

Extracts of the *Lecanicillium lecanii* Fungus as Biological Controller of Coffee Leaf Rust in Turrialba, Costa Rica

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The following research is the study and use of the *Lecanicillium lecanii* fungus as bio-controller of Coffee Leaf Rust (*Hemileia vastatrix*) in coffee plantations affected in the Turrialba area, as an effective and sustainable alternative for coffee growers. The main priority of the study is to verify the effect the *Lecanicillium lecanii* has on injuries caused by *Hemileia vastatrix* in coffee plantations and to determine whether these can be controlled. We proceeded to extract and grow samples of the *Lecanicillium lecanii* fungus in coffee plantations, in order to carry out tests in the laboratory as well as in the field, and to analyze its effects and properties on the *Hemileia vastatrix*. Among the main findings, stands out the effectiveness of the *Lecanicillium lecanii* to control coffee Rust in 93.67% in infected coffee leaves, which were analyzed in the laboratory and in 84.22% in plants analyzed in the field. It was determined that the *Lecanicillium lecanii* has a mutualistic symbiotic relationship with the coffee plant to remove Coffee Leaf Rust and that the properties and effects of such fungus make it an effective antagonist and controller of the *Hemileia vastatrix* pathogen. The use of the *Lecanicillium lecanii* is proposed as an effective means to reduce the use of chemical pesticides that have a negative impact on both, the environment and people's health; finally, this alternative represents a viable and potential option to eradicate the fungus, due to its effectiveness, resulting in benefits for the producer and the country.