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Survey of chilli fruit rot; potential threat to chilli crops a focus on Jaipur district

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Abstract

It is an important spice, vegetable as well as cash crop of Rajasthan, mostly cultivated in *kharif* season, which is quite remunerative for farmers. It is affected by several diseases, but among the fungal diseases, fruit rot caused by *Colletotrichum capsici* (Sydow) Butler and Bisby, is a serious disease and one of the major constraints in chilli cultivation throughout the world. In the present study a survey was conducted to assess the fruit rot incidence of chilli in four locations in Jaipur district. Overall 60.33 per cent fruit were found infected at surveyed four locations of Jaipur district during 2015 and ranges from 51.75% to 66.70%. Therefore the fruit rot incidence reveals that the predominance presence of fruit rot is a major constraints to profitable of chilli in Jaipur district.

Keywords: Chilli, *Colletotrichum capsici*, Per cent infected fruit

1. Introduction

Red pepper (*Capsicum annuum* L.) commonly known as chilli, is a prominent vegetable crop of India belonging to the nightshade family, *Solanaceae*. It has 24 chromosomes (2n) and may be herb or sub-shrub of height up to 2.5 m with extensively branched stem having hairy growth with purplish spots near the nodes. The tap root is strong with numerous lateral roots. Chilli fruits are considered vegetable and are botanically berries (Saxena *et al.*, 2016) [8]. It is a good source of capsaicin (capsaicinoid), vitamin A, vitamin C, riboflavin and thiamine. It contains about 8.8 g, 5.3 g carbohydrates sugar, 1.9 g protein and 534 micro g beta carotene per 100 g chilli (Panda *et al.*, 2010) [5]. In Jaipur, the area under chilli is about 1296 ha with annual production of 584 MT (Anonymous, 2015-16) [1]. Chilli is a universal spice crop of India grown in almost all the states of the country. The quality of the chilli varies from state to state. For example, chilli of Karnataka is known for its oil content, Gujarat quality is majorly known for its sharp color while that of Rajasthan is well known for making pickles.

Fruit rot or anthracnose or die-back of chilli caused by *Colletotrichum capsici* (Sydow) Butler and Bisby is one of the most destructive diseases of chilli in India. The pathogen cause severe damage to ripened fruits and reduce the quality and quantity of immature and mature fruits. This disease was reported first time in India from Coimbatore of Madras Presidency (Sydow, 1913) [9]. Due to this disease, more than 50 per cent crop loss has been reported from different parts of India (Ramchandran *et al.*, 2007) [7]. In Thailand, Poonpolgul and Kumphai (2007) [6] noticed anthracnose disease (*Colletotrichum* sp.) as most damaging disease of chilli reducing marketable yield up to 80 per cent. The disease has been reported to cause 8-27 per cent yield loss in Maharashtra, 20-60 per cent in Punjab and Haryana and 30-76 per cent in Tamil Nadu (Bansal and Grover, 1969; Sujathabai, 1992 and Datar, 1995) [2, 3]. In India, a calculated loss of 10-54 per cent has been reported in yield of the crop due to the anthracnose disease (Lakshmesha *et al.* 2005) [4]. The loss is high owing to the post and pre-harvest involvement of the pathogen causing a loss of 10-80 per cent of the marketable yield of chilli fruits (Than *et al.*, 2008) [10]. Survey is important to maintain national disease lists. A disease list helps the individual in the country to know which plant pathogen directly affects the parts of chilli plant and use appropriate quarantine and control measure to keep a check in causal agent. Keeping in mind the imperative use of chilli, thus the present survey was aimed to investigate the disease of chilli crop so as an integrated disease management control techniques can be developed.

Materials and Methods

Survey

Four locations of Jaipur district were surveyed to find out the per cent infected fruits of chilli during *khariif* season in the last week of October 2015. The infected chilli fruits were collected and recorded according to the disease assessments. The study areas were Kotputali, Chomu, Begus and Lalpura villages of Jaipur district. At each location, five fields were marked and at each field, five plants were assessed out to identify and count the number of healthy and diseased fruits. The formula used is based on the mean infected fruits calculated for each area as follows.

$$\text{Per cent infected fruits} = \frac{\text{Number of infected fruits}}{\text{Total number of fruits per plant}} \times 100$$

The per cent infected fruits generally indicates about the prevalence of the disease in a given area or host population. Every fruit of chilli is not infected at a time, therefore, the reason for implementing this survey was necessary to find out the per cent incidence of fruit rot of chilli on fruit basis.

Results and Discussion

Per cent infected fruits (Table 1) was recorded in last week of October from each visited location in Jaipur district by considering the infected fruits to the total number of fruits per plant basis. Overall 60.33 per cent fruit were found infected at surveyed four location of Jaipur district during 2015. Maximum per cent infected fruits (66.70%) was recorded from Chomu followed by Begus village (64.72%) and Kotputli (58.13%), while minimum per cent infected fruits (51.75%) was reported from Lalpura village. It has been observed that, this problem is increasing in all areas wherever chilli is cultivating and has also been observed to be increasing in Jaipur region of the Rajasthan. Data on per cent infected fruits was taken from each visited location in Jaipur district by considering the infected fruits to the total number of fruits per plant basis (Ying, 1987)^[11]. The maximum per cent of infected fruits (66.70%) was recorded in Chomu village followed by Begus (64.72%) while minimum infected fruits (51.75 %) was recorded from Lalpura village of Jaipur district.

Table 1: Per cent infected fruits of chilli at various locations of Jaipur district in 2015

Location	Fruit rot incidence (%)*
1. Begus	64.72
2. Lalpura	51.75
3. Chomu	66.70
4. Kotputli	58.13
Average	60.33

* Average of five fields

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