

EFFECT OF ESN ON WHEAT GROWN ON WET SOILS OF KENTUCKY

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Introduction:

University of Kentucky small plot research conducted since 2003 has shown that ESN (polymer coated urea) is a useful tool for nitrogen management especially in soils that are less than well drained. Wheat production is not common on these soils because they are often too wet in the spring, making timely N fertilization difficult. With increasing wheat prices, planted acreage has been rising. ESN has been shown to broaden the ideal N application window on these soils beginning in January and lasting up to Feekes 4-5 growth stage (late February) compared to the normal 2 week window for urea and UAN applications. The objective of this research project was to scale up to production size fields compare ESN applications to the farmer's current N management practices.

Methods:

Small plot research demonstrated that ESN applied in January produced very similar wheat yields compared to UAN or urea applied at Feekes 4-5 growth stage (current UK recommended N application time). Large plots (20 acres) were established in producer's fields in Davies, Union, and Graves counties in western Kentucky. Many soils in these counties are not well drained which is the reason wheat production is not common. Wheat (variety Branson) was no-till planted by the producer

and fall insecticide and herbicides were applied according to UK recommendations. In the late fall, plant stands were assessed for uniformity and the plot area was established. Half of the area (10 acres) was managed according to the farmers' current practice. Urea was used in Davies and Graves counties, while UAN was used in Union county as the N source for the farmer practice treatments. The N source for the other half of the field was ESN and was applied in the first week of January.

During the period of April 6th through April 9th, the region received a severe spring freeze. Temperatures dropped to 16 °F on April 8th and the high temperature was only 30 °F. At this time the Graves county location was in the Feekes 10.5 stage (flowering) and was completely destroyed. Union and Davies counties are in the northern part of the state and the wheat was not as mature (Feekes 6 and 8, respectively). Farmers in both counties decided to continue the study. At the time of the freeze the ESN treatment was darker green and slightly more advanced than the farmer practice.

Yield was determined using the cooperators combine by harvesting multiple passes within each treatment (Table 1.) Each pass was weighed and a yield was calculated. Because we were left with only two replications (location) the each combine

pass was considered a replication for statistical purposes.

Conclusions:

Yields were obviously reduced because of the freeze; however the ESN treatments still was significantly higher than the farmer practice at the Davies County location. This was a surprising result since the damage

looked more severe in this treatment. Yields were not significantly different at the Union County location, but moisture was higher for the ESN treatment. This might indicate slightly better N nutrition leading to later maturity. This study will be repeated in 2007-2008 growing season at five locations in western KY.

Table 1. Yield, moisture, and test weight for the split field comparison of ESN (polymer coated urea) and the farmer's regular N treatment.				
Location	Treatment	Yield bu/acre	Moisture %	Test Weight lbs/bu
Davies County	ESN	41.1	12.6	53.7
	Farmer Practice	34.6	12.3	52.4
	LSD (0.10)	3.0	0.2	NS*
Union County	ESN	51.5	14.1	58.3
	Farmer Practice	48.8	13.6	57.5
	LSD (0.10)	NS	0.3	NS

*Not significantly different at the 0.10 probability level.