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### **Evaluation of Different Recycling Fertilizers Regarding N Fertilizer Value and Ammonia (NH<sub>3</sub>) Emissions in Maize in Climate Chamber**

Nitrogen (N) is one of the most important nutrients in plant nutrition due to its central role in growth and development. Despite this, it represents a major environmental hazard not only by malpractices (leaching, eutrophication, volatilization, etc.) but also by the high-energy cost for production. Human urine is seen as an N-resource for “urban mining” and an available and unused source of nutrients, which by nitrification processes can be transformed into nitrified urine-based fertilizers (NUF). The aim of this study was to evaluate different N-sources as alternatives to conventional mineral N by analyzing dry weight (DW) per plant, fertilizer efficiency and N losses by volatilization in a maize (*Zea mays L. var. rugosa*) pot experiment in climate chamber for 7 weeks. Four N fertilizers were examined: Aurin (NUF with 1:1 NH<sub>4</sub><sup>+</sup>/NO<sub>3</sub><sup>-</sup>), CROP (NUF with 1:14 NH<sub>4</sub><sup>+</sup>/NO<sub>3</sub><sup>-</sup>), synthetic urine mimicking stored human urine (100% NH<sub>3</sub>-N) and urea (N<sub>2</sub>O-N amid form). Two modes of application were used for each N fertilizer: complete and split application. All treatments received the same nutrients during the experiment. No significant difference was observed between modes of application within each N fertilizer. The DW was higher in Aurin than other treatments (45-54 g plant<sup>-1</sup>), CROP and urea performed at the same level (25-35 g plant<sup>-1</sup>) and synthetic urine was the least efficient (10-13 g plant<sup>-1</sup>). Total NH<sub>3</sub>-N volatilization loss was higher in synthetic urine (11.8 and 5.2%) than in urea (2.0 and 1.2%) in complete and split application respectively; Aurin and CROP (<0.6%, both application modes) showed the lowest N losses. The NUF showed a reduction up to the 68% of N losses by volatilization compared with traditional mineral N fertilizers (urea). This research demonstrated that NUFs performed similar or better than mineral and raw urine-mimic fertilizer in terms of FW, DW and fertilizer efficiency, and with significant lower NH<sub>3</sub> losses by volatilization. This study confirms the NUF potential in two ways: as an alternative to reduce the mineral N dependence and as an innovative waste management option regarding nutrient recycling.