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Study on the control of DON-producing fusarium by fumigation in wheat

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ABSTRACT

Wheat is one of the three major food species in the world and it is also one of the most important food crops in China. Wheat suffers from many diseases during the production process, among which fusarium head blight (FHB) is one of the important diseases that plague the sustainable development of wheat production in China. With global warming and the changes in farming systems and methods, FHB is spreading. At present, FHB has become one of the important diseases worldwide. *Fusarium* is one of the dominant pathogens of FHB. The contamination of these pathogens will not only cause serious losses in the production, but also produce mycotoxins, such as DON and ZEN, which seriously affect the quality and safety of stored wheat and pose a potential threat to human and animal health. Therefore, the research on the *Fusarium* strains and its toxin production mechanism is of great significance for the prevention and control of FHB. In this study, we selected typical FHB wheat samples, and the main DON-producing *Fusarium* on the surface and inside of the head blighted grains was separated and purified. All isolates have been studied for their toxin production ability to verify their pathogenicity. Through ITS sequence analysis and phylogenetic analysis, the phylogenetic types were clarified, and the toxin-producing strains were genetically characterized. Then, the separated toxin-producing fungi were fumigated using ozone and chlorine dioxide gas. The results showed that the two different kinds of fumigants continuously inhibited *Fusarium*, and the ozone also showed a significant degradation effect on DON, which had a significant inhibitory effect on the production of DON by *Fusarium*.

Keywords: Grain storage, Fusarium head blight, Deoxynivalenol, *Fusarium* spp., Fumigation