

# ESN as a Spring Nitrogen Fertilization Choice for Winter Wheat in Ohio

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## Objective

To evaluate the effects of spring Environmentally-Smart-Nitrogen (ESN) on wheat yields.

## Background

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Crop Year:	2008	Soil Test:	P: 26 ppm K: 116 ppm
Location:	OARDC Western Branch		OM: 2.4%
County/Town:	South Charleston-Clark Co.	Row Width:	7.5 inches
Soil Type:	Brookston-silty-clay-loam	Planting Date:	October 11, 2007
Drainage:	Tiled	Seeding Rate:	126 lb/A
Previous Crop:	Soybean	Herbicide:	Harmony Extra
Variety:	Hopewell	Harvest Date:	July 15, 2008
Tillage:	No-till		

## Methods

Experimental design was a randomized complete block with four treatments replicated four times. Three nitrogen sources (urea, urea-ammonium nitrate (28%), and ESN) were evaluated at different application rates (60, 80 & 100 lb N/A), all applied at spring greenup. In addition to these three treatments, a zero (0) nitrogen- rate check plot was included in the study to estimate how much nitrogen was available in the soil, and was not included in the analysis. The zero check was only to estimate residual N and not a comparison treatment. No starter fertilizer was applied. A Great Plains No-till Drill was used for seeding. Nitrogen was surfaced applied by a 10 foot wide drop spreader in the spring for each treatment. Plots were 10 feet wide and 80 feet long. The center eleven rows were harvested for grain yield. A Massey Ferguson 8XP plot combine with a scale estimated grain weight. Grain moisture was approximately 12%.

## Results

Nitrogen sources behaved the same across treatments, regardless of nitrogen rates. Any further discussion will be yields of the three sources, averaged over nitrogen rates. Table 1 shows the average wheat grain yield among corresponding combined nitrogen-rate and sources (means followed by the same letter in a column are not statistically different).

Table 1. Grain yield for nitrogen rate and source.

Nitrogen Source Combined		Nitrogen Rates Combined	
Rate	Yield (bu/A)	Source	Yield (bu/A)
60	92.5 a	Urea	94.9 a
80	95.0 a	UAN	97.2 a
100	96.9 a	ESN	93.3 a
LSD (0.05)	NS	LSD (0.05)	NS

## Discussion & Summary

Differences may have not been detected among treatments because of residual N. The unusually large yield from the zero nitrogen rate check (71.1 bu/A) would support this possibility. Also, the 2008 winter and spring were very mild in respect to temperature, which could have increased soil microbiological activity, hence increasing soil-nitrogen mineralization rates. However, the ESN plots were lighter green than other treatments from greenup to flowering, especially when compared to UAN treatments -- but apparently did not correspond to yield reduction. This one year study would suggest that ESN may be an alternative N source for urea or UAN.

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