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Wheat Production

Gretchen Sassenrath
Kansas State University, gsassenrath@ksu.edu

D. E. Shoup
Kansas State University, dshoup@ksu.edu

R. Lollato
Kansas State University, lollato@ksu.edu

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Wheat Production

Abstract

Wheat production in southeast Kansas is often limited due to high rainfall during the harvest. In some years, this high rainfall can exacerbate disease pressure, especially fungal infections. This study presents results from a test of fungicide applications to control Fusarium head blight (FHB) or scab in poor quality wheat.

Keywords

wheat, fungicide, fusarium head blight, fungal disease, wheat yield

Cover Page Footnote

This research is funded in part by a grant from the Kansas Crop Improvement Association.

Wheat Production

G.F. Sassenrath, D. Shoup, and R. Lollato

Summary

Wheat production in southeast Kansas is often limited due to high rainfall during the harvest. In some years, this high rainfall can exacerbate disease pressure, especially fungal infections. This study presents results from a test of fungicide applications to control Fusarium head blight (FHB) or scab in poor quality wheat.

Introduction

Fusarium head blight (FHB) or scab is most commonly observed in wheat in southeast Kansas. However, in 2015, much of eastern Kansas experienced a devastating infection level of FHB. FHB decreases wheat yield, but more importantly, reduces wheat quality due to development of mycotoxins associated with the fungal infection. High levels of vomitoxin or deoxynivalenol (DON) can render the wheat unfit for human consumption, and at very high levels, may not be suitable as a feed grain.

Experimental Procedures

The 2015 wheat harvest season experienced a long period of rain. Wheat that was harvested prior to the rain was generally good, with little fungal infection. Wheat harvested after the rain tended to have a higher rate of FHB. We obtained two groups of wheat seed (cv. Everest) that were harvested early and late from a cooperating farmer from 2015 (Figure 1). The late-harvested seed was poorer quality, and the farmer performed extra cleaning to try to improve the quality.

Seed was planted in replicated research plots at Parsons in fall 2015. Fungicide treatments included: control (no fungicide); seed treatment; in-season (flag leaf and bloom); and seed treatment + in-season. Plants were harvested at maturity in June 2016. The harvested seed was tested at the Kansas Grain Inspection Service for test weight and protein content.

Results and Discussion

Late-harvested wheat seed was of noticeably poorer quality, with many white kernels (Figure 1). The late-harvested wheat also had a lower test weight (57) than the early-harvested seed (63). Both early- and late-harvested wheat seed had levels of DON that rendered the wheat unfit for human consumption, but would allow its use as an animal feed. The late-harvested seed had a much greater number of damaged kernels (data not shown) potentially due to the additional cleaning.

The 2016 harvest season experienced a long dry period, greatly improving the harvested quality of the wheat. Disease pressure in 2016 was minor. However, each additional fungicide treatment showed an additional increase in yield (Figure 2). Seed treatment plus in-season fungicide applications showed a 20-bu/a yield improvement over the untreated control. Although there was no statistically significant difference between the early- and late-harvested seed, the consistent trend showed that the poor seed quality from late-harvested wheat seeds had reduced yields across all treatments. No consistent differences in test weight or protein content were observed between the crops harvested in 2016 based on initial seed quality.

Acknowledgment

This research is funded in part by a grant from the Kansas Crop Improvement Association.

Figure 1. Healthy ("Good", early-harvested) and infected ("Bad", late-harvested) wheat seed (cv. Everest) collected from a cooperating farmer. The "Bad" seed had been cleaned several times, but still showed bleaching associated with FHB.

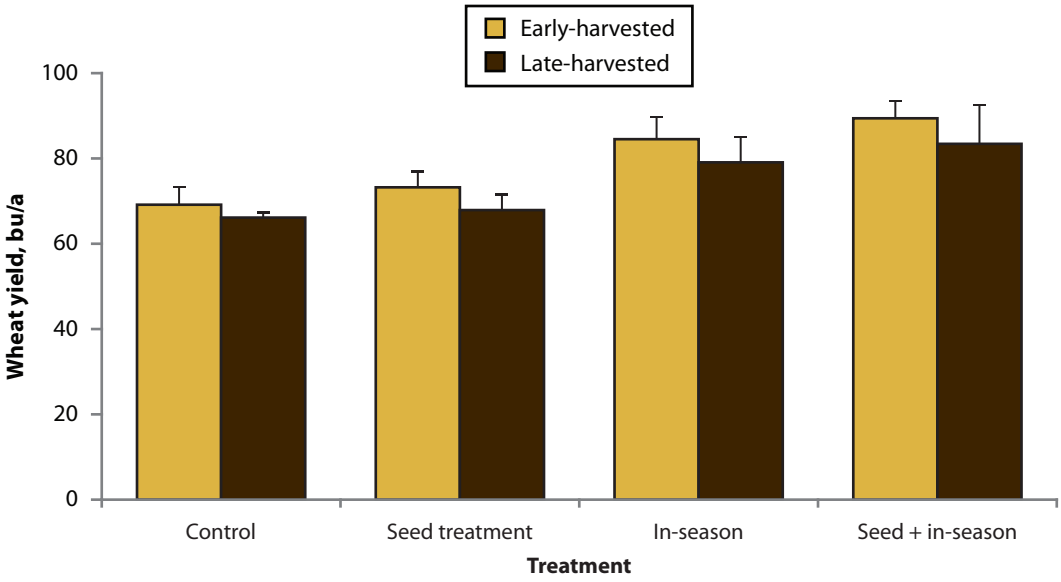

Figure 2. Impact of fungicide treatment on wheat yield for early-harvested ("good") and late-harvested ("bad") wheat seed.