Neonicotinoid Pesticides and Declines in Honey Bee Health; Will a Ban Solve the Issue?

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Important Points

•Pesticides are IMPORTANT tools used in modern agriculture

•Neonicotinoids were registered as reduced risk pesticide to replace the organophosphates, carbamates, and pyrethroids

•Banning neonicotinoids would increase the use of pesticides that have known non-target effects that are worse for the environment then neonicotinoids

•Several invasive species control programs relay heavily on neonicotinoids for control (ex. Hemlock Wooly Adelgid, Asian Citrus Psyllid, and Glassy-winged Sharpshooter)

Are Neonicotinoids Toxic to Bees?

•Acute and chronic studies have shown that neonicotinoids are toxic to honey bees and bumblebees (Blacquiere et al. 2012)

•All neonicotinoids are not created equal however, acetamiprid and thiacloprid are much less toxic to bees (Brown et al. 2014)

•Inconsistent results with field-realistic doses (Cresswell et al. 2012)

•Many other factors have been documented as contributing to pollinator decline (Epstein et al. 2012)

Documented Contributing Factors to Honey Bee Decline

•**Varroa destructor** (Boncristiani et al. 2012)

-Direct feeding damage

-Vectors pathogens (ex. Deformed Wing Virus)

-Acaricides directly added to the colony also stress bees

•**Pathogens** (ex. American foulbrood, Nosema bombi) (Mayack and Naug 2009, Evans and Schwarz 2011)

-Antibiotics and fungicides directly added to the colony also stress bees

•**Inadequate honey bee nutrition** in monoculture agriculture (Naug 2009)

-Complete food substitute not available for supplemental feeding

•**Habitat fragmentation** and land-use changes (Potts et al. 2010)

•**Increasing demand for pollination services** (Aizen and Harder 2009)

Recommendations

•Regulatory agencies need to have more thorough registration guidelines that incorporate bee toxicity data for all pesticides (Hopwood et al. 2012)

-Chronic toxicity

-Sublethal effects

-Synergistic effects

•Mandate better management practices following integrated pest management principles that protect bees on crops (Epstein et al. 2012)

-Ban certain application strategies

-Use less toxic neonicotinoids

-Education and communication

Summary

•There is NO definitive scientific evidence that neonicotinoids are the primary cause of pollinator declines

•Neonicotinoids are important reduced risk pesticides for management of some of our most damaging pests

•Neonicotinoids should be better regulated, not banned.

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Conclusion

Given the current state of knowledge, banning neonicotinoids is a premature and disproportionate response to a complex issue. This requires holistic scientific inquiry and interpretation, and cooperation among stakeholders. Any changes must be based on science rather than opinion, current trends, or fear.

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