

Nitrification Inhibitors- greenhouse Gases Mitigation Tool in Rice Agroecosystems

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Abstract—Methane (CH₄) and Nitrous oxide (N₂O) are two potent greenhouse gases emitted from rice cultivation. Rice is stable food for more than half of the world and 90% of total global rice is cultivated in Asia. Rice is a high nitrogen demanding crop and its demand is mainly fulfilled by applying artificial nitrogen based fertilizers. Types, rate, and different methods of this N based fertilizer application, play a significant role in CH₄ and N₂O emission from rice soils. Applied N affects the processes of methanogenesis, nitrification, and denitrification. Anthropogenic emissions from CH₄ and N₂O from rice soil can be reduced by the use of nitrification inhibitors. Nitrification inhibitors are chemical such as dicyandiamide, nimim, and thiosulphate which slow down the hydrolysis of N fertilizers. Nitrification also reduces the groundwater leaching of nitrate and reduces the groundwater and surface water pollution load. Therefore, the application of this nitrification helps in reducing greenhouse gas emissions and their application is recommended in rice agroecosystems.

Keyword: Rice; Methane, Nitrous oxide, Nitrification inhibitors, Global warming.