

# Agrium

## ESN Increases Corn Yields by Protecting Nitrogen Loss in Wet Weather

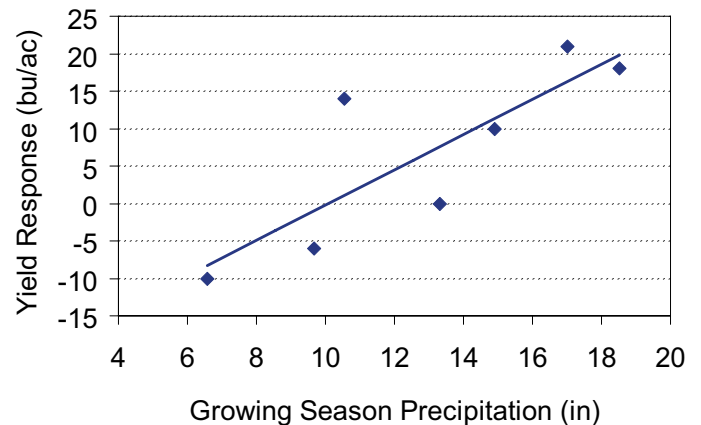


**Controlled Release Fertilizer**

A *smarter* source of nitrogen. A *smarter* way to grow.

**T**his Illinois study demonstrates that the benefit of ESN increases as conditions for N loss become more severe. The figure shows that as rainfall increases, a major factor in N loss, the advantage of ESN over conventional urea increases. The study has been conducted at multiple locations from 2003-2005. The 'yield response' shown on the figure is the difference between ESN and conventional urea (average yield with ESN minus average yield with urea) both broadcast and incorporated before planting. Each point on the graph is the average yield difference for four N rates at one site in one year. Note that in the wettest years, the yield advantage for ESN is about 20 bu/acre more than urea.

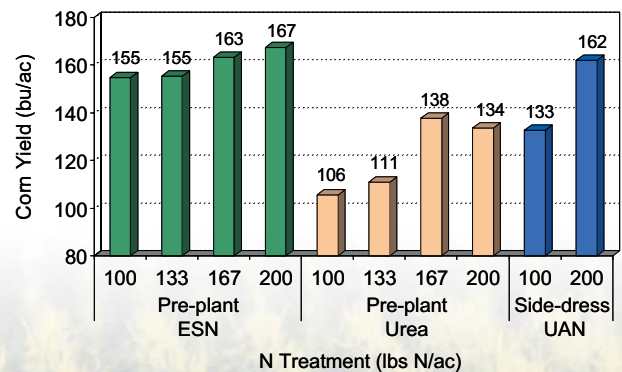
Source: Dr. Stephen Ebelhar, University of Illinois and Dr. Edward Varsa and Dr. Jorge Hernandez, S. Illinois University - Carbondale.



**Figure 1.** Yield benefit of ESN increases as rainfall, a major factor in N loss, increases.

**T**his 2004 study in Northeast Illinois shows a large yield advantage for ESN in a year when early summer rainfall was much above normal, a year with severe N losses from pre-plant applications of conventional N fertilizers. One wouldn't expect this kind of response in all conditions, but the study illustrates what is possible when N loss is severe. Pre-plant applications of ESN and urea were broadcast and incorporated before planting. Side-dress UAN was knifed in between rows at about V6 growth stage. The soils at this site are heavy-textured soils prone to denitrification losses under wet conditions.

Source: Dr. Randy Simonson, Total Soil Management, Catlin, IL



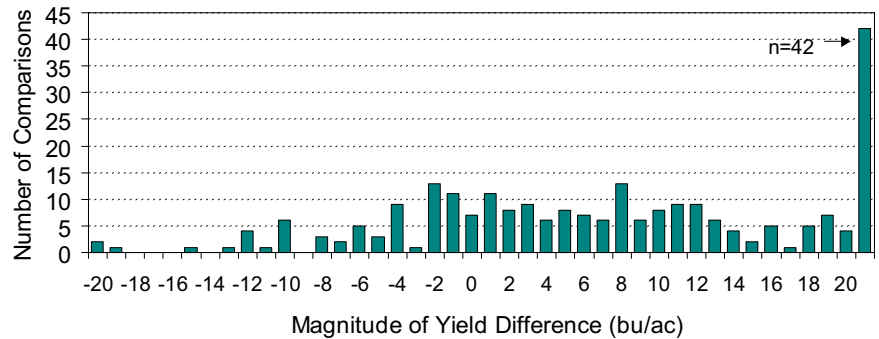
**Figure 2.** Under conditions of severe N loss when other N fertilizers performed poorly, ESN maintained top yields.



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This figure illustrates the range of yield differences observed between ESN and urea or UAN. The data are compiled from the many university studies conducted in the U.S. Corn Belt from 2000-2005. The 'yield difference' is obtained by subtracting the yield with pre-plant urea or UAN from the yield obtained with pre-plant ESN. Each source-rate combination represents an individual comparison for a total of 239 data points. Note that most comparisons show a yield advantage for ESN. Also note the large number of very large yield increases (yield increases greater than 20 bu/acre – the tall bar on the far right). These large yield increases usually occur when conventional N sources are subject to large N losses, for example in sandy soils with high rainfall (leaching losses), heavy soils with wet conditions (denitrification losses), or surface applications (volatilization losses from urea or UAN).



**Figure 3.** Compilation of corn-yield comparisons from university studies in the US Corn Belt, 2000-2005. Data represent comparisons of pre-plant ESN with pre-plant urea or UAN. Bars represent the number of comparisons from those studies resulting in a given yield difference.

Source: Agrium Inc. Compilation of data from many university studies from 2000-2005.

