

## NEONICOTINOID INSECTICIDE SEED TREATMENTS AND SOYBEAN YIELDS IN THE MIDWEST

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Neonicotinoids are the most widely used insecticides worldwide and are typically deployed as seed treatments (hereafter NST) in many grain and oilseed crops, including soybeans. However, there is a surprising lack of information regarding NST effectiveness in increasing soybean seed yield, and most published data suggest weak, or inconsistent yield benefit. The US is the key soybean-producing nation worldwide and Dr. Krupke will present the results of a collaborative project that includes soybean yield data from 194 randomized and replicated field studies conducted specifically to evaluate the effect of NSTs on soybean seed yield at sites within 14 states from 2006 through 2017. We show that across the principal soybean-growing region of the country, there are negligible and management-specific yield benefits attributed to NSTs. Across the entire region, the maximum observed yield benefits due to fungicide (FST = fungicide seed treatment) + neonicotinoid use (FST + NST) reached 2 bu/acre. However, when we account for the cost of seed treatments, we find that this practice appears to have little benefit for most soybean producers under current economic conditions - across the entire region, a partial economic analysis showed inconsistent evidence of a break-even cost of FST or FST + NST. These results demonstrate that the current widespread prophylactic use of NST in the key soybean-producing areas of the US should be re-evaluated and potential cost-savings may be realized by regionally, without reductions in yield.

For full paper, please see: <https://www.nature.com/articles/s41598-019-47442-8>

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