

# NITREA 45NU

Infused granular nitrogen fertilizer

## Features

- Infused nitrogen fertilizer with long shelf-life that withstands cold weather storage conditions
- Does not require hazmat placard; non-corrosive
- Is not a labeled pesticide. Does not kill bacteria in the soil
- Provides triple protection of nitrogen loss from volatility, nitrification and leaching
- Qualifies for NRCS Conservation Stewardship Program (CSP). Participants receive reimbursement from:
  - Air Quality Enhancement Activity: AIR08 nitrification inhibitor
  - Water Quality Enhancement Activity: WQL24 Enhanced Efficiency Fertilizer



NITREA™ 45NU is an infused 46-0-0 nitrogen fertilizer with both urease and nitrification inhibitors. NITREA 45NU protects nitrogen from volatilizing and leaching while allowing the better uptake of nutrients. With its combination of proven components and technologies, it allows for an increase in the uptake of nitrogen at every stage of the process, allowing for holistic management of the nitrogen from application in the field to uptake in the plant.

## How does it work?

NITREA 45NU contains NBPT which stabilizes surface applied nitrogen by inhibiting the activity of the urease enzyme, slowing hydrolysis thus minimizing ammonia volatilization loss. NITREA 45NU also contains dicyandiamide (DCD) which slows the conversion of ammonium to nitrate by temporarily disrupting the activity of the bacteria Nitrosomonas, thus minimizing nitrification and leaching below ground. Through CARBO's precision manufacturing infusion process, both NBPT and DCD thoroughly penetrate the urea granule protecting the nitrogen from loss.

**Reduce volatilization:** On the soil surface, specific NITREA 45NU components protect urea

On the surface, microorganisms produce urease, a nickel-based enzyme that catalyzes the breakdown of urea into ammonia (NH<sub>3</sub>) and carbon dioxide (CO<sub>2</sub>). Without any protection, urea is subject to this volatilization before it even enters the soil. With the infusion of NITREA 45NU components, the urea is protected, and the urease enzyme becomes ineffective at volatilizing the urea.

## Why NITREA 45 NU?

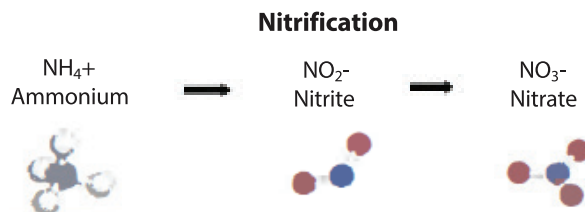
- Made with precision infusion technology, providing the granules with strength to enhance performance in the field and lessen the possibility of failure
- Possesses a nitrogen stabilizing mechanism that inhibits nitrogen in urea from converting to volatile ammonia gas and nitrates that can leach

NITREA 45NU is a uniquely enhanced nitrogen product that is manufactured by infusing nitrogen with NBPT and DCD. This process stabilizes the nitrogen so that it is less prone to volatilize and leach away from the targeted growing zone.

CARBO employs a proprietary infusion process to ensure the NBPT and DCD thoroughly penetrate the urea granule, protecting the nitrogen from loss.

Reducing nitrification and leaching: Specific NITREA 45NU components help defend against nitrification and keep nitrogen in the form of ammonium.

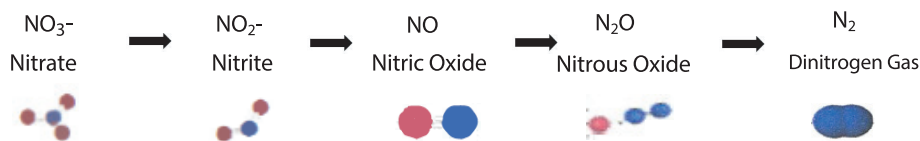
- NITREA 45NU moves through the organic layer of the soil, and into the soil profile, the threat shifts from volatilization to nitrification. At this stage, the urea moves away from the relatively insoluble component, and converts to ammonium ( $\text{NH}_4^+$ ).
- Once the urea converts to ammonium ( $\text{NH}_4^+$ ), specific NITREA 45NU components guard against nitrification, the process by which microorganisms convert ammonium to nitrate.



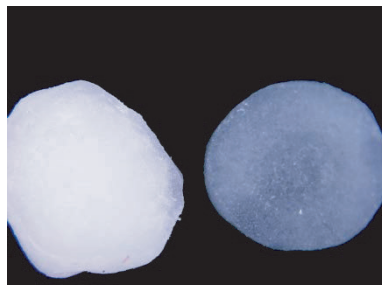
- Due to the cationic nature, ammonium ( $\text{NH}_4^+$ ) is caught by negatively charged soil colloids and mineral complexes in the soil. On the other hand, nitrate ( $\text{NO}_3^-$ ), due to its anionic nature, is highly susceptible to losses from leaching. Therefore, keeping nitrogen in the form of ammonium allows more nitrogen to be available to the plant.

Slowing denitrification: With more nitrogen in the form of ammonium ( $\text{NH}_4^+$ ) longer losses from denitrification are greatly reduced

In the case where ammonium is not protected, microorganisms rapidly undergo the nitrification process, creating nitrate. This creates an opportunity to increase the loss of nitrogen through denitrification. Denitrification occurs when nitrogen is lost through the conversion of nitrate to gaseous forms of nitrogen. This occurs when the soil is saturated and the bacteria use nitrate as an oxygen source.



By holding nitrogen in the ammonium form longer, denitrification is greatly reduced as the nitrate starting material isn't present in very high amounts



Untreated urea versus  
infused NITREA 45NU