

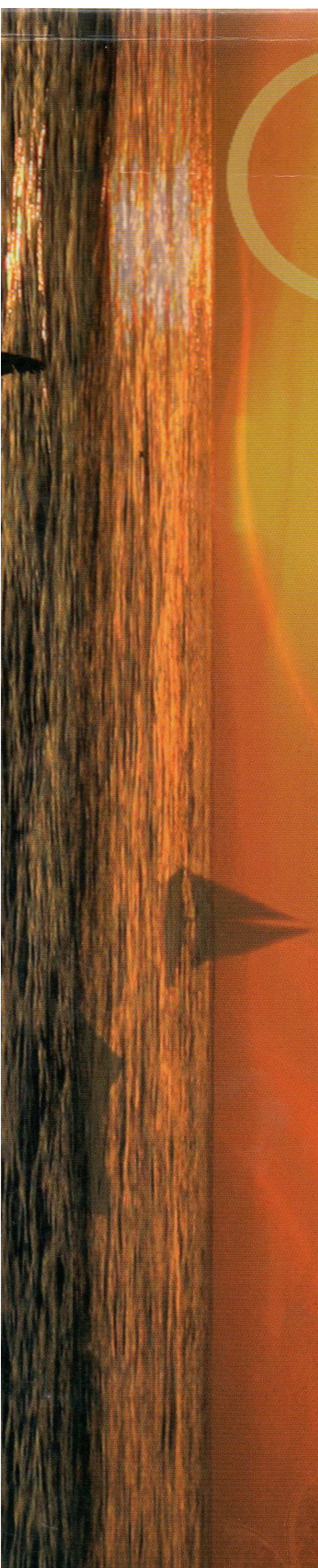
IV INTERNATIONAL CONFERENCE
ON ENVIRONMENTAL, INDUSTRIAL
AND APPLIED MICROBIOLOGY

BioMicroWorld 2011

Torremolinos, Málaga, Spain / 14-16 September 2011

<http://www.formatex.org/biomicroworld2011>

Book of Abstracts



Effects of the nitrification inhibitor 3,4-dimethylpyrazole phosphate (DMPP) and a biostimulant on soil microbial diversity and ammonia-oxidizing bacteria after bovine effluent application in experimental microcosms

Florio A.^{1,2}, Dell'Abate M.T.¹, Clark I.³, Hirsch P.³, Jhurreca D.³, Grego S.³, Benedetti A.¹

¹CRA - Research Centre for the Soil-Plant System, Rome (Italy)

²Department of agronomy and agrochemistry (DABAC), University of Tuscia, Viterbo (Italy)

³Plant Pathology & Microbiology Department, Rothamsted Research, Harpenden (UK)

The application of animal manure to soil can result in increased gaseous emissions such as NH₃, N₂O, CO₂ and CH₄, as well as nitrate leaching, contributing to climate warming and ground and surface water pollution.

Nitrification inhibitors are chemical compounds that delay microbial oxidation of ammonium to nitrate in soil for a certain period of time by depressing the activity of ammonia-oxidizing microorganisms. Biostimulants are products that optimise the adsorption of nutrients by plants through various different mechanisms, including stimulation of soil microbial activity. As a result, oxidation of ammonia to nitrate can be delayed, reducing N losses and increasing fertilizer use efficiency.

In this study, we assess the effects of the nitrification inhibitor 3,4-dimethylpyrazole phosphate (DMPP) and a biostimulant on microbial community-level physiological profiling (CLPP) and on the abundance of ammonia-oxidizing bacteria (AOB) using RT-qPCR in soil microcosms amended with bovine effluent. DMPP reduced the nitrification rate starting from the second week of incubation until at least the fourth week, while the application of the biostimulant led to substantial increases in net N mineralization. Both DMPP and biostimulant treatments induced rapid changes in microbial heterotrophic metabolism showing significant differences after 24h of incubation, as well as in the size of ammonia-oxidizing bacterial communities, which was affected by DMPP throughout the entire incubation period.

Keywords: Nitrification inhibitor, DMPP, biostimulant, bovine effluent, nitrogen use efficiency.

Enhancing survival and subsequent infectivity of fungus using UV protectants

Ching-Piao Liu¹ and Pei-Haw Lin

¹Department of Biological Science and Technology, China University of

Ultraviolet radiation (UV) can reduce the effectiveness of simulated solar radiation for a few hours can completely inactivate exposure to an UV-B radiation dose of 30µw cm⁻² on the conidia of the entomopathogenic *Metarhizium anisopliae* and *Beauveria bassiana* (SDA) was investigated. The addition of TiO₂ and SiO₂ solution), as well as the traditional UV protectants (0.25 mL) in culture medium was compared to see their performance in suspensions (0.25 mL). The radiation time was ranged from 1 to 48 h. The germination rate was measured at 24 h and 48 h. The performance of SiO₂ NP's the next, vegetable oil the third. All increased from 10% to 60% with the addition of TiO₂ NP's increased from 15% to 70%. The enhancing survival property of ZnO > benzophenone > sodium salicylate > methyl cinnamate.

Keywords UV-B radiation; UV protectants; Entomopathogenic fungus *Beauveria*; Morphology