

Deoxynivalenol (DON) contamination, in ppb, was determined by the Grain Association of Emilia Romagna (AGER, Borsa Merci Bologna, Italy) following an official protocol (MIP AGER DON rev 14 2017; <https://www.agerborsamerici.it/laboratorio-analisi/metodiche-e-determinazioni/>) on aggregate samples composed by random grains from four replicate plots.

DON contamination of the 50 spikes to be used in data analysis was estimated based on the relationship between average FHB severity (SEV, in % of affected spike area) and DON contamination (in ppb) measured in each experiment. Specifically, a Gompertz equation was fit to data in the following form:

$$\text{DON} = e^{-a} e^{-b \text{ SEV}}$$

The *nls* and *lm* functions of the ‘stats’ package were used to estimate the parameters *a* and *b* of the equation and the R^2 , respectively, and the *epi.ccc* function of the ‘epiR’ package was used to calculate the concordance correlation coefficient (CCC) (Lin, 1989; Madden et al., 2007; Stevenson, 2012). Different equations were run for the dataset of each experiment. Different estimations were performed for each experiment, because they had differences in wheat variety, artificial *F. graminearum* inoculation, previous crop, or irrigation, known to affect the production of DON (Mesterházy et al., 2003; Gourdain et al., 2011; Del Ponte et al., 2015; Rossi et al., 2015). These equations were built with the objective to estimate in this work the level of DON in the kernels for each experiment, and should not be used in other situations without validation. For EXP 1, parameter estimates were: $a = 1.79 \pm 0.83$, and $b = 0.03 \pm 0.01$, with $R^2 = 0.721$ and CCC= 0.803. For EXP2, parameter estimates were: $a = 3.55 \pm 0.433$, and $b = 0.31 \pm 0.03$, with $R^2 = 0.783$ and CCC= 0.882.

DON contamination of each single spike was finally estimated by using the equation with the FHB severity values assessed for each spike in EXP1 and EXP2.

References:

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