

## Predictive Modelling of Mycotoxins in Cereals

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Predictions of deoxynivalenol (DON) content in wheat at harvest can be useful for decision-making by stakeholders of the wheat feed and food supply chain. In 2012, a forecasting model for DON in wheat cultivated in the Netherlands has been published (Van der Fels-Klerx *et al.* 2012) and later this model has been validated (Van der Fels-Klerx, 2014). The objective of the current research was to further improve quantitative predictions for DON in mature winter wheat in the Netherlands and to make them accessible for two specific groups of end-users. One model was developed for use by farmers in underpinning *Fusarium* spp. disease management, specifically the application of fungicides around wheat flowering (Farmer model). The second model was developed for industry and food safety authorities, and conside-

red the entire wheat cultivation period (collector model). Model development was based on observational data collected from 638 fields throughout the Netherlands between 2001 and 2014. For each field, agronomic information, climatic data and DON levels in mature wheat were collected. Using multiple regression analyses, the set of biological relevant variables that provided the highest statistical performance was selected. Model validation showed good correlation between the predicted and observed DON levels. The two models maybe applied by various groups of end-users to reduce DON contamination in wheat-derived feed and food products and, ultimately, reduce animal and consumer health risks. Future research will also focus on mechanistic models to mimic *Fusarium* ssp. life cycle and toxin production.