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| **Item type** |  |
| **Bibliography** | Baiga, R.; Rao, B.K.R.; Dom, M. (2024) Nitrogen mineralization in an acid soil following biochar and urea co-application and its effect on the growth of Chinese cabbage, In: 7th PNG Conference on Science and Technology, 1-10 |
| **Abstract / Content summary** | The effect of soil applications of kunai grass (Imperata cylindrica) biochar and laboratory grade urea, individually and in combination, on nitrogen (N) mineralization in an acid soil was investigated through parallel experiments. The incubation study revealed that biochar alone and its co-application with urea at 200 kg N/ha inhibited urea transformation to ammonium-N (NH4+-N), while co-application with urea at 500 kg N/ha resulted in the highest nitrate-N (NO3--N) and mineral N concentrations over 90 days. The greenhouse experiment demonstrated that Chinese cabbage (Brassica rapa L. ssp. chinensis L.) exhibited significantly greater marketable fresh weight, dry matter, and N uptake in soil receiving urea N at 500 kg/ha or co-application of biochar with urea N compared to the control. Biochar alone or urea alone at 200 kg N/ha provided no short-term agronomic benefits, and the N use efficiency of the crop remained unaffected by the fertilizer regimes. Moreover, application of biochar alone at 10 t/ha did not enhance soil fertility in this tropical acid soil unless co-applied with sufficient urea N. The results of this study emphasized the importance of nitrogen mineralization in acid soils for optimizing nutrient N availability and minimizing nitrogen losses. Further research required includes field-based application of biochar from different feedstocks and their potential to improve soil fertility, reduce N losses, and enhance N availability for tropical crops of PNG. Keywords: Biochar, co-application, mineralization, N uptake, nitrogen use efficiency |
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