

Influence of weather on development of blight in cumin caused by *Alternaria burnsii*

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ABSTRACT

A field experiment was conducted using cumin cultivar Gujarat Cumin-2 (GC-2) during 2003-04 crop season to determine the weather factors on development of blight. Cloudy conditions of 4 to 5 days, 6.9 bright sunshine hours and 10.90 to 28.70 °C temperature found to increase the blight intensity. Maximum temperature, (25.00-37.30°C) and minimum (7.4-17.6°C) had positive correlation whereas relative humidity at morning (60.1-96.1 %) and evening (11.0-33.4 %) had negative correlation with disease severity.

Key words : Weather factors, *Alternaria burnsii*, blight, cumin.

INTRODUCTION

Cumin (*Cuminum cyminum* L.) belongs to the family umbeliferae, is one of the important seed spices commonly known as "zeera". It is widely grown to state of Rajasthan and Gujarat. Cumin seeds are used mainly as a spices in Indian cookery, as an essential ingredient in mixed spices and curry powder, for flavouring soups, sausages, pickles, cheese and for seasoning bread and cakes. Cumin seeds have been considered stimulative, carminative and astringent, hence used in diarrhea and dyspepsia (Anon., 1). Cumin oil is used in perfumery and flavouring liquors and in cordials. Such as important crop suffers from many serious diseases. Including blight which occurs more or less every year in Gujarat. The disease is attaining an alarming situation and may become a limiting factor for cumin cultivation area. Several workers have been reported the losses due to this disease up to 80 per cent (Joshi, 4; Anon, 2, Gemawat and Prasad, 3 and Savaliya, 7). Considering the importance of blight disease, this investigation was made to study the influence of weather factors on disease development was studied.

MATERIALS AND METHODS

The field experiment was conducted in randomized block design with four replications. Seeds of susceptible variety GC-2 were sown in 2.0 × 3.0 m² plot at 30 cm spacing on first week of November. NPK @ 30: 15: 0 kg/ha were applied. Development of the disease in terms of intensity was recorded periodically at 7 days interval starting from the appearance of disease. Disease intensity was recorded on 30 plants randomly selected from each replication using 0-4 scale. Per cent disease intensity was worked out by formula given by McKinny (5). Weather

parameters like temperature, relative humidity, sunshine hours and rainfall during period were recorded and correlated with disease development.

RESULT AND DISCUSSION

Data from the table 1 revealed that at an early stage of crop i.e. November to third week of December, there was no development of disease but it was appeared during the last week of December and subsequently increased till second week of February to the extent of 7.50 to 88.75 per cent. Increased temperature from 17.9 to 19.8 °C with increased in relative humidity from 54.9 to 56.9 per cent, linearly increased the blight intensity. On first standard week, blight was appeared to the extent of 12.50 per cent. During second standard week, under cloudy conditions of 4 to 5 days, 6.9 bright sunshine hours and 10.9 to 28.7 °C temperature found to increase the blight intensity from 45.00 to 62.50 per cent. In the morning relative humidity between 73.40 to 86.10 per cent linearly increased the blight intensity. Cloudy conditions during second week increased the disease during crop stage and lead it to devastating phase (Table 1).

The simple correlation coefficient analysis of weather parameters and disease intensity revealed a negative correlation of disease intensity with morning relative humidity (-0.3203), relative humidity evening (-0.7104) and mean relative humidity (-0.5603). A positive correlation coefficient was observed with maximum temperature (+0.3514), maximum temperature (+0.4834), mean temperature (+0.2291) and bright sunshine hours (+0.5603) (Table -2). Patel (6) reported that the less sunshine hours (8.73), cloudy conditions for two to three days, high humid weather (66.41 % and more), trace

Table 1. Weather parameters and development of blight of cumin during November-March, 2003-04

Std. Week	Temperature (°C)			Relative Humidity (%)			Bright sun shine hours	Rainfall (mm)	Blight intensity
	Max.	Min.	Mean	Morn.	Eve.	Mean			
44	35.1	16.6	25.85	82.3	28.6	55.45	9.3	0.0	0.00
45	32.6	14.9	23.75	70.6	27.9	49.60	9.4	0.0	0.00
46	30.1	14.4	22.25	66.0	23.3	44.65	8.3	0.0	0.00
47	31.4	11.2	21.30	83.1	22.6	52.85	9.0	0.0	0.00
48	32.2	12.5	22.35	77.9	21.7	49.80	9.0	0.0	0.00
49	28.9	12.4	20.65	77.1	28.3	52.70	8.5	0.0	0.00
50	26.5	10.1	18.30	75.4	23.7	49.50	8.6	0.0	0.00
51	25.6	7.4	16.50	75.1	25.4	50.25	8.8	0.0	0.00
52	26.7	9.2	17.95	76.4	33.4	54.90	7.8	0.0	7.50
1	28.2	9.0	18.60	86.1	25.7	55.75	8.0	0.0	12.50
2	28.7	10.9	19.80	81.9	31.9	56.90	6.9	0.0	45.00
3	25.0	7.7	16.35	81.3	23.7	52.50	9.3	0.0	62.50
4	26.1	8.4	17.25	73.4	19.1	46.25	9.8	0.0	63.75
5	28.3	8.1	18.20	73.6	19.9	46.60	10.2	0.0	80.00
6	31.3	11.4	21.35	79.4	21.4	50.40	9.9	0.0	86.25
7	32.7	12.8	22.75	82.6	18.3	50.45	9.7	0.0	88.75
8	34.4	12.9	18.65	67.8	11.0	39.35	10.1	0.0	88.75
9	37.3	14.1	25.70	60.1	13.1	36.60	9.3	0.0	88.75
10	39.3	17.6	28.65	61.9	13.1	37.50	10.1	0.0	88.75
Effective	25.00	7.40	16.35	60.1	11.0	36.60	6.9	0.00	7.50
Range	-	-	-	-	-	-	-	-	-
	37.30	17.6	28.65	86.1	33.4	56.90	10.2		88.75

Table 2. Correlation coefficient between blight of cumin and preceding two weeks weather parameters

Weather parameters		Simple correlation coefficient
Bright Sunshine Hours	(X ₁)	0.58913
Maximum Temperature (°C)	(X ₂)	0.35138
Minimum Temperature (°C)	(X ₃)	0.04834
Mean Temperature (°C)	(X ₄)	0.22906
Relative Humidity (%) (Morning)	(X ₅)	-0.32025
Relative Humidity (%) (Evening)	(X ₆)	-0.71042
Mean Relative Humidity (%)	(X ₇)	-0.56033

rainfall and 11.34 to 28.07 °C temperature found favour the infection and spread of the blight during second standard week.

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Received : December 2011; Revised : Feb. 2011;
Accepted : May 2012.