

Trichoderma harzianum* as inductor of a biochemical defense responses against *Septoria tritici

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The use of antagonists, single or combined with fungicides, is proposed an important tool for the leaf blotch of wheat management. The purpose of this study was to demonstrate the induction of a biochemical response when *T. harzianum* strains acted an antifungal action against *Septoria tritici* of wheat at three growth stages. The experiment was conducted in an experimental field during 2009 and 2010. A block design with 18 treatments and 3 replications was used. The treatments were: 2 strains of *T. harzianum* (Th5cc and Th118) that were applied as a seed coating and as a leaf spray at two growth stages (tillering) and (heading); healthy control plants (T) without the pathogen and the antagonists and control plants (Ti) inoculated with *S. tritici*. After 21 days of *S. tritici* inoculation, the extent of the leaf necrosis area and the pycnidial coverage percentage were estimated for each growth stage on Buck 55CL2 wheat cultivar. In addition, the leaf apoplast antifungal proteolytic activity was measured in plants 22 days after sowing. The proteolytic activity of the intercellular wheat fluid (IWF) and the endogenous germin-like protease inhibitors (GPI) were demonstrated throughout the growth stages till maturity. The literature shows that the antifungal action decreased in plants that were only inoculated with *S. tritici* but increased in those grown from seeds coated with the *T. harzianum* (Th5cc) strain. This increase stimulated defenses to the wheat cultivar. For the present experiment the proteolytic activity of the (IWF) decreased on (Ti) at tillering and heading. The proteolytic activity was similar to the healthy control when plants coming from coated seeds were sprayed with *T. harzianum* in both mentioned stages. The proteolytic activity was regulated by the GPI activity. At heading, the GPI was almost undetectable in the IWF of the flag leaf. Even so, its inhibitory activity was critical in the regulation of proteases. It is a first time that we have seen that *T. harzianum* stimulates a biochemical defense response in plants inoculated with *S. tritici* in all growth stages.