THE EFFECT OF THE APPLICATION TIME OF THE ANTAGONIST FUNGI *Trichoderma harzianum* ON *Fusarium oxysporum* CAUSES OF FUSARIUM WILTING IN TOMATO PLANTS

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ABSTRACT

Tomato production in Indonesia is low due to many factors, one of which is fusarium wilt disease. This disease can be controlled with the antagonist agent *Trichoderma harzianum*. This study aimed to identify the effect of antagonism of *T. harzianum* against *F. oxysporum* pathogens and to determine the appropriate time of application to suppress fusarium wilt disease in tomato plants. The in vitro test was conducted at the Plant Protection Laboratory of Universitas Pembangunan Nasional "Veteran" Yogyakarta and in vivo in Somodaran, Purwomartani, Kalasan, Sleman, Yogyakarta. The research method used a completely randomized design (CRD). There were 6 in vivo trials, namely T0 (control without *F. oxysporum* and without *T. harzianum* application), T1 (control without *T. harzianum* application), T2 (7 days before transplanting), T3 (3 days before transplanting), T4 (when transplanting), T5 (7 days after transplanting). Each consisted of 4 replications with each replication consisting of 10 plants taken 3 samples, so that there were 240 experimental plant units. The data obtained were analyzed using the F test (ANOVA), if the results showed significantly different treatments, further tests were carried out with the Duncan test level 5% (DMRT). The mechanism of antagonism of *T. harzianum* against the pathogen *F. oxysporum* were competition and parasitism. Application of *T. harzianum* 7 days before transplanting was significantly able to delay the incubation period longer, was able to reduce the proportion of disease and disease intensity, and was able to increase the number of fruit per plant.

Keywords: Tomato, *Trichoderma harzianum*, Fusarium wilt disease, *Fusarium oxysporum*