies considered relevant to Massachusetts and provided their views on a few of the more recent reviews. It is important to assess this information in the context of previous data and initiatives implemented over the use period of neonicotinoids and not consider this review as a comprehensive stand-alone overview.

CLA and RISE are committed to ensuring that tools are available to grow crops, sustainability, enhance landscapes, and protect homeowner properties. We recognize the vital role pollinators play in the environment and the plants we grow. Pollinators are critically important to the pollination of crops, and the health of pollinators is of paramount importance to everyone. Pollinator protection should be achieved by:

- A robust science-based risk assessment process to determine the potential risks posed by pesticides;
- A regulatory framework that balances potential risks and benefits appropriately;
- Consistent label language to mitigate potential risks appropriate to crop, application method, and pesticide product, based on the assessment;
- Robust and coordinated stewardship of pesticide products, crops, and pollinators by pesticide registrants, growers, state managed pollinator protection plans, and beekeepers;

- Training of pesticide applicators and education of growers to ensure use of BMPs.

Regulatory Testing Frameworks

Individual studies and review articles are not generally designed to replace the holistic regulatory process described above that characterizes potential risks and balances those against benefits. The studies can, however, if interpreted against objectives of the risk assessment help inform the risk characterization.

The Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA) of 1947 and subsequent amendments, most notably the Food Quality Protection Act (FQPA) in 1996, to ensure that all pesticides intended for use in the United States do not cause "unreasonable adverse effects on man or the environment". The regulatory process overseen by the U.S. Environmental Protection Agency (EPA) ensures safety based on the most rigorous pesticide risk/benefit analysis in the world. Other regulatory authorities, including those in developed countries or regions (e.g. the EU), often revert to a much simpler hazard (or toxicity) based approach that does not take into account the use rate, use conditions, mitigations and stewardship programs implemented to ensure the safe use of products. The EPA assessment is not only conducted at the time of initial introduction of a product but is updated with each new use approval and revisited on a regular timeframe (Registration Review) to adjust product labels for new findings and advancement in scientific knowledge. An excellent overview of the process is outline by the Cornell University Cooperative Extension[1].

Consideration of this process is important in relation to the IEc review. The review did make significant references to European studies which can result in interpretations that are slanted towards a more hazard-based assessment. Furthermore, the authors did not have access to EPA's final pollinator risk assessment which was released after the IEc review.

Registration Review and Pollinator Risk Assessment

The IEc supplemented its review with key documents from EPA's preliminary pollinator risk assessments for neonicotinoids, which was subsequently updated and revised based on extensive public comment and announced in January 2020[2].

EPA conducts periodic Registration Review (typically on a 15-year time frame) of all registered pesticide active ingredients to ensure that they meet current scientific and use standards. EPA can suspend the use of a product if it determines there is an imminent threat. It can also expedite the Registration Review process if appropriate.

EPA initiated the Registration Review of imidacloprid, the first registered neonicotinoid, in 2008 following its 15-year time frame but then expedited the review of the more recently registered neonicotinoids in 2011 to synchronize the process for this class of chemistry. Since that date, EPA has initiated several steps including: (a) an enhanced pollinator incident reporting process (July 2013); (b) expedited label changes for neonicotinoid products (August 2013); and (c) stringent restrictions on new neonicotinoid uses (April 2015) pending completion of Registration

[1] http://psep.cce.cornell.edu/issues/risk-benefit-fifra.aspx

[2] Proposed Interim Registration Review Decision for Neonicotinoids, Pollinator Protection, United States Environmental Protection Agency, https://www.epa.gov/pollinator-protection/proposed-interim-registration-review-decision-neonicotinoids

Review. EPA has routinely published its preliminary risk assessments for public comment and reviewed and refined its assessments based on the extensive comments received.

During the Registration Review of neonicotinoids, EPA developed a robust regulatory testing framework for pollinators, through participation of international scientists and including several opportunities for public comment; notably:

2008 – 2010	Planning for a workshop to develop a formal risk assessment process for bees to support the Registration Review process
2011	Workshop of international experts held by Society of Environmental Toxicology and Chemistry (SETAC) to propose approaches
2012	EPA/PMRA (Pesticide Management Regulatory Agency)/CDPR(California Department of Pesticide Regulation) White Paper based on SETAC recommendations
2012	White Paper taken to Science Advisory Panel for external review
2014	EPA Released Guidance Document for Bee Risk Assessment[3]
2012 - 2014	Development of colony-feeding study (CFS) protocol
2014 - 2017	CFS test implemented with neonics (and other ai's)
2015 - 2017	Pollinator Risk Assessment outreach via SETAC short course

Risk assessment proceeds through several tiers, from lab studies to semi-field studies to field studies. Later tiers are more applicable to real-life conditions, but they involve more variables that can confound the results. For example, the Colony Feeding Study determines the field exposure level that will affect the survival, growth or reproduction of a bee colony. It incorporates the impact of sub-lethal effects on individual bees.

Data Relevance and Reliability

The IEc authors found that 42 of the 70 studies identified at least one effect on bees caused by or associated with neonicotinoid exposure. However, they recognized –

> *… that this is an extremely broad-brush observation and should be understood in context: publication bias may result in a higher publication rate for studies that identify effects. Not all identified effects were seen at field-realistic concentrations. Some studies found one neonicotinoid to affect an endpoint while another neonicotinoid did not find it to affect that endpoint."*

We note additional relevant concerns. Press releases associated with individual studies have exaggerated claims, attracting considerable media coverage even though:

- The studies are conducted at exaggerated rates and/or under unrealistic lab conditions.
- Claims made by studies are not supported by a rigorous risk assessment.
- Claims are not supported by large scale, realistic field studies.

[3] USEPA Office of Pesticide Programs United States; Health Canada Pest Management Regulatory Agency; California Department of Pesticide Regulation (2014). Guidance for assessing pesticide risk to bees https://www.epa.gov/sites/production/files/2014-06/documents/pollinator_risk_assessment_guidance_06_19_14.pdf

Many factors can confound extrapolation from lab or semi-field conditions to actual field use. To address these concerns studies must be assessed to ensure that they represent:

- Label use rates under practical field applications;
- Realistic exposure routes;
- Practical use of field equipment;
- Control of factors not related to the treatment.

In the imidacloprid docket, EPA outlined its approach to the use of individual studies from the open literature in the risk assessment process, which is also pertinent to the other neonicotinoids:

> *…generally all open literature studies (with the exceptions noted in the individual discussions) did not provide raw data in order to conduct an independent verification of the statistical results. This limitation was one of the primary reasons that open literature studies were considered to be qualitative in their utility; those that were evaluated and considered invalid for utility in this risk assessment are tabulated in Appendix A. The studies from the open literature not only serve to broaden the database of species for which effects of imidacloprid can be characterized, but also expand on the suite of effects that are investigated in the registrant-submitted studies, which is generally limited to observations of mortality and clinical signs of toxicity (sublethal effects). Additionally, studies from the open literature serve to examine any differential toxicity that may be present in Apis vs. non-Apis bees, particularly as it relates to effects on individual bees at the Tier I level.*

Klimisch et al (1997)[4] developed a scoring system to assess the reliability of data from toxicological and ecotoxicological studies, which was later extended to physico-chemical studies. It is now largely accepted by regulatory authorities and organizations. Given the amount of effort put into the IEc review it would be useful to provide an assessment of the studies for risk assessment based on these considerations.

Specific Studies Highlighted in the IEc Review

The IEc review highlighted three specific studies for different reasons

- Lu *et al*. (2016)
  - IEc comment: Addresses Massachusetts specifically and is therefore of particular interest.
  - CLA/RISE comment: The work of Lu and colleagues on neonicotinoids came under significant criticism from the scientific community for several reasons, including insufficient replication, analytical methodology concerns, and misinterpretation of results. See Oliver 2015[5]. The study was conducted under a completely artificial study design and does not correspond to any features specific to the environment in Massachusetts. We strongly recommend further critical review of this work before it is considered in any policy discussions.

[4] Klimisch, H.-J., M. Andreae, and U. Tillmann, U. Regulatory Toxicology and Pharmacology 25, (1997). A Systematic Approach for Evaluating the Quality of Experimental Toxicological and Ecotoxicological Data. https://doi.org/10.1006/rtph.1996.1076

[5] Oliver, R. (2015). Note online version of paper reviewed hence apparent discrepancy in dates. http://scientificbeekeeping.com/a-review-of-dr-lus-paper-on-neonics-in-massachusetts/#_edn1

- Forister *et al*. (2016)
    - IEc comment: included because it addresses butterflies, and very little neonicotinoid ecotoxicological literature is available on non-bee pollinators.
    - CLA/RISE comment: Neonicotinoids do not have the same inherent toxicity to butterflies as to bees[6]. A growing body of literature investigating land use and butterfly declines shows that butterfly species richness at several sites in the general vicinity of Sacramento, CA have been declining since at least the 1980s, before neonicotinoids were commercialized. The Forister *et al*. study and butterfly census in California did not take place in agricultural use areas. There was no direct measure of neonicotinoid exposure in the study, but insecticide use was used as a surrogate. However, insecticide use is also a surrogate for land use.
- Stanley *et al*. (2017)
    - IEc comment: a relatively recent article of relevance, which was not cited in the most recent review articles.
    - CLA/RISE comment: This important study addresses some of the knowledge gaps for bumble bees. The exposure level and duration exceed typical field conditions; nevertheless, colony growth was not significantly affected. While "… larger sample sizes would be needed to increase the robustness of results," this finding correlates well with research on honey bees, showing that sub-lethal effects may not be relevant to growth, survival and reproduction of a colony under actual field conditions.

Review Articles

IEc authors noted difficulty in linking identified effects to relevance at field-realistic concentrations. They did, however, select a few recent reviews and offered some selective comments from them, which provides the assessment with a skewed conclusion not evident in the work overall.

The meta-analyses most quoted came from the Worldwide Integrated Assessment (WIA), an effort undertaken by the Task Force on Systemic Pesticides. This self-selected group of 29 primarily European scientists lacks an adequate understanding of the U.S. regulatory framework and scientific review. The report analyzes a limited number of existing studies but does not present new findings or substantiate any concerns about adverse effects of systemic insecticides to ecosystems that have not already been reviewed and taken into account by regulatory agencies. It covers a mere fraction of the thousands of published studies on neonicotinoids and well documented guideline studies conducted by the registrants.

The IEc authors also stated: *… only review (or review-like) articles we identified that draw the opposite conclusion consist of a co-published series of articles that adopt a "quantitative weight-of-evidence" approach. This set of articles concludes that there is "minimal risk to honeybees" to exposure from imidacloprid, clothianidin, and thiamethoxam and that these pesticides do not adversely affect colony viability or survival (Solomon and Stephenson 2017b, a, Stephenson and Solomon 2017b, a). We note that the funding for this suite of articles was provided by manufacturers of neonicotinoids, and moreover that the authors' analyses relied heavily on*

[6] Krishnan, N., Y. Zhang, K. G. Bidne, R. L. Hellmich. J. R. Coats,and S. P. Bradbury Environmental Toxicology and Chemistry 39, (2020). Assessing risks of insecticides to monarch butterfly larvae. http://dx.doi.org/10.1002/etc.4672

unpublished reports provided by these manufacturers, which limits third-party review of the underlying studies.

While it is appropriate to note the funding and scrutinize the conclusions, Solomon and Stephenson possess widely acknowledged academic credentials, garnered over many years, and have conducted impartial work for governments and the private sector. Theirs is not the only review (or review-like) article that has concluded *"minimal risk to honeybees*". Comprehensive reviews of multiple studies and databases conducted over nearly 20 years of research involving neonicotinoids and pollinators have been published by a diverse group of researchers. These reviews, which analyzed the extensive information available regarding pesticide-pollinator risk assessment, all conclude that neonicotinoid insecticides are unlikely to be a significant factor when assessing bee risk. Some of the relevant conclusions of these reviews are:

- Using the well-established Hill's epidemiology 'causal criteria,' Cresswell et al. (2012) reviewed dietary exposure in nectar and pollen and concluded "dietary neonicotinoids cannot be implicated in honey bee declines."[7]
- In reviewing environmental residue levels of neonicotinoids, Blacquiere et al. (2012) found residue levels to be lower than known acute or chronic toxicity levels and observed no sublethal effects in field studies conducted using realistic dosages.[8]
- Evaluating the relevant information on neonicotinoid uses in the United Kingdom, the UK Department for Environment, Food and Rural Affairs (DEFRA) concluded from the accumulated evidence across several independent studies that it "supports the view that the risk to bee populations from neonicotinoids, as they are currently used, is low."[9]
- 19 honey bee experts chosen to reflect a diversity of field of expertise in honey bee health and to represent the academic, business, and government sectors in North America and Europe, provided expert input to a causal analysis comparing 39 possible candidate causes of the reduced honey bee colony survival rates observed in North America since 2006. These experts classified neonicotinoids as "unlikely" causes, while Varroa mites and viruses were considered "probable" factors, and nutrient deficiency was considered to be a "likely" factor.[10]
- A report from the EcoHealth Alliance (2014) examined the drivers of honey bee colony decline and annual losses. Regarding neonicotinoids, this report concluded "scientific studies examining the overall impact of neonicotinoid pesticides on managed honey bee colony loss are yet to demonstrate colony level losses in field settings at field doses."[11]
- In its 92-page report, the Australian Pesticides and Veterinary Medicines Authority examined the impact of that country's extensive use of neonicotinoids, concluding "the introduction of the neonicotinoids has led to an overall reduction in the risks to the agricultural environment

[7] Cresswell, J.E., Desneux, N, and vanEngelsdorp, D. (2012). Dietary traces of neonicotinoid pesticides as a cause of population declines in honey bees: an evaluation by Hill's epidemiological criteria. Society of Chemical Industry, 2012. https://doi.org/10.1002/ps.3290

[8] Blacquiere, T., Smagghe, G , van Gestel, C.A.M., Mommaerts, V. (2012). Neonicotinoids in bees: a review on concentrations, side-effects and risk assessment. Ecotoxicology 21, https://doi.org/10.1007/s10646-012-0863-x

[9] UK Department for Environment, Food and Rural Affairs (2013). An assessment of key evidence about neonicotinoids and bees.https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/221052/pb13937-neonicotinoid-bees-20130326.pdf

[10] Staveley, J., Law, S., Fairbrother, A., and Menzie, C. Human and Ecological Risk Assessment: An International Journal (2013): A Causal Analysis of Observed Declines in Managed Honey Bees (Apis mellifera), Human and Ecological Risk Assessment: An International Journal, https://doi.org/10.1080/10807039.2013.831263

[11] Smith, K., Loh, E., Rostal, M., Zambrana-Torrelio, C., Mendiola, L. and Daszak, P. (2014). Pathogens, Pests, and Economics: Drivers of Honey Bee Colony Declines and Losses. EcoHealth 10, doi: 10.1007/s10393-013-0870-2

from the application of insecticides" and that "Australian honeybee populations are not in decline, despite the increased use of this group of insecticides in agriculture and horticulture since the mid-1990s."[12]

- Fairbrother *et al.* (2014) criticized the overreliance of laboratory studies in evaluating risk, noting "Assessing risks only under worst-case conditions with individual honeybees, divorced from properties provided by colony interactions, serves only to understand potential mechanisms of action of different chemicals but not their actual risks." When considering the extensive body of existing research, the authors concluded "it is not reasonable, therefore, to conclude that crop-applied pesticides in general, or neonicotinoids in particular, are a major risk factor for honeybee colonies."[13]
- Results from a three-year study in Maryland published in 2015 by scientists from the University of Maryland, the U.S. EPA and the USDA confirm what other extensive field research has shown – that field relevant exposures of neonicotinoids have negligible effects on honey bee colony health.[14]
- A two-year investigation of apiaries located in urban, rural and agricultural environments, published in 2016 by Washington State University scientists, concluded that the extremely low levels of neonicotinoid residues found in beeswax and pollen suggest that these products have a "low potential for negative effects on bee behavior or colony health."[15]
- A series of publications in 2017 by University of Guelph scientists took a quantitative weight of evidence approach in examining the effect of neonicotinoids on honey bee colony health and after reviewing numerous field studies concluded that as currently used, neonicotinoids do "not present a significant risk to honeybees at the level of the colony."[16](included in IEc report).
- By establishing a standardized active monitoring network for 5,798 apiaries over two consecutive years to quantify honey bee colony mortality across 17 European countries the authors concluded in 2017 "Our data highlight beekeeper background and apicultural practices as major drivers of honey bee colony losses. The benefits of conducting trans-national monitoring schemes and improving beekeeper training are discussed."[17]
- In 2017 based on an extensive review of studies published since the EU started restricting neonicotinoid use, the authors stated: "Because of temporal non-coincidence we conclude that declines of wild pollinators and of honeybees are not likely caused by neonicotinoids"[18]
- On Feb 3rd, 2020, EPA issued the Proposed Interim Decisions (PID) on neonicotinoids supported by a voluminous collection of scientific reviews, in probably the most comprehensive risk management assessment of this class of chemistry completed to date.

[12] Overview Report – Neonicotinoids and the Health of Honey Bees in Australia (February 2014). Australian Pesticides and Veterinary Medicines Authority 2013. ISBN: 978-1-922188-51-9 (electronic). 92 pages.

[13] Fairbrother, A., Purdy, J., Anderson, T. and Fell, R. (2014), Risks of neonicotinoid insecticides to honeybees. Environmental Toxicology and Chemistry, 33: 719–731. https://doi.org/10.1002/etc.2527

[14] Dively GP, Embrey MS, Kamel A, Hawthorne DJ, Pettis JS (2015) Assessment of Chronic Sublethal Effects of Imidacloprid on Honey Bee Colony Health. PLoS ONE 10(3). https://doi.org/10.1371/journal.pone.0118748

[15] T. J. Lawrence, E. M. Culbert, A. S. Felsot, V. R. Hebert, and W. S. Sheppard (2016). Survey and Risk Assessment of *Apis mellifera* (Hymenoptera: Apidae) Exposure to Neonicotinoid Pesticides in Urban, Rural, and Agricultural Settings. Journal of Economic Entomology, 2016, 1–9. doi: 10.1093/jee/tov397. https://www.ncbi.nlm.nih.gov/pubmed/26791816

[16] Solomon, K.R, Stephenson, G.L. (2017). Quantitative weight of evidence assessment of higher tier studies on the toxicity and risks of neonicotinoid insecticides in honeybees, Publications 1-4: Journal of Toxicology and Environmental Health, Part B. https://www.ncbi.nlm.nih.gov/pubmed/29157187

[17] Jacques A, Laurent M, EPILOBEE Consortium, Ribière-Chabert M, Saussac M, Bougeard S, et al. (2017) A pan-European epidemiological study reveals honey bee colony survival depends on beekeeper education and disease control. https://doi.org/10.1371/journal.pone.0172591

[18] Blacquière, T. and van der Steen J.J.M.(2017) Three years of banning neonicotinoid insecticides based on sub-lethal effects: can we expect to see effects on bees? Pest Management Sci. 73 (7): https://doi.org/10.1002/ps.4583

The analysis demonstrates that continued use of neonicotinoid products will not result in unacceptable risks provided that mitigations are applied for some uses[19].

Stewardship

Honey bee health is linked to a variety of factors associated with beekeeping and crop production. Pests and diseases of honey bees themselves (particularly Varroa mite); lack of forage and nutrition; lack of genetic diversity in bee breeding; and incidental pesticide exposure have all been implicated individually and in combination. Many initiatives have been introduced to address each of these factors, but better treatment for or eradication of Varroa would significantly improve bee health and minimize the impact of other factors. The overwhelming consensus of these reports is that the greatest single factor impacting bee health is the Varroa mite[20].

In addition to the Managed Pollinators Protection Plans (MP3s) introduced by States including Massachusetts, neonicotinoid manufacturers have been working as a consortium to ensure products are effectively stewarded. Industry commitments and proposals can be found in EPA's neonicotinoid dossiers[21] with detailed stewardship recommendations on the Growing Matters site[22].

In summary, the product stewardship program rests on a framework of three pillars: 1) BMPs; 2) Education and Outreach; and 3) Collaboration Networks. BMPs address seed treatment and other applications in agricultural crops, landscape ornamental plants, turfgrass, and pest-management settings. The BMPs form the foundation and lesson plans for the second pillar, education and outreach, which focuses on resource materials, such as brochures and fact sheets; customer engagement; and media amplification. Collaboration Networks cover 1) industry stakeholders that use or recommend the products such as agricultural commodity groups, university and county extension personnel; 2) partnerships with organizations working to improve pollinator health, pesticide safety, and stewardship education; and 3) groups that work to enhance pollinator forage and habitat.

Conclusions

The IEc literature review provides an update on the literature on neonicotinoids and pollinators over recent years. After the release of the IEc report, EPA released its Proposed Interim Decision for neonicotinoids, which details how both academic and company-produced literature are incorporated into the risk assessment process. It would be informative to further enhance the IEc review to determine how the individual studies inform EPA's analysis which is the most current and comprehensive risk assessment conducted and informed by over 25 years of data.

In the end, risk assessments are one part of a Risk Management decision. Massachusetts already has a comprehensive Managed Pollinator Protection Plan and as detailed above neonicotinoid manufactures are committed to effective stewardship to ensure these critical tools

[19] Docket numbers for each neonicotinoid can be found at Federal Register / Vol. 85, No. 22 / Monday, February 3, 2020 / Notices p5954 (Link)

[20] ISSN: 2470-993X, Honey Bee Colonies (August 2019), National Agricultural Statistics Service (NASS), Agricultural Statistics Board, United States Department of Agriculture (USDA); https://downloads.usda.library.cornell.edu/usda-esmis/files/rn301137d/f7623q868/ft849239n/hcny0819.pdf

[21] https://www.regulations.gov/document?D=EPA-HQ-OPP-2008-0844-1620

[22] https://growingmatters.org/besure

are available to applicators and used appropriately. We welcome the opportunity to discuss with stakeholders how this could best be tailored to specific Massachusetts' conditions and concerns.

*** END ***

Footnote: Cornell Report "*Neonicotinoids in New York State – economic benefits and risk to pollinators*" Analysis

Growing Matters Coalition Analysis At-a-Glance

Cornell report on: "Neonicotinoids in New York State – economic benefits and risk to pollinators"

The Growing Matters Coalition appreciates the work that went into the recent Cornell University report on neonicotinoids in New York State ("the Cornell Report"). In fact, there are many areas in the report that are reflective of the benefits farmers in New York, and nationwide, realize through the responsible use of these important pesticides.

We recognize the vital role pollinators play in the environment and some of the plants we grow. Pollinators are critically important to the pollination of many crops, and the health of pollinators is of paramount importance to everyone. We support initiatives to promote pollinator health and believe its complexity calls for thoughtful and stakeholder-engaged solutions, like the state managed pollinator protection plan. We believe collaborative and science-based efforts are the best way to achieve the shared goal of stewardship and protecting the long-term health of pollinators.

As we begin to discuss honey bee and pollinator health in New York, it's important that we understand and address the current state of honey bee health and populations in the state. According to the United States Department of Agriculture (USDA), National Agriculture Statistics Service (NASS), honey bees colonies or operations with five or more colonies in New York averaged an annual loss of 9.2% of hives from January 2019 to June 2020 (NASS, 2020) The NASS reported loss figure represents a drastic contrast to the Bee Informed Partnership data Cornell reported with a loss amount of 40-68% (since 2006)[23], although the basis of this statistic is not clear from the attributed data. There are also differences in the types of data sets. NASS's data capture and survey procedure is explained in the report, but data for operations with honey bee colonies are collected quarterly from a stratified sample of operations with five or more honey bee colonies. NASS regional field offices maintain the information and administer the questionnaires, providing adequate time to respond by mail or electronic data reporting (EDR). "Those that do not respond by mail or EDR are telephoned or possibly enumerated in person."[24] Conversely, the Bee Informed Partnership data is a voluntary survey of mostly hobbyist beekeepers.

[23] "2019/20 Total Winter All Colony Loss" Bee Informed Partnership, https://bip2.beeinformed.org/loss-map/

[24] "Honey Bee Colonies" National Agricultural Statistics Service, Agricultural Statistics Board, United States Department of Agriculture, https://downloads.usda.library.cornell.edu/usda-esmis/files/rn301137d/nc5819380/t148g6070/hcny0820.pdf

Nationally, “honey bee colonies for operations with five or more colonies in the United States on January 1, 2020 totaled 2.88 million colonies, up 8 percent from January 1, 2019.”Id. at 1. Loss of honey bee colonies nationally for operations with five or more colonies from January through March 2020, was 399,570 colonies, or 14 percent. New York’s honey bee colony loss from January through March 2020 was 10%, better than the national average during that time period. New York’s January - March 2019 honey bee colony loss was nearly 14%. There was an improvement of honey bee colony loss of nearly 4% in New York from 2019-2020.

It is also important to understand in this debate about pollinator health and the complexities underlying it, that “Varroa mites were the number one stressor for operations with five or more colonies during all quarters surveyed in 2019.” Id. at 1.

There are many areas where the Cornell report aligns with the established research:

Resistance Management & Pest Management

- Neonicotinoids are an important component of New York’s state pest management programs and in many cases are more efficacious and deliver better overall value to farmers compared to alternative products.
- Neonicotinoids are critical for controlling many invasive species in New York State including hemlock woolly adelgid, emerald ash borer, brown marmorated stink bug, spotted lanternfly and Asian long-horned beetle.

Seed Treatments

- Seed treatments provide protective measures when there is no rescue treatment for the pest.
- Seed treatments are useful as a risk management tool for early season and unpredictable soil pests and can be used based on historical pest pressures within a cropping system.
- Seed treatment use in New York has helped lead to an increase in cover crops which has multiple benefits including erosion control, water management and increased nutrient availability for the crop.

Fruit and Vegetable crops in New York

- “For many New York fruit and vegetable crops, soil- and foliar-applied neonicotinoid products provide consistent benefits for farmers and are important components of insecticide rotations. For a handful of important pests… there are few or no effective chemical alternatives available in New York.”[25]

Turf, Ornamental, and Landscape Management

• Cornell reports that neonicotinoids are very useful, beneficial to growers in the turf, ornamental and landscape management sectors.

[25] “Neonicotinoid insecticides in New York State: economic benefits and risk to pollinators” Cornell, College of Agriculture and Life Sciences, https://pollinator.cals.cornell.edu/pollinator-research-cornell/neonicotinoid-report/

While we appreciate Cornell's interest in neonicotinoids, the Growing Matters Coalition has remaining concerns with the report. The Coalition offers the following information for consideration contrary to some of the Cornell report's findings:

The EPA Proposed Interim Registration Review Decision (PID) for the nitroguanidine substituted neonicotinoids proposes continued use and minor mitigations based on the most comprehensive evaluation of risks and benefits of any effort to date. The risk and benefit evaluations that underly the EPA PIDs are:

1. More robust and comprehensive than the Cornell report

- Since 2008, EPA evaluations were developed in a process that has driven the current knowledge on bee assessments and has been a transparent process with a high level of engagement of the experts in academia, government and industry. The Cornell approach uses a less rigorous approach that has not undergone the same level of vetting and has not received the endorsement from the broader stakeholder and regulatory scientific community.

- The EPA final evaluations and PID considered over 100,000 comments from stakeholders (i.e., public comments) while the Cornell report did not seek broader input from the community of relevant stakeholders

- EPA relied on the best available science, which was identified with a thorough evaluation of the relevance and reliability of peer-reviewed and registrant submitted data. Only data relevant to the potential exposure or impacts to individuals, populations, communities or ecosystems from registered uses and from which the data were generated with robust and transparent methods, were considered. The Cornell report is not based on the same scientific rigor. Registrant submitted data, which is the primary basis of all regulatory authority decisions to date (e.g., EFSA, PRMA, EPA, California DPR) were not considered in the Cornell report. Rather, the Cornell report relies exclusively on peer-reviewed literature identified from online searches without any apparent evaluation of the reliability of the study, rigor or robustness of the methods, reproducibility, or relevance to New York use patterns. The relevance of sublethal effects to bee survival or colony health were not explained by Cornell but are considered by the EPA assessment.

- The EPA bee risk assessments consider the most relevant sources of potential exposure (nectar and pollen), following a paradigm that is consistent with PMRA and California EPA. The risk assessment paradigm follows a tiered approach, moving from an assessment based on conservative assumptions and laboratory effects data to leveraging field exposure and effects study data when the baseline, less resource intensive, assessments suggest a potential risk concern. This paradigm has been vetted and endorsed by the independent Scientific Advisory Panel composed of non-industry experts in the field of pollinator science. The Cornell report claims to be more comprehensive because it includes data on residues in water, dust and soil. However, the Cornell report made no effort to quantify the exposure of bees, and to determine the potential impacts to colony health and survival from residues in these metrices, which is a quintessential part of risk assessment.

2. More transparent than the Cornell Report

- The EPA pollinator risk assessments rely on all data, including industry, government and academic studies. The EPA has access to all raw data from guideline studies and evaluates

the reliability of that data under Good Laboratory Practices (GLP). These Data Evaluation Records (DER) can be obtained by stakeholders and the public. The risk assessments follow a publicly documented and vetted approach that has been subject to public scrutiny and comment as part of the regulatory process. The Cornell report on the other hand only presents data in summary tables and figures without a detailed methodology. In some cases, the claims in the Cornell report cannot be validated because its scientific methods or approach are not documented. Cornell's report relies only on, limited scope, peer-reviewed literature studies, which is only one component of EPA's evaluation of all data and sources.

3. Equivalently representative of New York scenarios as the Cornell report

- Both the EPA assessments and the Cornell report rely heavily on regional residue data to evaluate the risks associated with registered uses in New York. The EPA approach to understand the kinetics of residue uptake and decline, as well as active ingredient specific behavior, provides the EPA with a much better basis to extrapolate different conditions and deal with temporal and spatial variability.

4. Established to identify uses that require mitigation

- The EPA assessments evaluate the risk of uses independently so that risks can be identified for each use and potential mitigation requirements identified. The Cornell report does not differentiate uses, and as a result, cannot identify if a particular use requires mitigations. If the intent is to evaluate the risk and mitigation needs to support growers in New York, then this is not a suitable approach. Also, this approach is not consistent with the approach taken for other benefits evaluations.

The Cornell report, while well-intentioned, does not meet the needs of stakeholders in New York, while EPA assessments do meet the needs of stakeholders in New York.

Areas of Concern in Cornell University's approach to risk assessment in the Cornell Report

- Cornell does not recognize real use patterns on current labels (how farmers use the products) due to a flawed risk assessment process. This is problematic because it fools the public into believing it is legitimate scientific information as it pertains to what a risk assessment, by law, actually is. Due to the lack of documentation, it is unclear from the report whether label rates and use patterns were the only basis of consideration.
- Cornell's open literature and quality controls for risk assessments do not meet the rigorous process needed to ensure uniform, high quality data.
- The Cornell report's "risk assessment" does not always account for potential exposure or explain how conclusions were made.
- The Cornell report's authors displayed lack of understanding of systemic vs. foliar uptake.
- The Cornell report has very limited economic analysis of value of neonicotinoids.
- The Cornell report was not able to provide large amount of field data from New York to demonstrate utility in the state. Relied on regional and national data.
- There is a disconnect between methodology of how risks and benefits were calculated (chemical specific vs. class of chemistry/crop specific vs general use).

- The Cornell report does not consider EPA conclusions that seed treatments are low risk to pollinators.[26]
- Efficacy trials – Claims of no yield increases shows a flawed analysis.
- The Cornell report does not consider other economic decisions relative to costs of using seed treatments and other seed technologies.
- Seed Treatment Stewardship – the Cornell report did not acknowledge dust risk mitigation.

Protecting Our Environment Matters

Neonicotinoids help reduce overall insecticide use and maintain environmental sustainability:

- **Without neonicotinoids, farmers would have to rely on other chemicals** (mainly pyrethroids and organophosphates) and would dramatically increase their insecticide usage.
- In commodity crops, **1 pound of neonicotinoid lost would be replaced with nearly 5 pounds of other chemicals**, resulting in an **increase in application rate per acre of 375 percent**[27].
- U.S. cropped land would increase between 340,000 and 410,000 acres to offset losses in yield and quality, **much of which would come from the Conservation Reserve Program**, environmentally sensitive land established to preserve water, soil and wildlife.
- If neonicotinoids were no longer available, unintended environmental consequences could emerge, such as:
    - **Accelerated losses of pollinators and other beneficial insects** due to the increased use of alternative broad-spectrum foliar sprays.
    - Increased acreage devoted to farmland to compensate for crop losses, **leading to less available forage for pollinators and refuge for other beneficial insects.**
    - Decline in the use of cover crops due to increased tillage to disrupt soil pests now controlled by seed treatments, **resulting in increased soil erosion, run-off and loss of habitat for wildlife.**
    - I**ncreased dependence on older chemicals**, resistance development and impact to invasive species management programs.

The New York Department of Environmental Conservation's (DEC) Mission is: "To conserve, improve and protect New York's natural resources and environment and to prevent, abate and control water, land and air pollution, in order to enhance the health, safety and welfare of the people of the state and their overall economic and social well-being."

DEC's goal is to achieve this mission through the simultaneous pursuit of **environmental quality, public health, economic prosperity and social well-being**, including environmental

[26] "Proposed Interim Registration Review Decision for Neonicotinoids" Pollinator Protection, United State Environmental Protection Agency, https://www.epa.gov/pollinator-protection/proposed-interim-registration-review-decision-neonicotinoids

[27] The Value of Neonicotinoids in North American Agriculture: Executive Summary" https://aginfomatics.com/uploads/3/4/2/2/34223974/executive_summary_neonicotinoids.pdf

justice and the empowerment of individuals to participate in environmental decisions that affect their lives.

Responsible Use of Noenicitinoid Pesticides Is a Win-Win for DEC, communities, and the farming economy

The responsible use of neonicotinoids helps DEC live its stated mission **and** its simultaneous pursuit of socio-economic well-being for its citizens:

Economic Value

- Neonicotinoids add billions of dollars of value and jobs in North America; their loss would negatively impact farmers, families, communities, and the economy.

Importance to Integrated Pest Management (IPM)

- Neonicotinoids are cornerstones of modern integrated pest management (IPM); their loss would undermine the very practices that help keep destructive pests in check and limit tools available to applicators

Invasive Species

- There are few alternatives to neonicotinoids to stop invasive species, which if left unchecked, can have a devastating impact on commerce and entire communities

Yield & Quality

- Farmers need options and rely on a toolbox of technologies to optimize crop yield and quality; removing any one of these tools could prove detrimental, or force them to resort to less effective and/or harsher alternatives

Unintended Consequences

- A loss of neonicotinoids would have a serious impact on soil, water and pest management practices, including the loss of land used for wildlife conservation

About Growing Matters

Growing Matters is a coalition of organizations and individuals committed to scientific discourse on the stewardship, benefits and alternatives of neonicotinoid insecticides in North America. BASF, Bayer CropScience, Syngenta and Valent U.S.A. LLC are leading this coalition with support from Mitsui Chemicals Agro, Inc.

In 2013, the companies jointly commissioned a comprehensive evaluation of the economic and societal benefits of neonicotinoid insecticides to North American agriculture, as well trees, turf and landscape & production ornamentals. AgInfomatics, LLC, an independent agricultural consulting firm established in 1995 by professors from the University of Wisconsin-Madison and Washington State University, conducted the research and published a series of reports and resource materials.

Risk Assessment Approach - A Comparison of EPA and the Cornell University Neonicotinoids Report

In June 2020, Cornell University released a new report titled *Neonicotinoid Insecticides in New York State – economic benefits and risk to pollinators*, claiming that the report is a risk assessment. Below is an analysis of the U.S. Environmental Protection Agency's (EPA) risk assessment process, as compared to the methods used by Cornell University to put together their report.

Example: Risk Assessment for Honey Bees

Risk Assessment Standards	EPA	Cornell University	Notes
Definition of Risk	✓	✗	**EPA:** Compares exposure to toxicity in a defined manner. **Cornell:** Comparison of exposure to risk is inconsistent and unclear and sometimes is not even made. Frequently, only toxicity is considered.
Data Quality	✓	✗	**EPA:** Strict data quality standards including availability of raw data. **Cornell:** Uses open literature studies without consideration of data quality.
Multi-Tiered Approach	✓	✗	**EPA:** Begins with consideration of laboratory studies and default exposure estimates to individual bees, moving on to field studies and hive effects in order to create an increasingly more realistic risk assessment. **Cornell:** Combines all identified residue data and effects endpoints without consideration of whether the data are relevant to colony level.
Assessment of Active Ingredient and Individual Products	✓	✗	**EPA:** Reviews both the class of pesticide and individual products, taking into account differences. **Cornell:** Makes conclusions across entire class with no consideration for individual active ingredients.

This is just one area of the Cornell University report that is concerning. Cornell claims that their risk assessment goes beyond what is on the label, when they have actually used a flawed process. The information presented in the report looks similar to a scientific risk assessment, which is problematic when presented to any audience without a science background.

So, why is this concerning?

- Cornell's report was not a true risk assessment because it does not properly compare exposure to toxicity. The dose makes the poison!
- Cornell's report uses inappropriate endpoints. Open literature data and quality controls by Cornell for risk assessments do not meet rigorous process needed to ensure uniform, high quality data.
- Cornell's report was not a true risk assessment since it stops at Tier 1 (screening level). The report did not consider real world scenarios. This is important because screening level assessments use conservative assumptions, and do not take into account actual usage data.
- Generalizations were made across the neonicotinoid class about risks that might not be applicable to all of the neonicotinoids.

The Cornell report demonstrates the use and importance of neonicotinoids in New York, but it <u>should not</u> be regarded as a rigorous regulatory risk assessment.

June 22, 2020
P O Box 96
Pembroke, MA 02359

Taryn Lascola-Miner
Director, Crop and Pest Services
Massachusetts Department of Agricultural Resources
251 Causeway St
Suite 500
Boston, MA 02114-2151

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

Dear Director Lascola-Miner,

I am writing to comment on the results of the **2019 Neonics Scientific Literature Review** that was mandated in the **FY20 Budget**.

The review determined that 42 of 43 of the impact-based studies reviewed cited neonicotinoid insecticides as a major contributor to pollinator declines. The review also specifically states that the only studies that had mixed results were industry-funded. These findings are consistent with the overwhelming body of peer reviewed scientific research, worldwide, showing that neonicotinoids are clearly implicated in the unsustainable losses of managed bees and native pollinators.

The findings of this Literature Review are consistent with numerous global studies and demonstrate, along with other factors listed below, that restrictions on neonicotinoid use in Massachusetts are clearly warranted:

- A recent study found that U.S. Agriculture is 48 times more toxic to insect life than it was in the early 1990 and that neonicotinoids account for more than 90% of that increase.
- 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.
- While the EPA has failed to take significant action to curb the use of neonicotinoids, the European Union has instituted a full ban. Most significantly, early data from the United Kingdom shows that a seven-year-old neonicotinoid ban on oilseed crops has not negatively impacted crop production even as overall insecticide use has decreased. 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.

- Neonicotinoids are also a suspected contributor to the massive North American bird population losses over the last several decades. Neonicotinoid-coated crop seeds blanket agricultural areas—a single seed can contain enough active ingredient to kill a quarter-million bees or more —and eating just one such seed is enough to kill some songbirds. Even at low doses, neonicotinoids can harm birds' immune systems, fertility, and navigation, and cause rapid weight loss, thereby reducing birds' chances of surviving in the wild.
- 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 mammalian wildlife.
- Other research suggests that people exposed to neonicotinoids may similarly be at increased risk of developmental or neurological damage, including malformations of the developing heart and brain, memory loss, and finger tremors. These results raise special concern given that neonicotinoid exposure is often difficult or impossible to avoid. Conventional drinking water treatments do not remove neonicotinoids from contaminated water, and neonicotinoid residues have been found to contaminate produce and baby food. Because neonicotinoids are systemic and therefore permeate foods, they cannot be washed off.

While the Literature Review is limited to impacts on pollinators, the evidence for why we need strong restrictions on the use of neonicotinoids goes well beyond their effects on pollinators.

I therefore request that MDAR take immediate action to implement the restrictions on the use of neonicotinoids in the Commonwealth of Massachusetts that are detailed in Representative Carolyn Dykema's bill, **H.763 – An Act to protect Massachusetts Pollinators**. The states of Maryland, Connecticut and Vermont have passed legislation like H.763. New Jersey and other states have similar legislation pending. It is only a matter of time before this legislation is enacted in Massachusetts.

MDAR has an opportunity here to step up, do the right thing and, in the process, save the pollinators that will die while the legislative process plays out. This action would also help to heal the relationship between the beekeeping community and MDAR. It is a win for both sides

Sincerely,

Clifford R. Youse

Confront polluters. Seed solutions.

December 10, 2020

Michael Moore, Chair
Pesticide Board Subcommittee
Department of Public Health
305 South Street Boston, MA 02114

John Lebeaux, Commissioner
Department of Agricultural Resources
251 Causeway Street
Jamaica Plain, MA 02130

From: Megan Stokes, Community Action Works Campaigns
Re: Scientific Review of the Impacts of Neonicotinoid Pesticides on Pollinators

Community Action Works is an environmental public health group based in Boston and Northampton, empowering everyday people who are most impacted by environmental problems. We work side by side with communities to give them the training and skills to make change in their own backyard, becoming leaders in the fight against environmental threats.

Every year we get calls from folks all over the region concerned about the dangers of pesticides and how it can negatively impact their communities. Everyday people are sending a clear message that we need to confront toxic pesticide use in Massachusetts and fight for change. We have been able to build coalitions and collaborate with local residents all over the state to reduce pesticide use. For example we worked with residents from Hilltown to Boston to stop pesticide sprays along the Mass Highways and in Jamaica Plain to prevent sprays along rail lines. Clearly, pesticides are not only a hot topic in the scientific and environmental communities but also are concerns of Massachusetts residents.

As your own review of the scientific literature has shown, research has definitively proven the connection between pesticide use, namely neonicotinoids, and the decrease of bee populations. The negative effects of neonicotinoids have also impacted other insects and mammal life, the scientific research consistently proving the harm of this pesticide. The negative effects of pesticides is clear in how it affects animal populations, especially bees, and this in return has an effect on our food system and health.

COMMUNITY ACTION WORKS

Confront polluters. Seed solutions.

Pesticides have detrimental health effects, which can include impacts on the nervous system, irritation of skin and eyes, disruption of hormones, and cancer.[1] Research also indicates that people living in rural communities have higher rates of pesticide exposure than those living in urban areas.[2] Farmworkers in particular have high levels of pesticides exposure, and as a result suffer short and/or long term health consequences including stinging eyes, rashes, blisters, dizziness, infertility, birth defects, neurological disorders, and cancer.[3]

Pesticides don't just stay where you spray them and stop at town lines. Nor do they only harm their intended targeted weed or pest. It is important that we address these issues on the state level. Pesticides not only threaten the fabric of our food system, but have lasting health effects, especially for those living in ground zero for pesticide spraying. Residents in rural communities and the farmworkers who work in proximity to these toxins cannot be forgotten: we need policy and leaders that advocate for *everyone*.

We thank the Departments of Public Health and Agricultural Resources for their work on this issue and hope that it will move you to strictly regulate toxic pesticides like neonicotinoids for the sake of protecting bees and other animals, as well as everyday people who are wrongly forced to suffer the consequences of pesticides.

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[1] https://www.epa.gov/pesticide-science-and-assessing-pesticide-risks/human-health-issues-related-pesticides#What

[2] https://www.cdpr.ca.gov/docs/dept/comguide/effects_excerpt.pdf

[3] Calvert, G.M., Karnick, J., Mehler, L., Beckman, J., Morrissey, B., Sievert, J., Barret, R., Lackovic, M., Mabee, L., Schwartz, A., Mitchell Y., & Moraga-McHaley, S. (2008). Acute pesticide poisoning among agricultural workers in the United States, 1998-2005. American Journal of Industrial Medicine, 51(12), 883-898.
Sanborn, M., Cole, D., Kerr, K., Vakil, C., Sanin, L.H., & Bassil, K. (2004).

From:	Colin Antaya
To:	LaScola, Taryn (AGR)
Cc:	Sara Dewey
Subject:	Neonicotinoid Scientific Literature Review written testimony
Date:	Thursday, December 10, 2020 3:04:20 PM
Attachments:	Outlook-5m5mbsq2.png Conservation Law Foundation Neonic Lit Review Comments 3.20.20.pdf

Hi Taryn,

I'm following up CLF's oral testimony this morning at the neonicotinoids public hearing with written testimony that we submitted in March 2020. Given the passage of time, I wanted to make sure that the Subcommittee still had these written comments.

Thank you,
Colin

Colin Antaya
Legal Fellow
CLF Rhode Island
Pronouns: he/him/his

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For a thriving New England

CLF Massachusetts
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www.clf.org

March 20, 2020

Chair Michael Moore
Pesticide Board Subcommittee
Massachusetts Department of Agricultural Resources
251 Causeway Street, Suite 500
Boston, MA 02114-2151

Re: Neonicotinoid Scientific Literature Review

Dear Chair Moore and Members of the Subcommittee,

Thank you for the opportunity to comment on the Pesticide Board Subcommittee's scientific literature review of neonicotinoid pesticides. Conservation Law Foundation (CLF) applauds the Massachusetts Department of Agriculture (MDAR) for its science-based approach to addressing the critical issue of neonicotinoid use in the Commonwealth. The results of the literature review show unreasonable adverse effects from the current use of neonicotinoids. It is time to take steps to limit the use of this harmful class of pesticides.

CLF is a nonprofit, member-supported regional environmental organization working to conserve natural resources, protect public health, and promote thriving communities for all in the New England region. CLF supports sustainable agriculture in the Commonwealth for the many health, environmental, and economic benefits it provides our communities. We support common sense reductions in pesticide use that protect the public and environmental health.

Pollinators Are at Risk from Neonicotinoids

The purpose of the neonicotinoids scientific literature review is to determine whether current uses of neonicotinoids pose "unreasonable adverse effects to the environment as well as pollinators," and whether the current registered uses should be amended.[1] According to state regulations, an unreasonable adverse effect on the environment is an "unreasonable risk to man or the environment, taking into account the economic, social and environmental costs and benefits of the use of any pesticide."[2] The study provides clear evidence that neonicotinoids do pose an unreasonable risk to pollinators and should be restricted in the Commonwealth.[3]

[1] General Appropriations Act of 2020, H. 4000 § 2(2511-0100).
[2] 333 CMR 2.03.
[3] Memorandum, Pesticide Literature Compilation Approach and Results, IEC 1 (Dec. 2019), https://www.mass.gov/doc/neonics-scientific-literature-review-december-2019/download.

clf

conservation law foundation

Massachusetts' agricultural sector is heavily reliant on pollinators. Nationwide, about 75% percent of the food supply relies on pollinators.[4] A small number of crops are capable of wind pollination, including commodity crops like corn, wheat, rice, and soybeans.[5] However, fruiting food crops rely on pollinator assistance.[6] While large monoculture farms typically grow wind-pollinated crops, Massachusetts' agriculture economy is mostly made up of small and mid-sized farm operations that grow a diverse array of pollinator-reliant crops.[7] This makes Massachusetts farmers especially dependent on a healthy population of bees and other pollinators.

According to the review, pollinator exposure to neonicotinoids can result in a range of harms, from hindering bees' ability to navigate and pollinate to causing sudden death.[8] Impaired navigation has a detrimental impact on the hive's ability to source and share food, leading to a weaker bee population and increased susceptibility to disease and death.[9] The studies also found that reproductive function and development were harmed from non-lethal exposures.[10] Collectively, these harms have led to increased instances of colony collapse.[11]

Despite the importance of pollinators for our farmers and the harms caused by neonicotinoids, bees in the Commonwealth are exposed to these pesticides at high levels. The literature review found extensive evidence that exposure to neonicotinoids "adversely affect(s) a range of pollinator species important to the Commonwealth of Massachusetts."[12] For example, one study included in the review found that 72% of honey samples collected in the Commonwealth in 2016 contained neonicotinoids.[13] The literature review contains plentiful evidence that the continued use of neonicotinoid pesticides imposes an unreasonable adverse effect on pollinator health as well as an economic burden on Massachusetts farmers.

[4] Christopher Moffat et al., *Chronic Exposure to Neonicotinoids Increases Neuronal Vulnerability to Mitochondrial Dysfunction in the Bumblebee (Bombus Terrestris)*, FASEB J. 2112, (2015); Center for Pollinator Research, *What Are Pollinators and Why Do We Need Them?* PENN. STATE C. AGRIC. SCI., https://ento.psu.edu/pollinators/resources-and-outreach/what-are-pollinators-and-why-do-we-need-them (last visited Feb. 20, 2020).
[5] Catherine Headly, *Honey Bees & Neonicotinoids: Why Pollinators Need More Protections*, 38 N. Ill. U. L. Rev. 134, 137 (2017).
[6] Center for Pollinator Research, *What Are Pollinators and Why Do We Need Them?* PENN. STATE C. AGRIC. SCI., https://ento.psu.edu/pollinators/resources-and-outreach/what-are-pollinators-and-why-do-we-need-them (last visited Feb. 20, 2020).
[7] *Agricultural Resources Facts and Statistics*, COMMW. MASS., https://www.mass.gov/info-details/agricultural-resources-facts-and-statistics (last visited Mar. 6, 2020) (including a chart depicting the most commonly farmed crops in the Commonwealth); Catherine Headly, *Honey Bees & Neonicotinoids: Why Pollinators Need More Protections*, 38 N. Ill. U. L. Rev. 134, 137 (2017).
[8] Sydney A. Cameron & Ben M. Sadd, *Global Trends in Bumble Bee Health*, 65 ANN. REV. ENTOMOLOGY 209, 220-21 (2020); Danica Baines et al., *Neonicotinoids Act Like Endocrine Disrupting Chemicals in Newly-Emerged Bees and Winter Bee*, SCI. REP., Sept. 8, 2017, at 2, 5, 6.
[9] Cameron, *supra* note 8, at 222.
[10] Nicholas L. Anderson & Alexandra N. Harmon-Threatt, *Chronic Contact with Realistic Soil Concentrations of Imidacloprid Affects the Mass, Immature Development Speed, and Adult Longevity of Solitary Bees*. SCI. REP., Mar. 6, 2019, at 6.
[11] Cameron, *supra* note 8, at 209.
[12] Memorandum, Pesticide Literature Compilation Approach and Results, IEC 8 (Dec. 2019), https://www.mass.gov/doc/neonics-scientific-literature-review-december-2019/download.
[13] Chensheng (Alex) Lu et al., *Distributions of Neonicotinoid Insecticides in the Commonwealth of Massachusetts: A Temporal and Spatial Variation Analysis for Pollen and Honey Samples*, 13 ENV'TL CHEM. 4, 4 (2016).

conservation law foundation

The Commonwealth Must Restrict Neonicotinoids

Given the risks identified in the literature review, CLF recommends that the Subcommittee and the Commonwealth take action to restrict the use of neonicotinoids. First, the Subcommittee should revise current neonicotinoid approvals as required under 333 CMR 8.03. Specifically, the Subcommittee should consider limiting neonicotinoid application by disallowing residential use in favor of licensed applicators, restricting seed treatment practices, and requiring individual approvals prior to each use.

Second, the Commonwealth should work towards the passage of two bills: an Act to Protect Massachusetts Pollinators (H. 763) and an Act to Protect Pollinator Habitat (H. 818 / S. 497). Together, these bills will protect pollinator health through swift action to regulate the use of neonicotinoid insecticides in the Commonwealth while also creating a mechanism for stakeholder engagement on this critical and evolving issue.

In order to ensure successful protection against unreasonable adverse effects, the Commonwealth should consider additional steps to protect pollinators. For example, the Commonwealth could develop a compulsory apiary health monitoring system. Developing a mandatory apiary monitoring program could improve bee health tracking and inform further legislative and regulatory action.[14] We encourage the Commonwealth to use the robust findings of this scientific review to inform data driven, common sense protections for pollinators.

Thank you for your consideration. Please do not hesitate to be in touch if we can provide any additional information.

Sincerely,

Sara Dewey
Staff Attorney & Director of Farm and Food Initiative
Conservation Law Foundation
62 Summer Street
Boston MA 02110-1008
Tel: (617) 850-1702
E-Mail: sdewey@clf.org

[14] Connecticut and Vermont have passed legislation that requires the state to develop an apiary health monitoring system specifically geared towards assessing the impact neonicotinoids. 2019 Vt. Acts & Resolves 35, § 3; 2016 Conn. Acts 17, § 15 (Reg. Sess.).

From: Adam Stark
To: LaScola, Taryn (AGR)
Subject: Neonicotinoid pesticide use review comment
Date: Friday, November 27, 2020 3:09:19 PM

To whom it may concern,

Please add my voice (and by extension, the voice of our business, representing 50+ employees working through the pandemic) to the chorus of those concerned about the overuse of neonicotinoid pesticides in Massachusetts.

Yes, I understand that curtailing the use of neonicotinoids may make life harder for farmers, *in the short term*. It may marginally decrease yields and crop resilience *in the short term*. However, in the long term, we will be building a more resilient and sustainable agriculture system. It's all about long-termism. I encourage MDAR to consider the long term of agriculture in this state, and to curtail the use of neonicotinoid pesticides.

Thank you,

A quarter century as your natural grocer, and now the 2015 Retailer of the Year, for the natural products industry, for the USA. (Plus, other awards).

Adam Stark | Chief Miscellaneous Officer

Debra's Natural Gourmet

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www.DebrasNaturalGourmet.com | www.facebook.com/debrasnaturalgourmet

From: Ed Stockman
To: Lebeaux, John (AGR); Moore, Michael (DPH); Adam Hinds; natalie.blais@mahouse.gov; LaScola, Taryn (AGR)
Cc: carolyn.dykema@mahouse.gov; internet, env (EEA)
Subject: Neonics Scientific Literature Review Comments
Date: Tuesday, December 15, 2020 10:28:26 AM
Attachments: image001.png

Regeneration Massachusetts
Educating consumers about regenerative agriculture.
131 Summit Street,
Plainfield, MA 01070

December 14, 2020

RE: Neonics Scientific Literature Review Comments

Dear Pesticide Board Subcommittee Chair Michael Moore, Commissioner John Labeaux and Subcommittee Members:

On behalf of the almost 6500 Facebook followers of Regeneration Massachusetts, I offer these comments. Regeneration Massachusetts is a statewide organization dedicated to educating consumers about healthy, carbon-capturing soils associated with regenerative organic agriculture and the critical role they play in human nutrition and in mitigating climate change. Follow us on Facebook at https://www.facebook.com/marighttoknowgmos/.

Farmers, including beekeepers, have known for years that Neonics negatively impact both domestic and wild, native pollinator populations. Farmers who want to keep Neonics in their toolbox have an incomplete understanding of the importance of pollinators to crop production. Pollinators are essential to produce high yields of many crops grown in Massachusetts. Just as farmers depend on pollinators, the residents of Massachusetts depend on the Pesticide Board Subcommittee to make science-based decisions about the benefits and risks of certain pesticides.

After attending several Pesticide Board Subcommittee meetings, it's apparent the subcommittee relies much too heavily on data provided by the USEPA. As it relates to pesticides, Trump's EPA has been dysfunctional at best and nonfunctional (silent) at worst. Pesticide data provided by the USEPA and pesticide corporate representatives does NOT provide enough reliable information for a comprehensive, independent review process. Just as consumers depend on pollinators for an abundant food supply they also depend on the Pesticide Board Subcommittee to make knowledgeable, competent decisions about pesticides.

The USEPA limits their assessment of a pesticide to the active ingredients in a pesticide formulation. To protect the environment, pollinators and the residents of Massachusetts it's critical that the entire pesticide formulation be assessed for risks - not just the active

ingredients. Look at the situation of the "forever chemicals" being sprayed along with approved mosquito- killing pesticides in several communities in Massachusetts. A comprehensive, independent review process would prevent such calamities from happening.

For some reasons, the Pesticide Board Subcommittee, has lost its mandated focus as described in 333 CMR 8.03, - "The subcommittee shall individually review for registration and classification those pesticides with an active ingredient or use pattern which the Subcommittee determines may cause unreasonable adverse effect(s) on the environment when used in accordance with label directions." During the Pesticide Board Subcommittee meetings I attended there was little to no questions asked about the pesticide being reviewed and certainly no mention or concern about adverse effect(s) on the environment. It's essential that the subcommittee take their responsibility to protect the environment and citizens of the Commonwealth seriously.

The Neonics literature review conducted by **Industrial Economics** is clear. The science is clear. Farmers and citizens of Massachusetts depend on the Pesticide Board and the Pesticide Board Subcommittee to make science-based decisions about pesticides. It's obvious that Neonics pesticides require additional regulations that include a ban in Massachusetts.

Thank you for considering these comments.

Sincerely,
Regeneration Massachusetts

Ed Stockman, M.S.
Agrobiologist

From:	Elise Barry
To:	LaScola, Taryn (AGR)
Cc:	Karl - Charter
Subject:	neonicotinoid insecticides
Date:	Saturday, December 12, 2020 2:20:31 PM

Dear Taryn LaScola-Miner,

We heartily support any effort to limit or eliminate the use of neonicotinoid insecticides. We have a relative who is a bee-keeper so we have been following the studies about their ill effects for years. We are delighted, as naturalists and members of the Massachusetts Butterfly Club, the New England Entomological Society, and other nature organizations, that Massachusetts is stepping up to meet the science with action.

Thank you for your efforts,
Elise and Karl Barry
South Gulf Road
Belchertown, MA

From: e2huber@verizon.net
To: LaScola, Taryn (AGR)
Cc: Ernest Huber
Subject: Comments on Bill H763
Date: Monday, December 14, 2020 10:37:57 PM
Attachments: Oct 2019 Mass pesticide testimony.doc.docx

Dear Ms Lascola,

I was heartened by the hearing sponsored by the Massachusetts Pesticide Regulatory Committee on 12/10/2020 where public comment was received mostly about the Dykema bill H763. There seemed to be a general consensus that the neonics are harming our pollinators and that something needs to be done to curb the exponential growth of these long lasting dangerous chemicals.

I support immediate passage of bill H763 as an important first step in the right direction.

I am attaching testimony that I submitted last year on this bill.

Thank you,

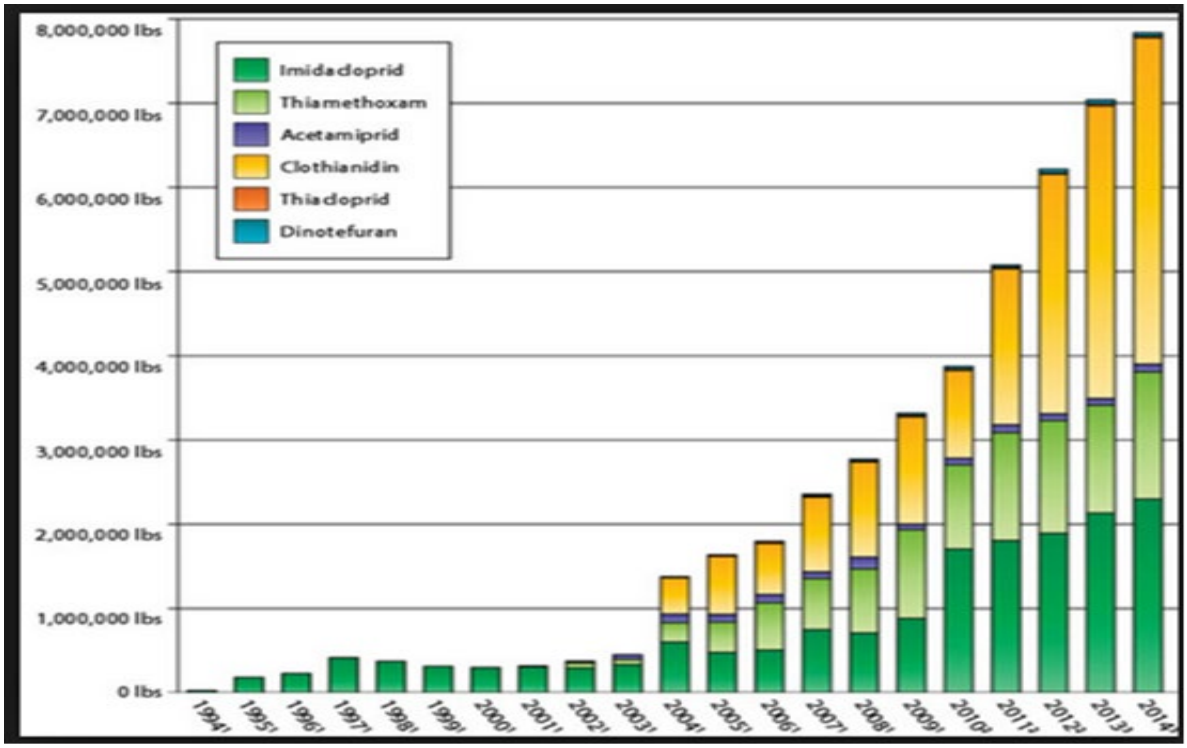
Ernie Huber

11/13/2019

RE: Massachusetts Bill H763 to Protect Massachusetts Pollinators

Dear Honorable Senators and Representatives of the Environment, Natural Resources and Agriculture Committee,

My name is Ernest Huber and I have been keeping between 1 to 10 colonies of bees in Carlisle, MA for 42 years. The health of bees is very different now from 42 years ago. Some of this difference has been unavoidable- our global economy resulting in the accidental introduction of foreign mites and foreign gut diseases like nosema. But some of the difference has been due to our own ove- use of new chemical systemic pesticides, fungicides , and herbicides. There is much recent evidence, for instance, that low level neonicotinoids in the environment can harm bees' immune system so that they are less able to fight the standard diseases like nosema. These effects are measureable at concentrations of only a few ppB and are bound to only get worse unless we act. A graph of the alarming exponentially growing use of neonicotinoids (from Pesticide Action Network) is shown below. Imidacloprid, the bar in green , is the most widely used pesticide in the world and is one of the most powerful in its effect on pollinaors. Some of these pesticides have very long life in the environment. This exponential growth is very frightening and needs to be reined in.



I believe the chemical problems for bees started in Carlisle in 2006, which, for me, was a watershed year. Before 2006 annual losses were low typically 10 % and annual honey yields were high- typically 70

lbs per hive or more. After 2006 colony losses have been very high , 30 to 100% and honey yields quite variable but averaging about only 10% of what they used to be before2006. Many Carlisle beekeepers have lost all their hives in one season. One Carlisle beekeeper said that he knows 12 other beekeepers who lost all their hives in each of the past two winters. There is a lot of variation from year to year and apparently this year , 2019, might be shaping up to be a major rebound in honey production. But the jury will still be out on sustainability until next Spring. Everyone could still encounter major losses this Winter. It is not just honeybees that are at risk here. It has been shown that native pollinators, like bumblebees are even more affected by exposure to low level neonicotinoids

There are two major sources of systemic pesticide contamination in Carlisle. One is some commercial corn fields that use neonicotinoid coated corn seeds. The other are professionally maintained lawns that use neonicotinoid grub control products. All of the beekeepers I know who keep bees near the cornfields have not been able to maintain colonies on a sustainable basis. One particularly troublesome spot is near the cranberry bog, which happens to also be near one of the commercial corn fields. There have been several beekeepers that have tried managing up to 30 or so hives at this location over the years without success. Back in 2008-2010 one of these beekeepers told me that he thought GMO corn pollen was responsible for the winter deaths of his colonies. I doubted that but then it turned out that Monsanto's GMO corn seed product was not able to fend off its attacking bugs so that was when Monsanto started coating its corn seed with neonicotinoids .

In my opinion bill H763 does not go far enough to decrease the use of neonicotinoids but they are a step in the right direction. Even better would be to place an outright ban on the use of all neonicotinoids such as the European Union has done. I believe Sen Eldridge's bill, S463, may have this kind of language in it but I haven't looked into it.

I urge the Massachusetts legislature to pass Rep Dykema's bill, H763, -An Act Protecting Massachusetts Pollinators to make Massachusetts a leader in pollinator protection for the sake of our food systems and protecting the diversity health of our native pollinator species.

Very Truly,

Ernest E. Huber Jr.

90 year old retired physicist and longtime hobby beekeeper

15 Partridge Lane

Carlisle, MA 01741

978-369-6678

From:	Maria Bartlett
To:	LaScola, Taryn (AGR)
Cc:	gardenclubfedma@gmail.com
Subject:	Neonicotinoid Use in MA: Pesticide Literature Review FY2020 Testimony
Date:	Monday, December 14, 2020 9:49:56 PM
Attachments:	Neonic letter to MDAR.docx

Director Lascola,

Please see the attached testimony submitted by the Garden Club Federation of Massachusetts relative to the Pesticide Board Subcommittee Literature Review and further restrictions on the use of neonicotinoids in Massachusetts.

Maria Bartlett
Environmental Awareness Chair
Garden Club Federation of Massachusetts

December 15, 2020

RE: AGR-Pesticide-Literature-Review-FY20 and the regulation of neonicotinoids in MA

Dear Director Lascola-Miner,

We are writing today regarding the AGR-Pesticide-Literature-Review-FY20 and whether the Pesticide Board Subcommittee and DOAR should alter the current use of neonicotinoids in Massachusetts.

The Garden Club Federation of Massachusetts represents 170 garden clubs across Massachusetts and over 10,000 club members. Our mission includes a Conservation Pledge whereby we pledge "**to protect and conserve the natural resources of the planet Earth and promise to promote education so we may become caretakers of our air, water, forests, land, and wildlife."** Based on that Pledge, we are writing to you today on behalf of the Garden Club Federation of Massachusetts to encourage the adoption of restrictions on the use of neonicotinoids in Massachusetts.

First of all, we greatly appreciate the Department of Agricultural Resources' laudable execution of its 2019 Neonics Scientific Literature Review ("Literature Review"). It was thorough and extensive.

We noted that the Review found that a broad majority of impact-based studies reviewed (42 of 43) cited neonicotinoid insecticides ("neonics") as a contributor to pollinator declines. Further, the Review found that the only studies with mixed results were industry-funded and not transparent. This Literature Review is consistent with several global studies that have found adverse impacts of neonics on pollinators.

However, the Literature Review did not provide policy recommendations with respect to neonicotinoids, so we appreciate this opportunity to underscore the concerns stated in the report, to provide additional concerns beyond the scope of pollinator impacts, and to provide specific policy recommendations for your consideration. Although we support the policy recommendations contained in H724, rather than wait for that 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.

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] 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.(ii) For these reasons, while our EPA has failed to take significant action to curb the use of neonicotinoids, the European Union has instituted a full ban.

Furthermore, while the Literature Review provides only one aspect (effect on pollinators) of why restricting neonicotinoid use is so important in the Commonwealth, the evidence shows that neonicotinoids pose a severe threat to other wildlife, including mammals. Neonicotinoids are a suspected contributor to the massive North American bird population losses over the last several decades.[iii] 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.[iv]

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 mammalian wildlife.[v]

Other research suggests that people exposed to neonicotinoids may similarly be at increased risk of developmental or neurological damage, including malformations of the developing heart and brain, memory loss, and finger tremors.[vi] These results raise special concern given that neonic exposure is often difficult or impossible to avoid. Drinking water treatment generally does not remove neonics from contaminated water,[vii] and neonic residues have been found to commonly contaminate produce and baby food.[viii] Because neonics permeate foods, they cannot be washed off.

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 neonicotinoid-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 municipal property.
- Significantly increase buffer zones for use near waterways.
- Ban aesthetic-only uses of neonicotinoids, even by licensed/certified applicators.
- 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.

A major campaign of the GCFM is a 2-year focus on our Native Plant Challenge. We have undertaken this campaign to educate and encourage our members to increase the number and variety of Native Plants in their home landscapes in order to support our pollinator populations. The use of neonicotinoids in the environment is counterproductive to this effort. Furthermore, it is not possible for our gardeners to know with any certainty which plants for sale at nurseries and other outlets HAVE NOT

been treated with neonicotinoids without the labeling requirement! How can we avoid neonics if we do not know which plants have been treated?!

We want to again thank you for this opportunity to share our concerns about the impacts of pesticides on our ecosystems and our health. We are grateful to see the Department taking a much-needed look at the impacts of neonicotinoids and we are counting on the Department of Agriculture Resources to protect the health and ecological integrity of our Commonwealth.

Jill Malcolm
First Vice-President

Maria Bartlett
Environmental Awareness Chair

Garden Club Federation of Massachusetts
400 Fifth Avenue, Suite 110
Waltham, MA 02451

[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 FranciscoSánchez-Bayoa and Kris A.G.Wyckhuysbc. *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

[iii] *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/2kTTrnc.

(iv) *See*; Ana Lopez-Antia et al., *Imidacloprid-Treated Seed Ingestion Has Lethal Effect on Adult Partridges and Reduces Both Breeding Investment and Offspring Immunity*, Envtl. 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.

[v] 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

[vi] 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.

[vii] 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.

[viii] *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/2IlE26V (visited Oct. 9, 2019).

December 15, 2020

Massachusetts Pesticide Board Subcommittee
Department of Agricultural Resources
251 Causeway Street
Boston, MA 02114

Re: Pesticide Literature Compilation Approach and Review (AGR – Pesticide Literature Review – FY20)

Chairman Moore and Members of the Subcommittee,

My name is Karen Connelly, I am the Executive Director of the Green Industry Alliance. The Green Industry Alliance is comprised of the Massachusetts Arborists Association (MAA), the Massachusetts Association of Landscape Professionals (MLP), the Massachusetts Association of Lawn Care Professionals (MALCP), the Irrigation Association of New England (IANE), and the Golf Course Superintendents Association of New England (GCSANE). Their mission is to promote awareness and educate the public and elected officials in the Commonwealth on best practices and professional standards in integrated pest management, lawn care and turf management, landscape design and maintenance, arbor care and irrigation, and golf course care.

We welcomed the opportunity to meet with Rep. Dykema, and then initiate the Review of Literature on the effects of Neonics in the environment. Since that time, as you are aware, the very extensive 15 year review by EPA scientists has been issued with direction for applicators based upon their findings.

The significance here is that licensed applicators do take direction from scientific findings made in research and analysis by educated scientific professionals, such as the EPA, the Pesticide Board and Pesticide Board Subcommittee, here in MA. Those products designated and approved for use by homeowners are also governed by the same science.

Our associations have held many seminars on Neonics, their use, effect on pollinators and the correct ways to apply products to mitigate the effects on these creatures. An example of this is making applications when they are not active. As you are aware, Neonics were introduced to benefit the wellbeing of applicators.

We monitor the number of calls to MDAR reporting bee kills due to pesticides. There are one or two a year, none related to Lawn and Landscape activities. We follow research activity in other countries. The continent of Australia uses Neonics successfully and has a thriving bee population. The difference is they have no Varroa mites.

Our associations receive reports from your meetings. Some of us attend. We are always impressed by the high level of education, discussion, the willingness to dig deep for more information and the enthusiasm you exhibit for your areas of expertise. Massachusetts ability and desire to review chemicals already reviewed by federal authorities in an effort to protect the population is admired.

Our members often ask the question – why are the public and legislators unaware and unappreciative of the diligent job done by those in your position to safeguard both commercial applicators and the retail market? MA has a system and protocols in place to do just that and industry sectors do not see the need to release that successful system into the legislative process.

Thank you for your time and consideration,
Karen T. Connelly
Executive Director, GIA

From:	Bob Mann
To:	LaScola, Taryn (AGR)
Cc:	Stephen A. Boksanski; Malcp
Subject:	Comments on Pesticide Literature Compilation
Date:	Monday, December 14, 2020 3:26:19 PM
Attachments:	MDAR Pesticide Literature Review GIA NALP.pdf

Good Afternoon, Taryn.

Please find attached comments from the Green Industry Alliance and NALP on the neonic literature review for the Pesticide Board Subcommittee.

Thanks so much.

Bob Mann
Director of State and Local Government Relations
National Association of Landscape Professionals
12500 Fair Lakes Circle, Suite 200, Fairfax, VA 22033
Direct Dial: 508.648.8582 | NALP HQ: 800.395.2522

December 14, 2020

Massachusetts Pesticide Board Subcommittee
Department of Agricultural Resources
251 Causeway Street
Boston, MA 02114

Re: Pesticide Literature Compilation Approach and Review (AGR – Pesticide Literature Review – FY20)

Chairman Moore and Members of the Subcommittee,

My name is Bob Mann, and I am submitting comments today on the Pesticide Literature Compilation Approach and Review Memorandum as a representative of the **Green Industry Alliance** (GIA) which is comprised of the Massachusetts Arborists Association (MAA), the Massachusetts Association of Landscape Professionals (MLP), the Irrigation Association of New England (IANE), the Golf Course Superintendents Association of New England (GCSANE), and the Massachusetts Association of Lawn Care Professionals (MALCP) where I am past-president and member of the Board of Directors. Our mission is to promote awareness and educate the public and elected officials in the Commonwealth on best practices and professional standards in integrated pest management, lawn care and turf management, landscape design and maintenance, arbor care and irrigation, and golf course care.

I am also Director of State & Local Government Relations for the **National Association of Landscape Professionals** (NALP) which for over 40 years has represented tens of thousands of certified professional pesticide applicators across the United States. Tasked with providing plant health services to millions of residential and commercial clients, the core values of our association include advocating on behalf of our members as to the benefits of healthy plants in our landscapes, fostering the highest standards of professionalism, and educating both our members and the public in caring for their landscapes in an environmentally responsible way. I have been a certified pesticide applicator here in Massachusetts since the mid 1980's.

The neonicotinoid insecticides play an instrumental role in managing difficult to control insect pests in the landscape. Due to their ability to translocate within the plant systemically, a very small amount of active ingredient can be highly effective against pests – especially those which feed within plants or subterranean insects such as white grubs - while allowing many non-pests and beneficial insects that come into casual contact with the plants to avoid exposure.

The green industry welcomed the introduction of the neonicotinoids in the early 1990's as a significant improvement over the organophosphate and carbamate insecticides that were commonly in use at the time. The neonicotinoids proved to be far less toxic to humans and were quickly adopted as tools ranging from home and garden products to effective flea and tick controls on pets. Viable alternatives do exist, but most are far more toxic to the environment generally and are more indiscriminate in their effects on non-target insects.

Some review is in order before commenting on the memorandum specifically. This memorandum stems from the effort by Representative Dykema to pass Bill H.763 - An Act to protect Massachusetts

pollinators.[1] GIA & NALP appreciate Representative Dykema's willingness to engage on this issue and to entertain changes in the bill to more accurately reflect real world uses of the neonicotinoids.

NALP was privileged to join with other stakeholders including the Green Industry Alliance, RISE, Mass. Farm Bureau and the Retailers Association of Massachusetts in meeting with Representatives Dykema and Pignatelli and Commissioner Lebeaux back in May of 2019 at which Rep. Dykema floated her idea of funding this literature review. All concerned voiced support for the review as it aligned with our common approach to pesticide regulation – follow the science.

At the time of this meeting, the December 31st due date was discussed, and concern was expressed about the short time frame given the fact that the department would need to go through the procurement process for retaining a firm to do the review, and then for the memorandum itself to be produced. Indeed, it was Rep. Pignatelli himself that expressed that the date was not realistic and his doubt that the memorandum would be completed by that date.

And that was before the onset of the pandemic. Indeed, the report was complete prior to when everything ground to a complete halt in mid-March. I was invited to a meeting with Commissioner Lebeaux on March 11th at his office along with other members of the Green Industry Alliance to discuss several priorities, including this report. At the time, we expected to see a public hearing scheduled quite soon.

As we all know, life changed right after that. As a member of MDAR's Pesticide Advisory Council, I have been intimately involved in observing what Crop & Pest Services has been doing during the pandemic, and the myriad challenges to carrying out their mission. It has not been easy and claims that the department was slow rolling this public hearing are unfair and quite frankly insulting. There were far more pressing issues that required their attention.

We found the conclusion of the memorandum disappointing - not nearly in depth as it needs to be to accurately depict the risks and benefits of neonicotinoid use - but at the same time not surprising:

> ***"Although it is clear that such compounds can adversely affect a range of pollinator species important to the Commonwealth of Massachusetts, it is beyond the scope of this effort to draw conclusions as to the probability or severity of such effects under Massachusetts-relevant field conditions, or to provide policy recommendations with respect to the management, regulation, or use of neonicotinoids."***

The first paper mentioned in the memorandum was Lu (2016)[2] and was ostensibly chosen not for its excellence but rather for locus, having been published by a professor at Harvard. This paper flies in the face of the overwhelming evidence in bee research. An in-depth review of this paper can be found here[3] for reference. Focusing upon papers written in Massachusetts is not a valid criterion for establishing public policy for pesticides. Insects and insecticides do not respect political boundaries.

Also, far too much attention has been leveled at pesticide applicators to the exclusion of scrutiny of beekeepers themselves. At the June 2020 meeting of State FIFRA Issues Research and Evaluation Group (SFIREG)[4] a white paper released by the states within EPA Region 4 calls attention to the issue of pesticide misuse within the pollinator industry:

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[1] https://malegislature.gov/Bills/191/H763

[2] Lu, C., Chang, C.-H., Tao, L., & Chen, M. (2016). Distributions of neonicotinoid insecticides in the Commonwealth of Massachusetts: a temporal and spatial variation analysis for pollen and honey samples. *Environmental Chemistry, 13*(1), 4. doi:10.1071/en15064

[3] http://scientificbeekeeping.com/a-review-of-dr-lus-paper-on-neonics-in-massachusetts/

[4] https://aapco.org/2015/07/30/sfireg-3/

"Considering all the work accomplished over the last six years, there is one issue that must be brought to the forefront concerning pollinator protection and improving hive heath, and that is the willful misuse of pesticides by the pollinator industry. While we acknowledge that many members of the pollinator industry are vigilant in using pesticides correctly and only in a manner consistent with the labeling, there are significant portions of the industry have seemingly adopted pesticide misuse as common practice. We are not trying to indict an entire industry as corrupt and placing all pollinators at risk, but it is the shared experience among the states that there are many beekeepers and others within the allied industries who are actively and intentionally promoting illegal pesticide use. Most of the misuse concerns are related to products targeting varroa mites and small hive beetles." [5]

At the December semi-annual meeting of SFIREG, discussion centered around the results of a survey taken of each of the ten EPA regions asking, in part:

"Recent concern has emerged from [Region 4] states and other states about how Pollinators are managed and concerns about bee keeping practices and products that might be causing issues. What issues do you see in your state and regions with regards to managed pollinator pesticide use practices, cases, and management where education, training, and pesticide labels…"

The response from the state of North Carolina stood out:

"Beekeepers take all kind of shortcuts in the pest management. They are supported by the distribution and marketing of unregistered products. We need to take more productive enforcement actions on the practices. I have submitted a proposal to PERC to develop training and outreach materials to address the misuse of ag products in beehives. We should support our apiary inspectors by coordinating training and inspections to address these issues. Apiary inspectors are not equipped, nor do they have the authority to enforce pesticide laws. The apiary staff in NC are very concerned about the stewardship issues and believe the over-use and misuse of amitraz is contributing to pest resistance and poor health of hives."[6]

The upshot of this discussion was for SFIREG to draft an issue paper that will be submitted to EPA to address these concerns. This is not a blanket indictment of all beekeepers but simply a reminder that we must not presume to know in advance the intricacies of issues before us, to keep an open and objective mind, and of the importance of understanding and following pesticide label directions.

As we discussed at the time of Rep. Dykema's May meeting, a thorough review of the science behind the neonicotinoids is not a "couple of months - couple of bucks" undertaking. EPA is in the final stages of their own periodic fifteen-year product reregistration review for the neonicotinoids – essentially the same undertaking that was called for here except that the EPA's deliberations were far more in depth.

In the Proposed Interim Decision for Neonicotinoids[7],issued on January 17th of this year, the EPA proposed the following changes: EPA is proposing:

- Management measures to help keep pesticides on the intended target and reduce the amount used on crops associated with potential ecological risks;
- Requiring the use of additional personal protective equipment to address potential occupational risks;
- Restrictions on when pesticides can be applied to blooming crops in order to limit exposure to bees;
- Language on the label that advises homeowners not to use neonicotinoid products;

[5] https://aapco.files.wordpress.com/2020/06/pollinator-issues-in-region-4-summer-sfireg-2020.pdf
[6] https://aapco.files.wordpress.com/2020/12/region-4-sfireg-report-december-2020.pdf
[7] https://www.epa.gov/pollinator-protection/proposed-interim-registration-review-decision-neonicotinoids

- Reduction in label rates when applied to turfgrass; and,
- Cancelling spray uses of imidacloprid on residential turf under the Food Quality Protection Act (FQPA) due to health concerns

Additionally, EPA called for pesticide applicator stakeholder groups to submit to the agency Best Management Practices for the Protection of Pollinators that are appropriate to their industry. NALP was pleased to submit BMP's for both turfgrass and ornamental uses that encourage a high level of stewardship. See Appendix A for NALP's BMP.

While NALP appreciates Rep. Dykema's efforts to focus her bill more narrowly than previous versions, we cannot be in support as the premise of the bill misstates the relationship between pollinators and the neonicotinoid insecticides. Current best research is focused upon parasites such as the *Varroa destructor* mite and viral infections vectored by these mites as being the central issue in pollinator health. NALP fully supports the adoption of best management practices for pollinators as well as an integrated pest management approach to control insect pests in the landscape that take into consideration recommendations published by UMass Extension.

EPA's re-registration process is collaborative – everyone has the opportunity to weigh in regardless of one's opinion on pesticides. NALP collaborates closely with the staff at the Office of Pesticide Programs to offer assistance answering questions about the benefits and costs related to how pesticides are used by landscapers. We do not always get what we ask for, but we fully embrace EPA's decisions as stakeholders. We trust the framework for the evaluation and registration of pesticides even when we disagree with outcomes.

Our objection to Rep. Dykema's legislative efforts is simple. Whether the neonicotinoid insecticides, or any active ingredient for that matter, should be legal for use in Massachusetts is a ***regulatory*** function, not a ***legislative*** function. The legislature has already spoken in this regard through Chapter 132b establishing the framework for the regulation of pesticides within the Commonwealth that aligns with FIFRA. MDAR and the Massachusetts Pesticide Board carry out the regulatory function through 333 CMR as State Lead Agency in cooperation with EPA. The Pesticide Board Subcommittee could impose further restrictions on the sale and use of neonicotinoids today if they chose to do so.

It is our view that legislation to ban or limit either individual or groups of pesticide active ingredients advances from the false premise that pesticides are not adequately regulated or regulated at all. In my capacity at NALP, I personally attend nearly every meeting of both the Pesticide Board and Pesticide Board Subcommittee and have done so for many years. I can personally attest to the professionalism they bring to their jobs, the high level of competence and their dedication to upholding the law and regulation governing pesticides. I can tell you that the staff at MDAR is held in high regard and respected by the regulated community and by their fellow pesticide lead state agencies nationwide. We are very fortunate in Massachusetts not only to have an excellent system in place for the regulation of pesticides, but also talented experts on staff to carry this mission through.

NALP is not in favor of legislative attempts to regulate pesticides, and fully in favor of the careful and deliberate process following the established procedure for evaluating pesticides. We urge the Subcommittee to continue following the lead of EPA as the neonicotinoid reregistration process draws to a close. Thank you.

Respectfully submitted,

Robert H. Mann
Director of State & Local Government Relations
Massachusetts Certified Pesticide Applicator #1269

NATIONAL ASSOCIATION OF LANDSCAPE PROFESSIONALS

Turf & Ornamental Best Management Practices for Pollinator Protection

Introduction

Protecting pollinators is a top priority for landscape professionals because of the valuable role pollinators play in promoting a healthy ecosystem, not just in landscaping and agriculture, but to the environment at large. Landscape professionals have a special duty when using pesticides to ensure that they are used according to label directions and consistent with recommendations made by university Cooperative Extension Services.

Insecticides are a component in the implementation of integrated pest management (IPM) programs, therefore science-based practices are critical to achieving both effective control and minimizing off-target damage. Insecticides are vital tools for landscape professionals to provide healthy turfgrass and ornamental plants that the public demands but must always be used with the abundance of care and with an acute understanding of protecting pollinators.

The following best management practices (BMPs) are provided for landscape professionals to promote pollinator health when using pesticides in two key landscape application types; turf management and ornamental protection. In many instances some of the same practices and precautions are taken in both application types but these best management practices also specifically highlight the differences in the application use patterns and detail responsible practices that should be considered.

Core Best Management Practices

1. Utilize Integrated Pest Management Strategies
2. Promote Pollinator Habitat
3. Training, Education and Following All Label Requirements

It is the recommendation of NALP that landscape professionals completely read, understand and practice these recommendations and always remain in compliance with federal and state pesticide labels along with any other state managed pollinator protection plans or other federal, state or local laws.

Lastly, these BMPs are advisory in nature and written to encourage compliance and promote thoughtful pesticide applications to protect healthy green spaces while encouraging and taking appropriate measures to promote pollinator health. NALP is keenly aware that each environment and scenario may present specific circumstances that require alternate considerations and therefore these BMPs are not entirely prescriptive nor exhaustive of additional steps that should be taken. These BMPs should be used as guidance and to demonstrate the professionalism of the landscape industry and the commitment the landscape industry has towards protecting pollinator health.

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Integrated Pest Management (IPM)

Integrated Pest Management (IPM) is an effective and environmentally sensitive approach to pest management that relies on a combination of common-sense practices. IPM is a recommended approach of how landscape professionals responsibly use pesticides to protect, preserve and promote healthy green spaces. Below we detail initial consideration for both turfgrass and ornamental uses and then we further provide recommendations for each application type individually.

IPM Considerations for both turfgrass and ornamentals:

- Positively identify the target insect. Different species of insects have different susceptibilities to different insecticides. Matching a pest to the most effective and least toxic insecticide should be the goal.
- Aim to control pests not eradicate them; eradication is impossible and leads to excessive and improper use of insecticides. Follow recommended damage thresholds for insect species.
- Set reasonable expectations with customers
    - Discuss acceptable damage thresholds and when to initiate control measures
- Use non-chemical techniques whenever possible
- When a pesticide is necessary, choose the least toxic/most effective product
- Only make applications when needed to control an insect population above the damage threshold.

Apply products judiciously based on site history, observations or forecasts from relevant scientific or regulatory agencies.

IPM - Turfgrass

- Plant turfgrasses known to have pest resistance such as endophyte-enhanced cultivars, which also display enhanced resistance against environmental stresses such as drought.
- Only make applications when needed to control an insect population above the damage threshold.
- Choose improved turfgrass varieties that will provide optimum performance while using less water, fertilizer and pesticide inputs as well as requiring reduced mowing.
- Mowing of weed flowers prior to treatment is an effective procedure to reduce insecticide exposure.
- Controlling weeds with herbicides prior to application of insecticides is an acceptable practice.
- Maintain highest practical mowing height which maximizes root mass, utilize core aeration for mechanical reduction in subsurface insect populations.
- Post-application irrigation per label directions increases efficacy and removes surface residues where pollinators can be exposed. Irrigation removes guttation fluid and dew that may contain residues is suggested.

IPM - Ornamentals:

- Choose plants that are appropriate for the USDA Plant Hardiness Zone the site and can be easily maintained and pruned to optimize plant health.
- Choose plants that have natural resistance to pest predation.
- When insecticide applications are needed, know the level of attractiveness to pollinators and if it creates a risk for pollinator exposure to insecticide injury – flowering plants vary in their attractiveness to pollinators and wind-pollinated plants are not attractive to pollinators.
- For pollinator attractive plants, do not treat with insecticides that have a risk of causing harm during bloom or when pollinators are actively foraging.

Habitat Promotion

- Provide abundant food for pollinators by creating and planting pollinator friendly areas in the landscape.
- Choose plants that are low input and provide nectar and pollen through the growing season
- Consider the addition of a bee garden to provide diverse habitiat for different species of pollinators as well as multiple sources of nutrition throughout the growing season, especially in areas that are not suitable for turfgrass, such as xeriscapes, shady areas and waterlogged areas .

Train, Educate, Understand and Follow All Pesticide Label Directions

Simply stated, the pesticide label is the law. Commercial pesticide applicators must always be appropriately certified and trained to use pesticides when managing healthy green spaces. The following are some additional consideration when applying pesticides and considering pollinator health.

- Acknowledge pesticides that have an EPA “bee box” on the label and closely read and follow all guidelines with these specific heightened precautions.
- Understand off target pest and products used to control them is essential in the effective use of insecticides.
- Use insecticides correctly, according to label directions and Cooperative Extension recommendations to avoid potential lethal and sublethal effects on pollinators.
- Understand the critical role that landscape professionals play in proper stewardship of insecticide products and the importance of following label directions.
- Following label directions can allow for the use of pesticides with low risk and impact on pollinators
-

The landscape industry is committed to protecting and promoting pollinator health by properly educating and training landscape pest management application that rely on the principles of IPM and the guidance provided in this document. Please contact NALP with any questions.

12500 Fair Lakes Circle, Suite 200, Fairfax, VA 22033
T: 703.736.9666 F: 703.322.2066
www.landscapeprofessionals.org

From: Heidi Dollard
To: LaScola, Taryn (AGR)
Subject: Comments on restricting neonicitinoids
Date: Wednesday, December 16, 2020 1:13:25 PM

To the Pesticide Board;

I am the Communications Coordinator for the Western Mass Pollinator Networks and a founding member of Belchertown For Bees, and I speak for both organizations. I listened with interest to the comments at the hearing on December 10. I agree with all of the comments limiting the use of neonics in Massachusetts.

Please consider the following points:

1- The global decline of insect populations is well documented, including the decline of valuable pollinators, essential to both our agriculture and our environment. Many bee species in Massachusetts are on the brink of extinction. This decline will continue unless we (you) do something to stop it.

2- Neonics kill insects. ALL insects. Furthermore, it lingers and accumulates in the environment for years, and is absorbed into plant tissue, including pollen and nectar, thereby continuing to kill and disable insects for years.

3- One blueberry farmer testified that his field with neonics was as productive as his organic field. That will not be true in future years as the pesticides accumulate.

4- In China, excessive use of pesticides has killed so many pollinators that pear and apple trees must be pollinated by hand. Do you think you could afford to eat a hand-pollinated pear in Massachusetts? How about your grandchildren?

https://www.huffpost.com/entry/humans-bees-china_n_570404b3e4b083f5c6092ba9

5- Protecting pollinators has widespread public support. At the last Town Meeting in Belchertown, the pollinator protection resolution passed with wide support, and very little discussion. Belchertown is both a farming community, and not especially porgressive.

6- While limiting neonics will cause some businesses initial expense and inconvenience (and cut into the profits of chemical companies), it will serve them well in the long term as they adjust their practices to sustainable methods.

Please make your decisions based on the long view. The time to restore beneficial insect populations is now, before it's too late. Your grandchildren will thank you.

Thank you for your consideration.

Heidi Dollard
401 South Gulf Rd

Belchertown, MA 01007

From:	Jane Sloboda
To:	LaScola, Taryn (AGR)
Cc:	Walter Timilty; louis.kafka@mahouse.gov
Subject:	H.763 - An Act to Protect Massachusetts Pollinators
Date:	Wednesday, December 2, 2020 9:48:17 AM

Dear Pesticide Board Subcommittee, Senator Timilty and Representative Kafka,

I am writing to you as a concerned citizen and a hobbyist beekeeper.

The scientific literature review of the effects of neonicotinoids on pollinators commissioned by the Pesticide Board Subcommittee, acting through the Department of Agricultural Resources, under its authority pursuant to FY20GAA-2511-0100, M.G.L. c.132B, Section 3A, clearly demonstrates that there is overwhelming scientific evidence that neonicotinoid insecticides pose unreasonable adverse effects to the environment as well as pollinators and that H.763 - An Act to Protect Massachusetts Pollinators should be passed without delay.

Senator Timilty and Representative Kafka - Please, urge the Speaker of the House to bring H.763 - An Act to Protect Massachusetts Pollinators to the floor for a vote before the end of the year.

Regards,
Jane Sloboda

From: Jennifer Johnson
To: LaScola, Taryn (AGR)
Subject: Comment on Neonic Scientific Lit Review
Date: Thursday, December 17, 2020 8:12:23 PM

Dear Board Members,

Thank you for holding the public meeting last week about neonicotinoid use in Massachusetts. I found it fascinating and informative. I hope it's not too late for you to accept my comment. I absolutely support limiting the used of neonics, and second the opinions of both participants Amy Musante and Cecily Miller. They each spoke eloquently and said exactly what I would have (if my wifi didn't keep cutting out ;). We are seeing disastrously shrinking numbers of insects and birds in our state. While there seem to be multifactorial reasons for this, certainly overuse of neonics, and other pesticides, play a huge yet controllable role. Please act on limiting them.

Thank you,

Jennifer Johnson, D.V.M.

From:	Jill Manca
To:	LaScola, Taryn (AGR)
Subject:	Please ban neonics
Date:	Thursday, December 17, 2020 5:58:54 PM

Thank you for conducting a literature review of neonics. Now that you have confirmed that the science finds these pesticides to be dangerous to bees and other beneficial insects and that neonics persist in plants, soil and water -- and may be dangerous to other life forms -- please take the next step. Follow the science. **Recommend regulations that restrict/regulate use and, when possible, ban neonics.** We've seen a drastic drop in insect and bird populations in the last decades, and pesticides are a part of the problem along with habitat loss and climate change. Making a transition to safe and sustainable methods of lands stewardship and agriculture is a top priority for me. Preserving biodiversity, including insect, bird and animal life, is essential to our survival as well as quality of life. Massachusetts can lead the way.

--
Jill Manca
art director | graphic designer

jmanca@rcn.com
12 Colby Road
Arlington MA 02476

From: John Duke
To: LaScola, Taryn (AGR)
Subject: Public comment Neonic hearing
Date: Friday, December 11, 2020 10:57:42 PM

Thank you all for having the public hearing and taking the time to listen to everyones comments and concerns. I am John Duke and I am a board member of NOFA/Mass. It was apparent to me that there was greater interest at that hearing to ban Neonics than there was to continue using them. My comments are to those business people that feel that their livelihood is in jeopardy if Neonics were to be banned. There is mounting evidence, and my personal experience has shown that pest pressure is a direct result from nutrient deficiencies in your growing system. A healthy plant can not be digested by pests. We have spent years killing pests and not asking why they are there in the first place. An infestation of pests is not because the plant has a Neonic deficiency. The plant has a nutrient deficiency and once that is addressed, the pest can no longer digest the plant and moves on or starves rather quickly. Through proper training and education, those 30 year business people can continue to operate just fine, be more cost effective, and far less harmful to all life. When you change the way you see the World, you see the World change. Thank you for you time, I trust you will put the needs of the Commonwealth ahead of Corporate wealth.

John Duke
12 Randall Lane
Mattapoisett, MA 02739

6/20/20

Taryn Lascola-Miner
Director, Crop and Pest Services
Massachusetts Department of Agricultural Resources
251 Causeway St
Suite 500
Boston, MA 02114-2151

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 ("Literature Review").

Specifically, the Review found that the broad majority of impact-based studies reviewed (42 of 43) cited neonicotinoid insecticides ("neonics") as a contributor to pollinator declines. Further, the Review 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 neonics 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 from 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, EPA continues to recommend 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 neonic uses in agriculture, yet provide little to no benefits to farmers.[ii] In fact, new research shows 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]

While EPA has failed to take significant action to curb the use of neonicotinoids, the European Union has instituted a full ban. Most significantly, early data from the United Kingdom shows that a seven-year-old neonicotinoid ban on oilseed crops has not negatively impacted crop production even as overall insecticide use has decreased.[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, 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.

Neonicotinoids 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 mammalian wildlife.[xi]

Other research suggests that people exposed to neonicotinoids 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 chlorination drinking water treatment generally does 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 Literature Review was limited to impacts on pollinators, the evidence for why we need strong regulations that go well beyond the actions of EPA demonstrates a much broader range of concerns.

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 neonicotinoid-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,

Bee Friendly Williamstown
Anne O'Connor, co-director
Williamstown, MA
e: anne.she.can@gmail.com

Brigid Bieber, Hobbyist Beekeeper
Boxborough, MA
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Plainfield Agricultural Commission
Anna Hanchett, Chair
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Pollinators Welcome
Tom Sullivan
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Regeneration Massachusetts
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Round the Bend Farm
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That's A Plenty Farm & Pollinator Habitat
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Toxics Action Center
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e: lena@toxicsaction.org

Western Mass Pollinator Networks
Peggy MacLeod, Co-Founder
Florence, MA (Regional organization)
e: wmassbees@gmail.com

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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 FranciscoSánchez-Bayoa and Kris A.G.Wyckhuysbc. *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 Pistoi, 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/2kTTrnc.

[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/2lR7Xfo (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*, Envtl. 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/2IlE26V (visited Oct. 9, 2019).

From:	Julia Fleet
To:	LaScola, Taryn (AGR)
Cc:	Joan Lovely; theodore.speliotis@mahouse.gov
Subject:	H.763 - An Act to Protect Massachusetts Pollinators should be passed without delay
Date:	Wednesday, December 2, 2020 12:51:42 PM

Dear Director LaScola-Miner,

I am writing to express my support of H.763 - An Act to Protect Massachusetts Pollinators, and request that it be passed without delay.
I am a backyard beekeeper in Peabody, MA. My bees as well as native pollinators face numerous challenges ranging from pesticides to climate change. Please help mitigate the harmful effects of neonicotinoids on pollinators by passing this act.
The scientific literature review of the effects of neonicotinoids on pollinators commissioned by the Pesticide Board Subcommittee, acting through the Department of Agricultural Resources, under its authority pursuant to FY20GAA-2511-0100, M.G.L. c.132B, Section 3A, clearly demonstrates that there is overwhelming scientific evidence that neonicotinoid insecticides pose unreasonable adverse effects to the environment as well as pollinators and that H.763 - An Act to Protect Massachusetts Pollinators should be passed without delay.
Thank you for your time. I look forward to seeing you at the hearing on December 10, 2020.

Sincerely yours,
Julia Fleet, DO
95 Goodale Street
Peabody, MA 01960

From: Kari Percival
To: LaScola, Taryn (AGR)
Subject: Ban Neonic Pesticides
Date: Thursday, December 17, 2020 4:45:10 AM

Dear Taryn Lascola, Director, Massachusetts Crop and Pest Services,

Thank you for conducting a literature review of neonic pesticides. Since the science finds these pesticides to be dangerous to bees and other beneficial insects and that neonics persist in plants, soil and water, and other life forms, I hope you will find the courage to follow through with the logical next step.

Recommend regulations that restrict/regulate use and, when possible, ban neonics. We've seen a drastic drop in insect and bird populations in the last decades, and pesticides are a part of the problem along with habitat loss and climate change. Making a transition to safe and sustainable methods of lands stewardship and agriculture is a top priority for me. Preserving biodiversity, including insect, bird and animal life, is essential to our survival as well as quality of life. Massachusetts can lead the way.

Best wishes,

Kari Percival
4 Seaview Ave.
Malden, MA 02148

From: Kate O"Connor
To: LaScola, Taryn (AGR)
Subject: Testimony for Pesticide Board Subcommittee
Date: Thursday, December 10, 2020 8:14:02 PM

Dear Committee Members,
I provided oral (sung) testimony on Thursday Dec 10. I am provide the lyrics to the song in writing. I hope you will decide to ban neonicotinoid insecticides in the state of Massachusetts to protect the health of residents, pollinators, birds, soil organisms and other wildlife. Thank you for your consideration.

Yours, Kate O'Connor

Honor Our Earth – Pesticide Free

Song - 2019 Kate O'Connor

Honor our earth, pesticide free. Growing our food without poisons, as it's meant to be.

Protect our earth, Neonics * free. Growing our food without poisons, as it's meant to be.

Earth knows how to grow our food, without a toxic bath.

She's been doing it for millions of years, before men plowed a chemical path.

Healthy soil has billions of creatures, who store carbon under the ground.

When we till and kill them with pesticides, they release carbon to our skies unbound.

Honor our earth, pesticide free. Growing our food without poisons, as it's meant to be.

Protect our earth, Neonics free. Growing our food without poisons, as it's meant to be.

Poisoning our pollinators. Millions of birds die.

Neonics are killers, and degrade our land and skies.

They sicken kids with toxins with every single bite.

Remove these deadly poisons to restore our healthy birthright.

Honor our earth, pesticide free. Growing our food without poisons, as it's meant to be.

Protect our earth, Neonics free. Growing our food without poisons, as it's meant to be.

Restore our earth without poisons, as it's meant to be.

Living our lives without poisons, as is meant to be.

* neonicotinoid insecticides

From: Wijnja, Hotze (AGR)
To: LaScola, Taryn (AGR)
Subject: Fw: Ban neonics
Date: Wednesday, December 16, 2020 4:27:15 PM

Hi Taryn: I am forwarding this comment relative to neonics.

Hotze

From: Lorri Berenberg <lorriberenberg@me.com>
Sent: Wednesday, December 16, 2020 1:39 PM
To: Wijnja, Hotze (AGR)
Subject: Ban neonics

Dear Members of the Pesticide Board Subcommittee,

Thank you for conducting a literature review of neonics. Now that you have confirmed that the science finds these pesticides to be dangerous to bees and other beneficial insects and that neonics persist in plants, soil and water -- and may be dangerous to other life forms -- please take the next step. Follow the science. **Recommend regulations that restrict/regulate use and, when possible, ban neonics.** We've seen a drastic drop in insect and bird populations in the last decades, and pesticides are a part of the problem along with habitat loss and climate change. Making a transition to safe and sustainable methods of lands stewardship and agriculture is a top priority for me. Preserving biodiversity, including insect, bird and animal life, is essential to our survival as well as quality of life. Massachusetts can lead the way.

Thank you for seeing that dangerous chemicals be banned and for helping to save all forms of life on our planet!

Sincerely,
Lorri Berenberg
Arlington, MA 02476

Massachusetts Beekeepers Association
massbee.org
facebook.com/massachusettsbeekeepers

Taryn Lascola-Miner
Director, Crop and Pest Services
Massachusetts Department of Agricultural Resources
251 Causeway St
Suite 500
Boston, MA 02114-2151

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

Dear Director Lascola-Miner,

I am writing to comment on the results of 2019 Neonics Scientific Literature Review that was mandated in the FY20 budget.

The review determined that 42 of 43 of the impact-based studies reviewed cited neonicotinoid insecticides as a major contributor to pollinator declines. The review also specifically states that the only studies that had mixed results were industry-funded. These findings are consistent with the overwhelming body of peer reviewed scientific research, worldwide, showing that neonicotinoids are clearly implicated in the unsustainable losses of managed bees and native pollinators.

Therefore, rather than waiting for pending legislation, we urge the Pesticide Board Subcommittee and the Massachusetts Department of Agricultural Resources to prioritize the implementation of the restrictions on the use of neonicotinoids in the Commonwealth of Massachusetts that are detailed in Representative Carolyn Dykema's bill, H.763 – An Act to protect Massachusetts Pollinators.

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). Please note that many of the studies analyzed in the Literature Review have also been used in the formulation EPA risk assessments over the past five years.

The findings of this Literature Review are consistent with numerous global studies and demonstrate, along with other factors listed below, that in the face of a broader ecological collapse, restrictions on neonicotinoid use in Massachusetts are clearly warranted:

- A recent study found that U.S. Agriculture is 48 times more toxic to insect life than it was in the early 1990 and that neonicotinoids account for more than 90% of that increase.

- 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.
- While the EPA has failed to take significant action to curb the use of neonicotinoids, the European Union has instituted a full ban. Most significantly, early data from the United Kingdom shows that a seven-year-old neonicotinoid ban on oilseed crops has not negatively impacted crop production even as overall insecticide use has decreased. 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.
- Neonicotinoids are also a suspected contributor to the massive North American bird population losses over the last several decades. Neonicotinoid-coated crop seeds blanket agricultural areas—a single seed can contain enough active ingredient to kill a quarter-million bees or more —and eating just one such seed is enough to kill some songbirds. Even at low doses, neonicotinoids can harm birds' immune systems, fertility, and navigation, and cause rapid weight loss, thereby reducing birds' chances of surviving in the wild.
- 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 mammalian wildlife.
- Other research suggests that people exposed to neonicotinoids may similarly be at increased risk of developmental or neurological damage, including malformations of the developing heart and brain, memory loss, and finger tremors. These results raise special concern given that neonicotinoid exposure is often difficult or impossible to avoid. Conventional drinking water treatments do not remove neonicotinoids from contaminated water, and neonicotinoid residues have been found to contaminate produce and baby food. Because neonicotinoids are systemic and therefore permeate foods, they cannot be washed off.

While the Literature Review is limited to impacts on pollinators, the evidence for why we need strong restrictions on the use of neonicotinoids goes well beyond their effects on pollinators.

Given the ecological and public health harms of neonicotinoids, we urge that the Department take immediate action to implement the restrictions on the use of neonicotinoids in the Commonwealth of Massachusetts that are detailed in Representative Carolyn Dykema's bill, H.763 – An Act to protect Massachusetts Pollinators.

Massachusetts Beekeepers Association
massbee.org
facebook.com/massachusettsbeekeepers

As representatives of the beekeepers of the Commonwealth of Massachusetts, given the clear need to fill a gap in federal regulation in a time of ecological collapse, we at Mass Bee are counting on the Department of Agriculture to protect the health and ecological integrity of our Commonwealth.

Sincerely,

Peter Delaney, President
Massachusetts Beekeepers Association
president@massbee.org

MASSACHUSETTS FARM BUREAU FEDERATION, INC.
"The Voice of Agriculture"
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December 3, 2020

Dear Members of the Pesticide Board Subcommittee

On behalf of the approximately 6,000 members of the Massachusetts Farm Bureau Federation we would like to thank the Pesticide Board Subcommittee for taking up the review of neonicotinoids. We are very pleased to see that the concerns regarding potential impacts of neonicotinoid insecticides are being explored, and that the process will be through a science-based Individual Review, which takes into account both the risk and benefits posed by pesticides.

We would like to offer the following suggestions:

- We were disappointed that a third- party contractor was chosen to do the review of neonicotinoids, particularly one with no experience in pesticide registration. The lack of experience is exhibited in several areas, most noticeably in credibility given to several studies which are flawed in design and or execution. We urge the subcommittee to trust the judgment of staff in their critique of the review the studies referenced in it.
- We urge the subcommittee to include as part of their assessment, a consideration of the comparative risk of alternatives to neonicotinoids should restrictions be put on this class of chemical. This has something that has historically been done with Individual Review and we believe such an assessment is particularly critical as part of this review.

  Restricting a pesticide obviously does not negate or lessen the need to use it. Whether they are homeowners or professionals, if neonicotinoids are not available, pesticide users will use other chemicals. As such, it is only common sense and good policy to ensure the likely alternatives are not worse than neonicotinoids. Impacts on pollinators, as well as other environmental and health impacts, should be considered in determining whether restrictions on neonicotinoids is warranted and/or responsible.
- There is real life data available in Massachusetts that should be considered:
  - We have had a number of honeybee kills in the past decade or so that were investigated by the Pesticide Bureau and determined to be caused by pesticides. While none were major kills, these incidents do provide useful insights into the relative risks of pesticides to honeybees in the Commonwealth – at least relative to acute toxicity.

    None of these kills were associated with neonicotinoid insecticides, despite being the most widely used class of insecticide in the country. All but one was associated with either pyrethroids or carbamate pesticides. It is our assessment that for both homeowners and farmers, these two classes of pesticides represent the most likely alternatives to most uses of neonicotinoids.
  - For several seasons, DAR's apiary and pesticide programs have jointly investigated all reports of honeybee colonies which have been reported to have "collapsed". In no cases were residues of neonicotinoids or other pesticides found. In every case we have seen reported, poor husbandry was determined to be the cause of the collapse. This contrasts

starkly against claims that neonicotinoids are responsible for such collapses.

Contact
Brad Mitchell
Deputy Executive Director
617.413.3727
brad@mfbf.net

From: Marcella Stasa
To: LaScola, Taryn (AGR)
Subject: Support for ban on nicotinoids
Date: Thursday, December 17, 2020 12:34:06 PM

To our Massachusetts Legislators and the Massachusetts Department of Agricultural Resources,

As someone who has chemical sensitivities, I would like to urge a statewide ban on nicotinoid pesticides.

I have neighbors who have their lawn treated throughout the summer by a licensed applicator, and with each application I suffer difficulty breathing which, depending on the length of exposure, takes anywhere from 3 to 10 days to resolve.

The neighbors are unwilling to discontinue the use of these toxins on their property. The most I have been able to do is get notifications from the company doing the spraying. This is, at best, inconsistent. It also involves my having to close, and keep closed, all doors and windows; shut down all ventilation in my home, including air conditioning, and block any cracks or other minor openings with wet rags. This is in the summertime when it can be warm enough to bring indoor temperatures to over 95 degrees without ventilation. I am forced to either leave my home for the day or to lock myself into this stifling environment for the day while the toxins dissipate. Even then, I can detect by smell and through breathing difficulties, that some of the pesticide has penetrated my home. Neither my neighbors nor the company doing the application seems to care how this affects my health, and there seems to be no available legal recourse for me or for others in my position.

As long as any pesticide application is permitted, either by private homeowners or licensed applicators, these toxins will affect the health of all persons, not just those of us with health issues. This is not simply a heath issue, it is also a matter of economics, as the cost to address illness caused by toxic chemicals stresses the already pandemic-affected health system.

The environment is also at risk. After aerial spraying for mosquitoes in 2019, I witnessed the death of bees on my property. These are insecticides meant to kill. They do not discriminate between species. They are sprayed at night to target the mosquitoes, but remain in the environment and they have an impact on other species, including humans.

Please consider a complete ban on these toxins. It is understood that mosquitoes can cause devastating illness but the use of these chemicals have devastating effects impacting the greater environment and the people living in it.

Thank you for the opportunity to comment.

Marcella Stasa
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508 529-6369
Mstasa@charter.net

From:	Mark Hanson
To:	LaScola, Taryn (AGR)
Cc:	Richard Callahan
Subject:	T
Date:	Thursday, December 17, 2020 3:07:26 PM
Attachments:	NeonicsScientificLiteratureReviewFrameworkMH.xlsx ATT00001.htm NeonicsScientificLiteratureReviewFrameworkMH.pdf ATT00002.htm NeonicsScientificLiteratureReviewFrameworkMH.numbers ATT00003.htm

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Dear Ms. Lascola,

Thank you for the opportunity to submit testimony relevant to comments I made at the public hearing on the findings of a scientific literature review that the Pesticide Board Subcommittee will use when determining whether current uses of neonicotinoid insecticides pose unreasonable adverse effects to the environment as well as pollinators, and whether current registered uses of neonicotinoid insecticides should be altered.

The comments are due today (12/17) the hearing was held on held on December 10, 2020 from 10:00 A.M. – 12:00 P.M.

Best Regards for your important work in this area,

Mark Hanson
Concord

Testimony:

The literature review could be improved by supplying the title and abstract of each article - - that would provide useful information to those using it to determine which articles might shed more light on a particular neonic under consideration. During the hearing I suggested that there are other articles that should be included on the spread sheet. Since 2012 I've been researching this topic and I've added some research articles to the spread sheet from my collection. These are standard scientific studies that appeared in reputable journals. In addition for the many cases where the spread sheet already included an article I've found useful, I copied in the title and abstract.

An example of a useful article that was missing from the spreadsheet presented on 12/10 was by Jeffery Pettis. He discovered that somewhat less than 5-ppb of imidacloprid in the pollen fed to larval honey bees caused them to be significantly more likely to contract nosema disease. In my work on native pollinators in Mass. I'm finding that they are less tolerant of neonics. One concern I see is that neonics affect the quality of pollination. I raise raspberries and I'm seeing poor pollination or incorrect pollination, where the bee visiting the flower carried pollen from another species … which pollen blocked correct fertilization. I have also been seeing this more in winter squash in the past 8 years or so.

I'm a member of the MCA/Native Pollinator Task Force as well as the Pollinator Health

Advisory Committee of the Town of Concord. I'm also a member of the Middlesex and Worcester County Bee Associations and Pesticide Committee of Mass Bee.

I've attached below a draft table where I've added my suggested updates. (there are 3 forms of the same file)

Citation	Funding source(s)	Author(s	Type o	Study typ	Author-report	Genus	Specie	Exposei	Exposei	Landsca	Plant typ	Region	Location(s)	Contaminan	Exposure conce	Exposure d	Exposure route(s)	Endpoints considered	Notes	Key conclusions	n	MH adde	title	Abstract
Traynor, Kirsten, et al. 2016																						1	In-hive Pesticide Exposure: Assessing risks to migratory honey bees from in-hive pesticide contamination in the Eastern United States	This study measured part of the in-hive pesticide exposure by analyzing residues from live in-hive bees, stored pollen, and wax in migratory colonies over time and compared exposure to colony health. We summarized the pesticide burden using three different additive methods: (1) the hazard quotient (HQ), an estimate of pesticide exposure risk, (2) the total number of pesticide residues, and (3) the number of relevant residues. Despite being simplistic, these models attempt to summarize potential risk from multiple contaminations in real-world contexts. Colonies performing pollination services were subject to increased pesticide exposure compared to honey-production and holding yards. We found clear links between an increase in the total number of products in wax and colony mortality. In particular, we found that fungicides with particular modes of action increased disproportionally in wax within colonies that died. The occurrence of queen events, a significant risk factor for colony health and productivity, was positively associated with all three proxies of pesticide exposure. While our exposure summation models do not fully capture the complexities of pesticide exposure, they nonetheless help
Hladik, Michelle, et al. 2015																						1	First national-scale reconnaissance of neonicotinoid insecticides in streams across the USA	To better understand the fate and transport of neonicotinoid insecticides, water samples were collected from streams across the United States. In a nationwide study, at least one neonicotinoid was detected in 53 % of the samples collected, with imidacloprid detected most frequently (37 %), followed by clothianidin (24 %), thiamethoxam (21 %), dinotefuran (13 %), acetamiprid (3 %) and thiacloprid (0 %).Clothianidin and thiamethoxam concentrations were positively related to the percentage of the land use in cultivated crop production and imidacloprid concentrations were positively related to the percentage of urban area within the basin. Additional sampling was also conducted in targeted research areas to complement these national-scale results, including determining: (1) neonicotinoid concentrations during elevated flow conditions in an intensely agricultural region; (2) temporal patterns of neonicotinoids in heavily urbanized basins; (3) neonicotinoid concentrations in agricultural basins in a nationally important ecosystem; and (4) in-stream transport of neonicotinoids near a wastewater treatment plant. Across all study areas, at least one neonicotinoid was detected in 63 % of the 48
Stewart, Scott, et al. 2014																						1	Potential Exposure of Pollinators to Neonicotinoid Insecticides from the Use of Insecticide Seed Treatments in the Mid-Southern UnitedStates	Research was done during 2012 to evaluate the potential exposure of pollinators to neonicotinoid insecticides used as seed treatments on corn, cotton, and soybean. Samples were collected from small plot evaluations of seed treatments and from commercial fields in agricultural production areas in Arkansas, Mississippi, andTennessee. In total, 560 samples were analyzed for concentrations of clothianidin, imidacloprid, thiamethoxam, and their metabolites.These included pollen from corn and cotton, nectar from cotton, flowers from soybean, honey bees, Apis mellifera L., and pollen carried by foragers returning to hives, pre-planting and in-season soil samples, and wild flowers adjacent to recently planted fields. Neonicotinoid insecticides were detected at a level of 1 ng/g or above in 23% of wildflower samples around recently planted fields, with an average detection level of about 10 ng/g. We detected neonicotinoid insecticides in the soil of production fields prior to planting at an average concentration of about 10 ng/g, and over 80% of the samples having some insecticide present. Only 5% of foraging honey bees tested positive for the presence of neonicotinoid insecticides, and there was only one trace detection (<
Pettis, Jeffery 2012																				The finding that individual bees with undetectable levels of the target pesticide, after being reared in a sub-lethal pesticide environment within the colony, had higher Nosema is significant. Interactions between pesticides and pathogens could be a major contributor to increased mortality of honey bee colonies, including colony collapse disorder, and other pollinator declines worldwide.		1	Pesticide exposure in honey bees results in increased levels of the gut pathogen Nosema	Global pollinator declines have been attributed to habitat destruction, pesticide use, and climate change or some combination of these factors, and managed honey bees, Apis mellifera, are part of worldwide pollinator declines. Here we exposed honey bee colonies during three brood generations to sub-lethal doses of a widely used pesticide, imidacloprid, and then subsequently challenged newly emerged bees with the gut parasite, Nosema spp. The pesticide dosages used were below levels demonstrated to cause effects on longevity or foraging in adult honey bees. Nosema infections increased significantly in the bees from pesticide-treated hives when compared to bees from control hives demonstrating an indirect effect of pesticides on pathogen growth in honey bees. We clearly demonstrate an increase in pathogen growth within individual bees reared in colonies exposed to one of the most widely used pesticides worldwide, imidacloprid, at below levels considered harmful to bees. The finding that individual bees with undetectable levels of the target pesticide, after being reared in a sub-lethal pesticide environment within the colony, had higher Nosema is significant. Interactions between pesticides and pathogens
Pecenka, Jakob, et al. 2015																						1	Non-target effects of clothianidin on monarch butterflies	Monarch butterflies (Danaus plexippus) frequently consume milkweed in and near agro-ecosystems and consequently may be exposed to pesticides like neonicotinoids.We conducted a dose response study to determine lethal and sublethal doses of clothianidin using a 36-h exposure scenario.We then quantified clothianidin levels found in milkweed leaves adjacent to maize fields. Toxicity assays revealedLC10, LC50, and LC90 values of 7.72, 15.63, and 30.70 ppb, respectively. Sublethal effects (larval size) were observed at1 ppb. Contaminated milkweed plants had an average of 1.14±0.10 ppb clothianidin, with a maximum of 4 ppb in a single plant. This research suggests that clothianidin could function as a stressor to monarch populations.
Dively, Galen, et al. 2015																						1	Assessment of Chronic Sublethal Effects of Imidacloprid on HoneyBee Colony Health	Here we present results of a three-year study to determine the fate of imidacloprid residues in hive matrices and to assess chronic sublethal effects on whole honey bee colonies fed supplemental pollen diet containing imidacloprid at 5, 20 and 100 μg/kg over multiple brood cycles. Various endpoints of colony performance and foraging behavior were measured during and after exposure, including winter survival. Imidacloprid residues became diluted or non-detectable within colonies due to the processing of bee bread and honey and the rapid metabolism of the chemical. Imidacloprid exposure doses up to 100 μg/kg had no significant effects on foraging activity or other colony performance indicators during and shortly after exposure. Diseases and pest species did not affect colony health but infestations of Varroa mites were significantly higher in exposed colonies. Honey stores indicated that exposed colonies may have avoided the contaminated food. Imidacloprid dose effects was delayed later in the summer, when colonies exposed to 20 and 100 μg/kg experienced higher rates of queen failure and brood-less periods, which led to weaker colonies going into the winter. Pooled over two years, winter survival
Taira, Kumiko 2014																				see abstract		1	Human neonicotinoids exposure in Japan	Abstract In Japan, there are currently seven neonicotinoid (NN) insecticides, e.g. acetamiprid, since 1992 registration of imidacloprid. The amount of domestic shipment of NNs was 407t in 2009. NNs are water-soluble, systemic, non- volatile and thermostable. Japanese MRLs for NNs are set at high levels compared to the rest of the world. NNs show persistent efficacy in plants, soil and natural water. Once ingested, NNs are transported through intestinal mucosa, blood-brain-barrier and placenta. The suspected health effects of environmental exposure to NNs were observed in Japan. 1. Inhalational exposure: 78 patients in 2004 and 63 patients in 2005 visited a clinic in Gunma prefecture with head- ache, chest pain and muscle pain after acetamiprid spray application to pinewoods for a few weeks. 2. Oral exposure: Since 2006, more than 4,000 patients visited the clinic after consecutive intake of conventional produce, e.g. domestic fruits/vegetables 500 g/day and/or tea beverage 500 ml/day, with health problems (neo- Conventional Produce Syndrome, neo-CPS). Urinary 6-chloronicotinic acid (a common metabolite of four NNs) was quantified by liquid chromatography/mass spectrometry at 7.5-84.8
Harada, Keiko Tanaka, et al. 2016																						1	Biological Monitoring of Human Exposure to Neonicotinoids Using Urine Samples, and Neonicotinoid Excretion Kinetics	**Background** Neonicotinoids, which are novel pesticides, have entered into usage around the world because they are selectively toxic to arthropods and relatively non-toxic to vertebrates. It has been suggested that several neonicotinoids cause neuro-developmental toxicity in mammals. The aim was to establish the relationship between oral intake and urinary excretion of neonicotinoids by humans to facilitate biological monitoring, and to estimate dietary neonicotinoid intakes by Japanese adults. **Methodology/Principal Findings** Deuterium-labeled neonicotinoid (acetamiprid, clothianidin, dinotefuran, and imidacloprid) micro-doses were orally ingested by nine healthy adults, and 24 h pooled urine samples were collected for 4 consecutive days after dosing. The excretion kinetics were modeled using one- and two-compartment models, then validated in a non-deuterium-labeled neonicotinoid micro-dose study involving 12 healthy adults. Increased urinary concentrations of labeled neonicotinoids were observed after dosing. Clothianidin was recovered unchanged within 3 days, and most dinotefuran was recovered unchanged within 1
Tsvetkov, N., et al. 2019																						1	Chronic exposure to neonicotinoidsreduces honey bee health nearcorn crops	Experiments linking neonicotinoids and declining bee health have been criticized for not simulating realistic exposure. Here we quantified the duration and magnitude of neonicotinoid exposure in Canada's corn-growing regions and used these data to design realistic experiments to investigate the effect of such insecticides on honey bees. Colonies near corn were naturally exposed to neonicotinoids for up to 4 months—the majority of the honey bee's active season. Realistic experiments showed that neonicotinoids increased worker mortality and were associated with declines in social immunity and increased queenlessness over time. We also discovered that the acute toxicity of neonicotinoids to honey bees doubles in the presence of a commonly encountered fungicide. Our work demonstrates that field-realistic exposure to neonicotinoids can reduce honey bee health in corn-growing regions.
Whitehorn, P.R., et al. 2017																				exposed bees collecting between 47% and 56% less pollen by the end of 10 trials. We also found evidence of two distinct strategies for maximising pollen collection: (1) extensions to the duration of individual buzzes and (2) extensions of the overall time spent buzzing. We find new complexities in buzz pollination, and conclude that the impacts of field-realistic exposure to a neonicotinoid pesticide may seriously compromise this important ecosystem service		1	Neonicotinoid pesticide limits improvement in buzz pollination by bumblebees	Neonicotinoid pesticides have been linked to global declines of beneficial insects such as bumblebees. Exposure to trace levels of these chemicals causes sub-lethal effects, such as reduced learning and foraging efficiency. Complex behaviours may be particularly vulnerable to the neurotoxic effects of neonicotinoids. Such behaviours may include buzz pollination (sonication), in which pollinators, usually bees, use innate and learned behaviours to generate high-frequency vibrations to release pollen from flowers with specialised anther morphologies. This study assesses the effect of field-realistic, chronic exposure to the widely-used neonicotinoid thiamethoxam on the development of sonication buzz characteristics over time, as well as the collection of pollen from buzz-pollinated flowers. We found that the pollen collection of exposed bees improved less with increasing experience than that of unexposed bees, with exposed bees collecting between 47% and 56% less pollen by the end of 10 trials. We also found evidence of two distinct strategies for maximising pollen collection: (1) extensions to the duration of individual buzzes and (2) extensions of the overall time spent buzzing. We find new complexities in buzz
Straub, Lars, et al. 2016																			I suspect that these same affects alter the viability of native pollinators as well. And the concentrations (1.5 and 4.5 ppb) are really low. Typically soils on farms and golf courses have neonics at much higher concentration. (See also Lu's measurements of pollen and honey in Mass)	two neonicotinoids (4.5 ppb thiamethoxam and 1.5 ppb clothianidin) significantly reduce the reproductive capacity of male honeybees (drones), Apis mellifera. the data clearly showed reduced drone lifespan, as well as reduced sperm viability. The widespread prophylactic use of neonicotinoids may have previously overlooked inadvertent contraceptive effects on non-target insects, thereby limiting conservation efforts.		1	Neonicotinoid insecticides can serve as inadvertent insect contraceptives	There is clear evidence for sublethal effects of neonicotinoid insecticides on non-target ecosystem service-providing insects. However, their possible impact on male insect reproduction is currently unknown, despite the key role of sex. Here, we show that two neonicotinoids (4.5 ppb thiamethoxam and 1.5 ppb clothianidin) significantly reduce the reproductive capacity of male honeybees (drones), Apis mellifera. Drones were obtained from colonies exposed to the neonicotinoid insecticides or controls, and subsequently maintained in laboratory cages until they reached sexual maturity. While no significant effects were observed for male tenurial (newly emerged adult) body mass and sperm quantity, the data clearly showed reduced drone lifespan, as well as reduced sperm viability (percentage living versus dead) and living sperm quantity by 39%. Our results demonstrate for the first time that neonicotinoid insecticides can negatively affect male insect reproductive capacity, and provide a possible mechanistic explanation for managed honeybee queen failure and wild insect pollinator decline. The widespread prophylactic use of neonicotinoids may have previously overlooked inadvertent contraceptive effects
Bonmatin, J., et al.																					8	1	Environmental fate and exposure; neonicotinoids and fipronil	Systemic insecticides are applied to plants using a wide variety of methods, ranging from foliar sprays to seed treatments and soil drenches. Neonicotinoids and fipronil are among the most widely used pesticides in the world. Their popularity is largely due to their high toxicity to invertebrates, the ease and flexibility with which they can be applied, their long persistence, and their systemic nature, which ensures that they spread to all parts of the target crop. However, these properties also increase the probability of environmental contamination and exposure of nontarget organisms. Environmental contamination occurs via a number of routes including dust generated during drilling of dressed seeds, contamination and accumulation in arable soils and soil water, runoff into waterways, and uptake of pesticides by nontarget plants via their roots or dust deposition on leaves. Persistence in soils, waterways, and nontarget plants is variable but can be prolonged; for example, the half-lives of neonicotinoids in soils can exceed 1,000 days, so they can accumulate when used repeatedly. Similarly, they can persist in woody plants for periods exceeding 1 year. Breakdown results in toxic metabolites, though concentrations of these in the
European Food Safety Authority																			see also https://ec.europa.eu/food/animals/live_animals/bees/study_on_mortality_en		21	1	Evaluation of the data on clothianidin, imidacloprid and thiamethoxam for the updated risk assessment to bees for seed	The European Commission has requested the European Food Safety Authority (EFSA) to perform an updated risk assessment as regards the risk to bees from the uses of the three neonicotinoid pesticides active substances clothianidin, imidacloprid and thiamethoxam applied as seed treatments and granules. In performing this evaluation, in accordance with Article 21 of Regulation (EC) No 1107/2009 and considering recital 16 of Regulation (EU) No 485/2013; EFSA has been asked to undertake a review of the new data relevant to the uses under consideration taking into account in particular, the new relevant data collected in the framework of the open call for data organized by EFSA in 2015 and any other new data from studies, research and monitoring activities. EFSA has established a specific methodology for the evaluation of the available data.
Gill, Richard, et al. 2012		The authors declare no competing financial interests	Supplementary Information is linked to the online																		26	1	Combined pesticide exposure severely affects individual- and colony-level traits in bees	Reported widespread declines of wild and managed insect pollinators have serious consequences for global ecosystem services and agricultural production1-3. Bees contribute around 80% of insect pollination, so it is imperative we understand and mitigate the causes of current declines4-6. Recent studies have implicated the role of pesticides as exposure to these chemicals has been associated with changes in bee behaviour 7-11 and reductions in colony queen production12. However the key link between changes in individual behaviour and consequent impact at the colony level has not been shown. Social bee colonies depend on the collective performance of numerous individual workers. So whilst field-level pesticide concentrations can have a subtle/sublethal effect at the individual level8, it is not known whether bee societies can buffer such effects or if it results in a severe cumulative effect at the colony level. Furthermore, widespread agricultural intensification
Lu, Chensheng, Kenneth M. WARCHOL 2, Richard A. CALLAHAN 2014	Callahan Family.		journal article		*Apis mellifera*	*Apis*	*mellifera*														76	1	Sub-lethal exposure to neonicotinoids impaired honey bees winterization before proceeding to colony collapse disorder	Honey bee (Apis mellifera L.) colony collapse disorder (CCD) that appeared in 2005/2006 still lingers in many parts of the world. Here we show that sub-lethal exposure of neonicotinoids, imidacloprid or clothianidin, affected the winterization of healthy colo- nies that subsequently leads to CCD. We found honey bees in both control and neonicotinoid-treated groups progressed almost identically through the summer and fall seasons and observed no acute morbidity or mortality in either group until the end of win- ter. Bees from six of the twelve neonicotinoid-treated colonies had abandoned their hives, and were eventually dead with symp- toms resembling CCD. However, we observed a complete opposite phenomenon in the control colonies in which instead of aban- donment, they were re-populated quickly with new emerging bees. Only one of the six control colonies was lost due to Nosema-like infection. The observations from this study may help to elucidate the mechanisms by which sub-lethal neonicotinoids expo- sure caused honey bees to vanish from their hives.
Lu, Chensheng, Kenneth M. WARCHOL 2, Richard A. CALLAHAN 2012	Harvard University.		journal article		*Apis mellifera*	*Apis*	*mellifera*														77	1	In situ replication of honey bee colony collapse disorder	The concern of persistent loss of honey bee (Apis mellifera L.) colonies worldwide since 2006, a phenomenon referred to as colony collapse disorder (CCD), has led us to investigate the role of imidacloprid, one of the neonicotinoid insecticides, in the emergence of CCD. CCD is commonly characterized by the sudden disappearance of honey bees (specifically worker bees) from hives containing adequate food and various stages of brood in abandoned colonies that are not occupied by honey bees from other colonies. This in situ study was designed to replicate CCD based on a plausible mechanistic hypothesis in which the occurrence of CCD since 2006 was resulted from the presence of imidacloprid, one of the neonicotinoid insecticides, in high-fructose corn syrup (HFCS), fed to honey bees as an alternative to sucrose-based food. We used a replicated split-plot design consisting of 4 independent apiary sites. Each apiary consisted of 4 different imidacloprid-treated hives and a control hive. The dosages used in this study were determined to reflect imidacloprid residue levels reported in the
Tan, Ken, et al. 2014	This work was supported by the Key Laboratory of Tropical Forest Ecology, Xishuangbanna Tropical Botanical Garden, and the CAS 135 program (XTBGT01) of	no competing interests	journal article		*Apis mellifera*	*Apis*	*mellifera*	all	all						Nectar 16.4 μg/L					Imidacloprid: (1) impair honey bee cognition. (2) Sublethal concentrations of imidacloprid can harm honey bee decision-making about danger by significantly increasing the probability of a bee visiting a dangerous food source. These results suggest that the effects of neonicotinoids on honey bee decision-making and other advanced cognitive functions should be explored. Moreover, research should extend beyond the classic model, the European honey	##	1	Imidacloprid Alters Foraging and Decreases BeeAvoidance of Predators	Concern is growing over the effects of neonicotinoid pesticides, which can impair honey bee cognition. We provide the first demonstration that sublethal concentrations of imidacloprid can harm honey bee decision-making about danger by significantly increasing the probability of a bee visiting a dangerous food source. Apis cerana is a native bee that is an important pollinator of agricultural crops and native plants in Asia. When foraging on nectar containing 40 mg/L (34 ppb) imidacloprid, honey bees (Apis cerana) showed no aversion to a feeder with a hornet predator, and 1.8 fold more bees chose the dangerous feeder as compared to control bees. Control bees exhibited significant predator avoidance. We also give the first evidence that foraging by A. cerana workers can be inhibited by sublethal concentrations of the pesticide, imidacloprid, which is widely used in Asia. Compared to bees collecting uncontaminated nectar, 23% fewer foragers returned to collect the nectar with 40 mg/L imidacloprid.
Calvo-Agudo, Miguel,et. al. 2019		The authors declare no conflict of interest.																		The use of insecticides in agriculture is one of the suggested causes of the decline in insect populations. Neonicotinoids are among the most widely used insecticides. However, they have important negative side effects, especially for pollinators and other beneficial insects feeding on floral nectar and pollen. We identified an exposure route: Neonicotinoids reach and kill beneficial insects when they feed on the most abundant carbohydrate source for insects in agro-ecosystems, honeydew. Honeydew is the excretion product of phloem-feeding hemipteran insects such as aphids, mealybugs, whiteflies, or psyllids. This route of exposure is likely to affect	11	1	Neonicotinoids in excretion product of phloem-feeding insects kill beneficial insects	Pest control in agriculture is mainly based on the application of insecticides, which may impact non-target beneficial organisms leading to undesirable ecological effects. Neonicotinoids are among the most widely used insecticides. However, they have important negative side effects, especially for pollinators and other beneficial insects feeding on nectar. Here, we identify a more accessible exposure route: Neonicotinoids reach and kill beneficial insects that feed on the most abundant carbohydrate source for insects in agroecosystems, honeydew. Honeydew is the excretion product of phloem-feeding hemipteran insects such as aphids, mealybugs, whiteflies, and psyllids. We allowed parasitic wasps and pollinating hoverflies to feed on honeydew from hemipterans feeding on trees treated with thiamethoxam or imidacloprid, the most commonly used neonicotinoids. LC-MS/MS analyses demonstrated that both neonicotinoids were present in honeydew. Honeydew with thiamethoxam was highly toxic to both species of beneficial insects, and honeydew with imidacloprid was moderately toxic to hoverflies. Collectively, our data provide strong evidence for honeydew as a route of insecticide exposure that may cause acute or chronic deleterious effects on non-target organisms. This route should be considered in future environmental risk assessments of neonicotinoid applications.
Anderson and Harmon-Threatt 2019	Clark Research Support Grant, Lebus Fund Award through the School of Integrative Biology at the University of Illinois at Urbana-Champaign	no statement provided	journal article	laboratory	*Osmia lignaria, Megachile rotundata*	multiple	multiple	larvae	not applicable					imidacloprid	"Once individuals reached the second instar larval stage, they were treated every 48 hours with 0.5	several months	direct contact (applied topically)	adult bee longevity, development speed, mass	The study design is intended to assess "the effects of chronic contact exposure [on larval bees] to realistic soil levels of neonicotinoids" using two species that are not ground nesting, but that are	"Chronic contact exposure in *O. lignaria* and *M. rotundata* resulted in species- and sex-specific effects on adult longevity, immature development speed, and mass that could have negative consequences for bees more generally." Effects were both positively and negatively correlated with exposure, as well as U-shaped, depending on sex and species.	1			
Arce et al. 2017	The Royal Society and the National Environmental Research Council	no statement provided	journal article	semi-field (feeding)	*Bombus terrestris*	*Bombus*	*terrestris*	all	all	non-agricultural parkland		Europe	Silwood Park, England	clothianidin	sucrose solution with 5 ppb clothianidin provided 3x/week, at a	5 weeks	oral ingestion	numbers of returning foragers, whether foragers carried pollen, pollen load mass, pollen load surface area, full	The dose "approximates a field realistic concentration."	Colony measurements found no treatment effect on colony weight gain and "no clear pattern" on the number of brood individuals (eggs, larvae, pupae); however, "by the end of the experiment treated colonies contained fewer workers, drones and gynes in comparison with control colonies."	2			
Azpiazu et al. 2019	Spanish Ministry of Science and Innovation	no statement provided	journal article	laboratory	*Osmia bicornis* L	*Osmia*	*bicornis*	adult	females					acetamiprid, imidacloprid, and a fungicide (myclobutanil),	lifetime mean consumption (excluding joint fungicide exposures): acetamiprid (2.89 ng/bee),	adult lifespan	oral ingestion	pollen and syrup consumption, longevity, ovary maturation, thermogenesis	The study aimed to test for synergistic effects of these three pesticides (two neonicotinoid insecticides and one triazole fungicide) in females of this species. Exposure concentrations	Imidacloprid had a "clear inhibitory effect on syrup consumption", which "was accompanied by decreased thoracic temperature and apathy". Acetamiprid "yielded no negative effects. "None of the compounds or mixtures … resulted in increased mortality." In addition, "[n]o significant differences were found in mean basal	3			
Baines et al. 2017	The Alberta Crop Industry Development Fund Ltd, Lacombe, AB, Canada	no statement provided	journal article	laboratory	*Bombus impatiens, Apis mellifera, Megachile rotundata*	multiple	multiple	newly-emerged adults	not applicable (leafcutter bees); worker					acetamiprid, clothianidin, imidacloprid, and thiamethox	see below	see below	oral ingestion of honey-water	mortality	Seven experiments: 1) acute exposure in bumble bees, 2) chronic exposure in bumble bees, 3) acute exposure in summer honey bees, 4) chronic exposure in summer honey bees, 5)	"In acute toxicity studies, late-onset symptoms, such as ataxia, were recorded as non-lethal endpoints for all three bee species. Clothianidin and thiamethoxam produced biphasic dose-response curves for all three bee species. Clothianidin and thiamethoxam were extremely toxic to winter worker honey bees prior to brood	4			
Baron et al. 2017a	UK Insect Pollinators Initiative and the Natural Environment Research Council	no statement provided	journal article	laboratory	*Bombus terrestris, B. lucorum, B. pratorum, B. pascuorum*	*Bombus*	multiple	adult	queens					thiamethoxam	Control, 1.87 and 5.32 ng/g	14 days	oral ingestion	feeding, survival, egg laying (colony initiation), waxing behavior, and ovary development	Doses "are within the range of thiamethoxam residues found in stored pollen and nectar in wild foraging bumblebee colonies… and from pollen and nectar collected from oilseed rape	Pesticide exposure did not affect queen survival rates, longevity, waxing behavior, egg laying, or the timing of egg laying. (The authors note, however, that "Owing to the low number of queens that laid eggs during the experiment our power to detect potential impacts on this variable was low.") The high dose "caused a	5			
Baron et al. 2017b	UK Insect Pollinators Initiative, funded jointly by the Living with Environmental Change programme, Biotechnology and Biological Sciences Research Council, Wellcome Trust, Scottish Government, Department for	no statement provided	journal article	laboratory	*Bombus terrestris*	*Bombus*	*terrestris*	adult	queens					thiamethoxam	control, 2.4 ppb	14 days	oral ingestion of syrup	Queen survival post-hibernation, probability of egg laying, syrup consumption	The authors "investigated the effects of thiamethoxam exposure on *B. terrestris* queens and tested for interactions with two natural environmental stressors: infection with the parasite *C. bombi* and variation in hibernation duration." Prior to pesticide exposure, queens had hibernated for 6 or 12 weeks. The authors also	"Exposure to thiamethoxam caused a 26% reduction in the proportion of queens that laid eggs, and advanced the timing of colony initiation, although we did not detect impacts of any experimental treatment on the ability of queens to produce adult offspring during the 14-week experimental period. As expected from previous studies, the hibernation duration also had an impact on egg laying, but there was no significant interaction with insecticide treatment. Modelling the impacts of a 26% reduction in colony founding on population dynamics dramatically increased the likelihood	6			
Becher et al. 2018	Biotechnology and Biological Sciences Research Council	no statement provided	journal article	modeling	"up to six European bumblebee species", including *Bombus terrestris L.*	*Bombus*	*spp.*	adult	queens					thiamethoxam, as per Baron et al. 2017b	2.4 ppb, as per Baron et al. 2017b	14 days, as per Baron et al. 2017b	oral ingestion of syrup, as per Baron et al. 2017b	Multiple, depending on the organizational level (individual, colony, population, landscape)	Introduces *Bumble*-BEEHAVE, an open-source "mechanistic multilevel systems model (individual-colony-population-community)" that is useful in testing individual and interacting effects of multiple stressors. It is an agent-based model "where individual behaviour is	"Simulating the impact of reproductive depression caused by pesticide exposure shows that the complex feedback mechanisms captured in this model predict higher colony resilience to stress than suggested by a previous, simpler model." The simulation involving pesticide exposure is based on data from a cited study (Baron et al. 2017) that found a 26% reduction in colony foundation after queens were treated with a neonicotinoid pesticide. The resulting population dynamics simulation "led to a strong	7			
Botias et al. 2017	Department for Environment Food & Rural Affairs	no statement provided	journal article	residue analysis	*Bombus hortorum, Bombus pascuorum, Bombus terrestris, Bombus lapidarius, and Bombus pratorum*	*Bombus*	multiple	all	all	agricultural, urban	**agricultural:** predominant crops were oilseed rape, winter wheat and spring	Europe	East Sussex (southeast England)	thiamethoxam, clothianidin, imidacloprid, thiacloprid, and acetamiprid plus 13 fungicides	see "Key Conclusions"	lifetime	all (field-exposed)	pesticide residues in wild bumble bees	"The aim of this study was to evaluate and compare exposure in different wild bumblebee species." Pesticide usage information "of the crops where bees were foraging was not provided by the farmers." 150 individuals were tested.	"Concentrations and detection frequencies were higher in bees collected from farmland compared to urban sites, and pesticide concentrations decreased through the season. Overall, our results show that wild bumblebees are exposed to multiple pesticides when foraging in agricultural and urban landscapes. Such mixtures are detected in bee tissues not just during the crop flowering period, but also later in the season." More detailed results are presented as detection frequencies, averages,	9			
Bryden et al. 2013	BBSRC, Defra, NERC, the Scottish Government and The Wellcome Trust, under the Insect Pollinators Initiative	no statement provided	journal article	laboratory and modeling	*Bombus terrestris*	*Bombus*	*terrestris*	all	all					imidacloprid	10 ppb	every 2 days (3 days over the weekend) for 42 days	oral ingestion	mortality and birth rates, colony size	This paper presents the results of a feeding study and also mathematically models stress on individual bees to predict colony-level outcomes in the wake of modeled exposure to sublethal levels of a neonicotinoid pesticide that is "near the upper range of that typically found in field realistic conditions."	"By the end of the 42-day experiment, we found a significant difference in colony size between control and treatment colonies. … there is impaired colony function in the pesticide treated colonies because the birth rates decreased relative to the control colony… . This analysis of the data from our experiment thus directly shows that sublethal pesticide exposure decreases colony size after a lagged growth period, and also indicates that this may be due to effects of impairment on colony function rather than direct mortality." In addition, the authors' compare their model to	10			
Cameron and Sadd 2020	USDA National Institute of Food and Agriculture	no statement provided	journal article	review	bumble bees	*Bombus*	*spp.*											multiple; see "Key Conclusions"	"The number of reports on bumble bee decline has grown exponentially during the past decade… Reports of multiple causes for the observed widespread declines of bumble bee populations have mushroomed." "At this juncture, a review of the large, exponentially growing body of work published over the past decade on the deteriorating state of bumble bee health worldwide, and the evidence for potential causes, will provide an informed framework for future research and	"There is evidence that habitat loss, changing climate, pathogen transmission, invasion of nonnative species, and pesticides, operating individually and in combination, negatively impact bumble bee health, and that effects may depend on species and locality." With respect to neonicotinoids, "recent research has shown significant impairment of cognitive functions …, foraging efficiency…, and colony fitness …in bumble bees fed field realistic doses of imidacloprid, clothianidin, or thiamethoxam in pollen or nectar over 1–2 weeks, the typical life span of a forager. Just 24 h of exposure to imidacloprid at 10 ppb in sugar syrup, followed by free foraging in pesticide-free fields for 48 days, led to impaired colony growth and nest condition … . Notably, bumble bees are not equally sensitive to all neonicotinoids; thiacloprid, for instance, appears to be less toxic	12			
Chambers et al. 2019	Specific Targeted Research Sixth Framework EU Project TEAMPEST, National Agricultural Research Foundation (NAGREF), Greece	no statement provided	journal article	field survey and model	honey bees	*Apis*	*spp.*	all	all	agricultural	not specified	Europe	Crete (Greece)	imidacloprid, thiamethoxam, clothianidin, acetamiprid, thiacloprid	No detects for clothianidin and A-cyhalotrin. <1% detection for acetamiprid and thiacloprid. The summed	lifetime	Nectar collected from spots within 2 km of the apiaries	seasonal honey production volume, colony population size	The authors conducted 6-year survey of 60 apiaries in Greece, gathering data that they combined into a model to assess the effects of field-based exposure to neonicotinoid insecticides on honey production. Data incorporated into the	The authors "found that sub-lethal concentrations of two widely used neonicotinoid insecticides (imidacloprid and thiamethoxam) detected in the nectar of flowers resulted in substantial losses in honey production for commercial beekeepers in our sample." More specifically, the results "indicated an average loss of 18.37 ± 8.5% in managed honeybee populations due to neonicotinoid effects" and	13			
Colgan et al. 2018	The European Research Council, Natural Environment Research Council, Biotechnology and Biological Sciences Research Council, Engineering and Physical Sciences	no statement provided	journal article	laboratory	*Bombus terrestris*	*Bombus*	*terrestris*	adult	workers, queens					clothianidin, imidacloprid	control, 6.47 ppb	4 days	oral ingestion of sucrose solution	in bee head tissue, genome-wide mRNA-sequencing and gene expression amplitude	"We addressed the following questions: a) Does neonicotinoid exposure lead to transcriptional changes in the head tissues of exposed bumblebees? (b) Do different neonicotinoids lead to different gene expression profiles? (c) Do	"We reveal that genes involved in important biological processes including mitochondrial function are differentially expressed in response to neonicotinoid exposure. Additionally, clothianidin exposure had stronger effects on gene expression amplitude and alternative splicing than imidacloprid. Finally, exposure affected workers more strongly than queens." More specifically, in workers, 55 genes are significantly differentially expressed in response	14			
Colin et al	Australian Research	no staten	journa	semi-fiel	*Apis mellifera*	*Apis*	*mellife*	all	all	suburba	within 1 k	Australia	Macquarie	imidaclopri	5 μg/kg	6 weeks	oral ingestion of	foraging behavior (age	The authors "studied how la	Exposed bees foraged at an earlier age, performe	15			
Colin et al	Australian Research	no staten	journa	semi-fiel	*Apis mellifera*	*Apis*	*mellife*	all	all	AZ: desert rangeland Australia: suburban	**AZ:** native vegetation **Australia:** within 1 km of a national park and surrounded by	North America, Australia	Santa Rita	imidaclopri	imidacloprid: control and 5 μg/kg thymol: gel provided "as per manufacturer's instructions"	6 weeks	oral ingestion of	capped brood, bee, and	Tucson colonies gathered a	"In Tucson we recorded a positive effect of imida	16			

Straub et al. 2019	Bundesamt für Umwelt, Agroscope, Vinetum Foundation, ETH Global, Chian Mai University Fund, USDA National Institute of Food and Agriculture, Swiss National Science Foundation, Foundation for Food	no statement provided	journal article	semi-field (feeding)	*Apis mellifera*	*Apis*	*mellifera*	all	all	not specified	not specified	Europe	Bern, Switzerland	thiamethoxam and clothianidin	3.9 ppb thiamethoxam plus 1.9 ppb clothianidin	42 days	oral ingestion of pollen	emergent worker mite infestation levels, clinical symptoms of DWV [deformed wing virus], *V. destructor* parasitism, worker mass on emergence, longevity in cages; also, colony strength, colony winter mortality, queen loss	Workers were "reared in field colonies but emerged in the laboratory." Exposure concentrations "represent field-realistic concentrations of the chemicals found in plant pollen." Colony maintenance included autumn and winter *V. destructor* management using formic and oxalic	The authors "show for the first time a synergistic time-lag interaction between mites and neonicotinoids that resulted in significantly reduced survival of long-lived winter honeybees. Even though these mites are potent vectors of viruses, the virus insecticide interaction had no significant impact. The data suggest a previously overlooked mechanism possibly explaining recent unsustainably high losses of managed *A. mellifera* honeybee colonies in many regions of the world." More specifically, neonicotinoid treatment alone did not significantly affect	##			
Tison et al. 2019	Freie Universität Berlin, The Deutsche Forschungsgemeinschaft, and a DAAD Postgraduate Scholarship	no statement provided	journal article	semi-field (feeding choice experiment) laboratory (learning	*Apis mellifera carnica*	*Apis*	*mellifera*	adult	workers					clothianidin	Feeding choice: control, 9 ppb Learning experiments: --Acquisition: control 0.1, 0.3, and 0.8 ng/bee --Consolidation:	Feeding choice: not applicable Learning experiments: single dose	oral ingestion of sucrose solution	Feeding choice experiment: proboscis extension response (PER), visitation rate, drinking time/bee, number of aborts Learning experiments: mortality, PER	The timing of clothianidin exposure for the learning experiments was as follows: for the memory acquisition experiment, exposure occurred 1 hour before the trial; for the memory consolidation experiment, 5 hours after conditioning (learning)	**Feeding choice:** No significant differences found in endpoints, which "rule[s] out the possibility that clothianidin has a repellent taste for honey bees." **Learning:** Treatment did not increase mortality; however, learning as measured using PER was affected: "conditioning was performed with forager bees exposed to different concentrations of clothianidin... before learning, after learning during memory consolidation, and just before	##			
Tosi and Nieh 2017	University of Bologna and the UCSD Academic Senate	no statement provided	journal article	laboratory	*Apis mellifera*	*Apis*	*mellifera*	adult	workers					thiamethoxam	acute: 1.34 ng/bee chronic: 1.42-3.48 ng/bee/day	acute: single dose chronic: 2 days	oral ingestion of sucrose solution	11 behavioral parameters related to the rate/ways in which bees reached a light in vertical chamber illuminated from above	The purpose of this study is to evaluate "how thiamethoxam may impair movement to light and locomotion because of the important role that these behaviors play in colony life and colony division of labor." Trials were three	"We present the first evidence that acute and chronic oral TMX exposure at field-realistic, sublethal levels can significantly alter forager movement to light." **Acute:** "Acute consumption (1.34 ng/ bee) impaired locomotion, caused hyperactivity (velocity: +109%; time moving: +44%) shortly after exposure (30 min), and impaired motor functions (falls: +83%; time top: −43%; time	##		A common neonicotinoid pesticide, thiamethoxam, impairs honey bee flight ability	Pesticides can pose environmental risks, and a common neonicotinoid pesticide, thiamethoxam, decreases homing success in honey bees. Neonicotinoids can alter bee navigation, but we present the first evidence that neonicotinoid exposure alone can impair the physical ability of bees to fly. We tested the effects of acute or chronic exposure to thiamethoxam on the flight ability of foragers in flight mills. Within 1 h of consuming a single sublethal dose (1.34 ng/bee), foragers showed excitation and significantly increased flight duration (+78%) and distance (+72%). Chronic exposure significantly decreased flight duration (−54%), distance (−56%), and average velocity (−7%) after either one or two days of continuous exposure that resulted in bees ingesting field-relevant thiamethoxam doses of 1.96–2.90 ng/bee/day. These results provide the first demonstration that acute or chronic exposure to a neonicotinoid alone can significantly alter bee flight. Such exposure may impair foraging and
Tosi et al. 2017a	Council for Agricultural Research and Economics, Agriculture and Environment Research Centre and Alma Mater Studorium, University of Bologna	no statement provided	journal article	laboratory	*Apis mellifera ligustica*	*Apis*	*mellifera*	adult	workers					clothianidin (CLO) and thiamethoxam (TMX)	thiamethoxam: control, 0.2 and 1 ng/bee clothianidin: control, 0.16 and 0.8 ng/bee	single dose	oral ingestion of sucrose solution	forager survival up to 4 days post-treatment; food consumption up to 4 days post-treatment [*ad libitum* diet only]; trehalose haemolymph levels 2 hours post-treatment [*ad libitum* diet only]	The purpose of this study is to evaluate whether "nutritional stress (limited access to nectar and access to nectar with low-sugar concentrations) and sublethal, field-realistic acute exposures to two neonicotinoids (CLO and TMX at 1/5 and 1/25 of LD_{50}) could alter bee	"Sublethal and field-realistic doses of neonicotinoids did not significantly reduce survival when foragers were fed *ad libitum rich* diets... However, neonicotinoids significantly reduced the survival of bees fed the *ad libitum* diets with qualities that were *intermediate* ... or *poor.*" In addition, "CLO and TMX also reduced the survival of bees fed *limited*-quantity diets with either *rich* ... or *poor* ... sugar qualities," and the authors found "a significant synergistic reduction in survival elicited by all	##			
Tosi et al. 2017b	University of Bologna and the UCSD Academic Senate	no statement provided	journal article	laboratory	*Apis mellifera ligustica*	*Apis*	*mellifera*	adult	workers					thiamethoxam	acute: 1.34 ng/bee chronic: 1.26-4.53 ng/bee/day; results analyzed for bees exposed to 1.96-2.90 ng/bee/day	acute: single dose chronic: 1 day and 2 days	oral ingestion of sugar solution	flight distance, flight duration, and velocity	This study tests "the effects of acute or chronic exposure to thiamethoxam on the flight ability of foragers in flight mills." "All TMX doses tested were lower than the worst case scenario thresholds, and did not increase mortality as compared to controls."	"In the acute experiment, foragers consumed a single sublethal dose of 1.34 ng and subsequently increased their mean flight duration and flight distance by 78% and 72% in comparison with control bees, respectively." "However, this increase in flight duration and distance is likely not beneficial because, at similar doses, TMX and other neonicotinoids cause flight disorientation." "In our chronic experiment, bees drank significantly more	##			
Tsvetkov et al. 2017	Ontario Ministry of Agriculture, Food and Rural Affairs	no statement provided	journal article	residue analysis, laboratory, semi-field (feeding)	*Apis mellifera*	*Apis*	*mellifera*	see details below	see details below					clothianidin, thiamethoxam,	see below	see below	see below	life span, hygienic behavior and the presence of laying queen	After investigating agrochemical concentrations in samples from "exposed" and "unexposed" locations, the authors "carried out an experiment to investigate the effects of clothianidin exposure—the most common NNI found in our	"We carried out experiments that approximated field-realistic exposure and found biologically significant effects of clothianidin exposure on honeybee worker morality, hygienic behavior, and the abilities of colonies to sustain a laying queen over time. Finally, we uncovered that the acute toxicity of NNIs to honey bees increases in the presence of field-realistic levels of a common fungicide. Our findings indicate that chronic NNI exposure reduces the health of honey bee	##			
Wagman et al. 2017	Prepared by USEPA Environmental Fate and Effects Division	no statement provided	report	risk assessment	primarily *Apis mellifera*	*Apis*	*mellifera*	adults, larvae	see details below					thiamethoxam and clothianidin	see details below; note that exposures of thiamethoxam are expressed as clothianidin equivalents (c.e.) "by adjusting for the ratio of the molecular weight of	see details below	oral ingestion and direct contact	see details below	This is a risk assessment developed in support of the registration review of thiamethoxam and clothianidin. "These two chemicals are assessed together because 1) clothianidin is a degradate of thiamethoxam; 2) the toxic effects and the concentrations at which	Results of the Tier I studies used for quantitative purposes in the risk assessment are described below. Registrant-submitted and open literature Tier II (semi-field) studies were available but are not summarized in the rows below because EPA determined they were of "qualitative utility", due to various limitations and uncertainties . Overall, however, the authors state "Based on the colony feeding study and other available studies, exposure to clothianidin affected adult and brood development." Registrant-submitted Tier III	##			
Wood and	none identified	no staten	journa	review	wild non-targe	multi	multiple										pollen/nectar of t	**Bees:** direct lethality to adults, colony growth, reproductive success, foraging efficiency, population trends. **Butterflies/moths:** population trends,	The paper's purpose is "to c	Research produced since the European Union's 20	##		The environmenta	Neonicotinoid pesticides were first introduced in the mid-1990s, and since then, their use has grownrapidly. They are now the most widely used class of insecticides in the world, with the majority ofapplications coming from seed dressings. Neonicotinoids are water-soluble, and so can be taken up bya developing plant and can be found inside vascular tissues and foliage, providing protection againstherbivorous
Wood et al. 2018	Western Grains Research Foundation, Saskatchewan Canola Development Commission, Saskatchewan Agricultural Development Fund, North American Pollinator Protection Campaign, Canadian Bee	no statement provided	journal article	semi-field (feeding)	*Apis mellifera* Linnaeus	*Apis*	*mellifera*	all	all	agricultural	"within an alfalfa field surrounded by pasture and fields of canola and cereals"	North America	Goodale Research and Teaching Farm, Western College of Veterinary Medicine, Saskatchewan	thiamethoxam, clothianidin, and imidacloprid (individually only)	control, 20 nM, 80 nM sugar syrup	12 weeks	oral ingestion of spiked sucrose syrup; in addition, pollen patties made with pollen from prior-year pollen traps were supplied	cumulative and three-week colony weight gains; brood area; number and cluster size of adult bees; cumulative and weekly syrup and pollen patty consumption	"We compared the effects of chronic, sublethal exposure to the three most commonly used neonicotinoids on honey bee colonies."	"Similar to other studies, we found largely no effect on colony performance at the midrange doses (20 nM or ~5 ng/g) of neonicotinoids present in the environment." "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, which reflects predominantly honey production of the colonies." The highest (80 nM) dose groups "had a significant negative effect on cluster size of the colonies." Neonicotinoid treatment did not significantly affect the number of adult bees at	##			
Wood et al. 2019	USDA National Institute of Food and Agriculture	no statement provided	journal article	residue analysis	*Apis mellifera*	*Apis*	*mellifera*			"a gradient of agricultural intensity" (10 to 93%); other landscape types included	agricultural land: maize and soybeans (about 30% each), cucumber (16%), sugar beet (11%),	North America	five counties in Michigan	clothianidin, imidacloprid, and thiamethoxam	Overall detection frequency (%) and means in ppb were: imidacloprid (56%, 0.85), clothianidin (83%, 1.00), thiamethoxam (89%, 3.03).		all (field-exposed)	residue concentrations and plant species identifications in trapped pollen	Pollen (n=357) was collected between June and September from traps associated with 114 colonies placed along a gradient of agricultural intensity.	The authors found "an impact of landscape context on neonicotinoid exposure, with colonies surrounded by a greater proportion of agricultural land exhibiting higher concentrations of neonicotinoids." However, "Despite being directly treated with neonicotinoid insecticides... the dominance of crop pollen in samples was negatively associated with pesticide residues. Instead, herbaceous non-crop plant species were consistently associated with neonicotinoid exposure, regardless of landscape context." In particular, "Higher clothianidin and	##			
Woodcock	Syngenta Ltd. and Ba	no staten	journa	field	*Apis mellifera,*	multi	multip	all	all	colonies	winter-so	Europe	Hungary (1	clothianidin	The reported me	oil rape flo	pollen/nectar of s	**Honey bees:** Endpoints were evaluated during crop flowering and in the year following exposure. Endpoints included colony size, worker and peak colony weight, hive survival and overwintering worker, brood, and storage cell numbers. **Bumble bees:** within-year reproductive output (colony weight	"In a large-scale experimen	**Honey bees:** Post-wintering, worker numbers in Hungary were significantly reduced (24% lower) by exposure to clothianidin. In the UK, although "high hive mortality precluded a formal statistical analysis of overwintering worker numbers", the median overwintering worker numbers were zero for all four clothianidin-treated sites but were above zero for two of the control and one of the thiamethoxam sites. Post-winter worker numbers in Germany were not statistically affected by treatment. Thiamethoxam did not significantly affect this endpoint. ***Bombus terrestris* and *Osmia bicornis*:** Although	##			
Wu-Smart and Spivak 2017	US EPA Science to Achieve Results (STAR)	no statement provided	journal article	laboratory	*Bombus impatiens* (Cresson)	*Bombus*	*impatiens*	adult, newly mated	queens					imidacloprid	combination of syrup and pollen syrup: control to 25.9 ppb pollen: control to 7.1 ppb	18 days ("a typical flower bloom period")	oral ingestion of sucrose syrup and pollen	syrup consumption rate, mortality, time to death, time to nest initiation, time to first brood emergence, nest weight, queen weight	"Here we chronically exposed bumble bee queens to neonicotinoid (imidacloprid) in both syrup (0, 1, 5, 10, and 25 ppb) and pollen (0, 0.3, 1.7, 3.3, and 8.3 ppb), paired respectively, to examine the potential adverse effects on the queen bee during the solitary foraging and nest initiation phase."	"Our data indicate that bumble bee queens exposed to environmentally relevant levels of imidacloprid during the solitary nest founding phase of their life cycle may suffer reduced survival or delays in nest initiation, which in turn could negatively affect colony development and reproductive success of annual bumble bee colonies." More specifically, "Survival analyses indicated that queens treated at 1, 10, and 25 ppb syrup exhibited greater mortality, and death occurred significantly sooner... but not in queens treated at 5 ppb." Control queen mortality was 14%, while mortality in the exposed groups ranged from 30% to 65%. In addition, "Nest	##		Effects of neonicotinoid imidacloprid exposure on bumble bee (Hymenoptera: Apidae) queen survival and nest initiation	Neonicotinoids are highly toxic to insects and may systemically translocate to nectar and pollen of plants where foraging bees may become exposed. Exposure to neonicotinoids can induce detrimental sublethal effects on individual and colonies of bees and may have long-term impacts, such as impaired foraging, reduced longevity, and reduced brood care or production. Less well-studied are the potential effects on queen bumble bees that may become exposed while foraging in the spring during colony initiation.This study assessed queen survival and nest founding in caged bumble bees [Bombus impatiens (Cresson) (Hymenoptera: Apidae)] after chronic (18-d) dietary exposure of imidacloprid in syrup (1, 5, 10, and 25 ppb) and pollen (0.3, 1.7, 3.3, and 8.3 ppb), paired respectively. Here we show some mortality in queens exposed at all doses even as low as 1 ppb, and, compared with untreated queens, significantly reduced survival of treated queens at the two highest doses. Queens that survived initial imidacloprid exposure commenced nest initiation; however, they exhibited dose-dependent delay in egg-laying and emergence of worker brood. Furthermore, imidacloprid treatment affected other parameters such as nest and queen weight. This study is the first to show direct impacts of imidacloprid at field-relevant levels on individual B. impatiens queen survival and nest founding, indicating that bumble bee queens are particularly sensitive to neonicotinoids when directly exposed. This study also helps focus pesticide risk mitigation efforts and highlights
Zawislak e	USDA Agricultural Re	no staten	journa	residue a	*Apis mellifera* L	*Apis*	*mellifera*			"an inte	**agricultural:** 81% cultivated; 57% soybeans, 10% rice, lower proportions of other	North Am	Lonoke Cou	174 commo	no neonicotinoids detected		all (field-exposed	residue concentrations	2014 sampling: single samples from 2 hives in each area (agricultural and rural), in both August and September 2015 sampling: single samples from 4 hives in the agricultural area in September	Of the 174 contaminants evaluated, 26 were det	##			

in 2013. Most of the 216 primary research studies were conducted in Europe or North America (62%), involved the neonicotinoid imidacloprid (76%), and concerned the western honey bee Apis mellifera (75%). Thus, little is known about neonicotinoids and bees in areas outside Europe and North America. Furthermore, because there is considerable variation in ecological traits among bee taxa, studies on honey bees are not likely to fully predict impacts of neonicotinoids on other species. Studies on crops were dominated by seed-treated maize, oilseed rape (canola) and sunflower, whereas less is known about

, insects. However, only approximately 5% of the neonicotinoid active ingredient is taken up by crop plants and most instead disperses into the wider environment. Since the mid-2000s, several studies raised concerns that neonicotinoids may be having a negative effect on non-target organisms, in particular on honeybees and bumblebees. In response to these studies, the European Food Safety Authority (EFSA) was commissioned to produce risk assessments for the use of clothianidin, imidacloprid and thiamethoxam and their impact on bees. These risk assessments concluded that these of these compounds on certain flower

Pesticide Regulatory Committee

December 15, 2020

Michael Moore, Chair
Pesticide Board Subcommittee
Department of Public Health

John Lebeaux, Commissioner
Department of Agricultural Resources

Public Hearing : Neonicotinoid Scientific Literature Review

Dear Pesticide Subcommittee Chair Moore and Commissioner Lebeaux

I write today to offer written testimony on the Scientific Literature Review findings.

I commend the Massachusetts State legislature for funding a scientific study on the effects of Neonitotinoids on pollinators. I appreciate the diligent and thoughtful work that went into this scientific review. It is scientifically clear from Industrial Economics Inc findings that neonicotinoids are a major factor in the unsustainable losses of pollinators which is being seen in the Commonwealth of Massachusetts. As the report states and Rep Dykema commented on in the oral hearing:

“Comprehensive reviews point to a large body of evidence documenting the ability of neonicotinoids to adversely affect pollinators”

“42 of 43 documents studying effects of these pesticides identified an adverse effect associated with neonicotinoid exposure”

“It is clear that such compounds can adversely affect a range of pollinator species important to the Commonwealth of Massachusetts”

The question before the Pesticide Regulatory committee and legislature is “ Does the Regulatory committee and the legislature have the will and fortitude to defend the pollinators and the citizens in our commonwealth?” The review clearly provides the scientific basis for restricting use of neonicotinoids to only licensed pesticides applicators. I urge the authorities to implement the recommended scientific bases restrictions without further delay. These scientific findings were brought forth a full year ago. Each day that passes more irreversible damage takes place in our commonwealth.

As the President of the Massachusetts Beekeepers Association (MBA) , I urge you to listen to voices of the MBA members and our 11 county associations. The MBA supports limiting the use of neonicotinoids to licensed pesticide applicators. Bee colony losses have been documented by MDAR to be over 50% each year. In 2017, Massachusetts beekeepers reported a 64.9% loss. This is not a sustainable loss and it will have lasting impacts on Massachusetts agriculture that is pollinated by bees. Bees play a critical role in our food chain. Our food supply would be

drastically affected without pollinators. The citizens of Massachusetts do not want to live in a world without blueberries, cranberries and other delicious fruits and vegetables.

In conclusion, as a citizen, human being, and beekeeper in the Commonwealth of Massachusetts, I urge the Pesticide Regulatory committee to act without delay in putting into effect the regulations necessary to limit the use of neonicotinoids to licensed applicators- the SCIENCE IS CLEAR and ACTION IS REQUIRED NOW.

Sincerely,

Mary E Duane
President Massachusetts Beekeepers Association
President Eastern Apicultural Society (EAS)
Past President Worcester County Beekeepers Association
EAS Master Beekeeper

From:	Marty Dagoberto
To:	LaScola, Taryn (AGR)
Cc:	Theoharides, Kathleen (EEA); Pierce, Sean T. (EEA); Lebeaux, John (AGR); Randle, Ashley (AGR); Dykema, Carolyn - Rep. (HOU)
Subject:	Coalition testimony re: Neonics, AGR-Pesticide-Literature-Review-FY20
Date:	Thursday, December 17, 2020 11:50:11 AM
Attachments:	NOFAMass_Coalition_AGR-Pesticide-Literature-Review-FY20.pdf

Dear Director Lascola-Miner,

On behalf of 55 agricultural, climate and pollinator advocacy groups, farms and businesses, along with several individuals, please find the attached joint testimony regarding the department's 2019 Neonics Scientific Literature Review. First and foremost, we wish to express our appreciation to the Department for its laudable execution of this review.

[An excerpt of our recommendations and closing words of the testimony]

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 neonicotinoid-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.

We hope to soon see decisive and appropriate action by the Department in response to the findings of this review and look forward to continued engagement in this process.

Best regards,

Marty Dagoberto L. Driggs
Policy Director
Northeast Organic Farming Association/Massachusetts Chapter (NOFA/Mass)

pronouns: he/him (Why do I list my pronouns?)
508-361-0136 (c) | nofamass.org

JOINT TESTIMONY ON NEONIC PESTICIDES REVIEW

December 17, 2020

Taryn Lascola-Miner
Director, Crop and Pest Services
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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 ("Literature Review").

Specifically, the Review found that the broad majority of impact-based studies reviewed (42 of 43) cited neonicotinoid insecticides ("neonics") as a contributor to pollinator declines. Further, the Review 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 neonics 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 from 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, EPA continues to recommend 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 neonic uses in agriculture, yet provide little to no benefits to farmers.[ii] In fact, new

research shows 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]

While EPA has failed to take significant action to curb the use of neonicotinoids, the European Union has instituted a full ban. Most significantly, early data from the United Kingdom shows that a seven-year-old neonicotinoid ban on oilseed crops has not negatively impacted crop production even as overall insecticide use has decreased.[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, 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.

Neonicotinoids 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 mammalian wildlife.[xi]

Other research suggests that people exposed to neonicotinoids 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 chlorination drinking water treatment generally does 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 Literature Review was limited to impacts on pollinators, the evidence for why we need strong regulations that go well beyond the actions of EPA demonstrates a much broader range of concerns.

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 neonicotinoid-coated corn and soybean seeds.
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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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Secretary Kathleen A. Theoharides
Asst. Secretary Sean Pierce
Commissioner John Lebaux
Deputy Commissioner Ashley Randle
Representative Carolyn Dykema

[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/2lRr4MF; 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 FranciscoSánchez-Bayoa and Kris A.G.Wyckhuysbc. *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 Pistoi, 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/2kTTrnc.

[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/2lR7Xfo (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*, Envtl. 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/2IlE26V (visited Oct. 9, 2019).

From:	Anne O"Connor
To:	LaScola, Taryn (AGR)
Subject:	Comment on Neonicotinoid Scientific Literature Review 2020
Date:	Monday, December 14, 2020 9:47:11 PM
Attachments:	OConnor_Williamstown_Statement_Neonic Scientific Literature Review 2020.pdf

Dear Ms. LaScola,

Please find attached a written copy of the spoken statement I delivered at the December 10 hearing of the Massachusetts Pesticide Subcommittee Board on the Neonicotinoid Scientific Literature Review.

Thank you,
Anne O'Connor

--
Anne O'Connor
Member, Williamstown Select Board
she | her | hers

December 10, 2020

Massachusetts Pesticide Board Subcommittee
Taryn LaScola-Miner
251 Causeway Street, Suite 500
Boston, MA 02114-2151

Neonicotinoid Scientific Literature Review

My name is Anne O'Connor and I am a member of the Select Board in Williamstown, in Berkshire County. I am speaking on behalf of Bee-Friendly Williamstown, a citizen group that formed in 2018. We are a network of more than 200 citizens in our area who have participated in educational events and advocacy efforts to raise awareness about the threats to pollinator health, and to promote opportunities to preserve and support pollinators.

We urge the Commonwealth to become a leader in pollinator protection. Research shows that native bees, butterflies, and many other insect species are in great decline, for a multitude of reasons. The science also clearly shows that neonicotinoids are especially damaging for the health of these pollinators. In just one example, bumblebees impacted by neonics display impaired foraging, increased queen mortality, increased worker mortality, and increased colony failure. With pollinators in such peril, why continue using the very chemicals that are so clearly killing them?

Neonics are frequently used to treat seeds. As the plant grows, neonics are present over the lifetime of the plant, including in its pollen and nectar. Many consumers do not realize that the seeds and seedlings they purchase, whether garden flowers or farm crops like corn or soy, are treated with these systemic neurotoxins. To protect pollinators, neonic-treated seeds should be banned from sale in our state, and at the very least, seeds and seedlings should be clearly labeled so that gardeners and farmers can avoid them if they wish.

Neonics have also been shown to escape into the environment and waterways, where they affect a wide array of species. The vast majority of plant species require insects for pollination and survival. Do we really want 70% of all plant species found in our landscapes to go extinct?

When we know something is bad, we should stop using it. We know neonics are toxic, so let's stop using them. Please restrict them today.

Anne O'Connor
201 Cole Ave, Apt 103
Williamstown, MA 01267
413 884 2598

From: parkmanhowe@aol.com
To: LaScola, Taryn (AGR)
Cc: Mike.Barrett@masenate.gov; tami.gouveia@mahouse.gov
Subject: RE: H.763 - An Act to Protect Massachusetts Pollinators
Date: Saturday, December 12, 2020 11:01:34 AM

Dear Taryn Lascola,

The scientific literature review of the effects of neonicotinoids on pollinators commissioned by the Pesticide Board Subcommittee, acting through the Department of Agricultural Resources, under its authority pursuant to FY20GAA-2511-0100, M.G.L. c.132B, Section 3A, clearly demonstrates that there is overwhelming scientific evidence that neonicotinoid insecticides pose unreasonable adverse effects to the environment as well as pollinators.

Furthermore, H.763 - An Act to Protect Massachusetts Pollinators should be passed without delay.

With thanks,

Parkman Howe
83 Acton Acton St.
Carlisle, MA 01741

From: PATRICIA NEARY
To: LaScola, Taryn (AGR)
Subject: Neonicotinoids
Date: Thursday, December 17, 2020 9:09:13 AM

Dear Ms Lascola,

I attended the 12/10 hearing regarding the neonicotinoids and I have been advocating the ban of public use of this poison in our environment for many years.

This is our opportunity to protect our bees, birds, wildlife, anD US, from this chemical. PLEASE don't let this opportunity pass and please limit the use of neonicotinoids.

Thank you for your attention.

Pat Neary
Bridgewater Green Committee
225 Lakeside Drive
Bridgewater, Ma 02324

508-697-8791 (Landline!)

Sent from I Pad

LaScola, Taryn (AGR)

From: Perry Carter <perrybcarter@gmail.com>
Sent: Saturday, February 22, 2020 12:09 PM
To: LaScola, Taryn (AGR)
Subject: Neonicotinoid pesticides comment

Hello, Taryn,

I'm reaching out to express my hope that neonicotinoid pesticides be banned. There is a large body of research indicating the great devastation these pesticides have brought to the planet and human health. This is why these pesticides have been banned or severely restricted in the European Union, Canada, and elsewhere. The residue from these pesticides are showing up in our water supply, poisoning our crops, killing bees which are vital to our survival, and are linked with human diseases like cancer and possibly autism and celiac disease. Given the climate crisis, there is no risk to banning the pesticides but a great risk continuing to use them in light of the research behind them.

I hope the committee will consider my comment.

Thank you!
Respectfully,
Perry Carter, resident of Northampton, MA

From:	Anne Williamson
To:	LaScola, Taryn (AGR)
Cc:	Anna Hanchett; ed stockman stockman; Bi-sek Hsiao; Sarah Stull
Subject:	AGR-Pesticide-Literature-Review-FY20
Date:	Friday, December 11, 2020 6:45:20 AM
Attachments:	Letter to Ag. Dept Neonics.pdf

Dear Director Lascola-Miner,

On behalf of the Plainfield Agricultural Commission, we wish to express our thanks for the department's Neonics Scientific Literature Review. You will find, attached here, a letter indicating our concerns for the continued use of neonicotinoid insecticides.

With this letter, we are urging the Massachusetts Department of Agricultural Resources to protect the health and ecological integrity of the Commonwealth. Thank you in advance for your consideration of this request.

Sincerely, The Plainfield Agricultural Commission

Anna Hanchett, Chair, Bi- Hsaio, Ed Stockman, Sadie Stull, Anne Williamson

11 December 2020

Taryn Lascola-Miner
Director, Crop and Pest Services
Massachusetts Department of Agricultural Resources
251 Causeway St
Suite 500
Boston, MA 02114-2151

RE: AGR-Pesticide-Literature-Review-FY20

Dear Director Lascola-Miner,

On behalf of the Plainfield Agricultural Commission, we wish to express our thanks for the Department's Neonics Scientific Literature Review.

As is clear in the studies analyzed, the situation for pollinators and wildlife is now dire due to the presence of neonicotinoid insecticides ("neonics"), and the findings are consistent with global studies on neonics. Meantime, EPA has failed to take significant action to curb the use of neonicotinoids, while the European Union has instituted a complete ban. Since the federal government refuses to take meaningful action, it is incumbent upon Massachusetts to act, without further delay, to protect pollinators and wildlife.

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 neonicotinoid-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.

With this letter, we are urging the Department of Agriculture to protect the health and ecological integrity of the Commonwealth.

Thank you in advance for your consideration of this request.

Sincerely, The Plainfield Agricultural Commission

Anna Hanchett, Chair, Bi- Hsaio, Ed Stockman, Sadie Stull, Anne Williamson

PO Box 71, Plainfield, MA 01070; 413-6345695

THE GENERAL COURT OF MASSACHUSETTS
STATE HOUSE, BOSTON 02133-1053

December 10, 2020

Michael Moore, Chair
Pesticide Board Subcommittee
Department of Public Health
305 South Street
Jamaica Plain, MA 02130

John Lebeaux, Commissioner
Department of Agricultural Resources
251 Causeway Street
Boston, MA 02114

Re: Scientific Review of the Impacts of Neonicotinoid Pesticides on Pollinators

Dear Pesticide Subcommittee Chair Moore and Commissioner Lebeaux,

We write today to offer testimony on the Scientific Review of neonicotinoid pesticides and their impacts on pollinators and the environment as required by the legislature. Bee colony loss and pollinator declines have been a persistent threat for over a decade, with Massachusetts experiencing a dramatic 50% colony loss as recently as 2018, the most recent data reported by MDAR. We appreciate the diligent work that went into the Review and wish to especially thank Secretary Theoharides for her partnership in ensuring its completion.

As you are aware, under Chapter 41 of the Acts of 2019, the Legislature directed and provided funding to MDAR to complete a scientific review of the impacts of neonicotinoid pesticides on pollinators. The review was completed exactly one year ago, with clear and unambiguous findings, stating that ***"comprehensive reviews point to a large body of evidence documenting the ability of neonicotinoids to adversely affect pollinators***" and that "***it is clear that such compounds can adversely affect a range of pollinator species important to the Commonwealth of Massachusetts."*** This comprehensive and well-documented review includes a thorough analysis of peer-reviewed scientific research and U.S. EPA product reviews, concluding that ***42 of 43 documents studying effects of these pesticides identified an adverse effect associated with neonicotinoid exposure.***

These conclusions, now 12 months old, clearly support decisive action by the Subcommittee and the Department to regulate these pesticides, consistent with the provisions of H.763, *An Act to protect Massachusetts pollinators*. Specifically, the review provides the scientific basis for restricting use of these pesticides to only licensed pesticide applicators.

At this time, we also offer comment on the process which has brought us to this point. We are troubled at the lack of urgency shown by the Subcommittee in completing this public hearing and finalizing recommendations by the statutory deadline of December 31, 2019. While we recognize that COVID-19 has impacted schedules across state government, the vast majority of agencies and the Legislature have continued to hold hearings by virtual means since last spring. The fact that it has taken the Department and the Subcommittee nine months to reschedule a public hearing required by legislative directive is extremely concerning.

Further, this delay continues a pattern of unresponsiveness by the Department and the Subcommittee with respect to these pesticides. The responsibilities of the Pesticide Subcommittee, as spelled out in 333 CMR 8.03, include "*The subcommittee shall individually review for registration and classification those pesticides with an active ingredient or use pattern which the Subcommittee determines may cause unreasonable adverse effect(s) on the environment when used in accordance with label directions."* Despite concerns about neonicotinoids being brought to the Department's attention repeatedly by the Attorney General's office, legislators and others since 2014, the Subcommittee failed to initiate an independent review or take any consequential action until 2019, when legislatively required to do so. This inability or unwillingness to respond to concerns that clearly fall within its purview raises concerns about whether the Subcommittee is able to fulfill its charge under the law to regulate pesticides.

Limits on neonicotinoid use are supported by a broad range of stakeholders, including the Massachusetts Beekeepers Association and 11 county beekeepers' associations across the Commonwealth; the Northeast Organic Farming Association; MassPIRG; Environment Massachusetts, Friends of the Earth, and Conservation Law Foundation; among others. Attorney General Maura Healey also supports limits on neonicotinoids, co-authoring H.763 as well as imposing a $75,000 settlement on Bayer Crop Science for misleading consumers about risks to pollinators. Additionally, retailers have been compelled to act, with Home Depot, Lowe's, Walmart, and BJ's Wholesale Club announcing replacement of these products on their shelves with less harmful alternatives.

More than any stakeholder, the agricultural community faces the risks of inaction, given that the $475 million Massachusetts agricultural sector is dependent on a healthy pollinator population. Limits on neonicotinoids are supported by Massachusetts Nursery and Landscape Association as well as the Massachusetts Flower Growers Association.

Other states, including Maryland, Vermont, and Connecticut, have already implemented similar restrictions, while Massachusetts, long a trailblazer in environmental protection, has yet to take action. With the review now complete and the scientific basis for limiting these pesticides now clearly established, we call on the Department and the Subcommittee to complete its process and implement restrictions without delay.

In conclusion, we strongly support the results of the scientific review and its unambiguous findings that limits on neonicotinoid pesticides are necessary. We urge the Subcommittee to act quickly in accordance with its authority and its legislative mandate to limit these products due to the threat they pose to pollinators and the environment. The science is clear and we ask the Subcommittee and the Department to fulfill their responsibilities to the public and take immediate action.

Sincerely,

Carolyn C. Dykema
State Representative
8th Middlesex District

Brian M. Ashe
State Representative
2nd Hampden District

John Barrett, III
State Representative
1st Berkshire District

James Arciero
State Representative
2nd Middlesex District

Ruth B. Balser
State Representative
12th Middlesex District

Linda Dean Campbell
State Representative
15th Essex District

Tackey Chan
State Representative
2nd Norfolk District

Michelle L. Ciccolo
State Representative
15th Middesex District

Mike Connolly
State Representative
26th Middlesex Districct

William L. Crocker, Jr.
State Representative
2nd Barnstable District

Claire D. Cronin
State Representative
11th Plymouth District

Angelo L. D'Emilia
State Representative
8th Plymouth District

David F. DeCoste
State Representative
5th Plymouth District

Carol A. Doherty
State Representative
3rd Bristol District

Mindy Domb
State Representative
3rd Hampshire District

Paul J. Donato
State Representative
35th Middlesex District

William J. Driscoll, Jr.
State Representative
7th Norfolk District

Lori A. Ehrlich
State Representative
8th Essex District

Kimberly N. Ferguson
State Representative
1st Worcester District

Dylan A. Fernandes
State Representative
Barnstable, Dukes &
Nantucket District

Ann-Margaret Ferrante
State Representative
5th Essex District

Sean Garballey
State Representative
23rd Middlesex District

Denise C. Garlick
State Representative
13th Norfolk District

Colleen M. Garry
State Representative
36th Middlesex District

Carmine L. Gentile
State Representative
13th Middlesex District

Thomas A. Golden, Jr.
State Representative
16th Middlesex District

Danielle W. Gregoire
State Representative
4th Middlesex District

Tami L. Gouveia
State Representative
14th Middlesex District

James K. Hawkins
State Representative
2nd Bristol District

Stephan Hay
State Representative
3rd Worcester District

Jonathan Hecht
State Representative
29th Middlesex District

Natalie M. Higgins
State Representative
4th Worcester District

Kevin G. Honan
State Representative
17th Suffolk District

Bradley H. Jones, Jr.
State Representative
20th Middlesex District

Patrick J. Kearney
State Representative
4th Plymouth District

Mary S. Keefe
State Representative
15th Worcester District

Kay Khan
State Representative
11th Middlesex District

Kathleen P. LaNatra
State Representative
12th Plymouth District

John J. Lawn
State Representative
10th Middlesex District

David H. A. LeBoeuf
State Representative
17th Worcester District

Jack P. Lewis
State Representative
7th Middlesex District

David P. Linsky
State Representative
5th Middlesex District

Kate Lipper-Garabedian
State Representative
32nd Middlesex District

Jay Livingstone
State Representative
8th Suffolk District

Marc T. Lombardo
State Representative
22nd Middlesex District

Adrian C. Madaro
State Representative
1st Suffolk District

Liz A. Malia
State Representative
11th Suffolk District

Paul W. Mark
State Representative
2nd Berkshire District

Joan Meschino
State Representative
3rd Plymouth District

Christina A. Minicucci
State Representative
14th Essex District

Liz Miranda
State Representative
5th Suffolk District

Frank A. Moran
State Representative
17th Essex District

David K. Muradian, Jr.
State Representative
9th Worcester District

Brian W. Murray
State Representative
10th Worcester District

Tram T. Nguyen
State Representative
18th Essex District

W. Smitty Pignatelli
State Representative
4th Berkshire District

Angelo J. Puppolo, Jr.
State Representative
12th Hampden District

David M. Rogers
State Representative
24th Middlesex District

Jeffrey N. Roy
State Representative
10th Norfolk District

Lindsay N. Sabadosa
State Representative
1st Hamphire District

Paul A. Schmid, III
State Representative
8th Bristol District

Danillo A. Sena
State Representative
37th Middlesex District

Alan Silvia
State Representative
7th Bristol District

Thomas M. Stanley
State Representative
9th Middlesex District

Paul F. Tucker
State Representative
7th Suffolk District

Steven Ultrino
State Representative
33rd Middlesex District

Aaron Vega
State Representative
5th Hampden District

Tommy Vitolo
State Representative
15th Norfolk District

Susannah M. Whipps
State Representative
2nd Franklin District

Joanne M. Comerford
State Senator
Hampshire, Franklin, &
Worcester District

Brendan P. Crighton
State Senator
3rd Essex District

Cynthia S. Creem
State Senator
1st Middlesex & Norfolk
District

Julian Cyr
State Senator
Cape and Islands District

James B. Eldridge
State Senator
Middlesex & Worcester
District

Ryan C. Fattman
State Senator
Worcester & Norfolk District

Patricia D. Jehlen
State Senator
2nd Middlesex District

Jason M. Lewis
State Senator
5th Middlesex District

Joan B. Lovely
State Senator
2nd Essex District

Michael O. Moore
State Senator
2nd Worcester District

Patrick M. O'Connor
State Senator
Plymouth and Norfolk District

Michael F. Rush
State Senator
Norfolk and Suffolk District

Susan Moran
State Senator
Plymouth & Barnstable District

Rebecca L. Rausch
State Senator
Norfolk, Bristol, and Middlesex District

Walter F. Timilty
State Senator
Norfolk, Bristol, and Plymouth District

CC:
Governor Charlie Baker
Attorney General Maura Healey
Secretary Kathleen Theoharides, EOEEA
Chair Smitty Pignatelli, House Chair, Committee on Environment, Natural Resources and Agriculture
Chair Anne Gobi, Senate Chair, Committee on Environment, Natural Resources and Agriculture
Commissioner Monica Bharel, Department of Public Health
Chris Eicher, Office of Speaker Robert A. DeLeo
The Massachusetts Dept. of Agricultural Resources Pesticide Board Subcommittee

From: Resa B
To: LaScola, Taryn (AGR)
Subject: Please regulate pesticides in Massachusetts!
Date: Wednesday, December 16, 2020 5:29:35 PM

Dear Taryn, et al.:

Thank you for conducting a literature review of neonics. Now that you have confirmed that the science finds these pesticides to be dangerous to bees and other beneficial insects and that neonics persist in plants, soil, and water — and may be dangerous to other life forms — please take the next step. Follow the science. Recommend regulations that restrict/regulate use and, when possible, ban neonics. We've seen a drastic drop in insect and bird populations in the last decades, and pesticides are a part of the problem along with habitat loss and climate change. Making a transition to safe and sustainable methods of land stewardship and agriculture is a top priority for me. Preserving biodiversity, including insect, bird, and animal life is essential to our survival as well as the quality of life. Massachusetts can lead the way!

As you know:
Broadspectrum -- Neonicotinoids are deadly to bees and other pollinators as well as whatever "pests" they are intended to eliminate.
Systemic -- these chemicals enter plants and linger there in leaves and flowers.
Persistent -- the chemicals do not break down or disperse in soil but stay there and remain toxic. The chemicals also enter our waterways, drinking water supplies, nd in our food chains.

Thank you for your time and consideration of this very serious matter.
Sincerely,
Resa Blatman and Stefan Cooke
Somerville, Massachusetts

LaScola, Taryn (AGR)

From: Ruth Loetterle <rloetterle@gmail.com>
Sent: Sunday, February 23, 2020 12:58 PM
To: LaScola, Taryn (AGR)
Subject: Eliminate neonicotinoids

I am writing to convey my support for the elimination of neonicotinoids in Massachusetts and that the sourcing of all plants sold In Massachusetts to be from organic or pesticide-free nurseries.

Thank you,
Ruth Loetterle
Member of Grow Native Massachusetts

Sent from my iPhone

From: Ryan D
To: LaScola, Taryn (AGR)
Cc: donald.wong@mahouse.gov
Subject: Neonicotinoid review
Date: Thursday, December 3, 2020 9:04:43 AM

Hello,

My name is Ryan Duggan. I am a Massachusetts beekeeper, an undergraduate studying Natural Resources Conservation at the University of Massachusetts Amherst, and served as the 2019 Massachusetts Honey Ambassador representing the Massachusetts Beekeepers Association.

While this background may make me appear biased, all that I have seen, heard, and researched on neonicotinoids has helped me to understand that they have very detrimental effects on the environment, and particularly on crucial pollinators. I understand the values of using pest treatments, but strongly believe that neonicotinoids should not have a place in Massachusetts.

Thus, as a Massachusetts resident, I would very much like to see H.763 - An Act to Protect Massachusetts Pollinators be passed as soon as possible. Our communities are already affected by so many other issues, and allowing pollinator decline due to neonicotinoids to become even worse is not something anyone can afford.

Thank you,
Ryan Duggan

From: Sh berg
To: LaScola, Taryn (AGR)
Subject: Neonic Scientific Literature Review Hearing, Pesticide Board, Testimony
Date: Thursday, December 10, 2020 8:17:24 PM
Attachments: SHIRA"S Bee Flyer.pdf

Thank you for today's hearing. Please accept this written testimony.

*****

Hello. I am writing as a member of Bee-Friendly Williamstown, GreeNA (North Adams) and Greylock Together. I also work with Berkshire Farms Apiary and belong to the Bennington Beekeepers and the Northern Berkshire Beekeeping Association.

Several years ago, we formed Bee-Friendly Williamstown in coordination with the Western MA Pollinator Networks. We passed a town resolution to bring into awareness the negative effects of the pesticides being nonchalantly sold and applied in our neighborhoods -- primarily by landscaping companies, the two area golf courses, the affordable housing authority and the college.

The elementary school's organic education garden, in fact, was bordered by a compound of houses that, emulating one another and heeding the guidance of trusted industry-oriented landscapers, signed package contracts that resulted in the "treatment" of their yards several times a season. Little yellow poison warning flags dotted the neighborhood.

Concerned, we gathered as gardeners, farmers, landscapers, beekeepers, birders, parents and pet-owners as we noted that we rarely heard buzzing bushes humming with bees as we had growing up. Our hearts ached.

In order to become bee-aware, we took on the work of educating ourselves. We shared what we learned through lectures, garden tours, films, native plant sales and community plantings.

We recalled what we had once known -- that insects are a healthy and essential part of a naturally functioning ecosystem without which, we cannot

grow many of the foods that we relish planting in our yards, buying from our local organic CSAs and farm stands, and purchasing at the market.

For the global perspective, we read about the Sixth Mass Extinction, the Global Insect Collapse, the Cornell Bird Study, and the Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services. We read about the effects of neonicotinoids (and other pesticides / herbicides *including* glyphosate) on our rusty patch bumble bees, monarchs, moths -- and therefore also on bats and birds all the way down the declining line. We learned that other countries had already banned neonics! That many countries operate on the *precautionary principle* to protect their populations from the start rather than to wait for the damage to be done several times over and when poisonous practices have become entrenched as protocol.

Furthermore, we continue to experience these destabilizing losses, at this particular moment in time, through the larger lens of climate change that demands that we proceed differently from business as usual.

Locally, we were inspired by the Great Barrington Pollinator Protection Plan and by the work of the Regenerative Design Group among others who offer intelligent, integrated, other options.

As we were overcome by the knowledge that the consequences of neonicotinoid use is amplified by cumulative exposures and pesticide interactions, we were simultaneously, just barely, still able to recall that the birth of the chemical age was really not so long ago. Not so long that we can't choose another path -- and support those struggling with the transition through mentorship and funding. How was it, after all, that we ever bought into the story that we should be poisoning our immediate air, soil, water and thus food as a regular course? The whole premise is baffling when you step back. Common sense says that intergenerational health should never be held hostage by business models hyper-focussed on marketable tasks and products or by the imitation thereof. There are so many other ways to steward.

We love our naturally beautiful, rural corner of the state, but we need your help. Planting a flower patch in front of the church is hardly sufficient. So we call on our elected leaders to aid us in our work -- the work that we started because of our love for the place we call home.

Please, ban neonicotinoids. It can only help in the long run. And please, don't let them be replaced by yet another toxin on the treadmill.

Thank you.

Shira Wohlberg
Williamstown / North Adams
Co-signed by Tony Pisano

Fall in Love with Pollinators!

Bees and other pollinators are essential to a healthy, diverse ecosystem.
They are vital to our food system, providing pollination for vegetables, herbs and fruits.
Who are our pollinators? Ants, flies, beetles, bats and...

Create a Welcoming Home

• **Lawns:** Reduce lawn to only actively used areas. Cut mowing schedule in half to increase forage, lessen soil microbial damage, and decrease emissions. Start mowing grass later in the season and end sooner. Diversify lawn mix. Enjoy natural, flowering ground covers as bountiful pollinator forage. These weed-wildflowers include clover, violets, thyme, ground ivy and dandelions. Give them time to bloom. Prune trees and shrubs to their natural shape and with ample undisturbed space beneath to protect roots and trunks from machinery rather than upbranching for mowers.

• **Toxins**: Cut budget for chemicals and other products (such as Weed & Feed, Round-Up, and any substance containing glyphosate or neonicotinoids such as imidacloprid, clothianidin, thiamethoxam, and acetamiprid). Ask garden centers for seeds and plants that have not been pre-treated with chemicals. Cut out foods grown with systemic pesticides such as Round Up Ready crops.

• **Meadows**: Transition lawn/acreage into meadow where goldenrod, asters and milkweed can flourish. Clearly delineate the border. Wait to mow until after the frost. Leave a rotating third of the field untouched each year.

• **Plants:** Prepare a bird and pollinator-friendly feast with native perennial flowers and shrubs that provide multi-storied and overlapping bloom periods. Grow large drifts of similar flowers for more accessible, safe and efficient pollinator foraging. Expand undisturbed property edges through strategies such as wildscaping. Cultivate peaceful, naturalized places that will live for generations.

• **Onsite Nutrients:** Leave leaves under hedges and edges as pollinator nesting sites and soil-enriching mulch. Sign a leaf-blower opt-out agreement with your maintenance company. Use a mulching mower on lawns to return nutrients to the soil. Leave dying trees and downed logs as nesting habitat after removing potentially dangerous branches. Consider forgoing fall bed clean-up in exchange for *winter interest* that provides shelter and food for birds, soil coverage, and safe nesting. In spring, where possible, cut whole stalks that may still have nesters inside for brush/compost piles and as "chop and drop" mulch rather than mincing.

• **Emissions**: Exchange fossil fuel-powered machinery for electric tools that are charged with renewable energy. Transition to human-powered tools such as rakes, brooms, human push mowers, and sickles and scythes wherever possible after reducing managed area.. Reduce number and frequency of maintenance tasks. Protect workers from respiratory / auditory exposures.

Give yourself a break and let nature BEE with less disturbance and more diversity.

www.wmassbees.org

RESOLUTION DECLARING WILLIAMSTOWN A POLLINATOR-FRIENDLY COMMUNITY

Article 39 - The purpose of this advisory, non-binding resolution is to encourage awareness, education, and voluntary action in support of pollinators. Bees, butterflies, and other pollinators are vital parts of our ecosystem, provide essential services for valued crops, and thus contribute to our local agricultural economy.

Whereas , bees and other pollinators are an essential component of a healthy ecosystem and a vital link in our food system, providing pollination to grow vegetables, herbs, and fruits;

Whereas , locally grown crops such as apples, blueberries, strawberries, squash, and tomatoes depend on pollinators and thus are at risk; and

Whereas , pollinator populations are in sharp decline due to human land use practices that are causing ongoing habitat loss and fragmentation, the expansion of pesticide use by consumers and professionals, and the spread of pathogens and parasites; and

Whereas , extensive research has documented that neonicotinoids and other systemic pesticides have been correlated with illness and death to bees, butterflies, moths, and other beneficial pollinators (that in turn affects bird populations); and

Whereas , guidelines for Integrated Pest Management practices are available which allow residents, businesses, farms, and towns to manage their land in ways that dramatically increase pollinator forage and nest sites while decreasing maintenance costs; and

Whereas , the monetary and social costs of maintaining pollinator-friendly landscapes can be less expensive than costs associated with maintaining chemically-treated mono- crop landscapes;

Now, Therefore, Be It Resolved by the Town Meeting of the Town of Williamstown that the Town of Williamstown is hereby declared a Pollinator-Friendly Community and that the town encourages the adoption of policies and practices that support pollinator health by minimizing the use and sale of pesticides and encouraging property owners, residents, town departments, and business owners to adopt pollinator-friendly best practices including:

* Delaying the mowing of fields to allow fall-blooming asters and goldenrods to bloom to provide an important food resource for pollinators getting ready to over-winter.

* Avoiding the planting of flowering plants which are treated with systemic insecticides and avoiding the use of seeds coated with systemic neonicotinoids.

* Planting diverse grass mixes for lawns that include low flowering ground covers such as clover while welcoming the presence of naturally occurring, low-growing wildflowers.

* Reducing lawn mowing schedules so as to allow these flowering ground covers to bloom to provide an important food resource for pollinators throughout the seasons and to reduce overall maintenance costs.

* Avoiding homeowner applications of pesticides that require a neighbor notification flag by the state of Massachusetts about the risks to children and animals, and avoiding non-agricultural homeowner usage of glyphosate products (e.g. RoundUp).

* Where possible, replacing portions of grassed areas with low maintenance flowering perennial shrubs, wildflower corridors, and trees.

* Allowing fallen leaves to remain along property borders under trees and shrubs as overwintering sites for insects (and birds).

6/23/2020
15 Major Hale Dr.
Framingham, MA 01701

Taryn Lascola-Miner
Director, Crop and Pest Services
Massachusetts Department of Agricultural Resources
251 Causeway St
Suite 500
Boston, MA 02114-2151

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

Dear Director Lascola-Miner,

I am writing to comment on the results of the **2019 Neonics Scientific Literature Review** that was mandated in the **FY20 Budget**, and based on these results, request that MDAR take immediate action to implement the restrictions on the use of neonicotinoids in the Commonwealth of Massachusetts that are detailed in Representative Carolyn Dykema's bill, **H.763 – An Act to protect Massachusetts Pollinators.**

The review determined that 42 of 43 of the impact-based studies reviewed cited neonicotinoid insecticides as a major contributor to pollinator declines. The review also specifically states that the only studies that had mixed results were industry-funded. These findings are consistent with the overwhelming body of peer reviewed scientific research, worldwide, showing that neonicotinoids are clearly implicated in the unsustainable losses of managed bees and native pollinators.

The findings of this Literature Review are consistent with numerous global studies and demonstrate, along with other factors listed below, that restrictions on neonicotinoid use in Massachusetts are clearly warranted:

- A recent study found that U.S. Agriculture is 48 times more toxic to insect life than it was in the early 1990 and that neonicotinoids account for more than 90% of that increase.
- 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.
- While the EPA has failed to take significant action to curb the use of neonicotinoids, the European Union has instituted a full ban. Most significantly, early data from the United Kingdom shows that a seven-year-old neonicotinoid ban on oilseed crops has not negatively impacted crop production even as overall insecticide use has decreased. 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.

- Neonicotinoids are also a suspected contributor to the massive North American bird population losses over the last several decades. Neonicotinoid-coated crop seeds blanket agricultural areas—a single seed can contain enough active ingredient to kill a quarter-million bees or more —and eating just one such seed is enough to kill some songbirds. Even at low doses, neonicotinoids can harm birds' immune systems, fertility, and navigation, and cause rapid weight loss, thereby reducing birds' chances of surviving in the wild.
- 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 mammalian wildlife.
- Other research suggests that people exposed to neonicotinoids may similarly be at increased risk of developmental or neurological damage, including malformations of the developing heart and brain, memory loss, and finger tremors. These results raise special concern given that neonicotinoid exposure is often difficult or impossible to avoid. Conventional drinking water treatments do not remove neonicotinoids from contaminated water, and neonicotinoid residues have been found to contaminate produce and baby food. Because neonicotinoids are systemic and therefore permeate foods, they cannot be washed off.

While the Literature Review is limited to impacts on pollinators, the evidence for why we need strong restrictions on the use of neonicotinoids goes well beyond their effects on pollinators.

I therefore request that MDAR take immediate action to implement the restrictions on the use of neonicotinoids in the Commonwealth of Massachusetts that are detailed in Representative Carolyn Dykema's bill, **H.763 – An Act to protect Massachusetts Pollinators**. The states of Maryland, Connecticut and Vermont have passed legislation like H.763. New Jersey and other states have similar legislation pending. It is only a matter of time before this legislation is enacted in Massachusetts.

MDAR has an opportunity here to step up, do the right thing and, in the process, save the pollinators that will die while the legislative process plays out. This action would also help to heal the relationship between the beekeeping community and MDAR. It is a win for both sides

Sincerely,

Jonathan D. Siegel

Jonathan D. Siegel

From: Starr, Thomas
To: LaScola, Taryn (AGR)
Subject: neonics
Date: Thursday, December 17, 2020 6:36:29 PM

Thank you for conducting a literature review of neonics. Now that you have confirmed that the science finds these pesticides to be dangerous to bees and other beneficial insects and that neonics persist in plants, soil and water -- and may be dangerous to other life forms -- please take the next step. Follow the science. **Recommend regulations that restrict/regulate use and, when possible, ban neonics.** We've seen a drastic drop in insect and bird populations in the last decades, and pesticides are a part of the problem along with habitat loss and climate change. Making a transition to safe and sustainable methods of lands stewardship and agriculture is a top priority for me. Preserving biodiversity, including insect, bird and animal life, is essential to our survival as well as quality of life. Massachusetts can lead the way.

Thomas Starr
Professor
Art + Design
Northeastern University
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Boston MA 02115
617 372 0977

TOXICS ACTION CENTER

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F: (617) 292-8057

AMHERST
150 Fearing St., #4A
Amherst, MA 01002
P: (413) 253-4458
F: (413) 256-6435

EMAIL:info@toxicsaction.org
WEB: www.toxicsaction.org

To: Massachusetts Pesticide Board Subcommittee
Re: Neonics Scientific Literature Review

Toxics Action Center is an environmental health non-profit with offices in Boston and Northampton. We know that the threats communities face from polluters is big, but that the power of a well-organized community group is bigger. That's why we work side-by-side with everyday people who are standing up to those that are harming our health and environment. Giving residents the knowledge and know how to make change in their backyard.

Every year we get dozens of calls from across the state from residents concerned about pesticides and what they can do about it. Throughout 2019, we helped bring together these residents to share information and local strategies to reduce pesticide use. But it is clear that pesticides don't just stay where you spray them and stop at town lines. Nor do they only harm their intended targeted weed or pest. It is important that we address these issues on the state level.

As the bee colonies die-offs continue to happen in Massachusetts, we've kept an eye on the science that's emerged linking neonicotinoids as one of the primary causes. Bees are an important part of our food system and our economy. That's why we've been calling for restrictions on bee killing pesticides like neonicotinoids.

In these political times we live in now, it is critical that we take into consideration science as we make policy. We applaud the Pesticide Board Subcommittee's work reviewing the science on neonicotinoids and find their method of reviewing impact-based studies to be rigorous and sound.

Their findings that the majority of the literature they reviewed showed that these pesticides negatively impact bees is clear. And in the cases where there were studies that found no negative impact, the funders of the studies had been pesticide manufacturers themselves and relied on non-public reports that had not been reviewed by a third party.

We hope that as the state legislature moves forward in protecting bees and our ecosystem that they will rely on this science.

LaScola, Taryn (AGR)

From: Tusi RitaChild <ritachild@hotmail.com>
Sent: Saturday, February 22, 2020 12:03 PM
To: LaScola, Taryn (AGR)
Subject: Banning Neonicotinoids

Dear Pesticide Board Subcommittee,
I strongly oppose any use of neonicotinoid insecticides on any public land in our beautiful Massachusetts.

The scientific studies are crystal clear. Neonics seriously, adversely affect bee and pollinator populations, and they leave their negative impact on the food that we and wildlife consume.

We can no longer use the excuse that these chemicals are convenient. They wreak havoc in the long run and are extremely detrimental to our pollinators, our food supply, and our health.

I urge you to ban neonics completely.

Thank you.

Tusi Gastonguay
121 Willow St.
Florence, MA 01062

Wollaston Garden Club
PO Box 147
Quincy, MA 02170

Date: December 17, 2020

To: Taryn LaScola-Miner
Pesticide Board Subcommittee
51 Causeway Street, Suite 500
Boston, MA 02114-2151

Re: Scientific Literature Review of the Effects of Neonicotinoids on Pollinators

Dear Ms. LaScola-Miner:

A well-respected member of the Wollaston Garden Club (WGC) has brought our attention to the recent public hearing about the effects of neonicotinoids on pollinators.

Located in Quincy, Massachusetts we were founded in 1927 and the WGC is currently celebrating its 93rd year! We have 116 members made up of men and women gardeners of all ages, abilities and interests. Our gardening abilities range from novice to four certified master gardeners. In addition to gardening, many club members are beekeepers. The WGC is also a member of The Garden Club Federation of Massachusetts, Inc. and The National Garden Clubs, Inc.

We are writing on behalf of our entire membership who is deeply concerned about the role of neonicotinoid insecticides. In the last decade the WGC has made decided changes in the City of Quincy's gardens that we maintain with many foreign and exotic plants to those which fall into native, environmentally friendly categories. While these new specimens easily fit into this niche and which we hope will flourish, we have noticed some weaknesses.

Notably, monarch butterflies and many varieties of bees are the victims of poisonous neonicotinoids. Neonicotinoids are also persistent in the environment and even as they degrade, they remain toxic to bees and other beneficial insects. These systemic pesticides have insidious means of sublethal effects, including the reproduction systems and the nervous system.

We hope efforts are being made to research and to replace current chemicals with safe substitutes. Thank you taking our concerns under serious consideration.

Sincerely,

Kathleen Ceurvels and Ann Foresman
Wollaston Garden Club Co-Presidents