



Do novel urease inhibitors improve plant performance?

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Urea is one of the most used nitrogen (N) fertilizers worldwide. However, its application on soil surface results in considerable N losses due to the hydrolytic activity of ureases present in the soil. Therefore, urease inhibitors have been used as additive in urea-based fertilizers to slow down the urea hydrolysis on soils surface and decrease N losses by volatilization, which contributes to the formation of greenhouse gases (CO₂ and NO_x). Three organic compounds synthesized by our group (OC1, OC2 and OC3) were more effective than the reference inhibitor (NBPT) on the inhibition of ureases present in an agricultural Clayey dystrophic Red Latosol (IC₅₀ < 250 μM). None of the novel urease inhibitors were toxic to *Lactuca sativa* (lettuce; dicot) or *Pennisetum glaucum* (millet; monot), in which OC2 and OC3 (100 μM) even improved the growth of lettuce roots. Supplementation of urea-treated soil with OC3 boosted N content in millet by 37.5% in comparison to urea-treated plants devoid of OC3. Overall, OC3 is a promising additive candidate for the development of new environmentally friendly fertilizer formulations based on urea

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