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N Sources and Cool Season Grass Fertilization

When evaluating nitrogen (N) sources for cool season grass fertilization, the ‘simple’ answer is: if equivalent pounds of N are applied, the yield response to the source should be very similar. Unfortunately, ‘simple’ isn’t how fertilizer applications in nature typically work.

The complications of comparing N sources for cool season grass production have a lot to do with the environment into which they are applied. Grass covered soil surfaces typically have varying degrees of partially decomposed litter that may inhibit granules from reaching the soil surface and dissolving into the soil profile prior to losses (typically volatilization...) occurring. Appropriate moisture levels can also be an issue –not enough moisture (a half-inch or so, typically...) or too much all at one time can increase N losses, too. It’s why even when we apply *equivalent* N rates, we don’t always observe equivalent N *responses*.

Here, we’re typically comparing urea and ammonium nitrate as our N sources, sometimes based on price and sometimes simple availability. Once we sort through those two things, the question becomes: what about performance? Previous work at Kansas State University looked at brome and fescue fertility plots receiving either urea or ammonium nitrate to find out.

In the brome studies, both sources were applied to their respective plots over several years at the same equivalent N rate. Only in year two of the study did forage production favor ammonium nitrate over urea with the other study years and production over the seven-year study were nearly equal between sources. Bottom line: when applied *appropriately*, either urea *or* ammonium nitrate can be surface applied on well drained Kansas soils with little loss potential or *expected* production differences. While ‘appropriately’ can differ from year to year based on weather, it typically means applications to *non-frozen* soils from November through early March when conditions are less conducive for volatilization losses.

When not applied appropriately or extenuating circumstances result in conditions we did *not* plan on, losses can and do occur (one study of N loss when one inch of water was applied to a frozen soil just following application of urea and ammonium nitrate found losses approaching 25% in runoff water for *both* sources). Knowing these differences is a good reminder to plan ahead to best manage everything from product selection to application timing and even the need for product inhibitors to mitigate risk as needed.