

Do botanical extracts and potentially antifungal mulch treatments suppress *Fusarium graminearum* inoculum?

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Fusarium Head Blight (FHB) is one of the most important cereal diseases worldwide causing not only significant reductions in grain yield but also severe contaminations of the harvested products with mycotoxins that jeopardise food and feed safety. The predominant species of the FHB disease complex is *Fusarium graminearum* (FG; teleomorph *Gibberella zeae*). In maize-wheat rotations with reduced- or no-till systems, the remaining maize residues on the soil surface represent an important inoculum source for infection of the subsequent cereal crop. Hence, agronomic practices such as suitable crop rotations and management of crop residues with ploughing are commonly used to control FHB in wheat cropping systems. Nevertheless, continuous ploughing has also several drawbacks, such as increased soil erosion risks and decreased soil fertility in the upper soil layers. Within the framework of the Horizon 2020 project MycoKey, the main objective of this study is to develop prevention strategies to suppress FHB and thus decrease the risk of mycotoxin accumulation in wheat. One approach consisted of applying various botanical extracts and freshly mulched material from crops with potential antifungal activity onto FG infected maize residues in the field. The botanicals included two mustard extracts and suspensions of milled Chinese galls, while the mulch treatments were harvested from mustard and clover crops. Preliminary results revealed that the mulch treatments decreased the deposition of discharged *G. zeae* ascospores and reduced FHB disease symptoms on wheat heads. Currently, the analyses of the mycotoxin content (deoxynivalenol and zearalenone) in the harvested grains is in progress and results will be discussed. Furthermore, *in vitro* studies showed that the botanical extracts have the ability to suppress not only the mycelium growth but also the germination of conidia and ascospores as well as their discharge from mature perithecia. The preliminary data of this study suggest that there is a great potential to suppress FG inoculum using non-conventional agricultural methods using botanical extracts and mulch layers from crops with antifungal properties.