AB162 Resources and References

*Note, these resources and references represent a fraction of the literature on this subject. For example, a Google Scholar search of "bee" & "neonicotinoid" returns over 12,400 scholarly works.

Insects - including pollinators - are a crucial part of any functioning ecosystem.

Goulson, D. (2019). The insect apocalypse, and why it matters. Curr. Biol. 29, R967–R971.

Janousek, W. M. et al. (2023). Recent and future declines of a historically widespread pollinator linked to climate, land cover, and pesticides. Proc. Natl. Acad. Sci. 120, 1–9.

Wagner, D. L. (2020). Insect declines in the anthropocene. Annu. Rev. Entomol. 65, 457–480.

Zattara, E. E. & Aizen, M. A. (2021). Worldwide occurrence records suggest a global decline in bee species richness. One Earth 4, 114–123.

Pollinators are commonly said to contribute to the production of one out of every three bites of food, a service that was valued at approximately US$215 billion globally in 2005

Randall, B. (2020). The Value of Birds and Bees. Retrieved April 30, 2023 from https://www.farmers.gov/blog/value-birds-and-bees#:~:text=By%20helping%20plants%20reproduce%2C%20pollinators,each%20year%20in%20ecological%20services.

Vanbergen, A. J., & Initiative, T. I. P. (2013). Threats to an ecosystem service: pressures on pollinators. Frontiers in Ecology and the Environment, 11(5), 251-259.

Nevada honey bee keepers continue to report colony loss.

Bee Informed Partnership (2023). National Management Survey Map. Retrieved April 30, 2023 from https://bip2.beeinformed.org/loss-map/

Neonicotinoid pesticides are linked to declines of insect populations on a global level, including pollinator declines specifically, and direct exposure has been shown to harm pollinator health and pollination services.

Goulson, D. (2019). The insect apocalypse, and why it matters. Curr. Biol. 29, R967–R971.

Janousek, W. M. et al. (2023). Recent and future declines of a historically widespread pollinator linked to climate, land cover, and pesticides. Proc. Natl. Acad. Sci. 120, 1–9.

Lu, C., Hung, Y. T., & Cheng, Q. (2020). A review of sub-lethal neonicotinoid insecticides exposure and effects on pollinators. Current pollution reports, 6, 137-151.

Pisa, L., Goulson, D., Yang, E. C., Gibbons, D., Sánchez-Bayo, F., Mitchell, E., ... & Bonmatin, J. M. (2021). An update of the Worldwide Integrated Assessment (WIA) on systemic insecticides. Part 2: impacts on organisms and ecosystems. Environmental Science and Pollution Research, 28, 11749-11797.

Singla, A. et al. (2021). Influence of neonicotinoids on pollinators: A review. Journal of Apicultural Research 60.1, 19-32.

Stanley, D. A. et al. Neonicotinoid pesticide exposure impairs crop pollination services provided by bumblebees. Nature 528, 548–550 (2015).

Stuligross, C. & Williams, N. M. (2021). Past insecticide exposure reduces bee reproduction and population growth rate. Proc. Natl. Acad. Sci. U. S. A. 118, 1–6.

Wood, T. J., & Goulson, D. (2017). The environmental risks of neonicotinoid pesticides: a review of the evidence post 2013. Environmental Science and Pollution Research, 24, 17285-17325.

Neonicotinoids are *systemic* and persists in soils, waterways, and non-target plants

Botías, C. et al. Contamination of wild plants near neonicotinoid seed-treated crops, and implications for non-target insects. Science of the Total Environment 566, 269-278 (2016).

Goulson, D. An overview of the environmental risks posed by neonicotinoid insecticides. Journal of Applied Ecology 50.4, 977-987 (2013).

Halsch, C. A. et al. Pesticide contamination of milkweeds across the agricultural, urban, and open spaces of low-elevation northern california. Front. Ecol. Evol. 8, 1–11 (2020).

Klarich Wong, K. L., Webb, D. T., Nagorzanski, M. R., Kolpin, D. W., Hladik, M. L., Cwiertny, D. M., & LeFevre, G. H. (2019). Chlorinated byproducts of neonicotinoids and their metabolites: an unrecognized human exposure potential?. Environmental science & technology letters, 6(2), 98-105.

Wood, T. J., & Goulson, D. (2017). The environmental risks of neonicotinoid pesticides: a review of the evidence post 2013. Environmental Science and Pollution Research, 24, 17285-17325.

Zioga, E., Kelly, R., White, B. & Stout, J. C. Plant protection product residues in plant pollen and nectar: A review of current knowledge. Environ. Res. 189, (2020).

Impacts of neonicotinoids on non-insect wildlife

Eng, M. L., Stutchbury, B. J., & Morrissey, C. A. (2019). A neonicotinoid insecticide reduces fueling and delays migration in songbirds. Science, 365(6458), 1177-1180.

Gibbons, D., Morrissey c., & Mineau, P. A review of the direct and indirect effects of neonicotinoids and fipronil on vertebrate wildlife. Environmental Science and Pollution Research 22, 103-118 (2015).

Hagen, P., Carstensen, M., Michel, E., & Kelly, J. (2020). Assessing Neonicotinoids Exposure in Free-Ranging White-Tailed Deer in Minnesota.

Alternatives to neonicotinoids

Furlan, L., & Kreutzweiser, D. (2015). Alternatives to neonicotinoid insecticides for pest control: case studies in agriculture and forestry. Environmental Science and Pollution Research, 22(1), 135-147.

Jactel, H. et al. (2019). Alternatives to neonicotinoids. Environment international 129, 423-429.

Detection in humans

Laubscher, B., Diezi, M., Renella, R., Mitchell, E. A., Aebi, A., Mulot, M., & Glauser, G. (2022). Multiple neonicotinoids in children's cerebro-spinal fluid, plasma, and urine. Environmental Health, 21(1), 1-9.

Ospina, M., Wong, L. Y., Baker, S. E., Serafim, A. B., Morales-Agudelo, P., & Calafat, A. M. (2019). Exposure to neonicotinoid insecticides in the US general population: Data from the 2015–2016 national health and nutrition examination survey. Environmental research, 176, 108555.

Pollination has larger impacts on crop yield than pesticide use

Leach, A., & Kaplan, I. (2022). Prioritizing pollinators over pests: wild bees are more important than beetle damage for watermelon yield. Proceedings of the Royal Society B, 289(1986), 20221279.