Postive Environmental Impact

Optinyte® Technology (Nitrapyrin) vs. DCD (Dicyandiamide)

YES

N-Serve® and Instinct NXTGEN® Nitrogen Stabilizers

Optinyte® technology in Instinct NXTGEN and N-Serve nitrogen stabilizers was awarded the Presidential Green Chemistry Challenge Award stating that the technology added about 50 million bushels of additional corn equating to over $205 million in additional production revenue for U.S. corn growers; and reduced carbon dioxide emissions by about 664,000 metric tons.

Source: Environmental Protection Agency

Results showed that on average, greenhouse gas emissions decreased by 51 percent.

51% less greenhouse gas emissions

Source: Wolt, J. D. 2004. A meta-evaluation of nitrapyrin agronomic and environmental effectiveness with emphasis on corn production in the Midwestern USA.

Nutr. Cycl. Agroecosyst. 69: 23–41. doi:10.1023B:FRES.0000025287.52565.99.

Data does not support

DCD

"The efficiency of DCD and DMPP under continuously application in one given site is needed to examine. Meanwhile, the impact of their toxicity on plant growth and human health is also needed to study after years of application. Furthermore, the environmental impact of DCD related to the release of [greenhouse gas emissions] from soil still needs more studies to confirm." This statement was in the conclusion of a meta-analysis conducted on DCD—49 peer-reviewed publications could not determine the toxicity or the environmental benefit of DCD.

Source: Scientific Reports | nature.com

The microbes targeted by DCD, the ammonium oxidizing bacteria, were significantly affected by DCD with reductions in population size and altered activity. In field experiments, Instinct and N-Serve did not reduce numbers of ammonium-oxidizing bacteria (i.e., Nitrosomonas).

This statement from peer-reviewed research demonstrates that Optinyte suppresses nitrifying bacteria in the soil, but does not kill bacteria.

Source: Soils and Plant Nutrition Department | Bacteriostatic action of nitrification inhibitors

Environmental Protection Agency. Presidential Green Chemistry Challenge: 2016 Greener Reaction Conditions Award. www.epa.gov/greenchemistry/presidential-green-chemistry-challenge-2016-greener-reaction-conditions-award

[2]**Yang, M., Y. Fang, D. Sun, and Y. Shi. 2016.** Efficiency of two nitrification inhibitors (dicyandiamide and 3,4-dimethypyrazole phosphate) on soil nitrogen transformations and plant productivity: a meta-analysis.
www.nature.com/articles/srep22075.pdf

Rodgers, G. A., and J. Ashworth. 1982. Bacteriostatic action of nitrification inhibitors. Can J Microbiol. 28: 1093-1100.

Inoue, K., T. Sakamato, J. Z. Min, K. Todoroki and T. Toyo'oka. 2014. Determination of dicyandiamide in infant formula by stable isotope dilution hydrophilic interaction liquid chromatography with tandem mass spectrometry. Food Chemistry 156: 390-393.

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