

Neonicotinoid seed treatments produce higher soybean yields in the Southern US

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A bean leaf beetle (*Cerotoma trifurcata*), one of many insects that are controlled by using neonicotinoid-treated soybean seeds. Credit: Winston Beck, Iowa State University, Bugwood.org

Scientists from Mississippi State University have found that treating

soybean seeds with neonicotinoid pesticides (imidacloprid or thiamethoxam) provides higher yields in southern U.S. states. The results of their study, which are published in the *Journal of Economic Entomology*, contrast with a 2014 report from the U.S. Environmental Protection Agency, which stated that neonicotinoid seed treatments offered no economic benefits.

Led by Jeff Gore, an extension/research professor at Mississippi State, the researchers evaluated 170 field trials on soybean fields in four southern states (Arkansas, Louisiana, Mississippi, and Tennessee) over 10 years. Neonicotinoid seed treatments resulted in yields that were 203 kg/hectare higher in Louisiana, 165 kg/hectare higher in Mississippi, 112 kg/hectare higher in Arkansas, and 70 kg/hectare higher in Tennessee.

"We believe that the neonicotinoid seed treatments did provide a benefit to growers in our area and that the EPA document did not represent our region of the U.S.," said Dr. Gore. "The data do contradict the EPA document to some degree."

The article notes that other studies (including the EPA's) were somewhat skewed toward farms in the northeastern or north Midwestern states in the U.S., which have lower pest pressures than farms in the lower Mississippi Valley.

In the southern U.S., farmers have begun planting earlier in the year in order to avoid problems with drought conditions. However, by doing so they face problems involving early-season pests, such as bean leaf beetles, white grubs, wireworms, lesser cornstalk borers, three corner-alfalfa hoppers, grape colaspis, pea leaf weevils, and many species of thrips. Neonicotinoid treatments help to control these early-season pests, and are valued for their ability to protect against insects that suck sap from plant leaves and stems.

In addition to the higher yields, the researchers found that economic returns for neonicotinoid seed treatments were higher in four out of the 10 years studied.

"Our results demonstrate significant yield and economic increases in some situations resulting from the use of neonicotinoid seed treatments in Mid-South soybean production," the authors wrote. "Because these benefits are likely the result of management of a complex of multiple pest species that usually occur at subthreshold levels individually and because those complexes are difficult to predict at the time of planting, at-planting insecticides (including seed treatments) are broadly recommended for soybean [integrated pest management](#) in the Mid-South."

More information: "Value of Neonicotinoid Insecticide Seed Treatments in Mid-South Soybean (Glycine max) Production Systems," jee.oxfordjournals.org/lookup/...i/10.1093/jee/tow035

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