

Tiara Primayanti, 2012, Antagonism of Mycorrhizae *Glomus sp.* and *Trichoderma harzianum* as biological agents against *Fusarium oxysporum* causes stem rot disease on maize plants (*Zea mays L. var. Manding*). THESIS. Under the guidance of Dr. Ir. Tini Surtiningsih, DEA and Dr. Sucipto Hariyanto, DEA, Department of Biology Faculty of Science and Technology, Airlangga University, Surabaya.

ABSTRACT

The aimed of this study are determine the effects of mycorrhizal *Glomus sp.* and *Trichoderma harzianum* and their combination against pathogenic fungi *Fusarium oxysporum* on growth and production of maize (*Zea mays L. var. Manding*). Planting is done in the rural farmland in Kendal village, Kendal sub-district, Ngawi district in May to July 2012, using a polybag. This research is experimental using completely randomized design and 3 x 4 factorial test. There are 6 treatment groups, which are the control group plants without giving mycorrhizal *Glomus sp.*, *Trichoderma harzianum* and *Fusarium oxysporum*; group of plants by adding 30 g mycorrhizal *Glomus sp.*; group of plants by adding 30 mL *Trichoderma Harzianum*; group of plants by adding a mixture of 30 g mycorrhizal *Glomus sp.* and 30 mL *Trichoderma harzianum*; group of plants by adding 30 mL *Fusarium oxysporum* where there are differences in the time of inoculation which are at the time of planting and when plants aged 4 week after planting (WAP); and the combination of plants. Parameter attack *Fusarium oxysporum* includes broad attack of *Fusarium oxysporum* and attacks intensity of *Fusarium oxysporum*. Growth parameters include plant height, stem biomass, root length, root biomass, nutrient uptake on leaves. Production parameters include cornhusk + cob weight, cob weight without cornhusk, cob length, fresh weight and dry weight of corn kernels. Growth and production data of maize were analyzed by ANOVA test. If there is a significant difference followed by Duncan test at 5% level. The results showed that giving *Fusarium oxysporum* at the time of planting influential to the rotten stem on maize (*Zea mays L. var. Manding*) with broad attack 40% and intensity of attack 20%. The give of biological agents mycorrhizal *Glomus sp.* and *Trichoderma harzianum* along with mixture of mycorrhizal *Glomus sp.* and *Trichoderma harzianum* influential to patogenic fungi attack, *Fusarium oxysporum*, with broad attack and intensity of attack 0%. The give of biological agents mycorrhizal *Glomus sp.* and *Trichoderma harzianum* along with mixture of mycorrhizal *Glomus sp.* and *Trichoderma harzianum* provide a significant differences ($\alpha < 0,05$) against the attack of *Fusarium oxysporum* to the growth and production of maize (*Zea mays L. var. Manding*). The give of mycorrhizal *Glomus sp.* results in highest mark on root length (41,2 cm/plant), root fresh weight (66,4 g/plant), root dry weight (28 g/plant), weight of wet grain (74,4 g/plant), seed dry weight (49,6 g/plant); cornhusk+cob weight (102.6 g/plant); without cornhusk cob weight (81 g/plant). The give of *Trichoderma harzianum* results in highest mark on plant height (181 cm/plant), wet stem weight (194 g/plant), stem dry weight (111.8 g/plant), and the length of the cob (9 cm/plant).

Keywords: *corn, Zea mays L. var. Manding, mycorrhizae, Glomus sp. Trichoderma harzianum, Fusarium oxysporum, growth and production.*