

Article title	Minimizing Nitrogen Losses From Cropping Systems: Effectiveness of Organically-Enhanced Nitrogen Fertilizer.
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Abstract	<p>A new nitrogen (N) fertilizer, organically-enhanced fertilizer, produced by utilizing sterilized and chemically converted organic additives extracted from municipal wastewater biosolids, were evaluated for N mineralization, ammonia volatilization, N leaching, and effects on soil acidification, relative to urea, a commonly used N fertilizer. Laboratory incubations at three temperature levels (20, 30, and 40°C), two sets of column leaching schemes (continuous and intermittent irrigation regimes), and ammonia volatilization experiments under aerobic (upland) and anaerobic (flooded) conditions were conducted in four appropriate soils (Greenville loam, Lakeland sand, Guthrie silty-clay, and Sumter clay). The organically-enhanced fertilizer had significantly lower nitrification than urea. At all three temperature levels, the lag phase during the nitrification process was 28.6 days for organically-enhanced fertilizers compared to 5.5 days for urea. The longer lag phase duration with organically-enhanced fertilizer could result in reduced nitrate losses. This was confirmed in leaching studies where nitrate leaching resulting from the two irrigation regimes was significantly lower for the organically-enhanced fertilizer than urea. Amending the soil with the organically-enhanced fertilizer had ammonia volatilization losses (5% and 22% of applied N) significantly lower than those of the urea-fertilized soil (33% and 58% of applied N) under aerobic and anaerobic conditions, respectively. We conclude that the organically-enhanced fertilizer could be an attractive N source under both upland and flooded cropping systems. Recycling of sterilized and converted organic wastes (carbon, amino acids, and micronutrients), and minimizing N losses from land to atmosphere and surface- and ground water bodies could have environmental and food security benefits.</p>
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