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Effects of fungicide application timing and cultivar resistance on Fusarium head blight and deoxynivalenol in winter wheat

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Fusarium graminearum causes Fusarium head blight (FHB) in wheat. FHB reduces yield and quality and contaminates grain with the mycotoxin deoxynivalenol (DON). Effective management strategies are needed. The objectives of this research were to 1) Determine the effect of fungicide application timing at anthesis (the standard timing) and 6 and 12 days later on FHB and DON in the winter wheat cultivars Overley (susceptible) and Overland (moderately resistant) and 2) Compare the effects of a triazole and a strobilurin fungicide on FHB and DON in Overley and Overland. In 2015 two field trials (irrigated and rain-fed) were conducted in Nebraska, USA. The triazole Prosaro (prothioconazole + tebuconazole) and the strobilurin Headline (pyraclostrobin) were applied with a CO_2-powered backpack sprayer at anthesis and 6 and 12 days later. A split plot design in randomized complete blocks with 4 replications was used. Main plots were cultivars and subplots were fungicide treatments. FHB index and DON were significantly ($P < 0.05$) lower in Overland than in Overley. The window of fungicide application to control FHB and DON was widened from anthesis to 6 days later without loss of efficacy. Headline was less effective than Prosaro in controlling FHB and DON. Moderate resistance combined with a triazole fungicide most effectively reduced FHB and DON. The results indicate a wider fungicide application window and the effectiveness of combining resistance with a triazole fungicide.