

## Recommendations for Using ESN on Winter Wheat - Canadian Prairies and Northern Plains

**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 it's needed 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 (N) application timing. It can be used to enhance nitrogen-use efficiency and crop performance in a variety of cultural practices. The options in this document give general guidelines for preferred use in wheat under different nitrogen-management strategies for the Canadian Prairies and Northern Plains. The potential for winter N-loss is generally low to moderate in this environment. ESN performs best on winter wheat when applied in the fall at seeding. For fall applications, ESN is recommended as a single N source to provide controlled feeding during the fall establishment period and rapid growth the following spring. ESN blends easily with other granular fertilizers and provides convenient one-pass fertilization. Spring top-dress applications on winter wheat or spring pre-plant applications on spring wheat usually perform best if blended with soluble N sources, such as ammonium sulfate or urea.

### ESN Fall Application at Seeding (preferred):

On the Canadian Prairies and the Northern Great Plains full value of ESN is derived from fall application at time of seeding winter wheat. Applying ESN at seeding means no need to top-dress in spring...meaning no extra time, application costs, or wondering if you will get to the field in time to meet the crop's peak N demand – takes the risk and cost out of spring top-dressing.

- *Pre-plant band, side/mid-row band.*
- *Pre-plant broadcast and incorporated.*
- *Seed-row placed ESN provides a physical barrier between the seed and the urea within the coating and greater seed-row safety than urea or ammonium sulphate nitrogen sources. Within the Canadian Prairie provinces, safe rate guidelines exist for seed placed N on the provincial agricultural websites. ESN can be used at 3X indicated rates when it is 100% of the N source, ESN can be used at 2X the existing safe rate when it is 70% 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/)*
- *Pre-plant broadcast unincorporated, using the seeding operation or incorporation.*
- *Crop residue is necessary to hold ESN in place (broadcast applications).*
- *Heavy crop residue may restrict ESN - soil contact, and potentially affect N release from ESN due to poor ESN to soil moisture contact.*
- *Impregnating crop protection chemicals on ESN has not been evaluated.*

### ESN Representative:



### Spring Application(acceptable):

ESN as 100% of a spring N application is not recommended for top-dressing on winter wheat in this environment primarily for reasons of the sometimes-limited rainfall to move nitrogen into the crop root zone and early nitrogen demand of the crop. This is a crop with early spring N demand that may not be fully met by using a controlled release N source. Performance of spring ESN application often improves when blended with a conventional N source. Winter wheat breaks dormancy and takes up N at soil temperatures that may be too cool for adequate release from ESN.

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. 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.

### Winter Wheat Development and ESN Nitrogen Management for Canadian Prairies and Northern Great Plains

Region	N-Loss Potential	Recommended Use
Western Canada and the Semi-Arid Great Plains	Low to High	Fall: Preferred
Recommended Blend		
Time of Application	ESN	Conventional N
Fall: at seeding	100%	Not needed
Spring: dormancy until green-up	50-75%	25-50%
Spring: on actively growing wheat (green-up to 5 leaves)	30-50%	50-70%

**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.**

### Spring Wheat

ESN may be applied in fall for spring wheat similar to recommendations for application at planting on winter wheat. These applications should comprise a high percentage of the total N as ESN, preferably 100% ESN to protect against over-winter and early spring nitrogen loss. Fall-applied ESN should be incorporated.

Spring ESN application is preferred 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 optimize 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.

