

## Recommendations for Using ESN on Winter Wheat in the Pacific Northwest

***ESN technology protects your nitrogen investment from loss mechanisms, ensuring your wheat crop gets N when it needs it most. ESN goes beyond traditional nitrogen by providing you:***

- **Maximum Yield** – ESN has proven to increase yields by providing a continuous N supply when wheat needs it most.
- **Maximum Flexibility** – ESN can be blended with other dry fertilizers and reduce the number of required applications.
- **Maximum Safety** – ESN won't burn your crop like urea or ammonium nitrate.
- **Convenient Application Window** – ESN can allow more flexibility in nitrogen application timing.
- **Protection for the environment and qualification for US Government Incentive Payments.**

### Wheat Use Recommendations

ESN's controlled nitrogen release provides flexibility in nitrogen application timing. It can be used to enhance nitrogen-use efficiency and crop performance in a variety of cultural practices. The options below give general guidelines for preferred use in wheat under different nitrogen-management strategies for eastern geographies. The Pacific Northwest is a region of great diversity in weather and soil conditions. Winter and spring wheat are grown in both dryland and irrigated cropping systems. Yields and nitrogen-loss potential are highly variable and generally correspond to available moisture from rainfall and/or irrigation.

Recommendations below are generalized and may be varied for specific local conditions or cropping systems. For specific local recommendations, please consult your crop advisor, retailer, or ESN representative.

In areas of low to moderate nitrogen loss potential, best results are often achieved when ESN is applied in the fall at time of seeding winter wheat. For fall applications, ESN is recommended as a primary N source to provide controlled feeding during the fall establishment period and rapid growth the following spring. Fall ESN application eliminates the risk and cost of spring top-dressing.

For areas of high N-loss potential, early spring ESN application is preferred. Spring application reduces the risk of over-winter loss and applies N closer to the time of peak crop uptake. Fall ESN application may be acceptable in these areas and provide better performance than soluble fertilizers, but ESN should be applied when soils are cool to slow nitrogen release from ESN.

### Fall Applications:

- *ESN should comprise a high percentage of the nitrogen, typically 80-100%.*
- *ESN may be applied pre-plant banded, pre-plant broadcast and incorporated, as a side band application, or in seed-row following suggested seed-safe N rates for ESN placement.*
- *ESN can be used at up to 3X the indicated safe rates of urea when it is 100% of the N source, ESN can be used at 2X the safe rate of urea when it is 70-75% of the N source and at 1.5X the safe rate indicated, when it is 50% of the total N source. Tables for seed-safe rates of ESN for soil type and planter configurations can be found at [www.smartnitrogen.com/](http://www.smartnitrogen.com/).*
- *Small amounts of other nitrogen sources may be blended to supply some immediately available nitrogen to stimulate tillering along with other elements such as sulfur or phosphate.*

### ESN Marketing Representative:



### Spring Application:

ESN top-dressed in spring on winter wheat in this region should be blended with a soluble nitrogen source such as urea or ammonium sulfate. Early spring top-dress ESN performs very well under sprinkler-irrigated conditions. ESN may be applied from dormancy up to five-leaf stage as a blend with other soluble N sources such as urea and/or ammonium sulfate. Suggested portion of ESN in the blend is shown in the table below. Irrigated cropping systems should use the high end of the blend ranges shown. Low rainfall, dryland areas should use a lower ESN percentage in the blend. ESN is not recommended after the 5-leaf stage. ESN as 100% of a spring N application is not recommended for top-dressing on winter wheat in low-rainfall dryland

production because of early nitrogen demand of the crop and sometimes-limited rainfall to move nitrogen into the crop root zone. Early spring N demand that may not be fully met by using a controlled-release N source. Winter wheat breaks dormancy and takes up N at soil temperatures that may be too cool for adequate release from ESN.

For best results, blends should be applied early in the spring before or at "green-up" in order to assure adequate soil moisture and meet early demand of the wheat. The later the N application occurs, the greater the demand for immediate N supply and the lower the percentage of ESN recommended in the blend. ESN is not recommended after the five-leaf stage.

Nitrogen-Loss Potential	Application Timing	Recommended Blend % of N as ESN
Low	Preferred: Fall (time of seeding)	80-100%
	Early spring:dormancy until green-up	50-75%
	Spring: green-up to 5 leaves	30-50%
High or Irrigated	Fall (time of seeding)	80-100%
	Preferred: Early spring dormancy until green-up	60-90%
	Spring: Green-up to 5 leaves	40-60%

### Spring Wheat

Spring pre-plant ESN application is preferred for spring wheat and should be incorporated before or at planting to ensure good contact with soil moisture. Seed-placed or banded ESN is optimal where possible and where safe rates can be used. Blends supplying 50-75% of the N as ESN are appropriate for pre-plant applications on spring wheat. This blend should be sufficient to maximize both yields and protein. For greater protein benefit, use the greater percentage of ESN. Post-emergent top-dress applications on spring wheat are less effective in this region and are not recommended.

***Every type of nitrogen fertilizer is applied and handled differently.***

***These general use recommendations for ESN are based on optimal growing conditions.***

***Your specific conditions and goals should be considered to achieve best results.***

