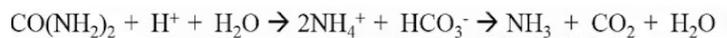
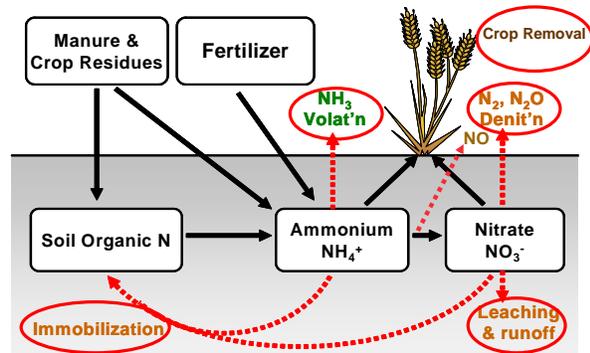


# Station 8: Ammonia- It's Also a Gas

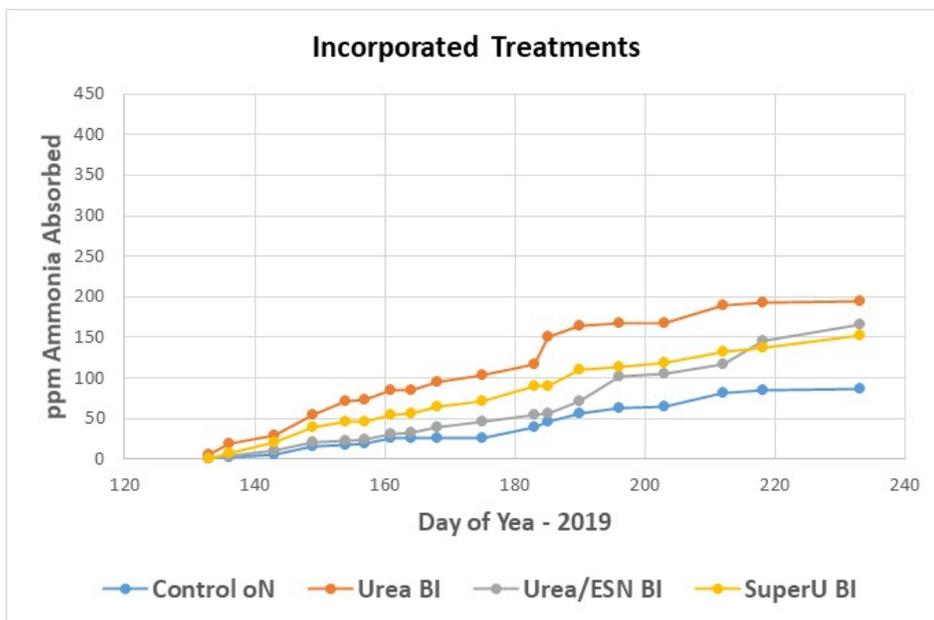
## 4R Nutrient Stewardship Self-Guided Tour



Custom-made chamber and passive colorimetric dosimeter tubes for measuring NH<sub>3</sub> emissions



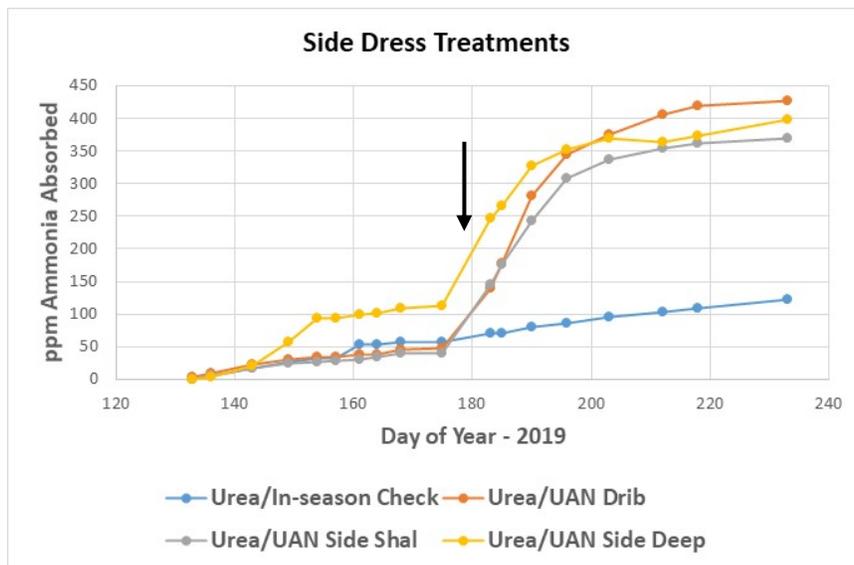
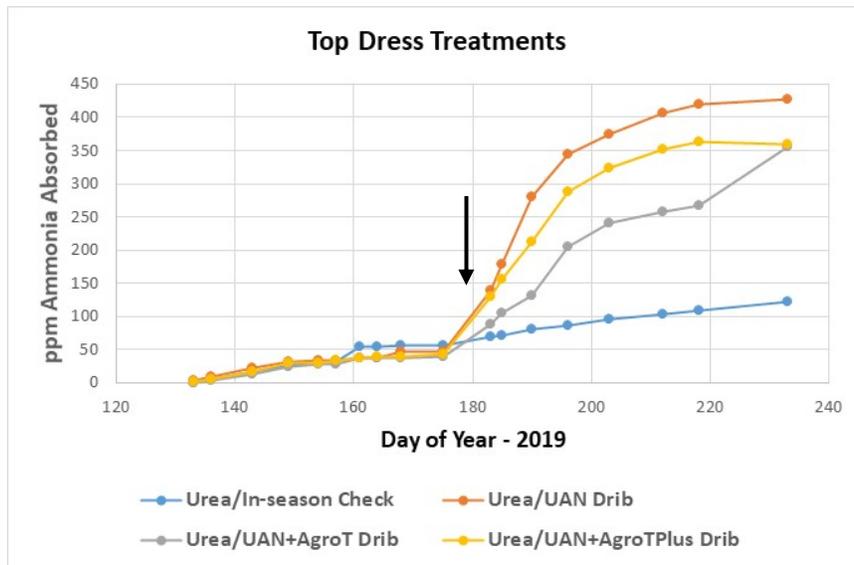
NH<sub>4</sub><sup>+</sup>-based fertilizers are prone to loss vis NH<sub>3</sub> volatilization



- Ammonia (NH<sub>3</sub>) volatilization is a significant loss pathway of NH<sub>4</sub><sup>+</sup>-based fertilizers such as urea. It can be a costly loss for farmers; 10-50 lbs N/ac. It occurs when urea hydrolysis elevates pH levels and increases the concentration of gaseous NH<sub>3</sub> around granules.
- The project tested combinations of integrated best management practices considering “4R” components in three groups of 1) Pre-plant broadcast incorporation of urea-based sources; 2) In-season top-dress UAN with urease/nitrification inhibitors; 3) In-season UAN placement through surface dribble or side-dress at varying depths.
- When fertilizers were pre-plant broadcast incorporated at the recommended rate, enhanced efficiency fertilizers of ESN and SuperU reduced NH<sub>3</sub> volatilization loss by 15-22% than conventional urea (above figure).

# Station 8: NH<sub>3</sub> volatilization

## 4R Nutrient Stewardship Self-Guided Tour



- ✦ For in-season topdressing of UAN, use of AgroTain was best to lower NH<sub>3</sub> volatilization loss, confirming the benefit of urease inhibitors in reducing NH<sub>3</sub> losses from corn fields in MB. AgroTainPlus reduced emissions but the nitrification inhibitor likely prevented NH<sub>3</sub> from going to nitrate; meaning it stayed at the soil surface at higher levels and for longer time than AgroTain that doesn't have nitrification inhibition.
- ✦ For the in-season UAN placement, side-dress application showed an advantage in reducing NH<sub>3</sub> volatilization losses compared to surface dribble treatment.
- ✦ These results suggest an advanced 4R management of using enhanced efficiency fertilizer products and in-season side-dressing UAN are effective measures to reduce NH<sub>3</sub> volatilization loss for corn production.