Volatilization loss of ammonia (NH₃) from surface applied urea-based fertilizers or manure may be substantial. A simple, low cost technique to measure losses would assist growers in making future 4R Nutrient Management choices to minimize losses, specifically Right Source, Right Placement and Right Time.

Such a technique has been developed by the University of Guelph¹ and has been used extensively by Ontario extension staff². This technique was evaluated in a variety of Manitoba field situations in 2012 and 2013.

**Method**

The technique followed was based on experiences of Ontario extension staff.

1. Immediately after N application the zone is covered with a chamber with ventilation holes. In our case, “recycled” recycling boxes with 40-50 holes to allow air exchange (Figure 1).

2. Inside the chamber a glass “dosimeter tube or dositube”(#3D, Gastec Corporation) is held on a small stake, about 6” above the soil surface (Figure 1). Break off the tip of the tube to allow NH₃ to enter.

3. The dositube contains purple packing material (containing sulphuric acid) that turns yellow when it reacts with NH₃ in the air (becoming ammonium sulphate). The tube is marked in NH₃ ppm.hr which gives an index of NH₃ loss.

4. Tubes are read at 1-2 day intervals to give a cumulative total proportional to actual losses.

5. With an anemometer recording wind speed at a 30 cm (12”) height, the NH₃ ppm.hr reading can be converted to lb N/ac using this formula:

   $$\text{Estimated Total Loss} = 0.89 \times ((0.217Dw) - (0.034D) + 0.71)$$

   - **D** = dositube reading
   - **w** = wind speed m s⁻¹ at 12” height the previous day

   Since rainfall moves surface urea into the soil, boxes and fresh dositubes should be reinstalled to an adjacent area after each rainfall if one wishes to continue monitoring.

   The farmer cooperator questioned whether there were NH₃ losses when side dressing corn with UAN (28-0-0) @ 60 lb N/ac.
   - Compared surface dribble, dribble into injection slot (shallow) or injected at 3” depth (deep).
   - Volatilization risk factors were high: Almasippi sand, pH 8.6 with moist soil below the dry surface.
   - Dribbling UAN into an open, moist slot had the highest relative loss.
   - Result: Grower modified equipment to place N deeply

**References**