

Busting the Myths around ESN

ESN Smart Nitrogen is a nitrogen granule coated with a flexible polymer. While it has been available for use in broad acre farming for some time, there are still some myths surrounding the product. From blending to usage rates and similarities to other products, here are a few of the common misconceptions surrounding ESN, and the truth behind them.

The following is not intended to be complete or detailed use recommendations for all geographies, crops, or applications. User assumes all responsibility for proper use and handling for specific geographies, crops, and applications. Please consult ESN recommendations and/or your ESN marketing representative for complete use recommendations.

For more information:

<http://www.smartnitrogen.com/how-to-apply-esn/use-all-crops>

Myth #1: ESN releases nitrogen by breakdown of the coating. ESN's coating remains intact through the growing season giving long-lasting control over N release into the soil. Unlike some other slow-release fertilizers, ESN does not release nitrogen by chemical "breakdown" of the coating or the fertilizer. ESN releases N by diffusion of nitrogen solution through the coating into the soil.

Myth #2: ESN won't release in dry soil. ESN will in fact release in very dry soil. Lab studies have shown that soil moisture does not slow the ESN diffusion process until soil moisture dries to about 20-30% of field capacity. After that, the release can slow, or cease in extreme situations, but crops would be at or near their permanent wilting points. Once moisture is reintroduced, the process will begin again, releasing nitrogen into the soil.

Myth #3: ESN release rate is determined by soil moisture. ESN release is controlled by soil temperature, not moisture. Some moisture is needed to initiate the diffusion process and continue dissolving the urea inside the coating, but temperature controls the rate of the process.

Myth #4: ESN starts to release at 50°F. ESN may release some nitrogen very slowly at temperatures down to about the freezing point of water at which diffusion is no longer possible. As temperature increases, N release gradually increases to coincide with greater crop demand, but ESN release does not "turn on or off" at 50°F.

Myth #5: ESN must be blended with other forms of nitrogen to be effective. While ESN can be, and often is, blended with other fertilizers, it does not have to be blended with other forms of nitrogen to be effective. ESN releases nitrogen in approximate synchronization with the nitrogen demands of many crops. It can serve as the sole nitrogen source for your crops in many situations, reducing the number of passes you have to make on your fields.

There are some situations in which ESN should be blended, such as when top-dressing winter wheat after it has broken dormancy or top-dressing corn after about the V6 growth stage. Discuss ESN use with your agronomist or ESN rep to determine the best choice for your farm.

Myth #6: ESN cannot be blended because blending destroys the coating. ESN is designed to withstand normal handling processes. Proper handling and blending will not destroy the coating. Excessive blending or handling or poorly maintained equipment



may damage the coating and reduce ESN's effectiveness. To help avoid abrasion of the coating, add ESN to the blend last and mix for the minimum time required to achieve uniformity.

Myth #7: I can reduce the total amount of fertilizer my crops need if I use ESN. ESN does increase N-use efficiency in many crops and environments. When applied as recommended, lower rates of ESN can often maintain crop yields similar to normal rates of conventional N sources. However, profitability is usually greatest, and risk lowest, if ESN is used at the same rates as a grower's conventional program.

Myth #8: ESN releases too quickly to be applied pre-plant. ESN can be applied at or before planting on many crops. The release of nitrogen is controlled by temperature, not time, so cooler spring temperatures prevent the release of too much nitrogen before crop growth. As soil temperatures rise and crops begin to grow faster, more nitrogen is released, closely matching crop demand.

Myth #9: ESN must be incorporated. ESN need not be incorporated in many environments. Incorporation is recommended where possible to ensure good contact with soil moisture, but ESN has been proven effective in a variety of surface applications, for example, top-dressing winter wheat, broadcast applications on no-till crops, and in forage grasses. Surface applications without incorporation are not recommended for arid and semi-arid regions without irrigation because of limited surface soil moisture.

Myth #10: ESN floats and will wash away with heavy rain. A small percentage of ESN granules are buoyant and may float in water. Some surface movement is possible if surface water flow is strong enough to erode soil in conventional-till or erode residue in no-till.

Significant movement of ESN offsite is rare and results from the combination of recently applied ESN, sloping topography, bare soil, and sufficient rainfall for erosion, a combination that should be avoided. Light incorporation is preferred where possible to prevent the possibility of granule movement.

Myth #11: ESN can't be applied in the fall because the granules will burst when frozen. ESN does not burst when frozen. The flexible coating is a durable polymer that withstands freezing. ESN has been shown to be effective as a fall application where cold temperatures prevent N release overwinter and/or where fall N applications are an appropriate N management practice.

Myth #12: ESN is the same as inhibitors and other enhanced-efficiency products. ESN is unique among enhanced-efficiency fertilizers in agriculture. It provides longer-lasting protection, better performance, greater benefits and greater value than other EEF options.

ESN is a controlled-release nitrogen fertilizer. Because the polymer coating encapsulates the nitrogen, it controls all N losses by regulating the exposure of N to the environment. Nitrogen inside the capsule normally releases over a period of about 50-80 days, depending on soil temperature, protecting the nitrogen during the typical periods of loss.

Agrotain and other urease inhibitor products are chemical additives, called stabilizers, that reduce volatilization for a short time immediately after application. Urea treated with these products is still immediately water soluble, leaving them susceptible to leaching.

Still have questions or need more info?

Visit www.smartnitrogen.com/agronomics/faqs

