Spring Malting Barley

2013 FERTILITY MANAGEMENT TRIAL

Fertility, primarily Nitrogen, is an extremely important factor in malting barley production. In order to be considered high quality malting barley, crude protein levels must be between 9-12%. Yield and crude protein content of spring malting barley are greatly impacted by N amounts available to the plant during growth and development. Determining the most effective N rate and source will lead to sustainable fertility management recommendations to balance quality and yield. Two sources of nitrogen were analyzed – urea and environmentally smart nitrogen (ESN). ESN is a polymer coated, slow release form of nitrogen.

The trial was planted late due to an abnormally cool and wet spring. These weather conditions persisted throughout the entire growing season, impacting harvesting date as well. The trial was harvested on September 16, 2013 with a Hege 125b plot combine. Samples were collected and cleaned through a Clipper Eclipse fanning mill. Grain moisture and test weight were analyzed on a Dickey-John GAC 2500. Replicate samples were composited across each treatment, and sent to North Dakota State University for grain quality analysis. Yield was adjusted to 14.5% moisture.

Plot data showed a significant difference in yield. (Table 1.) There was no significant difference in grain crude protein levels. It is difficult to make assumptions on one year of data, however it can be theorized that the ESN released nitrogen too slowly for any significant yield impact at the two lowest rates. (60 lbs./ac, 90 lbs./ac). It can also be assumed that weather played a role in ESN release and overall N performance.

Table 1. Nitrogen rate and source with resulting yield and protein

N rate (lbs./ac)	Source	Yield (bu./ac)	LSD @ 0.05	Crude protein	LSD @ 0.05
0	N/A	37.6	C	12.4	A
60	Urea	45.1	ABC	12.2	A
90	Urea	50.9	AB	12.1	A
120	Urea	52.5	A	12.3	A
60	ESN	40.6	C	12.1	A
90	ESN	41.7	BC	12.2	A
120	ESN	46.5	ABC	12.0	A

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RESEARCH AT A GLANCE

PURPOSE:

Determine the most appropriate nitrogen rate and fertilizer source for malting barley production.

TRIAL LOCATION:

Upper Peninsula Research and Extension Center, Chatham, MI

Soil type – well-drained Eben Very Cobbly Sandy Loam

EXPERIMENTAL DESIGN:

Split plot design with four replications

TRIAL ESTABLISHMENT:

- Rasmussen, 6-row malting barley variety from Minnesota
- Planted May 5, 2013
- Plot size 3' wide by 20' long
- Borders and alleys trimmed to minimize edge effect
- Huskie applied for weed control (11 oz./acre)
- Prosaro applied to control Fusarium head blight (8.2 oz./acre + 4 oz. surfactant/100 gal. water)

Figure 1. Malting barley yields realized with various nitrogen fertilizer rates and sources.

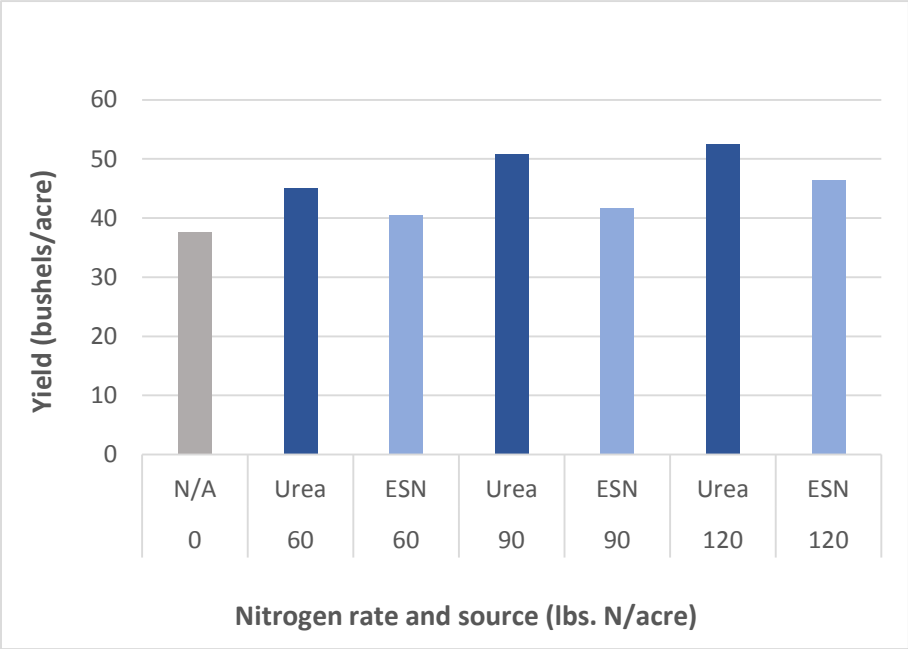

Figure 2. Malting barley fertility trial at the Upper Peninsula Research and Extension Center (photo credits, J. Isleib 2013).

CONCLUSIONS

Much knowledge has been gained by the MSU malting barley research program over the past three years, which has prompted the desire to repeat this trial in 2016. Balancing nitrogen requirements to meet yield and quality goals continues to be a top priority.

This trial was managed by Jim Isleib (U.P. MSUE Field Crop Educator) Dr. Russ Freed (MSU Professor) and Christian Kapp (UPREC Crop Technician), and supported through Michigan State University Project GREEEN and AgBioResearch.

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Research and resources can be found at:

msue.anr.msuedu/topic/info/malting_barley