10-12 Can biologically produced nitrification inhibitors (BNI) suppress soil microbial populations other than nitrifiers?

A case study with *Brachiaria humidicola*

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Nitrification products, nitrites and nitrates, are vulnerable to leaching and denitrification, resulting in low nitrogen use efficiency by crops. If nitrification process is inhibited, N recovery and uptake are substantially improved and pollution problems are reduced. It was reported that NO3-N in the fields of B. humidicola (BH) was lower than in the fields of other forage grasses, due to the compounds released from the roots of BH that inhibits nitrification. Our investigation is aimed at determining the influence of the root exudates of BH on nitrification, soil microflora and plant growth promoting microorganisms through soil incubation/pure culture studies.

Fresh Andosol and Terrace yellow (TY) soil, contrasting in total N, C and pH characteristics, were used. Microbial counts were done by MPN method whereas NH4+ and NO3- analysis were done in an auto analyser. Root exudates of BH, at 30 AT units/g soil, completely inhibited the nitrification in fresh TY soil while only 34% was found in the Andosol, over 60 days of incubation. Some amount of nitrogen was not accountable in the fresh Andosol, probably immobilized in microbial biomass, however immobilization was not found in the TY soil and dry Andosol. Total bacteria, Fluorescent Pseudomonas and ammonium oxidizing bacteria were not affected in the soils were BH was grown whereas nitrite oxidizing bacterial population was going down, probably due to the absence of nitrite in the soil.

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