The fact that significant amounts of fertilizer nitrogen (N) applied during crop production is lost to ground and surface water sources is well known. Less emphasis has been devoted to environmental losses of N from applied fertilizers to the atmosphere as nitrous oxide (N₂O). Nitrous oxide is a major greenhouse gas with potency that is about 300 times that of carbon dioxide; N₂O is believed to contribute significantly to global warming and climate change. Either way, leakage of nitrate or N₂O–N to the environment is a lose–lose situation in terms of both its deleterious environmental effects and its economic loss to crop producers. Co-application of nitrification inhibitors with ammoniacal fertilizers has often been recommended as a best management practice with the dual advantages of reducing N loss through leaching as well as N₂O emissions from soil during crop production.

In the midwestern United States, nitrapyrin (N-Serve), introduced in the early 1960s (registration: 1974), has been traditionally applied to reduce N leaching loses from crop fields with great success. Over the years, use of N-Serve has been expanded to include reducing N₂O emissions and improving crop N use efficiency, especially in poorly or excessively drained soils. However, adoption and use of N-Serve has been limited, perhaps because it was primarily be co-applied with fall-applied anhydrous ammonia when soil temperatures drop to about 50°F. In 2010, a reformulated N-Serve that is water soluble and suitable application with liquid fertilizers (including urea nitrate as well as liquid manure) was made commercially available. This compound has received little study in the eastern Corn Belt.

Researchers at Purdue University, West Lafayette, studied the effect of this new nitrapyrin formulation (trade name: “Instinct”; Dow AgroSciences) on the rate of nitrification inhibitors in liquid N fertilizers effective in Indiana studies. 

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