ESN®
SmartNitrogen

# Recommendations for Using ESN on Potatoes in the Canadian Prairies and Upper Northern U.S. Tier States

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

- Maximum Yield – ESN has proven to increase yields bybproviding 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.

***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.***

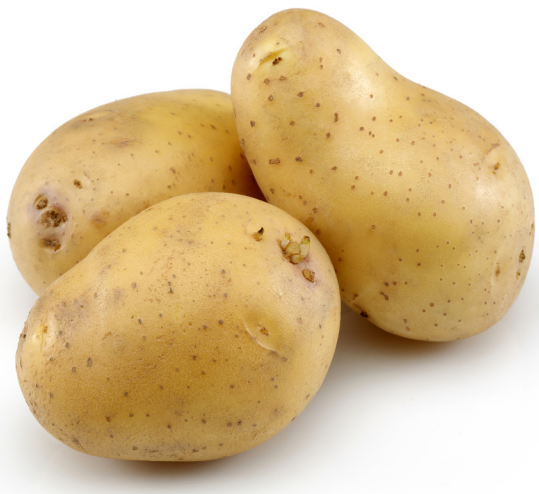
## Potato Use Recommendations

Proper nitrogen (N) nutrition of potatoes is essential to high yields, optimum crop quality, and maximum profitability. Nitrogen is essential for vegetative growth and protein synthesis. Nitrogen is essential to the photosynthetic factory that converts solar energy to carbohydrates that are stored in the tuber. Potatoes require high N rates, but N timing is a critical factor in potato yield and quality. Potato N need is closely synchronized with specific growth stages. Five general stages are commonly used to describe potato growth and development. The growth stages are: I) sprout development, II) vegetative growth, III) tuber initiation, IV) tuber bulking, and V) maturation. Sufficient N is needed in the initial stages to stimulate leaf growth, but too much N early can cause excessive vegetative growth and delay tuber initiation. Potatoes take up little N in the first month after planting (Growth Stage I), but take up about 60-80% of the total N needs during tuber initiation and tuber bulking (Stages III & IV) when most of the total dry matter is accumulated. Nitrogen uptake is nearly complete by the end of Stage IV. Timing of specific growth stages is approximate and varies with variety and environmental conditions.

ESN can improve the profitability of potato production by supplying the right amount of N at the right time. ESN is designed to release the bulk of its N during the period of greatest crop demand. Controlled N release simplifies N management by replacing the common practice of multiple N applications with one simple application.

## Nitrogen and Potato Production

Nitrogen management in potato production presents numerous challenges. Most potatoes are grown on sandy soils under irrigation or in humid regions where rainfall is supplemented by irrigation. In addition to delaying tuber initiation, excess N early in the season is prone to greater losses because of limited plant uptake and greater potential for excess precipitation. ESN is a tool that can help overcome these losses if used properly. ESN increases N-use efficiency by protecting most of the N from loss until the period of rapid crop uptake.



Nutrien™


Interactions of weather, timing of N demand, and potential for N loss should be considered in determining the most appropriate ESN application. The following recommendations are the result of field-testing in key potato-producing areas. Actual results may vary depending on weather and soil conditions.

## Canadian Prairies and Upper Northern U.S. Tier States

### *ESN Application Timing*

Potato production is optimized when N supply is maintained at the proper level for each growth stage. This is traditionally accomplished with multiple side-dress applications and/or fertigation. ESN is designed to provide a steady, season-long N supply with a single application when used appropriately. Studies in this geography indicate ESN usually provides the greatest benefit when applied at planting. Research has shown one-time ESN application at planting can produce greater yields and quality than traditional multiple side-dress or fertigation applications.

### *Application Rates*

ESN is generally recommended at rates similar to conventional N fertilizers. When applied at normal recommended rates, increased N efficiency with ESN usually increases yields. ESN can produce yields similar to conventional N fertilizers at lower rates than conventional fertilizers. However, economic analysis usually indicates greater profitability from increased yields at recommended rates than maintaining yields at reduced N rates. Where N efficiency does not limit yields, ESN may provide greater advantage by maintaining yields with reduced N rates.

Under conditions where conventional fertilizers are applied at higher-than-recommended rates to compensate for N losses, lower rates of ESN may be superior because of ESN's ability to reduce N losses and supply what the crop needs when it is needed. Local field testing should be used to fine-tune ESN programs.

### *Placement*

ESN may be broadcast and incorporated or banded.

Incorporation insures consistent contact with soil moisture for the most predictable release. ESN may be banded in or near the row with a greater margin of safety than conventional N fertilizers. The ESN coating reduces the exposure of the seed and seedling to potential salt and ammonia damage.

**ESN Marketing Representative:**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