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## Extension study on fruit rot disease of chilli, in Khammam district of Telangana

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### Abstract

Chilli (*Capsicum annum*) is an important spice as well as vegetable global cultivated crop. It is used in many cuisines but also found to have many medicinal properties. Chilli (*Capsicum annum* L.) is an important cash crop of Central Telangana region. In Khammam District chilli is grown in 21,340 ha area with 1.02 lakh tons annual production (AMC 2018-19). Chilli (*Capsicum annum* L.) crop is main cash crop to the farming community next to Paddy and maize crops in the District. Cost of cultivation of Chilli was high than other crops in spite of that the farmers were interested to cultivate the Chilli (*Capsicum annum* L.) crop by getting high net returns. During 2019-20 majority area of Chilli (*Capsicum annum* L.) crop was severely affected by fruit rot disease in the District, the extent of disease observed up to 53.6% in some areas at second picking stage in the month of December. The percent disease incidence in Khammam district is varies from 36.0% to 53.6%. The maximum disease incidence was recorded in Kusumanchi (53.6%) followed by Khammam Rural (48.5%), Karepalli (47.0%), Konijerla (45.40%), Kamepalli (45.3%), Thallada (43.4%), Mudigonda (42.8%) and Enkur (41.6%) in the month of December.

**Keywords:** *Capsicum annum*, extension, fruit rot disease

### Introduction

Chilli (*Capsicum annum*) is an important spice as well as vegetable worldwide cultivated crop. It is used in many cuisines but also found to have many medicinal properties. It belongs to the family Solanaceae. Green chillies are rich source of vitamins especially vitamin A, C, B1 and B2 (Saimbhi *et al.*, 1977) [12] and is also rich in vitamin P (Rutin), which is of immense pharmaceutical importance. Pungency in chilli, is due to the presence of Capsaicin, a digestive stimulant and a cure for rheumatic troubles. The fruit of *Capsicum* has a variety of names, such as 'chilli', 'chilli pepper' or 'pepper' depending on place (i.e., differences between the English-speaking countries) and type of fruits. India is largest producer with 36% share in global production (Sahitya *et al.*, 2014) [11]. Indian chilli is considered to be world famous for two important commercial qualities like colour and pungency levels. Some varieties are famous for the red colour because of the pigment "Capsanthin" and others are known for biting pungency attributed to Capsaicin green. China, India, Mexico, Morocco, Pakistan, Thailand and Turkey are the most important exporters of chilli. However, the average productivity of dry chilli is low in India as compared to China, Taiwan, and Mexico where it yields 3 tons per ha. (Peter, 1998) [9]. The main reason for the low productivity in India is the cultivation of open pollinated varieties which do not have the genetic capacity to break the yield barriers, (Kaur *et al.*, 2011) [8]. Chilli is mainly cultivated in tropical and sub – tropical countries of the world and India is the largest producer of chilli in the world accounting for over 45% of the total area under cultivation. Andhra Pradesh, Telangana, Maharashtra, Karnataka, Orissa and Tamil Nadu account for about 75% of the total area as well as production of India. In Telangana chilli is grown in about 0.64 lakh ha area with 3.4 lakh tons annual production (AMC 2018-19). Chilli (*Capsicum annum* L.) is an important cash crop of Central Telangana region. In Khammam chilli is grown in 21,340 ha area with 1.02 lakh tons annual production (AMC 2018-19). The occurrence of diseases caused by fungi, bacteria and viruses greatly hampers the production of chilli. This crop suffers from about more than 40 fungal diseases (Rangaswami, 1979) [10]. Out of which fruit rot of chilli is one of the major and devastating diseases of chilli causes severe losses (35.4-53.6%) both in yield and quality of the chilli depending upon the varieties (Bansal

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and Grover, 1969) [3]. *Colletotrichum capsici* is the most important plant pathogen worldwide, causing economically important disease fruit rot. The pathogen is seed, soil, and air borne. The disease is prevalent in almost all major chilli growing areas and it is reported to cause 25-48% loss in different parts of India (Datar, 1995; and Ekbote, 2001) [5, 6].

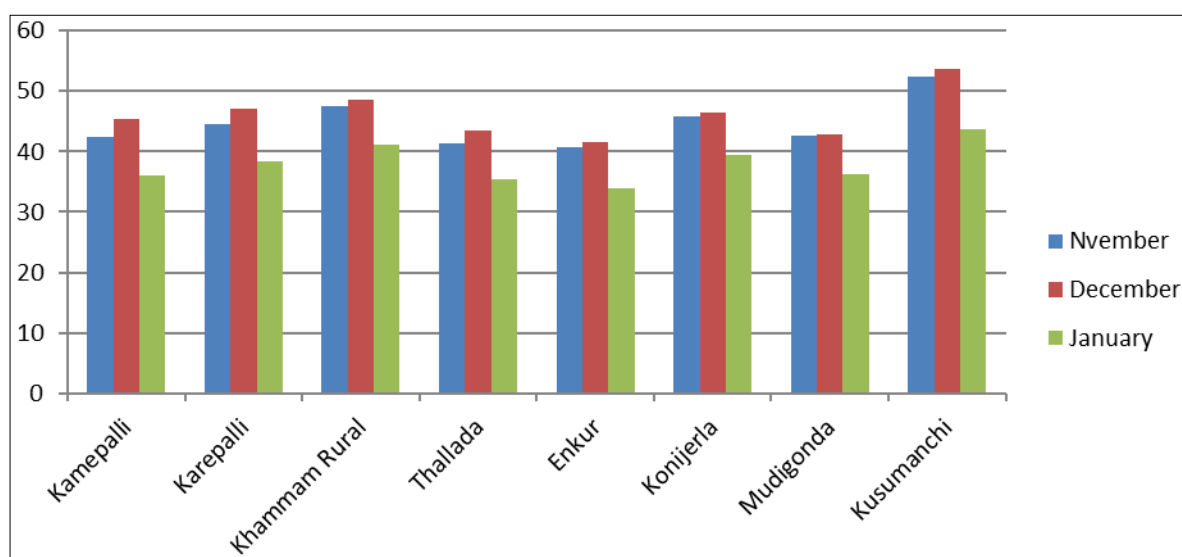
### Extension study

Extension Survey was carried out for recording the incidence of fruit rot of chilli grown in some farmer's field in Khammam districts at three picking stages of chilli in November, December and January months during 2019-20. In each mandal five farmers were selected randomly from field where the chilli crop was grown. Different locations were surveyed during *Kharif* season 2019-20 for assessing the intensity of the fruit rot disease. Some plants from each cultivar or crop were taken randomly every time from each locality, damage and prevalence of fruit rot on chilli under in

Khammam District conditions. The percent disease intensity (PDI) calculated as follows: For such survey eight mandals of Khammam district was selected in chilli growing areas were randomly selected and from each village five fields were randomly selected. In each field the incidence of fruit rot of chilli was recorded on five m<sup>2</sup> patches by counting the infected fruit and total number of fruits. The data is summarized indicates (table-1) that the disease incidence recorded in Khammam district on an average was 42.7% and it varies from 38.7% to 49.8% from Mandal to Mandal while the maximum incidence was recorded in Kusumanchi (49.8%) followed by Khammam Rural (45.7%), Karepalli (43.3%), Konijerla (42.3%), Kamepalli (41.6%), Mudigonda (40.5%), Thallada (40.0%) and Enkur(38.7%) in three months consecutively as well as highest disease incidence was recorded (46.0%) in December, followed by November (44.6%) and January (38.1%).

**Table 1:** Fruit rot Disease incidence in the Khammam District during in the year 2019-20

Name of the Mandal	% of Disease incidence in November	% of Disease incidence in December	% of Disease incidence in January	Average per cent of disease incidence
Kamepalli	42.5	45.3	37.0	41.6
Karepalli	44.6	47.0	38.4	43.3
Khammam Rural	47.4	48.5	41.2	45.7
Thallada	41.4	43.4	35.4	40.0
Enkur	40.7	41.6	34.0	38.7
Konijerla	44.8	45.4	38.4	42.3
Mudigonda	42.6	42.8	36.2	40.5
Kusumanchi	52.4	53.6	43.6	49.8
Mean	44.6	46.0	38.1	42.7



**Fig 1:** Graphical representation of fruit rot disease incidence (%) in Chilli during 2019-20 in Khammam District

### Influence of relative humidity (%) and temperature on fruit rot disease

The fruit rot disease incidence in Chilli (*Capsicum annum*) was significantly correlated with Relative Humidity (%) in three months. Highest disease incidence (46.0%) on an average was recorded at 89.06% R.H. during in the month of December in all Mandals in the District revealed by Table 2. The disease incidence generally depends on four factors choice of variety, cropping system (monocropping of chilli), crop nutrition (heavy dose of nitrogenous fertilizers) and weather. Such variations in fruit rot disease severity and wide spread nature have been reported by earlier workers. Anamik *et al.* (2012) [2]. Gradually the per cent of fruit rot disease on

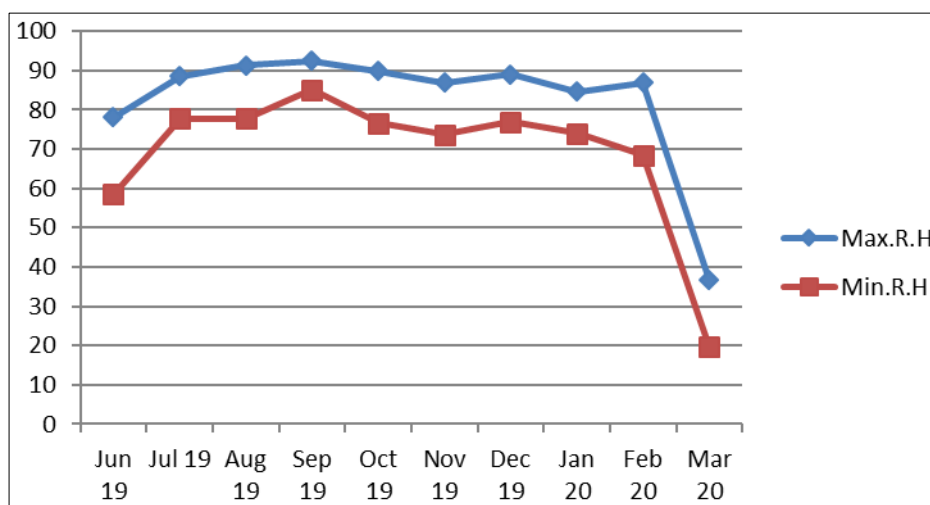
an average increased from November (44.6%) to December (46.0%) as well as decreased from January (38.1%) onwards due to decreasing the Relative Humidity and increasing the day temperatures. It was revealed that predominant presence of the fruit rot disease is varied by environmental factors and inoculum presence in particular place. The present findings are in agreement with the earlier reports of Ekbote (2002) who conducted a survey of the prevalent diseases of chilli (*Capsicum annum*) in 6 taluks in the Haveri district of Karnataka. Fruit rot caused by *Colletotrichum capsici* was found to varies around 42.7% and similar results were reported by Chigoziri *et al.* (2013) [4] from Gboko and Ohimini, South Nigeria. It is thus clear that fruit rot of chillies

is widespread and a major constraint. Fruit rot is also predominant in chilli growing pockets of the Central Telangana Region in Telangana State. The fruit rot disease was severely damaged in first three pickings in Chilli crop

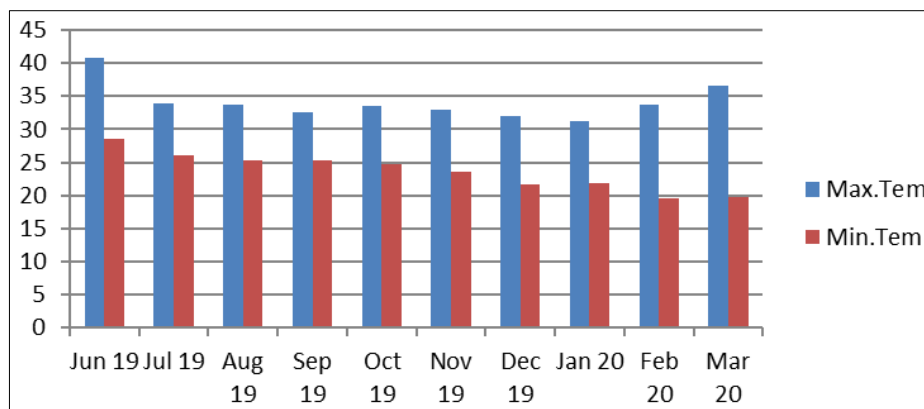
due to heavy dew and downfall of temperatures during crop period as well as variation in between day temperatures and night temperatures.

**Table 2:** Weather data during the crop period in Khammam District in 2019-20.

Month & Year	Maximum Temp C <sup>0</sup>	Minimum Temp C <sup>0</sup>	Maximum R.H (%)	Minimum R.H (%)
June-2019	40.90	28.52	78.13	58.43
July-2019	33.92	25.97	88.48	77.76
August-2019	33.68	25.30	91.23	77.77
September-2019	32.54	25.33	92.50	85.07
October-2019	33.60	24.77	89.90	76.68
November-2019	32.87	23.53	86.93	73.73
December-2019	31.97	21.74	89.06	76.87
January-2020	31.29	21.87	84.61	74.00
February-2020	33.81	19.48	86.83	68.48
March-2020	36.63	19.69	36.63	19.69



**Fig 2:** Graphical representation of Relative Humidity (%) during the crop period.



**Fig 3:** Graphical representative of Temperature (C°) during the crop period in 2019-20

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