Agronomic Impacts of Harvest Date in Winter Wheat

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Introduction

- In Ohio, winter wheat is harvested from late June to mid-July. Rain events during harvest can severely impact grain yield and quality.
- Producers often wait for grain to dry in the field (~13%), thus no post-harvest drying is required. However, test weight starts to decrease below 18% moisture.
- Deoxynivalenol (DON) is a mycotoxin caused by head scab that can continue to increase until harvest.
- Earlier harvest would extend the growing season for double-crop soybeans.

Objective

The objective of this study is to determine the effects of on-time vs. late harvest on yield, test weight, and DON levels of soft red winter wheat.

Risks of Delayed Harvest

- Disease
- Lodging
- Seed Sprouting
- Harvest Loss

Methods

Planting
- Planted fall 2015 after the Hessian fly-free date at the Western Agricultural Research Station (South Charleston, Ohio)
- Plots: 5 ft x 29 ft, row width of 7.5 inches
- Population: 1.6 million seeds ac⁻¹
- N Fertilizer: 20 lbs. preplant, 100 lbs. Feekes 5

Experimental Design
- Randomized complete block design.
- 2 Treatments: On-time harvest vs. late harvest

Data Collection
- From combine grain gauge at harvest: grain moisture, test weight, and yield.
- DON testing completed with GC/MS.

Data Analysis
- Contrast procedure in SAS at α = 0.05.
- Prices and discounts – ADM Columbus 2016.

Results

Harvest Treatments
- On-time (June 29, 2016)
- Late (July 8, 2016)
- Rain between treatments
  - July 1 - 0.21”
  - July 3 – 0.21”
  - July 5 – 0.16”

Figure 1. Effect of harvest date on grain test weight (P < 0.0001).

Figure 2. Impact of harvest date on grain yield (P < 0.0001).

Economics

<table>
<thead>
<tr>
<th></th>
<th>On-time</th>
<th>Late</th>
</tr>
</thead>
<tbody>
<tr>
<td>Return (@ $4.50/bu)</td>
<td>$562.50/acre</td>
<td>$522.00/acre</td>
</tr>
<tr>
<td>Drying</td>
<td>$0</td>
<td>$0</td>
</tr>
<tr>
<td>Shrinkage</td>
<td>$(8.35/acre)</td>
<td>$(8.00/acre)</td>
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<tr>
<td>Test Weight</td>
<td>$(18.75/acre)</td>
<td>$(58.00/acre)</td>
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<tr>
<td>Vomitoxin</td>
<td>$0</td>
<td>$0</td>
</tr>
<tr>
<td>Return after discounts</td>
<td>$543.75</td>
<td>$455.65</td>
</tr>
</tbody>
</table>

Conclusion

- On-time harvest resulted in: greater yield, no shrinkage discount, smaller test weight discount, and higher return.
- Harvesting on-time increased gross income by $88.10 compared to late wheat harvest.
- There are many benefits to timely wheat harvest (especially before a rain event) including a reduction in harvest risks, increased return.
- If harvesting too early (at >18% moisture), there is an additional drying cost.

Acknowledgements

- Western agricultural research station farm manager and staff
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