Pollinator News

Sept. 29, 2017

It is the mites because . . .

“But even if the varroa mite problem were solved today, this would not by itself solve all of the problems facing honey bees and beekeepers,” Dr. Jeff Pettis, Research Leader USDA - Agricultural Research Service

The latest research on mites, and another avenue to control them is welcomed. However, the recent research and surveys and the current “Mite-A-thon” obfuscates the real cause of the bee health crisis: their toxic environment.

The focus on varroa mites, as the sole pest to honey bees, detracts from a primary factor affecting the health of honey bees: pesticides. The varroa mite has been in the USA since the mid-1980’s. Beginning in 2005 bees started dying in unprecedented numbers. As the cause had not yet been identified, it was called “colony collapse disorder (CCD).” While many researchers have correlated the ecosystem accumulation of systemic and conventional pesticides with abnormal bee mortality, too many continue to discount bee toxic pesticides, including those pesticides clearly defined as “bee toxic.” But in this bee health crisis “There is relatively little incentive for university entomologists to consider complex real-world issues such as the cumulative effects of toxic synergies that involve low doses of neonicotinoids, the way beekeepers might.”

Research across a number of years shows the residues of crop protection pesticides in bee hives creating sub-lethal and behavioral altering environmental levels of toxins within the “house, nursery, and food pantry” of the bee hive. When honey bees eat sub-lethal levels of toxins, when they feed it to their young, when it contaminates the pollen and nectar they bring into the hive, or the pesticides leach across frames contaminating pesticide-free pollen or nectar, of course the bees are susceptible to the effects of the varroa mite. A weakened immune system is typically attacked on many fronts. With honey bees the varroa mite is just the final straw in the colonies’ health. “It is the mites because” of the accumulation of pesticide residues on the bee forage, as well as pesticide residues in and on water.

Pesticide exposure alters the varroa- to-bee-relationship allowing varroa to overrun the hive. Using Bee Informed Partnerships’ treatment threshold of no more than three varroa mites per hundred bees the composite sample of a bee yard is just under or at the threshold. When the bees are subjected to an insecticide spray, if it is in the city, maybe mosquito abatement, or in agriculture, aphid spraying on a blooming crop; a relatively “light hit” of pesticides may only kill half of the bees. What happens to the varroa to bee ratio then? Every varroa mite in a brood cell raising its next generation are happily feeding on healthy bee larva. In a matter of hours, themite to bee ratio may double. Research is showing however, that varroa mites exposed to sub-lethal levels of these same pesticides go into hyper
breeding mode. Several weeks out the hive is in trouble with a varroa mite overload; but it is mites because, not because of mites.

It is simply mis-information to continue to promote a single cause, varroa mites, and therefore imply a single solution. It is mis-information to the food consumer, agricultural stakeholders, and policy makers to ignore other factors simply because it makes for convenient data collection. Dr. Pettis provided additional insights in his 2014 testimony stating, “The loss of honey bees may also reflect a much larger issue of general pollinator declines, with honey bees acting as an indicator species.” An insightful examination of the honey bee health crisis is presented in Vanishing Bees by S. Suryanarayanan and D.L. Kleinman, who suggest “that forms of knowledge and ignorance about honey bee toxicology are a result of methodological choices that do not necessarily reflect the ground realities of commercial pollination or the social lives of honey bees.”

Research has shown toxicities of individual pesticides increase when they are mixed together.\(^9,10,11\) Research shows there are high residue levels of pesticides in the hive that kill queen bees, and larvae.\(^9,12,13,21,23,24\) Pesticide labels clearly state which products are toxic to bees, and other non-target organisms.\(^11\) Systemic neonicotinoid pesticides are labeled as bee toxic, and the research shows the toxicity of these pesticides from direct, residue, and cumulative impacts upon bees.\(^21,22,24\) Research shows bees exposed to low levels of pesticides have higher varroa mite loads.\(^25\) These higher mite loads compromise the honey bees immune system resulting in higher virus and Nosema loads.\(^10\) Some pesticides turn off the honey bees’ ability to detoxify pesticides.\(^26\) Research is showing fungicides are problematic for honey bee health.\(^9,14,15\) Research shows that pesticides applied to a crop, or yard, or public lands, drift.\(^16,17,18,19,20\) If the pesticides drift onto pollinator habitat then that forage is now a contaminated food source for honey bees and other pollinators. But it makes for difficult research when examining the impact of all of these factors on bee health. And yet, we must. Bee health is not failing just because of the varroa mites; varroa mites are taking advantage of a hive already suffering a weakened immune system as they interact in their ecosystem. “It is the mites, because…”

Recent national honey bee loss numbers paint an incomplete picture of bee health, and discount the efforts that beekeepers are engaged in to keep their bees alive. The constant requeening of hives, splitting hives in the fall, keeping bees out of their spring buildup areas until the risk of planting pesticide coated corn seed is done, and the continual feeding of bees as if they were feedlot livestock.

We must ensure research is complete, encompasses the bees’ real-world, and involves /acknowledges beekeepers in the research design, development, and implementation. Honey bee health will only improve when we acknowledge the complete experience of the honey bee and the beekeeper.

The factors impacting honey bee health are pesticides, pests, pathogens, and poor forage. To continue the fallacy of a single pest is misleading. When examining bee health one cannot simply assess one pest, but every single factor, and the cumulative effects of all of the factors. Bee health is not a singular assessment—as samplers of the environment, honey bees are telling us the accumulation of pesticides make the immune system weaker, reduce the reproductive ability of the queen and drone bees, make bees forgetful, accelerate the hive tasks of worker bees, and affect the next generation of bees. It is
irresponsible to ignore the impact of pesticides upon honey bees, when so many of the chemicals are registered, and sold with federal pesticide labels clearly stating “this product is toxic to honey bees.” (For example see this pesticide label [http://www.syngenta-us.com/currentlabel.aspx?productid=721](http://www.syngenta-us.com/currentlabel.aspx?productid=721)) Assessing the health of bees from the four factors impacting their health: pesticide exposure, bee pests and diseases, and loss of forage may difficult for scientists, we cannot continue to do research simply on one pest of the bee thinking that is the only problem. We cannot continue to ignore the other factors affecting bee health that allow the varroa mite to have such an impact. The intense use of pesticides contributes significantly to the weakened health of honey bees exacerbating the impact of the varroa mite. If it is just varroa mites impacting the health of honey bees, what has caused the decline in Monarch butterflies?


3 Varroa Mite Researchers Talk High Infestations in Bee Colonies, Carol Miller, Growing Produce, [http://www.growingproduce.com/vegetables/varroa-researchers-talk-high-infestations/](http://www.growingproduce.com/vegetables/varroa-researchers-talk-high-infestations/)


7 Ibid, page 9

8 Insect pollinators contribute $29 billion to U.S. farm income, Krishna Ramanujan, May 22, 2012, [http://news.cornell.edu/stories/2012/05/insect-pollinators-contribute-29b-us-farm-income](http://news.cornell.edu/stories/2012/05/insect-pollinators-contribute-29b-us-farm-income)


10 Crop Pollination Exposes Honey Bees to Pesticides Which Alters Their Susceptibility to the Gut Pathogen Nosema ceranae, Jeffery S. Pettis, Elinor M. Lichtenberg, Michael Andree, Jennie Stitzinger, Robyn Rose, Dennis vanEngelsdorp, Published: July 24, 2013, [https://doi.org/10.1371/journal.pone.0070182](https://doi.org/10.1371/journal.pone.0070182), [http://journals.plos.org/plosone/article?id=10.1371/journal.pone.0070182](http://journals.plos.org/plosone/article?id=10.1371/journal.pone.0070182)

11 Protecting Honey bees from pesticides (a list of labelled bee toxic pesticides), Purdue University Extension, [https://extension.entm.purdue.edu/publications/E-53.pdf](https://extension.entm.purdue.edu/publications/E-53.pdf)


13 Corn seed treatment insecticides pose risks to honey bees, yield benefits elusive, Purdue Extension, By Shari L Finnell, Manager of Media Relations and Public Information, [https://extension.purdue.edu/pages/article.aspx?intItemID=25137](https://extension.purdue.edu/pages/article.aspx?intItemID=25137)

Fungicides can reduce, hinder pollination potential of honey bees


Pesticide Drift Tree Damage Reports Up this Spring May 19, 2016
Ben Beckman - Pesticide Safety Education Program Extension Assistant, University of Nebraska-Lincoln, http://cropwatch.unl.edu/2016/pesticide-drift-tree-damage-reports-spring

Dicamba Drift Reports Rise in Tennessee


Common crop pesticides kill honeybee larvae in the hive, Sara LaJeunesse, January 27, 2014
http://news.psu.edu/story/301619/2014/01/27/research/common-crop-pesticides-kill-honeybee-larvae-hive

Combined neonicotinoid pesticide and parasite stress alter honeybee queens’ physiology and survival, Claudia Dussaubat,. Alban Maisonnasse,. Didier Crauser,. Sylvie Tchamitchian,. Marc Bonnet,. Marianne Cousin,. André Kretzschmar,. Jean-Luc Brunet,. & Yves Le Conte,Scientific Reports 6, Article number: 31430 (2016),doi:10.1038/srep31430, https://www.nature.com/articles/srep31430


Read more at: https://phys.org/news/2016-09-high-pesticides-colonies-linked-honey.html#jCp
The great nutrient collapse: The atmosphere is literally changing the food we eat, for the worse. And almost nobody is paying attention. (from Politico.com) By Helene Bottemiller Evich 9-13-17

Read the full article http://www.politico.com/agenda/story/2017/09/13/food-nutrients-carbon-dioxide-000511

Excerpt: Ziska devised an experiment that eliminated the complicating factor of plant breeding: He decided to look at bee food.

Goldenrod, a wildflower many consider a weed, is extremely important to bees. It flowers late in the season, and its pollen provides an important source of protein for bees as they head into the harshness of winter. Since goldenrod is wild and humans haven’t bred it into new strains, it hasn’t changed over time as much as, say, corn or wheat. And the Smithsonian Institution also happens to have hundreds of samples of goldenrod, dating back to 1842, in its massive historical archive—which gave Ziska and his colleagues a chance to figure out how one plant has changed over time.

They found that the protein content of goldenrod pollen has declined by a third since the industrial revolution—and the change closely tracks with the rise in CO₂. Scientists have been trying to figure out why bee populations around the world have been in decline, which threatens many crops that rely on bees for pollination. Ziska’s paper suggested that a decline in protein prior to winter could be an additional factor making it hard for bees to survive other stressors.

Ziska worries we’re not studying all the ways CO₂ affects the plants we depend on with enough urgency, especially considering the fact that retooling crops takes a long time.

“We’re falling behind in our ability to intercede and begin to use the traditional agricultural tools, like breeding, to compensate,” he said. “Right now it can take 15 to 20 years before we get from the laboratory to the field.”
Court of Appeal Rejects California's Approval of Bee-Killing Pesticides

San Francisco, CA — The First District California Court of Appeal issued an opinion Tuesday in a lawsuit challenging a California Department of Pesticide Regulation (DPR) decision to approve additional uses for two bee-killing pesticides without disclosing the impact on honeybees. Pesticide Action Network, Center for Food Safety, and Beyond Pesticides, represented by Earthjustice, filed the underlying lawsuit in 2014, seeking to halt DPR’s practice of approving ever more uses for neonicotinoid pesticides pending completion of the agency’s languishing scientific review of the evidence linking agricultural use of neonicotinoids to a global honeybee die-off. DPR began its scientific review in early 2009 after it received evidence that neonicotinoids are killing bees, but DPR has yet to complete its review or take meaningful action to protect bees. Instead, DPR has continued to allow increased use of neonicotinoids in California.

“DPR acknowledged almost 10 years ago that neonicotinoids are killing bees, yet the agency has approved more and more uses for these toxic pesticides every year since,” said Earthjustice attorney Greg Loarie, who represented the groups. “It’s time for DPR to do its job and protect honeybees and the multi-billion dollar agricultural economy that bees make possible in this State.”

At issue in the lawsuit was DPR’s decision to expand the use of two powerful neonicotinoid insecticides – sold under the trademarks Venom Insecticide and Dinotefuran 20SG – despite the agency’s still-pending review of impacts to pollinators. The case underscores larger problems with DPR’s unwillingness to comply with laws enacted to ensure that pesticides do not threaten human health, agriculture, or the environment.

“This ruling is welcome news, given the crisis facing bee populations in California and across the country, along with the resulting impacts on farmers and our food system,” said Paul Towers, Organizing Director and Policy Advocate at Pesticide Action Network. “We applaud the court for confirming that the state must evaluate the impacts not only of these two pesticides, but also the toxic combination effect of multiple pesticides, as well as meaningfully consider alternatives to their use. This is a win for public health, the environment -- and in particular honeybees.”

A growing body of independent science links the class of pesticides called neonicotinoids to bee declines, both alone and in combination with other factors like disease and malnutrition. Twenty-nine independent scientists conducted a global review of 800 independent studies and found overwhelming evidence of pesticides linked to bee declines.

“Unless halted, the use of these pesticides threatens not only the very survival of our pollinators, but the fate of whole ecosystems. DPR has a responsibility to step in and say no. Particularly in the current political climate, it is all the more important to continue to hold all regulators accountable and to have states step up and protect beekeepers and the environment,” said Rebecca Spector, West Coast Director at Center for Food Safety.

“An overwhelming body of scientific literature calls for regulatory action to protect vulnerable pollinator and other non-target species from toxic pesticide use,” said Jay Feldman, Executive
Director of Beyond Pesticides. “This court decision enforces regulatory responsibility to assess the full range of impacts caused by the indiscriminate pesticide poisoning in order to preserve essential ecological services that are critical to sustaining life.”

One in every three bites of food depends on bees for pollination, and the annual value of pollination services worldwide are estimated at over $125 billion. In the United States, pollination contributes $20-30 billion in agricultural production annually. And in California alone, almonds crops — entirely dependent on bees for pollination — are valued at over $3 billion.

### See us at

<table>
<thead>
<tr>
<th>Event</th>
<th>Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nashville Area Beekeepers Assn.</td>
<td>Oct. 8, 2017</td>
</tr>
<tr>
<td>Pennsylvania State Beekeepers Assn.</td>
<td>Nov. 3-4, 2017</td>
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<tr>
<td>Ohio State Beekeepers Assn. Conf.</td>
<td>Nov. 4, 2017</td>
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<tr>
<td>Empire State Honey Producers Assn. Conf. (Niagara Falls, ON)</td>
<td>Nov. 17-18, 2017</td>
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<tr>
<td>American Beekeeping Federation Conf.</td>
<td>Jan. 10-14, 2018</td>
</tr>
<tr>
<td>Tri-County Beekeepers Assn. Workshop</td>
<td>March 2-3, 2018</td>
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</tbody>
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### Research

**Neonicotinoids act like endocrine disrupting chemicals in newly emerged bees and winter bees,**

Danica Baines, Emily Wilton, Abbe Pawluk, Michael de Gorter & Nora Chomistek, Published online Sept. 8, 2017

**Abstract**

Accumulating evidence suggests that neonicotinoids may have long-term adverse effects on bee health, yet our understanding of how this could occur is incomplete. Pesticides can act as endocrine disrupting chemicals (EDCs) in animals providing characteristic multiphasic dose-response curves and non-lethal endpoints in toxicity studies. However, it is not known if neonicotinoids act as EDCs in bees. To address this issue, we performed oral acute and chronic toxicity studies including concentrations recorded in nectar and pollen, applying acetamiprid, clothianidin, imidacloprid, and thiamethoxam to bumble bees, honey bees and leafcutter bees, the three most common bee species managed for pollination. 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 production in spring, making this the most sensitive bee stage identified to date. Chronic exposure to field-realistic levels of neonicotinoids reduced bee survival and caused significant late-onset symptoms for all three bee species. Given these findings, neonicotinoid risk should be reevaluated to address the EDC-like behavior and the sensitivity of winter worker honey bees.

**American Honey Producers Association**

**Annual 2018 Convention & Trade Show**

The AHPA 49th annual convention will be January 9-13, 2018 at the DoubleTree by Hilton San Diego Mission Valley, California.

Our trade show is one of the largest beekeeping trade shows in the country and it's a highlight for the convention attendees to come and meet new companies and see new products.

We will have conference sessions on new research and hot topics within the beekeeping industry such as legislative changes, new science information, honey trade & adulteration issues, and honey market & pollination reports. Our keynote speaker is Dr. Michael Roberts, Executive Director of the Resnick Program for Food Law and Policy.

The group activity this year will be a Fiesta in Old Town San Diego! Don’t miss out on the fun!

Convention & Trade Show information and registration can be found on [www.ahpanet.com](http://www.ahpanet.com)

**American Beekeeping Federation 2018 Conference and Trade Show**

Celebrate the 75th Diamond Anniversary of the ABF at the 2018 American Beekeeping Federation Conference & Tradeshow, January 9-13, at the Grand Sierra Resort in Reno, Nevada. Discover the many facets of the ABF with four days of spectacular educational sessions, networking and fun.

- Hear from experts, trendsetters & influencers.
- Learn best practices.
- Shop a tradeshow full of the latest beekeeping innovations.
- Showcase your skills in the 2018 Honey Show.
- Have next-generation fun at the Kids and Bees program.
- Network with 900+ fellow beekeepers

75-YEARS STRONG! Make your plans today to join us in Reno for a brilliant conference and a celebration of the association's 75 years of accomplishments. More information go to [http://abfconference.com/](http://abfconference.com/)
Seeds for spring flowers for honey bees!

Pollinator Stewardship Council has partnered with Ohio Prairie Nursery in support of pollinator habitat. **You can get native seeds for eastern U.S. planting zones here.** Select “Support our Cause” (http://www.ohioprairie nursery.com/?ref=pollsteco) to view featured seed selections to benefit pollinators. *A portion of sales generated from our website will help support our work.*

Seeds for honey bees WEST of the Mississippi

To increase plant biodiversity, improve gardens yields, and make a positive difference for the future, plant for pollinators WEST of the Mississippi with bbbseed. The Plant for Pollinators Project, developed by bbbseed, offers a discount on their pollinator mixes. Go to their website, find and enter the discount code, and *Plant For Pollinators!*
https://www.bbbseed.com/articles/plant-for-pollinators-project/

Betterbee Has Seeds for Pollinator Habitat

Betterbee was at the Massachusetts Beekeepers Assn. Spring Meeting offering a variety of seed mixes for beekeepers to plant. You can find seven seed mix varieties at their [website](http://www.betterbee.com).

Pollinator Stewardship Council
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832-727-9492 www.pollinatorstewardship.org

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Harmony Honey Co.

Red-Headed Honey https://redheadedhoney.com/
Sunrise Feed & Supply http://sunsifeed.com/

Kentucky State Beekeepers Association http://www.ksbabeekeeping.org/

Geauga County Beekeepers http://www.geaugacountybeekeepers.org/
Nature’s Own Designs Apiary Products http://nodglobal.com/


The Studio Digital http://www.thestudiodigital.com/

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Michigan Commercial Beekeepers Assn.

Wilson County Beekeepers
The Wilson County Beekeepers Association of Middle Tennessee

People & Pollinators Action Network

Crop Pollination Association Inc.
Beepollination: the future of Australia’s Food Security

Delta Bee Club

Hackenberg Apiaries

Butterfly Pavilion  
https://www.butterflies.org/

A.H. Meyer & Sons, Inc.  
http://www.ameyerandsons.com/

People and Pollinators Action Network  
http://www.peopleandpollinators.org/

Seib’s Hoosier Honey  
http://www.seibshoosierhoney.com/

Strachan Apiaries  
https://www.strachanbees.com/

Sunshine Apiary, Inc.  
https://www.facebook.com/sunshineapiary/

Tennessee Beekeepers Assn.  
http://www.tnbeekers.org/

Empire State Honey Producers Assn.  
http://www.eshpas.org/

Smith Farm Pure Honey  
www.smithfarmpurehoney.com/

Randy Oliver  
http://scientificbeekeeping.com/

Browning’s Honey Co., Inc.  
http://www.browningshoney.com/

Wilson County Beekeepers Assn.  
http://wilsoncountybeekers.org/

Hackenberg Apiaries  
http://hackenbergapiaries.org/

Nashville Area Beekeepers Assn.  
http://nashbee.org/

Delta Bee Club  
http://www.deltabeeclub.org/

Colorado State Beekeepers Assn.  
http://coloradobeekeepers.org/

Heartland Apicultural Society  
http://www.heartlandbees.org/

Beekeepers of Middle Tennessee  
http://mountainbees.org/

Northern Kentucky Beekeepers Assn.  
http://www.norbeamkeepers.com/

Clarksville Montgomery County Beekeeping Assn.  
http://www.cmcbap.com/
Beekeepers Working for Beekeepers

The Board and Program Director are all beekeepers. We work to:

- Raise awareness about the adverse impact of pesticides on pollinators critical to the supply of food and the ecosystem.
- Provide advocacy, guidance, and tools to document the detrimental effect of pesticides on pollinators.
- Affect regulatory processes of pesticide risk assessment, label, and enforcement.