| Supplementary Table S1. Current information on the | main effect of agricultural | I practices on mycotoxin content in | maize |
|--|-----------------------------|--------------------------------------|--------|
| Supplementary Table 51. Guitent information on the | mann cheet of agricultural | in practices on mycotoxin content in | maize. |

| Agricultural Practice | AFs | FBs | DON ZEN | Notes | Reference |
|-----------------------|-----|-----|---------|---|-----------|
| Sowing/plant density | | + | + | FB1 and B2 occurrence was always significantly higher (P<0.05) with late (May) compared to early sowing date (March-April). In DON, the effect of early sowing was only significant in 2007 for the early hybrid, while the effect of high density (80,000 pt/ha) <i>vs</i> low density (65,000 pt/ha) differed over the three years according to the hybrid maturity. | [1] |
| | | + | | Earlier planting consistently resulted in lower ear rot severity and FB1 contamination. | [2] |
| | | + | | High plant density (80000 pt ha^{-1}), nitrogen fertilization and late sowing date (May 3 to May 16) increased FBs contamination (+133%). | [3] |
| | | + | | Maize fields subjected to dry planting contained significantly more FBs (1,004 \pm 379 µg/kg) than those sown by wet planting (230 \pm 88 µg/kg) (P <0.10). | [4] |
| Hybrid | | - | + | FBs concentration did not differ significantly depending on the hybrid season length A significant increased DON concentration in the kernels when associated with the use of late maturity hybrids. | [1] |
| | | + | | Hybrid frequently had significant effects (P≤0.05) on FB1 contamination. | [2] |
| | | - | | The effect of hybrid maturity and the interactions between the independent variables (agricultural practices and hybrid) and random factors (year and site) were never significant. | [3] |
| | | + | | The main role of fatty acids, with a higher FBs (FB1+FB2+FB3) contamination in hybrids showing a higher linoleic acid content and a higher masking action in hybrids with higher oleic to linoleic ratio. | [5] |
| Soil management | | | | In the soil under no-tillage, contamination with fungal spores was 92.9% higher compared to the soil under conventional tillage. DON and ZEN content varied but it was not considerably influenced by the different tillage systems applied. | [6] |
| Irrigation | + | | | Drought level represented by weekly-ARID (Agricultural Reference Index for Drought) values before and after mid-silk is a significant predictor (p-value < 0.10) for AF contamination risk. | [7] |
| | + | | | Aridity indexes based on meteorological data confirmed the influence of drought conditions on AFB1 synthesis. | [8] |
| | + | | | AF levels averaged over a period of three years from $33.5 \pm 12.0 \ \mu g \cdot kg - 1$ for non-irrigated, $29.3 \pm 11.4 \ \mu g \cdot kg - 1$ for moderately irrigated and $24.2 \pm 8.5 \ \mu g \cdot kg - 1$ for well-irrigated plots. | [9] |
| | | + | | Irrigation significantly affected the level of FB contamination (P<0.05) | [10] |
| | | - | | The type of irrigation had no distinct effect (P $>$ 0.10) on the FB levels, which were 508 \pm 219 and 555 \pm 275 $\mu g/kg$ in fields with flood and sprinkler irrigation systems, respectively. | [4] |
| | | | + | 3.5 - to 5-times higher DON concentration in kernels at limited- than well-watered conditions: 380 compared with 75 $\mu g/kg.$ | [11] |
| Pesticides | | + | - | The insecticide treatments (alpha-cypermethrin) against second-generation ECB larvae significantly reduce the FBs contamination but did not significantly reduce the DON contamination. | [1] |
| | | + | | Insecticide treatments (active ingredient: alpha-cypermethrin) reduced (-54%) the FBs occurrence compared to the untreated control. | [3] |
| | - | + | | ECB control (deltamethrin) and tebuconazole applied at BBCH67. FB1 varied from 6767 μ g/kg in the unsprayed plot to 4429 (-35%) and 3013 (-56%) μ g/kg in respectively the plot treated with tebuconazole and with the addition of deltamethrin. | [12] |
| | | + | + | The efficacy of ECB control was evaluated at 89.96% for FBs with insecticide (deltamethrin) and 89.97% with insecticide+fungicide (deltamethrin and tebuconazole). The efficacy was evaluated at 85.40% for ZEN with insecticide and 82.10% with insecticide+fungicide. | [13] |

Supplementary Table S1. (Continued).

| Agricultural Practice | AFs | FBs DON ZEN | Notes | References |
|-----------------------|-----|-------------|--|------------|
| | | + | Lambdacyhalothrin or deltamethrin (20 g ha ⁻¹). DON levels were highly significantly affected by insecticide treatment ($F_{1,88}$ =35.925; P <10 ⁻⁴). On average, DON levels were significantly lower (151.73 µg/kg) in treated maize than in the control (849.04 µg/kg). | [14] |
| + | | | Insecticides: A mixture of chlorpyrifos and cypermethrin applied at 0.450 and 0.045 kg ha ⁻¹ respectively. A significant effect ($P < 0.001$) of insecticide application timing on fumonisin occurrence in maize kernels was observed. Efficacy of the best application timing to control fumonisin occurrence was 73% in 2006 and 84% in 2007. | [15] |

The agricultural practice has an impact (+); the agricultural practice does not have an impact (-) Abbreviations: aflatoxins (AFs), fumonisins (FBs), deoxynivalenol (DON), zearalenone (ZEN)

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| Supplementary Table S2. Current information on reduction of mycotoxin-producing Aspergillus spp and Fusarium spp growth and myco- |
|---|
| toxin production by plant-produced compounds. |

| Plant (compound) | Target fungal species | Type of assay | 7 Reduction | References |
|---|--|---------------------|---|------------|
| Essential oils (EOs) | | | | |
| Eucalyptus grandis, E. staigeiriana, E. citriodora, and the hybrid E. grandis x E. urophylla | A. flavus A. parasiticus | In vitro | <i>E. staigeiriana</i> showed the best potential on fungal growth control. The major active ingredients were limonene and geranial. The effect on mycotoxin production was not tested. The antifungal activity tests showed that the oil was active | [1] |
| Cymbopogon citratus | A. flavus A. parasiticus A. ochraceus A.niger A. fumigatus | In vitro | against all the five <i>Aspergillus</i> species, and the minimum inhibitory concentration (MIC) of the oil ranged from 15 to 118 mg/ml. The MIC* ranged from 15 to 118 mg/ml. The major active ingredients were geranial, neral, myrecene and geraniol. The effect on mycotoxin production was not tested. | [2] |
| Thyme (<i>Thymus vulgaris</i>), rosemary (<i>Rosmarinus officinalis</i>), and laurel (<i>Laurus nobilis</i>) | ^y A. flavus A. parasiticus | In vitro/in vivo | Thyme showed the highest inhibition on <i>A. parasiticus</i> growth (39 mm diameter of inhibition zone), followed by rosemary (15 mm) and laurel (10 mm). | [3] |
| Clove (Syzygium aromaticum) and vatica (Vatica diospyroides) | A. flavus | | Clove showed 84.7% inhibition on conidial germination of <i>A</i> . <i>flavus</i> at 100 μ L L ⁻¹ , and complete inhibition of disease infectior on maize seeds at 10 μ L L ⁻¹ . Vatica completely inhibited growth sporulation, conidial germination, and disease infection of <i>A</i> . <i>flavus</i> both <i>in vitro</i> and on maize seeds at 50 μ L L ⁻¹ . The main active ingredients were eugenol (62.4%) and benzyl acetate (48.8%) for clove and vatica oil respectively. The effect on mycotoxin production was not tested. | |
| Cinnamon (<i>Cinnamomum verum</i>) essential oil (CEO) | A. flavus | In vitro | <i>A. flavus</i> growth rate diminished and lag time increased as the concentration of CEO increased. The major active ingredients was cinnamaldehyde. | [5] |
| Cinnamaldehyde, citral and eugeno | lA. flavus | In vitro | A.flavus growth and AFB_1 production were completely inhibited by 0.80 mmol/L of cinnamaldehyde and 2.80 mmol/L of citral. At lower concentration, cinnamaldehyde, eugenol, and citral significantly reduced AFB_1 production with inhibition rate of 68.9%, 95.4%, and 41.8%, respectively, while no effect on fungal growth. | [6] |
| <i>Ocimum sanctum</i> essential oil (OSEO) | F. graminearum | ı In vitro | MIC and minimum fungicidal concentration of OSEO were 1250 and 1800 μ g/mL, respectively. ZEN concentration was insignificant at 1500 μ g/mL concentration. The main active ingredients was eugenol (34.7%). | [7] |
| Rocket seeds (<i>Eruca sativa</i>), rosemary (<i>Rosmarinus officinalis</i>) and tea tree (<i>Melaleuca alternifolia</i>) | F. graminearum F. avenaceum F. semitectum F. solani F. oxysporum | n In vitro | IC50* and MIC ranged from 0.044 to 0.049 % and 0.087 to 1.00 % for rocket essential oil, and from 0.049 to 0.282 % and 0.455 to 0.616 % for rosemary essential oil, and from 0.043 to 0.170 % and 0.192 to 0.361 % for tea tree essential oil respectively. | [8] |

(Continued)

Supplementary Table S2. (Continued).

| Plant (compound) | Target fungal species | Type of assay | y Reduction | References |
|--|--|---------------------|---|------------|
| Clove (Eugenia caryophyllata), thyme (Thymus vulgaris) and black cumin (Nigella sativa) | A. flavus F. verticillioides | In vitro | Clove significantly decreased the growth of both tested fungi at all tested concentrations (0.1, 0.5 and 1%); it also resulted in AFs (45.47%) and FBs (33.29%) reduction. Black cumin (1 and 2%) was effective only in suppressing the growth of <i>A. flavus</i> . The main active ingredient in clove oil was eugenol (78.41%). | [9] |
| Solanum torvum (Torvoside K) | A. flavus F. verticillioides | | MICs ranged from 31.25 to 250 μg/ml ⁻¹ , for <i>A. flavus</i> and <i>F. verticillioides</i> respectively. | [10] |
| Garcinia kolakola and Azadirachta indica | A. flavus, A. parasiticus, | In vitro | Inhibition growth was higher by <i>G. kola</i> for both fungi, respectively 77.5% for <i>A.flavus</i> and 54.8% for <i>A.parasiticus</i> , and lowest by <i>A.indica</i> , 35.1% and 30.5% respectively. | [11] |
| Equisetum arvense and Stevia rebaudiana | A. flavus F. verticillioides | In vitro | Inhibition of growth for both fungi was significant (>99% inhibition at 0.95 a_w). AFB ₁ and FB ₁ presence were not significantly affected. | [12] |
| Antioxidants/Phenolic compounds | s | | | |
| 2-hydroxy-4methoxybenzaldehyde (HMB) from <i>Decalepis hamiltonii</i> | F. verticillioides | In vitro/in vivo | Dose-dependent strong inhibitory activity with MIC value of $100 \mu \text{g/mL}$, FB ₁ production was completely inhibited at 400 mg/L under <i>in vitro</i> and 750 mg/kg under <i>in vivo</i> . | [13] |
| Allyl (AITC), phenyl (PITC) and benzyl isothiocyanates (BITC) from cruciferous vegetables | n F. verticillioides | In vitro | The mean reduction of FB_2 was 84.9%. | [14] |
| Allyl isothiocyanate (AITC) from brassica plants | A. parasiticus F. tricinctum F. verticillioides Alternaria alternata F. graminearum | In vitro | AITC treatments at 50, 100 and 500 mL/L inhibited visual growth of all fungal species and kept the production of 12 mycotoxins at undetectable levels (eg.AFB ₁ at 72.08 \pm 12.70 mg kg of corn; AFB ₂ at 2.14 \pm 0.34 mg/kg) | , [15] |
| Ferulic acid | F. verticillioides F. proliferatum | In vitro | The lag phase significantly decreased for both moulds (p \leq 0.001), However, 10 mM ferulic acid significantly increased (p \leq 0.001) fumonisin production. | ≤ [16] |
| Tetra-hydro-curcuminoids (THCs) from natural curcuminoids | F. proliferatum | In vitro | Inhibition percentage of fungal growth reached 70% at 13.4 μ mol ml ⁻¹ concentration of THCs. FB ₁ reduction ranged between 31-37%. | [17] |
| Budmunchiamine A (BUA) isolated from <i>Albizia amara</i> Pithecolobine (PI) isolated from <i>Albizia saman</i> | A. flavus | In vitro | Inhibitory effect on both <i>A. flavus</i> growth and AFB ₁ production by BUA and PI at concentration of 1 mg/mL. MIC ranged from 6.8 to 19.6 mm and 0.015–0.5 mg/mL,respectively for BUA and PI. | [18] |
| Trans-2-hexenal (T2H) | A. flavus | | Significant reduction of fungal populations. Absence of AFB_1 in almost all sets of experiment. | [19] |

Minimum inhibitory concentration - MIC; Inhibitory Concentration - IC

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