

Use of *Trichoderma* as a biocontrol agent and biofertilizer**Enrique Monte Vazquez.1;RUBIO, M.B.1;BETTIOL, W.2;NICOLAS, C.1;HERMOSA, R.1****1Centro Hispano-Luso de Investigaciones Agrarias (CIALE), Departamento de Microbiología y Genética, Universidad de Salamanca, 37185 Villamayor, Salamanca, Spain; E-mail: emv@usal.es;2Embrapa Environment, C.P. 69, 13820-000 Jaguariúna, SP, Brazil**

Species of the fungal genus *Trichoderma* have broad environmental opportunism, evolving from a mycoparasitic lifestyle to avirulent plant symbionts or even plant endophytes. Because of their ability to antagonize plant-pathogenic fungi some *Trichoderma* strains are used for biological control of plant diseases, acting through different mechanisms of action. Some *Trichoderma* strains have been registered for commercial application as fungicide products in agriculture due to their efficacy of biocontrol, large capacity to survive in different environments, and genetic and phenotypic stability. In interaction with plants, *Trichoderma* is able to increase plant defense responses, root development, plant growth, seed germination, leaf greenness, photosynthetic efficiency and carbon dioxide uptake, and ameliorate abiotic stresses or facilitate a better assimilation of nutrients and detoxification of xenobiotics. *Trichoderma* spp. can also improve the plant nutritional level and modify the root architecture to get a more efficient nutrient uptake that can substantially increase nitrogen use efficiency in crops. Some strains only express one of these mechanisms, but the most efficient ones exhibit several of them, either simultaneously or sequentially, and can even favor the activities of rhizobacteria and mycorrhizae. *Trichoderma* can be ruthless with enemies but benefactor and protector of the plant in adverse situations. From a biotechnological point of view, the isolation of genes from *Trichoderma* spp. and this subsequent transfer to a plant genome may result in a significant improvement in plant defense and resistance to abiotic stresses.