Genetic Literacy Project
SCIENCE NOT IDEOLOGY

Canada's suspect move to phase out neonicotinoids to 'protect bees' sets stage for US regulatory battle

Jon Entine | Genetic Literacy Project | October 3, 2018

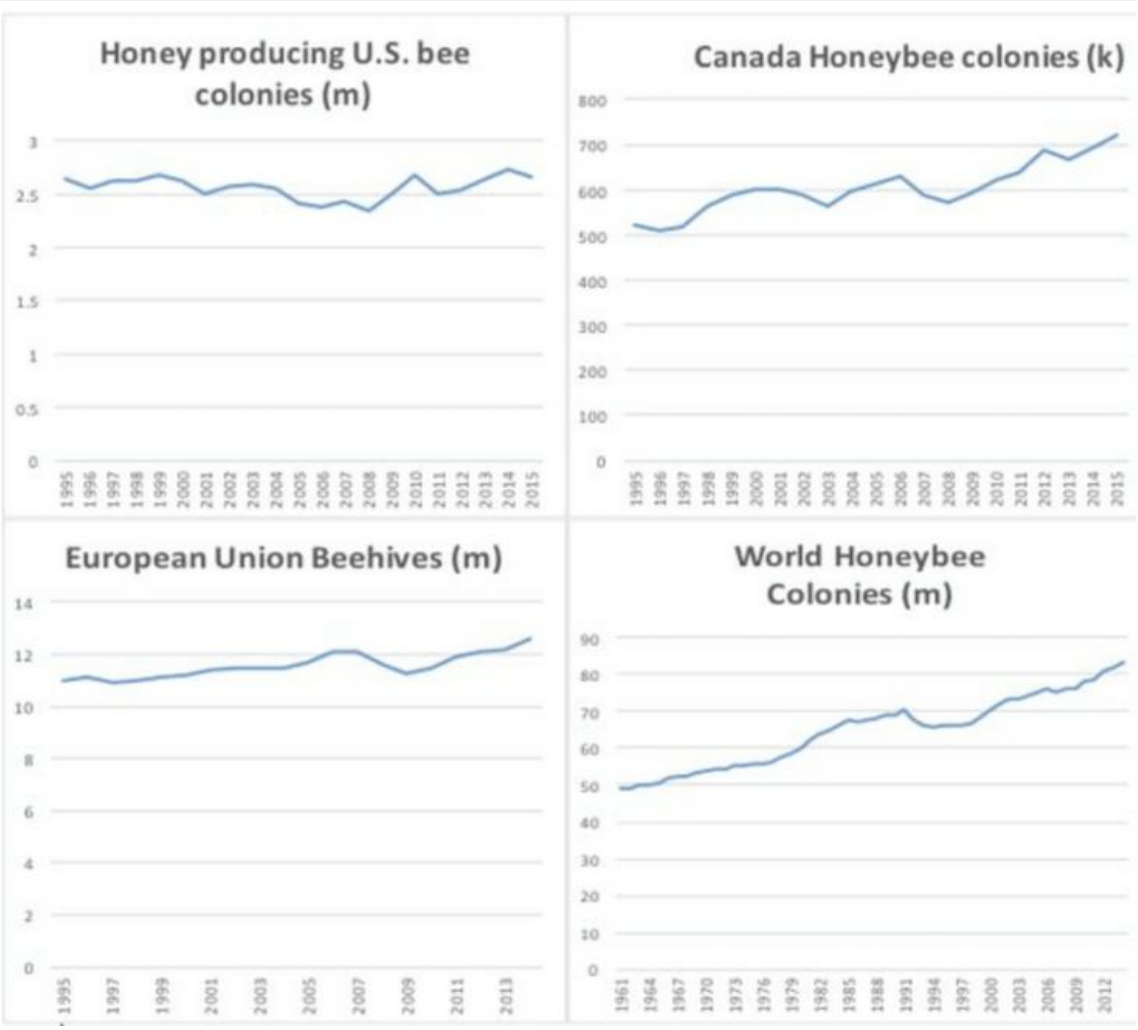
Canada's PMRA—its environmental regulatory agency, part of HealthCanada—rolled out for public comment its tentative decision to phase out almost all outdoor uses of neonicotinoid pesticides over the next 3-5 years. Neonicotiniods, or neonics, are crop protection products that have become the world's most widely used pesticide class thanks to their ability to selectively control pests that destroy crops, while also being human- and animal-safe.

However, neonics have become embroiled in a multi-year controversy in Europe and North America over whether they hurt beneficial species, specifically honeybees and wild bees. For years, advocacy groups critical of conventional agriculture, relying almost entirely on laboratory studies, have argued that the pesticide weakens or kills honeybees. Field studies contradict the lab reports, and now even the most ferocious anti-neonic advocacy groups, such as the Sierra Club, have recently reversed course, saying the latest evidence does not support an impending 'bee apocalypse'.

Some of these groups have raised questions about the health of wild bees, which are more difficult to monitor and for which very little data exist. There are genuine concerns about how healthy bees, which face a range of challenges, from deadly mites and the chemicals used to control them to climate change to urbanization. But no clear link has been made to neonicotinoids.

EU bans neonics

Canada's move comes about five months after the European Union announced its decision to ban all outdoor uses of neonic pesticides after December, 2018—making permanent and expanding what was originally a two-year moratorium (imposed five years ago) on the use of these pesticides on flowering crops. The EU ban—a years-long objective of anti-pesticide campaigners—was based on claims that neonics pose a threat to honeybees, wild bees and other pollinators. This despite the fact that honey bee populations have been steady or rising in Europe and North America during the entirety of the two decades since neonics were introduced and have been rising worldwide for over a half-century. The position also ignores the fact that the 2 percent of wild bee species responsible for 80 percent of crop pollination—putting them into greatest contact with neonics—appear to be under no threat of population decline.



The EU reached its decision after years of prodding by activist beekeepers—mostly small hobby owners—and pesticide opponents. There have been dozens of mostly laboratory studies and reports exploring every conceivable mechanism through which neonics could harm bees. But full-scale field studies—the most realistic metrics—have consistently contradicted the lab research.

Inexplicably, the EU 'Bee Guidance Document' (BGD)—used as the basis by which politicians made the decision to extend the moratorium—excluded most field studies, raising accusations that the process was rigged. For instance, it specified that bees used in the field tests could not show a mortality rate greater than seven percent when the natural fluctuation of honey bee colony populations is three times higher—up to 21 percent—making it impossible to demonstrate that pesticide-related mortality did not exceed the determined threshold.

Just as impossible was the BGD's spatial separation requirements for field test fields, which required an area of 173 square miles—seven times the size of Manhattan or four times the size of

Paris—for a single full-scale test. It was generally agreed that such a requirement simply couldn't be met in the European landscape.

The result was that the EU did not evaluate the most powerful evidence, which made a persuasive case that real-world hive activity appears to neutralize the impact of the tiny amount of neonics bees were exposed to. They instead based their evaluation almost exclusively on laboratory studies that consistently overdosed honeybees while ignoring real world circumstances.

Canadian switch

In aligning Canada with the EU's neonic ban decision, PMRA took a stunningly different tack as it was well aware that the field data on honeybees and wild bees did not support a ban. The agency turned to a 'special review' of the neonicotinoid pesticides Thiamethoxam and Clothianidin begun in November, 2016 (coinciding with PMRA's decision to phase out the oldest, and arguably most redundant neonic compound, Imidacloprid). It concluded that these two neonics did pose a threat—but not to bees and pollinators! Rather to aquatic invertebrates, specifically midges and mayflies.

What? It's fair to say this curve ball took almost all observers by surprise. After all the arguments—based on roughly a decade of studies, claims and counter-claims—about the supposed neonic threat to honeybees and other pollinators, PMRA took 18 months to pull a completely new rabbit out of the regulatory hat.

Mayfly. Image credit: Janos Bugany/MTI

PMRA's analysis and conclusions were considered odd by expert scientists in the field. The document alleged potential harm to midges and mayflies across Canada's 4 million square miles. But the data was scant to say the least. Beyond a couple of 'mesocosm' experiments (in artificially constructed aquatic micro-environments testing effects on the species placed in them), no one has direct evidence of diminished midge and mayfly populations. PMRA admitted this in an early September webinar explaining its proposal. That's because no one knows for sure what these populations are, or how they fluctuate, in the first place.

In the absence of evidence of direct harm to midges and mayflies (or other aquatic invertebrates), PMRA fell back on judging whether measured concentrations of these neonics in water monitoring data exceeded their 'thresholds of concern' for aquatic invertebrate safety, as PMRA explained in its initial August technical briefing on its assessment and its September webinar. But PMRA concedes that its data on detected concentrations of neonics in freshwater samples is incomplete and inconsistent: robust, they claim, for Ontario and Quebec; limited and partial for the western provinces.

The west, however, comprises the bulk of Canada's land area producing as much as 63 million acres of row crops, and using more neonic pesticides by volume than elsewhere in Canada. Despite information collection limitations, PMRA says that what water data it has from 'out west' reveals neonic concentrations that regularly exceed their 'thresholds of concern' for adverse effects on aquatic invertebrates.

Which brings us to those thresholds of concern—or of 'acceptable risk'—and how they are established. It turns out that the key to PMRA's regulatory conclusion is the radically conservative threshold it chose to set for 'acceptable risk'—PMRA's statutory criterion—to aquatic invertebrates. PMRA chose 1.5 parts per billion (ppb) for acute exposure of aquatic invertebrates to the Bayer Corporation's neonic Clothianidin—and 1.5 parts per *trillion*(ppt) for chronic (long-term) exposure of aquatic invertebrates. At these concentrations, PMRA judges that 95 percent of aquatic invertebrates would be safe from any harmful effects.