

DECREASING LOSS WHEN USING UREA

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Selecting the right nitrogen source when fertilizing pastures and hayfields has always been important in nitrogen use efficiency. For many years we have had the option of using either urea or ammonium nitrate as the nitrogen source in our fertilizers. A basic recommendation was to use urea in spring, but use ammonium nitrate in summer and early fall. Urea was usually cheaper, but more prone to nitrogen loss due to volatilization, which occurs in hot weather with limited rainfall.

Over the last few years, many suppliers do not carry ammonium nitrate, due to the regulations and security concerns that are associated with the malicious use of this fertilizer. The result is that many producers no longer have an option of nitrogen sources, only urea.

The Problem

Urea is 45 percent nitrogen, and is an excellent source of nitrogen. The problem is that its nitrogen is in the form of ammonium. These ammonium molecules are prone to be released and potentially lost to the atmosphere through a process called volatilization. This loss is usually when temperatures are in the mid-70s or above and when there is limited rainfall to dissolve the fertilizer and get it into the soil solution. When the urea remains on the soil surface an enzyme called urease breaks the urea down, releasing the ammonia gas into the atmosphere. Research has shown up to 40 percent of the N can be lost through this process.

This is the reason urea was a good N source for spring, since temperatures are cooler and rainfall is plentiful. But summer and fall are hotter and drier, making ammonium nitrate a better source of N. It is not susceptible to volatilization loss.

Minimizing N loss with Urea

There are methods to decrease N loss to volatilization from urea. Applying the day before a rain works well. If you can't do that, the next best thing to do is to make the urea stable for a longer period of time, hopefully until rain is received. We can do this by coating the urea with a urease inhibitor. This will make the urea stable for an extra 7-10 days before volatilization losses begin. The primary urease inhibitor available in TN is called Agrotain, although there may be others available.

A study by researchers in Georgia indicated that bermudagrass yields were the same between ammonium nitrate and urea coated with Agrotain. There were other materials that were supposed to decrease volatilization, but bermudagrass yields were lower with those products compared to bermudagrass with ammonium nitrate or urea with Agrotain.

Conclusion

When fertilizing pastures in the spring, urea alone is a great nitrogen source. But when it comes time to fertilize warm-season grasses or tall fescue for fall stockpiling, make sure

to get the urea coated with a urease inhibitor such as Agrotain. It will make the urea stable for a longer period of time and improve N efficiency.