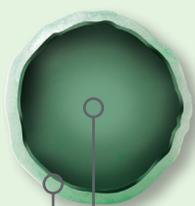


# How ESN technology works



Polymer coating

Urea

## Coated nitrogen granules

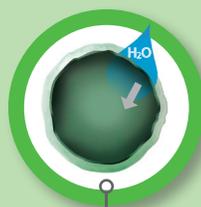
ESN technology uses a flexible, polymer coating to encapsulate an N granule. The coating protects the N from loss mechanisms, releasing it when the crop needs it most.

## Temperature controlled-release

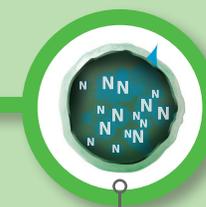
The unique polymer coating releases N based on the two requirements for crop growth: moisture and temperature. Moisture creates an N solution inside the coating, and the solution moves through the coating at a rate based on soil temperature. The movement and rate match the N demand of the growing crop.

## Backed by independent research

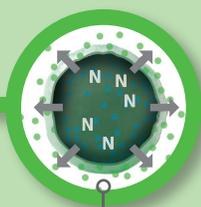
ESN is backed by over 800 crop years of testing by independent, third party researchers. The data is proof of performance for a unique product.



Water moves in through the coating



N dissolves into solution inside the granule



N moves out through the polymer

Into soil solution



sorghum

For more information about ESN technology visit [SmartNitrogen.com](http://SmartNitrogen.com)

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**ESN**  
SmartNitrogen



- Enhances nitrogen use efficiency
- Improves crop yield and quality
- Provides convenience through ease of use
- Environmentally responsible

## ESN technology for sorghum

During the first few weeks after planting, sorghum takes up very little nitrogen (N). But in a few weeks of rapid growth at mid-season, the crop consumes 60-80% of its total N needs.

ESN technology controls the N supply until the growing plants need it most. Additionally, it significantly reduces N loss to the environment. Using ESN technology is a smarter way to grow.

## ESN technology and increased yield

Research has shown that increased yield is a result of ESN technology protecting N from being lost to the environment. ESN maximizes N efficiency, compared with similar N treatments from urea or UAN. Resulting yield increases of more than 30 bu/ac have been recorded. An average increase of 10-15 bu/ac was typical in areas of higher N loss.

### ESN benefits can be experienced in a range of conditions

- ESN can control losses by volatilization, leaching or denitrification.
- Greatest yield benefits of ESN are usually observed under conditions of excess rainfall or surface application prone to volatilization from urea.
- ESN can allow single-application N management and eliminate the need to side-dress.
- ESN can be blended with other conventional dry fertilizers to balance the need for immediately available N with ESN protection.

## Other benefits of ESN technology

### Wider application window

ESN provides a wider application window in both the spring and the fall, allowing you to apply fertilizer on your schedule.

### Reduced lodging

ESN's controlled nitrogen feeding may reduce lodging by preventing excessive early vegetative growth.

### Convenient to use and apply

ESN is compatible with no-till operations and is easy to blend. It will not set-up in storage and therefore has a longer shelf life.

### Environmentally responsible

ESN significantly reduces N loss, providing substantial benefits to the environment. In the US, National NRCS and local EQIP programs offer grower incentives for the use of ESN.

## Application timing and handling

ESN is generally applied at rates similar to conventional N fertilizers. Field location, weather conditions, timing of N demand and potential for N loss are all factors to consider in determining application timing.

ESN was developed and extensively tested to resist the effects of normal handling. Excessive handling can affect the coating and N release.

For more application timing and handling recommendations talk to your local retailer, ESN representative, or visit [www.SmartNitrogen.com](http://www.SmartNitrogen.com).

A **SMARTER** SOURCE OF NITROGEN,  
A **SMARTER** WAY TO GROW.®



ESN is the only controlled-release nitrogen designed for agriculture that delivers a significant return on investment through increased nitrogen efficiency.

