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Inoculation of *Fusarium oxysporum* f. sp. *cepae* into Big Onions (*Allium cepae*)

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Abstract

Basal rot is a serious disease of *Allium cepa* (big onions) causing both pre harvest and storage losses. It is caused by the soil borne fungus *Fusarium oxysporum* f. sp. *cepae*. In this study, the best method of artificial inoculation and the inoculation concentration capable of causing a higher disease incidence was investigated, with a view to determine i) the mode of penetration of the pathogen (infection method) and ii) the optimum inoculum concentration that causes the disease. The pathogen was initially isolated from diseased onion bulbs and its morphology was studied using light microscopy. Two inoculum concentrations (1×10^5 and 1×10^7 spores/ml) and two inoculation methods i.e. dip method (with and without wounding the bulbs) and injection method, were tested using the spore suspensions of the pathogenic organism and healthy big onion bulbs, to determine the optimum inoculum concentration and the best inoculation method. Fourteen replicates were used in each treatment. Wounded big onion bulbs, dipped in both concentrations of spore suspensions, were the first to show disease symptoms. Furthermore, 1×10^7 spores/ml inoculum concentration was more effective than 1×10^5 spores/ml suspension in causing the disease. The outcome of this study is important for management of basal rot disease by maintaining the pathogen population below the harmful level and also for screening for resistance of the hosts. This knowledge can also be useful in the planning of disease management strategies. According to the results it can be concluded that dipping the onions in spore suspension after wounding is the best inoculation method of *F. oxysporum*. 1×10^7 spores/ml concentration is capable of causing more damage to the bulb as compared to 1×10^5 spores/ml concentration, as there was a significant difference between the extent of disease symptoms when healthy onion bulbs were inoculated with the two concentrations ($p = 0.05$).