Certain health-promoting cereal varieties are more resistant to fungal infection

Fusarium infection of cereals present a risk to health because these fungi produce so-called mycotoxins, toxic substances that are dangerous to humans. Within NRP 69, a research group investigated the factors that could reduce the risk of mycotoxin contamination. They observed that a modified crop rotation can reduce infection. Furthermore, certain wheat, oat and barley varieties with particularly high levels of health-promoting compounds, such as antioxidants and beta glucans, are more resistant to Fusarium infection.

Not all cereals are the same. Some varieties contain more health-promoting compounds such as beta glucans or antioxidants. Hence, the cultivation and consumption of healthier wheat, barley and oat varieties is encouraged. To be truly healthy, cereals should not contain mycotoxins. These toxic substances occur when cereals are infected with Fusarium fungi. Within NRP 69, researchers from Agroscope investigated the factors that could reduce the risk of mycotoxins accumulation in wheat, oats and barley, and also whether certain cereal varieties are less frequently contaminated with mycotoxins. In the course of their work, they investigated in particular whether varieties with a high content of health-promoting compounds are less susceptible to fungal infection. Earlier laboratory studies suggested that wheat varieties with a high content of health-promoting antioxidants were more resistant to fungal infestation. Thus, the project investigated under field conditions the correlations between these compounds and Fusarium resistance in wheat, oats and barley.

In a first step, the research group carried out a nationwide survey of barley and oat samples to analyse the cropping factors that have an influence on the species infected with the predominant Fusarium species and the resulting contamination with different mycotoxins. It was observed...
To avoid *Fusarium* infection and the resulting mycotoxin contamination, cereal producers should primarily modify crop rotation patterns. Barley should not be sown in fields where maize was the previous crop, while oats should not be grown after small grain cereals. The risks arising from crop rotation could be further reduced by ploughing and sowing less susceptible cereal varieties. By following these recommendations, the need for fungicides and their negative impact on the environment can be substantially reduced.

**Extending the forecasting system**

**FusaProg to barley**

The FusaProg forecasting system is a nationwide service from Agroscope that provides information on the regional and cropping related risk of *Fusarium* infection in wheat. It has been available to wheat producers since 2007, helping farmers to decide whether or not to apply fungicides. In the light of their project results, the researchers are now extending the information system to barley. For oats, more research is needed to understand the life cycle of the respective dominant *Fusarium* species before the platform can be extended to oats.

Further information:

www.nrp69.ch

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**Recommendation**

**Fewer fungicide applications thanks to an adjusted crop rotation**

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