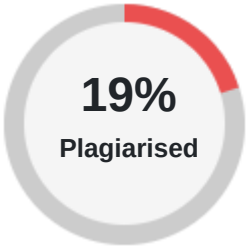
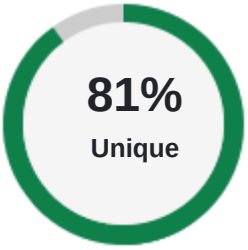
Plagiarism Detector

Date: 2020-07-28

PLAGIARISM SCAN REPORT





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An in vitro and field experiments for two consecutive years were conducted at Bangladesh Institute of Nuclear Agriculture, Mymensingh to investigate the efficacy of Trichoderma harzianum against Sclerotium rolfsii causing collar rot disease of soybean and chickpea. In in vitro the antagonistic activity of T. harzianum against S. rolfsii was observed through dual culture. In field experiment Trichoderma was applied as soil treatment and seed treatment. The percent inhibition of S. rolfsii induced by T. harzianum was found upto 78.9% in in vitro. The maximum reduction of collar rot disease incidence over control (82.4% in soybean and 77.6% in chickpea) was recorded in the plot where T. harzianum was applied in the soil. The highest seed germination (86.3% in soybean and 84.8% in chickpea), maximum fresh shoot weight (94.5 g plant-1 in soybean, 62.5 g plant-1 in chickpea), maximum fresh root weight (10.7 g plant-1 in soybean, 9.3 g plant-1 in chickpea) and the highest yield (2830 kg ha-1 in soybean, 1836 kg ha-1 in chickpea) were obtained by the application of Trichoderma in soil. The study indicated that the tested isolate of T. harzianum had potential in controlling collar rot disease of soybean and chickpea. For the reduction of collar rot incidence application of T. harzianum in soil was found more effective than seed treatment with the antagonist. 1. INTRODUCTION Soybean (Glycine max L.) is a leguminous crop that is grown in tropical, sub-tropical and temperate climate. This crop has a tremendous value in agriculture for source of high quality plant protein and vegetable oils and also capable to fix nitrogen in soil. The world production of edible oils consists of 30% soybean [1]. Soybean seed contains about 40-45% protein and 20-22% oil, 20-26% carbohydrate and a high amount of Ca, P and vitamins [2]. Chickpea (Cicer arietinum L.) is also a leguminous crop and one of the oldest cultivated crops for consumption in the world. Being a subtropical and drought resistant crop, it grows well in cooler and dry climate. It is a vital source of protein augmented human food and animal feed, mainly for the low-income population of Southeast Asia [3]. It offers a range of health benefits. It helps to increase digestion, keeps blood sugar level stable and increases protection against diseases. The grain of chickpea is highly nutritious containing 45% starch, 25% proteins, 6% sugars, 6% crude fiber, 5% fat, 3% ash, 0.19% calcium and 0.01% minute quantities of some important vitamins and minerals [4,5]. Among different natural constraints towards the low production of crop, chiefly diseases are the most significant. Many phytopathogenic soil-borne as well as seed borne fungi are responsible for disease development which attack plants during seedling to maturity stages. Collar rot caused by Sclerotium rolfsii Sacc. is a fungal disease affecting crops all over the world [6] . This soil-borne pathogen causes rot at collar region on a wide range of plant species belonging to families Compositae and Leguminosae whereas members of Graminae are less susceptible to this disease [7]. The most common hosts are legumes, crucifers and cucurbits. The initial symptom of collar rot of soybean and chickpea was recorded on the leaves in form of slight paleness followed by yellowing of leaves and loss of vigour of plant. Infection usually occurs at the collar region as brownish black discoloration. Gradually the discoloration is found to spread 3-5 cm both upward and downward along the stem and tap root, respectively. In advanced stage of infection, all the leaves shed, turn brown dry and often cling to dead stem. The mycelium of pathogen grows over the diseased tissue and surrounding the soil forming a white mat of mycelial thread with the typical brown to chocolate brown mustard seed sized sclerotia. Collar rot is a serious threat, which under conducive conditions causes 55-95% mortality of the crop at seedling stage [8]. It is very difficult to manage the disease as the causing organism S. rolfsii survives in the soil as sclerotia and chlamydospores [9]. The sclerotia is considered as the primary inoculum of the pathogen as well as its principle means of dispersal [10]. As there is no effective fungicide or resistant variety for the management of the disease the farmers cannot maintain the desire plant population in the field and consequently the yield is reduced. In this context bioagent can be an alternative source for controlling soil-borne diseases [11]. Several strains of Trichoderma spp. have been found to be effective as biocontrol agents of various soil borne plant pathogenic fungi such as Fusarium, Pythium, Rhizoctonia and Sclerotium and also for seed borne fungi [12, 13, 14]. The biological control of S. rolfsii on bean plants

by using Trichoderma spp. had been investigated [15]. Therefore, the present study was undertaken to investigate the efficacy of Trichoderma harzianum against S. rolfsii causing collar rot disease of soybean and chickpea. 2. MATERIALS AND METHODS 2.1 Source and maintenance of Trichoderma harzianum and Sclerotium rolfsii The isolate of T. harzianum was obtained from Plant Pathology Division, Bangladesh Institute of Nuclear Agriculture (BINA), Mymensingh. Pure culture of T. harzianum was made in PDA plates following hypal tip culture technique [16] and preserved at 5ºC for further use. The isolate of S. rolfsii was obtained from diseased plant samples of soybean and chickpea collected from the experimental field of BINA at Mymensingh and Magura, respectively. Diseased plants showing typical symptoms of collar rot were collected from the field. Infected plant parts were cut into 3 mm segments including the advancing margins of infection. The segments were surface disinfected with 0.5% sodium hypochlorite solution for 2 minutes. These were washed thoroughly with sterilized water and dried between folds of filter paper. The sterilized segments were transferred in PDA plates and incubated for 7 days at 26ºC. Pure culture was obtained by sub-culturing three times and pathogenicity test on the crops were carried out [17]. Pure cultures of the final isolate was maintained on PDA plates and kept in the refrigerator (5ºC) until required.

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Jun 2, 2017 - Soybean (Glycine max L.) is an important legume crop that grows in tropical, sub-tropical and temperate climates. Soybean seeds contain high ...

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Jun 14, 2014 - Soybean seed contains about 40-45% protein and 20-22% oil, 20-26% carbohydrate and a high amount of Ca, P and vitamins. (Rahman et al.

https://pdfs.semanticscholar.org/9522/0a9c85aefaec3bb380fe726d3611e6357a47.pdf

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Oct 14, 2018 - This soil-borne pathogen causes rot of collar region on a wide range of plant species belonging to families Compositae and Leguminosae whereas members of Graminae are less susceptible to this disease (Mahen et al., ... recorded at regular intervals. Table 1: List of fungicides used for seed treatment.

http://www.chemijournal.com/archives/2018/vol6issue6/PartH/6-5-491-779.pdf

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rolfsii is a pathogen of high economic impact since it affects numerous crops worldwide. It has an extensive host range; at least 500 species in 100 families are susceptible, the most common hosts are legumes, crucifers and cucurbits and commonly occur in the tropics, subtropics and other warm temperate regions [2]. S.

https://www.ijpsonline.com/articles/effect-of-plant-extracts-bio-agents-and-fungicides-against-sclerotium-rolfsii-causing-collar-rot-in-chickpea-3355.html

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The mycelium of pathogen grows over the diseased tissue and surrounding the soil forming a white mat of mycelial thread with the typical buff brown to chocolate brown mustard seed sized sclerotia. The survey revealed that the disease was ...

https://krishikosh.egranth.ac.in/handle/1/5810020971

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is a serious threat, which under conducive conditions caused 55-95% mortality of the crop at seedling stage (Gurha & Dubey, 1982). Prevalence of collar rot of ...

http://www.pakbs.org/pjbot/PDFs/40(1)/PJB40(1)453.pdf

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Aug 20, 2007 - Infected plant materials brought back from the field were washed, cut into 5 mm segments including the advancing margins of infection. The.

https://academicjournals.org/journal/AJB/article-full-text-pdf/C87FF5C7798
