Neonicotinoid Seed Treatments and Pollinator Issues

by Stefan Gailans

Neonicotinoids, or "neonics" as they are often called, are a family of insecticides commonly found in corn and soybean seed treatments across the Corn Belt. Seed treatments such as Poncho, Votivo, Gaucho and Cruiser all contain one form or another of a neonicotinoid insecticide. These insecticides are systemic, meaning that as the crop grows from the treated seed the insecticide is translocated through the plant into root and leaf tissues. In turn, this provides protection from chewing and sucking insect pests of corn and soybeans, such as cutworms and aphids.

Neonicotinoids Recently in the News

On April 29, 2013, a two-year suspension was issued in the European Union (EU) on the use of neonicotinoids beginning in December 2013. This suspension was in response to recent findings that implicated neonicotinoids among several factors negatively affecting the health of non-target insects, such as honey bees. Bees are important pollinators for numerous agronomic and horticultural crops around the world, including alfalfa and almonds. While neonicotinoid insecticides were protecting field crops and vegetable crops from insect pests in Europe, the insecticides were also shown to be disturbing honey bees in agricultural areas.

Additional research on the issue will be conducted during the two-year suspension. Shortly after the suspension in the EU was announced, the U.S. Department of Agriculture and Environmental Protection Agency jointly issued a report that identified use of neonicotinoid insecticides as one potential cause of Colony Collapse Disorder in honey bees in North America. More recently, DuPont Pioneer announced last fall that it would be making available neonicotinoid-free corn and soybean seed in Canada after neonicotinoids were linked to bee deaths in Ontario and Quebec.

PFI Members' Interest in Better Understanding Neonicotinoids

Neonicotinoids were recently discussed at the Practical Farmers of Iowa Cooperators' Program meeting in December 2013. Matt O'Neal, extension entomologist with Iowa State University, gave a brief presentation on current neonicotinoid research to field crop farmers. He explained how neonicotinoids can affect non-target insects like honey bees. Talc, a common lubricant used to move seed through the planter box while planting treated seed, can function as a carrier of the neonicotinoid insecticide seed treatment. Foraging bees can then come into contact with the contaminated talc as it is expelled during planting. Corn pollen from plants grown from treated seeds can also contain neonicotinoids because of the systemic nature of the insecticide. The pollen is then sometimes collected by honey bees and taken back to the hive.

Additionally, Matt presented findings that showed increased crop vulnerability to other insect pests (those not directly controlled by the neonicotinoids) when crops were grown from neonicotinoid-treated seed. For example, soybeans grown from neonicotinoid-treated seed experienced greater infestations of Japanese beetles than soybeans grown from non-treated seed. Corn grown from neonicotinoid-treated seed was also more susceptible to spider mites than corn grown from non-treated seed.

What followed Dr. O'Neal's presentation was a discussion among the field crop farmers about the possibility of conducting on-farm research comparing crops grown from neonicotinoid-treated and neonicotinoid-free seeds. Chief among the discussion topics was the availability, or lack thereof, of neonicotinoid-free corn and soybean seed in the state. Most of the farmers seemed to agree that neonicotinoid-free soybean seed would be attainable but finding corn seed would be much more difficult, if not impossible.

◀ *Wendy with husband Johnny Rafkin on Wendy's family farm in Charles City.*

Wendy Johnson, who farms near Charles City, was among the farmers who expressed interest in conducting a trial comparing neonicotinoid-treated seeds with non-treated seeds.

"This is a no-brainer for us," Wendy says. "[My cousin] Doug and I had been concerned about the honey bees and the research Dr. O'Neal presented on was really outstanding." Wendy will be conducting the trial using soybeans in 2014. "It was easier for us to get neonicotinoid-free soybean seed than corn seed in our area from our local dealer. We really had to address the question of availability of seed first before going forward with the trial."

Neonicotinoid insecticide seed treatments on corn and soybean seed are ubiquitous these days. The trial on Wendy's farm will seek to determine if the seed treatment benefits the soybean crop in terms of grain yield and reduced insect pest pressure.

Wendy explains that implementing this upcoming trial on her farm is ultimately about "anything we can do to add to the research both for ourselves and for other farmers." ■

For more on neonicotinoids, look for the companion post to this article on the PFI blog.

For more on Iowa pollinators, read this blog post about Rick and Stacy Hartmann's 2013 pollinator field day: www.bit.ly/Hartmann_Pollinator_FD