

Module 6.4-1 Minimizing ammonia loss with 'right place' for sugarcane and corn in Brazil. With some forms of fertilizer, loss of N by volatilization of ammonia (NH_3) can reduce N use efficiency. The amount of N volatilized depends strongly on source, placement, and weather conditions. Sugarcane has been harvested in Brazil by slash-and-burn for decades. Lately, due to economic and environmental issues, more sugarcane has been mechanically harvested and grown with minimum tillage, which over time leads to more crop residues at the soil surface. Measurements of NH_3 losses following surface application of N to such sugarcane soils have revealed high losses when urea is the N source (**Figure 1**). Losses can be reduced, but not eliminated through use of a urease inhibitor. Other research on soils cultivated to corn found large reductions in NH_3 losses when urea-containing fertilizers were incorporated into the soil (**Figure 2**). Thus, urea-containing fertilizers can be used in sugarcane, provided that they are either incorporated or placed into the soil (injection or banded placement is possible in no-till systems). Use of a urease inhibitor can also help reduce losses.

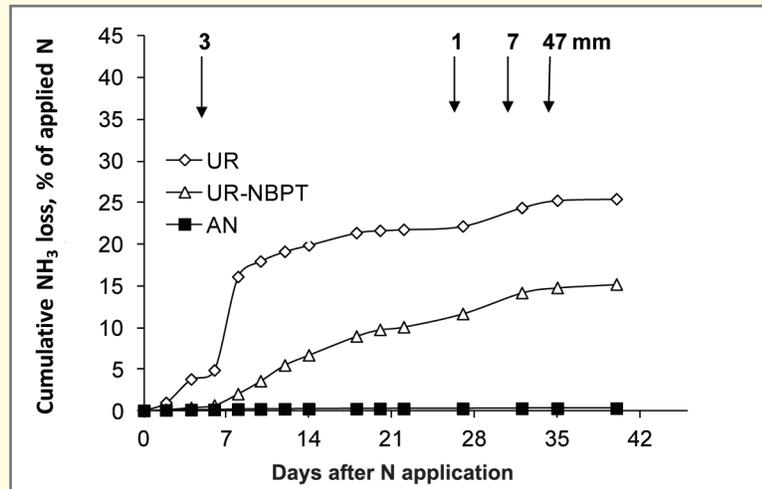


Figure 1. Cumulative ammonia losses from urea (UR), ammonium nitrate (AN) and NBPT-treated urea (UR-NBPT) surface-applied to a trash-covered sugarcane soil. Arrows indicate the amount (mm) and the date of rain events after N application. **Source:** Cantarella et al. (2008).

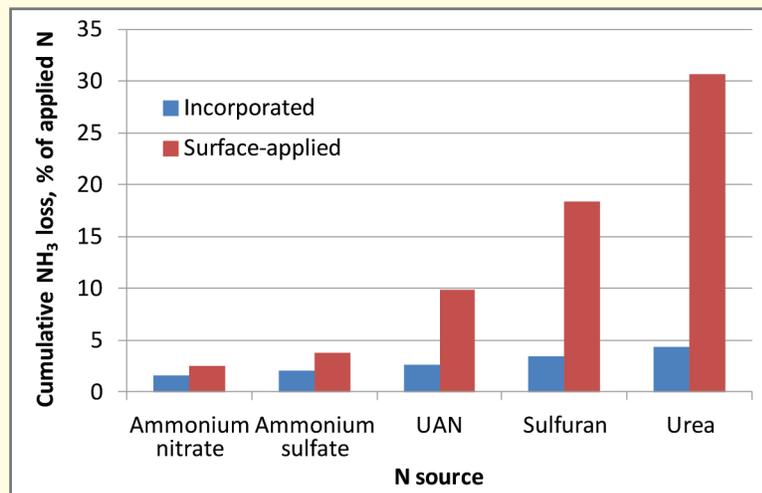


Figure 2. Ammonia volatilization from different N sources in corn crop in conventional tillage. UAN = urea ammonium nitrate; Sulfuran = UAN + ammonium sulfate, a fluid with 40% of its N in the form of urea, 40% as ammonium, and 20% as nitrate. **Source:** Lara-Cabezas et al. (1997).

References:

Cantarella, H. et al. 2008. *Scientia Agricola* 65(4):397-401.
Lara-Cabezas, W.A.R. et al. 1997. *Revista Brasileira Ciência Solo* 21:489-496.

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