

# DEBUNKING MYTHS ON FALL NITROGEN APPLICATIONS

## AGROTAIN® NITROGEN STABILIZER FEATURES AND BENEFITS:

AGROTAIN is the one growers trust to protect their nitrogen from volatilization - keeping it available for plants to optimize yield potential - protecting their investment today and their legacy for tomorrow.



### PROTECTS YIELD POTENTIAL

AGROTAIN is proven to optimize yields when nitrogen loss is a limiting factor.



### COLD WEATHER PROTECTION

A trusted urease inhibitor, AGROTAIN has proven cold weather protection.



### PROVEN RESULTS

AGROTAIN is backed by more than 20 years and 1,000 trials on millions of acres worldwide.

### MYTH

#### AMMONIA VOLATILIZATION DOES NOT OCCUR IN COLDER WEATHER.

Ammonia volatilization occurs when the urease enzyme breaks the urea molecule into ammonia gas which is a process called urea hydrolysis. This process is a chemical reaction that is not dependent on temperature, meaning the reaction can occur in freezing temperatures.

The underlying data was provided by Montana State University under a Research Trial Financial Support Agreement with Koch Agronomic Services, LLC and neither Montana State University, nor the individual researchers referenced, endorse or recommend any product or service.

### TRUTH

#### NITROGEN LOSS OCCURS IN COLD WEATHER

Studies conducted by Montana State University, proved ammonia volatilization occurs in sub-freezing temperatures. The urease inhibitor technology of AGROTAIN delays the hydrolysis process and prevents nitrogen loss via ammonia volatilization even in cold weather. The average loss due to ammonia volatilization with AGROTAIN treated urea was seven percent, compared to untreated urea with an average loss of 20.5 percent.

## SUPERU® FERTILIZER FEATURES AND BENEFITS

Backed by 25 years of research, SUPERU contains a urease and nitrification inhibitor, which protect against all three forms of nitrogen loss.



### COMPLETELY SOLUBLE

SUPERU fertilizer arrives readily available for plant uptake.



### MORE ACRES, LESS TIME

SUPERU allows for broader and more even spread patterns, meaning growers can cover more acres in less time than with UAN and anhydrous ammonia.



### INCORPORATED PRODUCT

Inhibitors are uniformly integrated within every single granule.

### MYTH

#### AMMONIA VOLATILIZATION IS THE ONLY CAUSE FOR FALL-APPLIED NITROGEN LOSSES.

Ammonia volatilization is not the only method of nitrogen loss when it comes to fall-applied nitrogen. While the belief may be denitrification is more likely to occur in warm, moist soils, the thawing and freezing of snow and ice can lead to denitrification of a nitrogen application, as well.

Source: Aulakh, M.S. and Rennie, D.A. 1986. Nitrogen transformations with special reference to gaseous N losses from zero-tilled soils of Saskatchewan, Canada. Soil and Tillage Research, 7: 157-171.

### TRUTH

#### DENITRIFICATION OCCURS IN COLD WEATHER.

In a study conducted by the University of Saskatchewan, the research showed 35 percent of fall-applied nitrogen was lost to denitrification and denitrification rates were six times higher in no-till fields due to the higher population of denitrifiers. Broadcasting SUPERU can protect against all three forms of nitrogen loss, making it an ideal solution to prevent volatilization and denitrification losses.

# BEST MANAGEMENT PRACTICES OF FALL BROADCAST NITROGEN

To ensure a grower is making the most of a fall nitrogen application, consider these best management practices.

## DO:

- Treat urea with AGROTAIN nitrogen stabilizer or use SUPERU fertilizer
- Use a non-nitrate fertilizer, like anhydrous ammonia or urea
- Ideally, broadcasting should occur when soils temperatures are at 10°C or below
- Select the proper field to apply nitrogen on

## DO NOT:

- Apply on fields that are very wet
- Apply on fields when the soil froze in a wet condition
- Apply on fields with compacted, drifted or crusted snow
- Apply on fields with fresh snow cover
- Apply during extremely cold weather conditions that would prevent urea from penetrating the snow cover rapidly.

Please check with local jurisdictions on compliance and 4R practices when considering fall nitrogen applications.

## IDEALLY, A GROWER WOULD APPLY FERTILIZER ON DRY SOILS, BUT IF AN APPLICATION MUST OCCUR ON SNOW-COVERED GROUND, THESE ARE THE OPTIMAL CONDITIONS:

- Two to four inches of light, fluffy snow on a dry soil
- Followed by thawing conditions
- This allows movement of urea through the snow and into the soil.

## A WORD OF CAUTION:

The above applies to a specific set of soil and climatic conditions. Growers have tested and proven this approach on stubble and forage fields in drier regions of the prairies. However, this technique is not recommended for areas with higher snowfall totals or if the soil surface is sealed off by a late-fall ice storm. Nor is it recommended for nitrate containing fertilizers, since ammonium nitrate can raise the melting point of snow.

## BOTTOM LINE:

Ammonia volatilization and denitrification occurs even under freezing conditions. If an application must be performed in freezing conditions, then protect against significant nitrogen losses with AGROTAIN or SUPERU.