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Oral Communication Abstract – PH.02

CHITOSAN HYDROCHLORIDE DECREASES *FUSARIUM GRAMINEARUM* GROWTH AND VIRULENCE AND BOOSTS GROWTH, DEVELOPMENT AND SYSTEMIC ACQUIRED RESISTANCE IN TWO DURUM WHEAT GENOTYPES

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Fusarium head blight (FHB) is a devastating disease for cereals. FHB is managed by fungicides at anthesis, but their efficacy is variable. Conventional fungicides accumulate in the soil and are dangerous for animal and human health. This study assayed the antifungal ability of chitosan hydrochloride against Fusarium graminearum. Chitosan reduced F. graminearum growth and downregulated the transcript of the major genes involved in the cell growth, respiration, virulence, and trichothecenes biosynthesis. Chitosan promoted the germination rate, the root and coleoptile development, and the nitrogen balance index in two durum wheat genotypes, Marco Aurelio (FHB-susceptible) and DBC480 (FHB-resistant). Chitosan reduced FHB severity when applied on spikes or on the flag leaves. FHB severity in DBC480 was of 6% at 21 dpi after chitosan treatments compared to F. graminearum inoculated control (20%). The elicitor-like property of chitosan was confirmed by the up-regulation of TaPAL, TaPR1 and TaPR2 (around 3-fold). Chitosan decreased the fungal spread and mycotoxins accumulation. This study demonstrated that the non-toxic chitosan is a powerful molecule with the potential to replace the conventional fungicides. The combination of a moderately resistant genotype (DBC480) with a sustainable compound (chitosan) will open new frontiers for the reduction of conventional compounds in agriculture.