



# LSP *Myth Buster* #46

An ongoing Land Stewardship Project series on ag myths and ways of deflating them.

Updated: March 2016

## → **Myth:** Neonics in Soybeans Make Economic Sense

### → **Fact:**

For better or worse, agriculture is full of tradeoffs between economic viability and environmental sustainability. Nowhere is that more true

than when it comes to the use of the herbicides, insecticides, fungicides and all of the other toxins used to keep crop pests at bay. Whenever a chemical killer is introduced into the environment, there are bound to be negative repercussions for our water, soil and wildlife. But agribusiness often justifies the use of pesticides by arguing that without them, conventional farming would simply not be viable. A whole lot of corn and soybean farmers will go out of business and the grain trade will collapse, goes this line of reasoning. A few eggs must be broken to make an omelet.

Society is constantly weighing the pros and cons of such thinking, and many question whether any economic argument trumps environmental health. But sometimes it becomes clear the economic reasons for using an agrichemical are based on a false premise, making the environmental harm it causes even harder to justify. There are times, it turns out, when those eggs are being broken for the sake of a pretty worthless omelet.

For example, in January 2016 a report produced by researchers from 12 universities spread across the Corn Belt concluded unequivocally that using a popular class of insecticides on soybeans was in most cases a waste of farmers' money. The insecticides in question are a class of chemicals similar to nicotine called "neonicotinoids." They were introduced to field crop farming in the early 2000s, and quickly became the most widely used class of insecticides, especially in the U.S. Corn Belt. One estimate is that in 2011 more than 80 percent of corn and around 40 percent of soybean acreage nationally was planted with seeds treated with neonicotinoids (those percentages have undoubtedly gone up since then).

One reason they are so popular is that neonics, as they are called, are extremely water-soluble. That means plants can absorb them and circulate them from the root zone up into leaves and other tissues, including pollen and nectar. So seeds coated with neonics can make the plant that emerges from the soil basically toxic to certain insect pests. From the farmer's point of view, such a systemic insecticide is more efficient and safer, since it does away with spraying standing plants later in the season, when wind and rain can cause such chemicals to go where they are not supposed to go.

The trouble is, making a plant toxic to an insect pest often makes it toxic to beneficial bugs as well. Specifically, neonics have been implicated in the decline of bees around the world. This is a big deal: honeybees, bumblebees and a myriad of other pollinator insects are responsible for every third bite of food we take. Earlier this year, the Environmental Protection Agency announced that one type of neonic insecticide damaged hives and honey production even when "used appropriately."

As the environmental arguments against neonics pile up, the economic justification for using them on at least one crop is

collapsing, thanks in large part to the 12-state report released in January. It was based on data gathered from more than two dozen peer-reviewed studies and was co-authored by scientists from universities in Minnesota, Iowa, North Dakota, South Dakota, Michigan, Indiana and Wisconsin, among others. What it found was that neonics are a victim of bad timing. The soybean aphid is the most economically devastating insect pest of soybeans in northern states, and neonics are marketed as a way to control them. The problem is, neonics protect soybean seedlings for only about three weeks, which takes care of things into late spring-early summer. But aphid populations become a problem in midsummer, after the neonic's effects have worn off. Put simply: using neonic soybean seeds did not increase yields in most cases.

"For typical field situations, independent research demonstrates that neonicotinoid seed treatments do not provide a consistent return on investment," concluded the scientists, adding that, "The current use of neonicotinoid seed treatments in soybeans and other crops far exceeds pest pressures."

To make things worse, neonics can increase infestations of other pest species by disrupting biological controls. For example, while feeding on plants slugs ingest the neonic insecticide but do not die from it. However, the insecticide makes them toxic to ground beetles, the principle natural enemies of slugs. Researchers found that in slug-infested fields, soybeans grown without neonic seed produced higher yields than their treated counterparts. This is significant, since slugs are emerging as a key pest in no-till cropping systems utilized in northern states.

Not surprisingly, Syngenta, Bayer and other makers of neonic products are defending this class of insecticides, saying basically that farmers wouldn't use them if they didn't work. But even an official with the Minnesota Soybean Research and Promotion Council told the *Star Tribune* newspaper that the 12-state study was "balanced" and helped clarify confusion farmers were having about neonics.

The authors of the January study recommend battling soybean pests with an integrated approach that includes rotating crops, preserving natural enemies of pests, and scouting crops and then applying insecticides in a targeted way.

It should be noted that neonic-treated soybeans aren't always a waste of money. They can be effective for managing early-season pest problems in certain situations, such as when a field is being transitioned into soybeans from pasture or grassland, for example. Given that loss of diverse habitat is another major factor in the demise of pollinators, that's one more argument for not plowing up yet more perennial cover and in the process creating the need for a highly controversial bug killer.

### → **More Information**

- The 12-state report, "The Effectiveness of Neonicotinoid Seed Treatments in Soybeans," is at [https://swroc.cfans.umn.edu/sites/swroc.cfans.umn.edu/files/e-268\\_the\\_effectiveness\\_of\\_neonicotinoid\\_seed\\_treatments\\_in\\_soybean\\_web\\_15.pdf](https://swroc.cfans.umn.edu/sites/swroc.cfans.umn.edu/files/e-268_the_effectiveness_of_neonicotinoid_seed_treatments_in_soybean_web_15.pdf).