



MycoTWIN - MycoKey  
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**Integrated and innovative key  
actions for mycotoxin management  
in the food and feed chain**

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# BOOK of ABSTRACTS

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## FREE-AIR CO<sub>2</sub> ENRICHMENT (FACE) IMPACT ON *FUSARIUM* MYCOTOXINS AND THEIR MYCOTOXIGENIC PRODUCER FUNGI

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The effect of elevated CO<sub>2</sub> (e[CO<sub>2</sub>], 570 ppm) compared to ambient (a[CO<sub>2</sub>] = 404 ppm) on *Fusarium* mycotoxin contamination in winter cereals (wheat and oat) and their mycotoxigenic producer fungi was investigated with FACE experiments. The comparison between e[CO<sub>2</sub>] and a[CO<sub>2</sub>] was carried out in 3 different growing seasons (2011–12, 2012–13 and 2015–16) and different genotypes (2 bread wheat, 2 durum wheat and 2 oat cultivars).

On average, the genotypes significantly differed in terms of their mycotoxin content. Common wheats had the lowest levels of deoxynivalenol, their modified forms and emerging mycotoxins. The highest deoxynivalenol content was recorded in durum wheat, while oats resulted more prone to T<sub>2</sub>/HT<sub>2</sub> toxins, enniatins and nivalenol. In all years, e[CO<sub>2</sub>] significantly increased all the aforementioned mycotoxins, from 1.4 to 2.8 times.

The fungal DNA content of grains did not differ significantly between e[CO<sub>2</sub>] and a [CO<sub>2</sub>] for none of the cvs in all years. Oats were more susceptible to colonisation by *F. langsethiae* and *F. poae*, durum wheats by *F. culmorum*/*graminearum* and *F. avenaceum*. Across all samples colonisation with *F. langsethiae* and *F. poae* were positively correlated (50% covariation). Correlations between the remaining pairs of colonisers were weakly positive or non-significant suggesting absence of mutual exclusion between the fungal species. Across all samples *F. langsethiae* and T<sub>2</sub>/HT<sub>2</sub> toxins, *F. poae* and nivalenol as well as *F. avenaceum* and enniatins were positively correlated with covariation of ~50%.

The results indicate that future rising CO<sub>2</sub> levels, may increase the threat of grain mycotoxins contamination, as a consequence of a higher toxinogenesis of fungal producers.

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