

## Supplementary Material

### The direct and indirect effects of fungicides and nontarget pesticides on deoxynivalenol accumulation

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Table S1. Concentration ranges in pesticide sensitivity tests.

Pesticides	Concentration (mg kg <sup>-1</sup> )
Epoxiconazole	0.1, 0.2, 0.4, 0.8, 1.6, 3.2, 6.4
Hexaconazole	0.1, 0.2, 0.4, 0.8, 1.6, 3.2, 6.4
Imidacloprid	0.75, 1.5, 3.0, 6.0, 12.0, 24.0, 120.0
Isoproturon	0.8, 1.6, 3.2, 6.4, 16.0, 32.0, 160.0
Mesosulfuron-methyl	1.2, 2.4, 4.8, 12.0, 24.0, 48.0, 240.0

Table S2. The concentrations of pesticides in *in vitro* induction experiments.

Pesticides	Concentration (mg kg <sup>-1</sup> )		
Epoxiconazole	0.3	0.8	3.6
Hexaconazole	0.2	1.2	7.5
Imidacloprid	1.2	12.0	120
Isoproturon	1.6	16.0	160
Mesosulfuron-methyl	2.4	24.0	240

Table S3. Primers and real-time PCR procedure used in this study.

Application	Primer name	Sequence (5'→3')	Mixed reaction liquid	Real-time PCR procedure	Product size
Internal control	actin-RT-F	TAGCATCGCATCTCATCAC	10 µL of 2 × SYBR Green PCR Master Mix, 0.4 µL of each forward and reverse primer (10 µM),	3 s at 95 °C, followed by 40 cycles of 10 s at 95 °C, 30 s at 60°C. Data	150 bp
	actin-RT-R	CAGCAACTTCTTCCTCCAT	1 µL of 40-fold diluted template cDNA, 8.2 µL of RNase-free ddH <sub>2</sub> O	collection at 60 °C	
Tri5 expression	Tir5-RT-F	GATGGAGAACTGGATGGT	10 µL of 2 × SYBR Green PCR Master Mix, 0.4 µL of each forward and reverse primer (10 µM),	3 s at 95 °C, followed by 40 cycles of 10 s at 95 °C, 30 s at 60°C. Data	168 bp
	Tri5-RT-R	TGCTTAGACGAGTGTAGG	1 µL of 40-fold diluted template DNA, 8.2 µL of RNase-free ddH <sub>2</sub> O	collection at 60 °C	
Population abundance of PH-1	Fg16N-F	ACAGATGACAAGATTCAGGCA	10 µL of 2 × SYBR Green PCR Master Mix, 0.4 µL of each forward and reverse primer (10 µM),	1.5 min at 95 °C, followed by 40 cycles of 30 s at 95 °C, 45 s at 64°C,	280 bp
		CA			
	Fg16N-R	TTCTTTGACATCTGTTCAACCC	1 µL of 10-fold diluted template DNA, 8.2 µL of RNase-free ddH <sub>2</sub> O	and 45 s at 72 °C. Data collection at 72 °C	

Table S4. Environmental residual concentrations of pesticides and one and ten times the pesticide application concentrations.

Pesticides	Environmental residual concentration range (mg kg <sup>-1</sup> )	Application concentrations (mg kg <sup>-1</sup> )	Ten times of the application concentrations (mg kg <sup>-1</sup> )
Epoxiconazole	0.010-0.620	0.650	6.50
Hexaconazole	0.001-0.470	0.500	5.00
Imidacloprid	0.010-0.538	0.550	5.50
Isoproturon	0.014-0.053	0.050	0.500
Mesosulfuron-methyl	0.001-0.065	0.065	0.650



Table S6. UPLC–MS/MS conditions of the analytes studied.

Compounds	Ion source	CV (V)	Quantification ion transition	CE1 (eV)	Confirmatory ion transition	CE2 (eV)
DON	ESI+	150	297.2→249.1	5	297.2→203	15
Epoxiconazole	ESI+	120	330→141	20	330→121	20
Imidacloprid	ESI+	92	256.1→209.1	9	256.1→175.1	17

Table S7. Recoveries and RSD values for DON, epoxiconazole and imidacloprid in two spiked levels from different matrices.

Compound	Matrix	Spiked level (mg kg <sup>-1</sup> )	Recovery (% ,n=5)	RSD <sup>a</sup> (% ,n=5)
DON	TBI medium	0.01	88.3	9.50
		1	94.3	4.50
	Wheat leaf	0.01	82.5	3.50
		1	106.9	7.80
	Wheat ear	0.01	94.6	12.1
		1	97.4	3.50
Epoxiconazole	Wheat leaf	0.01	102.3	6.30
		1	97.4	5.10
	Wheat ear	0.01	111.4	6.90
		1	96.1	5.70
Imidacloprid	Wheat leaf	0.01	86.5	3.20
		10	84.9	1.50
	Wheat ear	0.01	90.6	5.40
		10	102.0	1.60

<sup>a</sup>RSD, the relative standard deviation