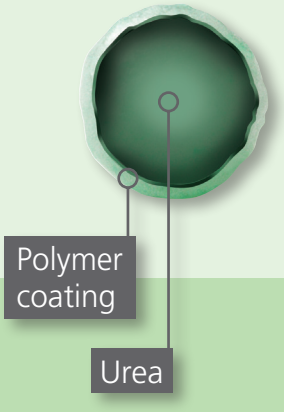
How ESN technology works



Coated nitrogen granules

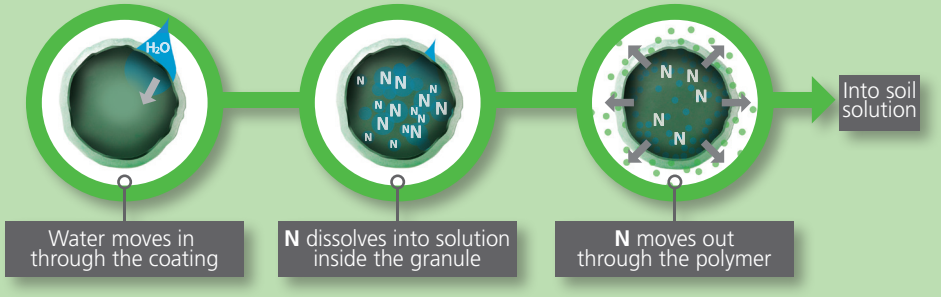
ESN technology uses a flexible, polymer coating to encapsulate an N granule. The coating protects the N from loss mechanisms, releasing it when the crop needs it most.

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.



For more information about ESN technology visit **SmartNitrogen.com**

Nutrien™

1049_0523_AG_BROCHURE_CORN

ESN® SmartNitrogen

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

ESN technology for corn

During the first few weeks after planting, corn 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 up to 40 bu/ac have been recorded. An average increase of 15-20 bu/ac was typical in areas of higher N loss.

ESN has been shown to increase yield in a range of conditions

Soil drainage class	Greater precipitation or irrigated	
	Lower organic matter	Higher organic matter
Poorly drained	15-20 bu/ac	8-10 bu/ac
Moderately well drained	15-20 bu/ac	8-10 bu/ac
Well drained	15-20 bu/ac	8-10 bu/ac

- Expectations are based on 80% of N attached to ESN
- Greater precipitation = 6-8 inches of combined rainfall in May and June (a majority of the Corn Belt)
- Areas with lower precipitation have shown up to 30 bu/ac increases
- Higher organic matter represents >3-4%

Reduced lodging

Excessive available nitrogen (N) early in the growing season can sometimes overstimulate vegetative growth in grain crops resulting in lodging. ESN's controlled nitrogen supply provides N when it is needed, avoids early season excesses, and may reduce the lodging caused by excessive N supply.

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.

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**.

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.