Comments on the 2013 Minnesota Nitrogen Fertilizer Management Plan by

Agrium Advanced Technologies

The following comments are directed mainly at Chapter 5 of the Minnesota Department of Agriculture document titled "Minnesota Nitrogen Fertilizer Management Plan". Agrium Advanced Technologies would like to commend the Minnesota Dept. of Agriculture on including enhanced efficiency fertilizers (EEFs) in the nitrogen Best Management Practices (BMPs). Enhanced efficiency fertilizers (EEFs) are products designed to increase nutrient availability and plant nutrient uptake while decreasing losses to the environment compared with a reference soluble fertilizer. By including EEFs grouped together in an unbiased way demonstrates Minnesota is much farther ahead than other states.

Our comments address how EEFs, specifically Environmental Smart Nitrogen (ESN) are referred to in the BMPs. Agrium Advanced Technologies (AAT) ESNis a polymer coated urea product, that is considered a controlled release fertilizer. The polymer membrane allows water to diffuse into the granule, dissolving the nitrogen inside, becoming a water and urea solution. Moisture and temperature – the same growing conditions that favor plant growth and nutrient demand – release nitrogen from the polymer coating. Moisture creates the nitrogen solution inside the coating, which moves through the coating at a predictable rate, based on soil temperature.

The current recommended application timing for corn states using ESN is acceptable but with risks. We disagree with the term "risks" because it is very broad and not defined for ESN. The term "risk" is broken down into six categories on page 41. They are as follows: Agronomic, Economic, Psychological, Environmental, Societal, and Logistical. As a person reads these, and sees that a product such as ESN is acceptable but with risks, this very broad category may lead some not to use ESN with the fear that there is something wrong with it.

In an email correspondence between Gyles Randall (formerly with University of Minnesota, Waseca) and Alan Blaylock (Manager of Agronomy, Agrium Advanced Technologies), Gyles states that the risk terminology around ESN is solely economic. Gyles writes "The cost is substantially higher than the cost of N supplied as urea or ammonia. Therefore, ESN falls into a higher economic risk category and not an environmental risk category. We consider ESN to fit within the general category of Acceptable, but with greater risk."

There is a substantial price difference on most fertilizers and ESN is not the only exception nor always the highest cost. Currently, on a per pound of nitrogen basis, anhydrous ammonia costs $0.40/pound, urea costs $0.54/pound, UAN 28% costs $0.60/pound, and ESN costs $0.72/pound.

Most years the price spread is similar, with ammonia as the cheapest source of nitrogen fertilizer. If economic risk is a concern, then all fertilizers costing more than the cheapest source should also be considered an economic risk.

In addition, while there is a price spread between different fertilizers, there are other benefits that outweigh the economic risks. For example, a grower uses 150 lbs of N/acre as anhydrous ammonia, which can be applied from fall to late spring, with the later application potentially damaging the plant. Using the costs above, the cost of fertilizer will be around $60/acre, plus an additional $12/acre for application costs, for a total cost of $72/acre. That same grower decides to use urea instead due to convenience of timing of application. The new cost for the same 150 lbs N/acre is now $81/acre plus $5/acre for application costs. The total new costs are $86/acre, but the convenience of applying a more versatile source of fertilizer, as well as the logistical risks outweigh the economic risks, making the increased cost justified. The following year, the same grower, finds there were significant N losses limiting his yields so he and decides to try an EEF product, such as ESN. . The recommendation for the field is to use a blend of 80% ESN and 20% urea pre-plant (our recommendation for most of Minnesota at that time) which will cost $103/acre. Again, because of the convenience of application, the application cost is only $5/acre, with a total cost of$108/acre. ESN allows for a better nitrogen use efficiency, when compared to anhydrous ammonia and urea, increasing the potential for environmental losses.,. On average, using ESN has demonstrated an average increase of 8 to 10 bushels corn/acre. The return to the grower by using ESN is ~$50/acre more than ammonia or urea alone. Therefore, based on this analysis, there is actually more “risk” in using anhydrous ammonia or urea.

Enhanced efficiency fertilizers are one tool that farmers can utilize to help increase their nutrient use efficiencies. Using EEFs, especially ESN, farmers have the ability to increase yields, lower N rates, and increase nutrient use efficiencies, which can decrease the potential for nutrient losses to the environment. We encourage you to consider the risk analysis around EEFs in the Minnesota Nitrogen Fertilizer Management Plan. As with any best management practice, EEFs must be used within the framework of a 4R Nutrient Management System (right source applied at the right rate, right time, and in the right place) in order to achieve the desired results.