

Spring Malting Barley

2015 PRE-HARVEST SPROUT TRIAL

Pre-harvest sprout (PHS) occurs when the barley kernels germinate upon the seed head before harvest. PHS is highly undesirable by the malting industry and will lead to rejection of grain. This condition is caused by environmental factors such as lengthy or excessive periods of rainfall when the plant has reached physiologically maturity. Adequate rainfall and favorable temperatures were realized throughout the duration of the trial.

Research treatments consisted of three different harvest methods:

1. Control treatment of allowing the grain to dry naturally in the field and harvesting at 13.5% moisture
2. Swathing the grain at 16% moisture and then combining at 13.5% moisture
3. Harvest at grain moisture between 15% to 20% and then subject grain to aeration to dry down to optimal moisture levels.

Treatment 1 was harvested on September 1, 2015. Treatment 2 was swathed on August 13, 2015 and harvested on September 1, 2015. Treatment 3 was harvested on August 27, 2015. All harvests were done with a Hege 125b plot combine. The treatment 3 grain was analyzed for moisture, test weight and temperature and then put into mini-grain bins which were then placed under constant aeration (Figure 1). Moisture was monitored weekly until it reached an acceptable level for storage (Figure 2).

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.

Figure 1. The miniature grain bins used to dry down grain from treatment 3 were manufactured out of metal pails with a suspended screen floor placed into the bottom. Two vent holes were cut into the metal lid.



RESEARCH AT A GLANCE

PURPOSE:

Determine the feasibility of harvesting malting barley at high moisture levels (16-20%) in order to alleviate the incidence of pre-harvest sprout (PHS).

TRIAL LOCATION:

Upper Peninsula Research and Extension Center, Chatham, MI

Soil type - well-drained
Eben Very Cobbly Sandy Loam

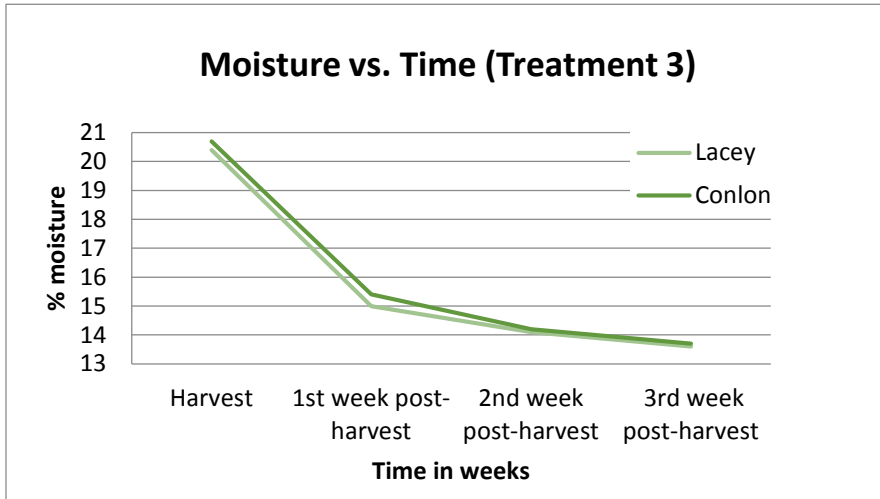
EXPERIMENTAL DESIGN:

Randomized complete block design, four replications

TRIAL ESTABLISHMENT:

- Conlon (2-row) and Lacey (6-row) malting barley varieties used
- Planted May 8, 2015
- Plot size 3' wide by 35' long
- Borders and alleys trimmed to minimize edge effect
- 70 lbs. N fertilizer top-dressed after planting (urea 46-0-0)
- Huskie applied for weed control (13.5 oz./acre)
- Prosaro applied to control Fusarium head blight (8.2 oz./acre + 4 oz. surfactant/100 gal. water)

Figure 2. Grain moisture (%) change over time for early, high moisture treatment (3), subject to bin aeration



Treatment 2 plots received numerous periods of rain post-swath, which resulted in the cut stems sinking below the grain stubble it was resting on. This allowed for great difficulty in harvesting, along with yield loss amount of up to 41% (Table 1) when compared to the control treatment. It was also noted that during the swathing operation itself, that the 2-row type was better suited for the swathing practice, due to finer stems interlocking amongst themselves, allowing for a greater amount of the grain stems to lay upon the stubble (Figure 3). The 6-row type had larger, waxier stems that feel between the cut grain stubble.

Table 1. Yields of harvest method treatments

	Yield (bushels/acre)		
	Natural	Swathed	High moisture
Conlon	36	28	33
Lacey	48	26	48

Figure 3. Treatment 2 swathed plot



CONCLUSIONS

This trial illustrated swathing as an inefficient cultural practice, but harvesting grain at higher moistures and then using mechanical aeration showed potential. After a period of three weeks, grain moisture levels were lowered enough for suitable storage. Quality data, however, was inconclusive.

This study will be repeated in 2016.

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Malting Barley
Research Program

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Research and resources
can be found at:

[msue.anr.msu.edu/topic/
info/malting_barley](https://msue.anr.msu.edu/topic/info/malting_barley)