Recent Science on Neonicotinoid Insecticides

A recent outpouring of scientific research identifies the use of neonicotinoid insecticides or “neonics” as a leading cause of massive losses of bees and other pollinators. New science also links neonics with harms to other wildlife—like fish, birds, deer, bats and aquatic insects—sometimes dubbed a “second Silent Spring”—and raises concerns about neonic water contamination and potential human health impacts. The most recent relevant research is summarized below:

**Neonic Impacts on Bees and Other Pollinators:**

- **Main et al. (Oct. 2019)** — Neonics detected in soils adjacent to fields with historic neonic use as well as those without; higher neonic soil concentrations were correlated with lower native bee species richness. [http://bit.ly/2OhMB6W](http://bit.ly/2OhMB6W).
- **Chan et al. (Aug. 2019)** — Finding neonic residues in soil from *cucurbita* and field crops “pose a high risk” to the female hoary squash bee, also concluding risks are likely to be applicable to other species of ground-nesting bees in agricultural soils. [https://go.nature.com/2Ry2loa](https://go.nature.com/2Ry2loa) (and discussed at [https://bit.ly/2LCMwJi](https://bit.ly/2LCMwJi)).
- **Sanchez-Bayo et al. (Apr. 2019)** — Finding 40% of insect species are at risk of extinction. Steepest butterfly declines found in places with large areas of neonic-treated farmland. [http://bit.ly/2LFRrPs](http://bit.ly/2LFRrPs).
- **Basley and Goulson (Apr. 2018)** — Plants located next to neonic-treated wheat crop found to be contaminated with neonic; concentrations were comparable to and sometimes higher than those in treated crops and stayed at these levels for up to 21 months after sowing. [https://bit.ly/2LCTRbO](https://bit.ly/2LCTRbO).
- **McArt et al. (2017)** — Finding neonic thiamethoxam posed the greatest oral exposure risk to honey bees in apple orchards and was detected in bee bread at multiple orchard sites where thiamethoxam was not sprayed. [https://go.nature.com/2LO2ksS](https://go.nature.com/2LO2ksS).
Harms to Fish, Birds, Deer, and Other Wildlife:

- **Berheim et al.** (Jan. 2019) — White tailed deer exposed to the neonic imidacloprid demonstrated hypothyroidism and lethargy, decreased body and organ weight, decreased jawbone length, and higher mortality rates for fawns. Surprisingly, imidacloprid found in spleens of control group deer, demonstrating ubiquity of neonics in the environment. [https://go.nature.com/2sGOOHb](https://go.nature.com/2sGOOHb).

Food and Water Contamination and Human Health:

- **Mineau** (Sept. 2019) — Analysis of state and federal water testing data finding neonics “frequently” in New York surface waters and roughly a third of Long Island ground water samples, indicating a “very high” probability of “ecosystem-wide” damage. [https://on.nrdc.org/2Q7kT17](https://on.nrdc.org/2Q7kT17).

Neonic Inefficacy and Alternatives:

- **Mourtzinis et al.** (Sept. 2019) — Neonic seed treatments in soybean provide negligible benefits to farmers. [https://go.nature.com/2KVXUQa](https://go.nature.com/2KVXUQa).