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INCIDENCE OF CORYNESPORA LEAF SPOT ON BLACKGRAM WITH OTHER FOLIAR DISEASES

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ABSTRACT

A field experiment was conducted to study the incidence of corynespora leaf spot of blackgram (*Corynespora cassiicola*) with other foliar diseases during *kharif* and *rabi* 2012-13 at Regional Agricultural Research Station, Lam, Guntur, Andhra Pradesh. There was a significant and positive correlation between powdery mildew and corynespora leaf spot incidence during *kharif* 2012-13 whereas, PDI also had positive correlation with powdery mildew and MYMV (Mungbean Yellow Mosaic Virus) though it is non significant but MYMV and leaf crinkle diseases showed negative correlation with corynespora leaf spot incidence. There was a negatively significant correlation between corynespora leaf spot and powdery mildew disease during *rabi*.

INTRODUCTION

Blackgram or urdbean (*Vigna mungo* L.) is an important pulse crop of Andhra Pradesh (A.P) grown in an area of 4.29 lakh ha producing 2.51 lakh tonnes with a productivity of 585 kg/ha (Department of Agriculture and Cooperation, Government of A.P., 2010). The crop is of special significance in A.P as it fits well in rice – pulse cropping system as a relay crop particularly in Krishna – Godavari and North Coastal zones.

Urdbean is very rich source of protein containing 24% in its seed and is the richest in phosphoric acid among pulses and in combination with cereal it fulfills the requirement of protein in human diets (Duffus and Slaughter, 1980). Leaf spot incited by *C. cassiicola* (Berk. and Curt.) Wei (1950) is the major in A.P. Corynespora leaf spot caused yield loss ranging from 15-60 per cent. The loss may be extended to the tune of 60 per cent in blackgram (Reddy, 1998). Information regarding corynespora leaf spot disease development in relation to other foliar diseases is lacking. Hence, the present study was carried out.

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MATERIALS AND METHODS

Incidence of Corynespora Leaf Spot in Relation to other Foliar Diseases of Blackgram

The experiment was conducted during *kharif* and *rabi* 2012-13 at Regional Agricultural Research Station (RARS), Lam, Guntur, Andhra Pradesh. LBG 752 was sown in 25 sq m plots at 30 x 10 cm spacing, 24 plots were sown in each season.

Data was collected regarding per cent disease incidence of foliar diseases *viz*., corynespora leaf spot, powdery mildew, MYMV, leaf crinkle virus and leaf curl diseases. Disease severity data was collected by adopting standard scales of All India Coordinated Research Project on MULLaRP (Alice and Nadarajan, 2007). The per cent disease incidence was calculated with the following formula.

$$\text{Per cent disease incidence} = \frac{\text{Number of plants infected in a micro plot}}{\text{Total number of plants in a micro plot}} \times 100$$

The per cent disease index (PDI) was computed from the above scale by using the following formula (Wheeler, 1969).

$$PDI = \frac{\text{Sum of all the numerical ratings}}{\text{Number of observations} \times \text{maximum disease grade}} \times 100$$

RESULTS AND DISCUSSION

Incidence of Corynespora Leaf Spot on Blackgram in Relation to other Foliar Diseases

During *kharif* season 2012-13 Mungbean Yellow Mosaic Virus (MYMV) disease was observed initially followed by corynespora leaf spot, powdery mildew and leaf crinkle. While during *rabi* season 2012-13 initially powdery mildew was observed followed by corynespora leaf spot, MYMV and leaf crinkle but leaf curl disease was not observed in both seasons during 2012-13.

Table 1. Incidence of corynespora leaf spot on black gram in relation to other foliar diseases during *kharif* 2012- 13

PLOT NO	CORYNESPORA	PM	LEAF CRINCLE	MYMV
1	27.0 (31.30)*	17 (24.350)	3.0 (9.974)	9.0 (17.458)
2	29.0 (32.58)	16.0 (23.578)	2.0 (8.130)	7.0 (15.342)
3	34.0 (35.669)	21.0 (19.370)	3.0 (9.974)	11.0 (19.370)
4	43.0 (40.976)	23.0 (27.275)	0.1 (1.812)	7.0 (15.342)
5	23.0 (28.658)	17.0 (24.350)	0.0 (0.000)	11.0 (19.370)
6	57.0 (49.024)	63.0 (52.535)	0.0 (0.000)	17.0 (24.350)
7	47.0 (43.280)	57.0 (49.024)	1.0 (5.739)	13.0 (21.134)
8	54.0 (47.294)	37.0 (37.465)	0.0 (0.000)	7.0 (15.342)
9	33.0 (35.062)	41. 0 (39.815)	0.0 (0.000)	7.0 (15.342)
10	37.5 (37.761)	33.0 (35.062)	2.0 (8.130)	11.0 (19.370)
11	34.0 (35.669)	23.0 (28.658)	0.1 (1.812)	4.0 (11.537)
12	59.0 (50.185)	28.0 (31.948)	0.0 (0.000)	19.0 (25.842)
13	47.0 (43.280)	34.0 (35.669)	0.1 (1.812)	13.0 (21.134)
14	28.0 (31.948)	15.0 (22.786)	0.0 (0.000)	29.0 (32.583)
15	32.0 (34.450)	23.0 (28.658)	0.0 (0.000)	18.0 (25.104)
16	41.0 (39.815)	53.0 (46.720)	0.1 (1.812)	15.0 (22.786)
17	19.0 (25.842)	22.0 (27.972)	0.0 (0.000)	43.0 (40.976)
18	37.0 (37.465)	43.0 (40.976)	0.0 (0.000)	29.0 (32.583)
19	49.0 (44.427)	32.0 (34.450)	2.0 (8.130)	17.0 (24.350)
20	57.0 (49.024)	28.0 (31.948)	0.0 (0.000)	7.0 (15.342)
21	33.0 (35.062)	22.0 (27.972)	0.0 (0.000)	7.0 (15.342)
22	43.0 (40.976)	23.0 (28.658)	2.0 (8.130)	13.0 (21.134)
23	28.0 (31.948)	27.0 (31.306)	0.0 (0.000)	7.0 (15.342)
24	27.0 (31.306)	25.0 (30.000)	0.0 (0.000)	5.0 (12.921)

*Figures in the parentheses are arc sine transformed values

Table 2. Disease severity of corynespora leaf spot on black gram in relation to other foliar diseases during *kharif* 2012- 13

PLOT NO.	CORYNESPORA	PM	MYMV
1	35.56 (36.604)	20.00 (26.565)	20.00 (26.565)
2	31.11 (33.902)	36.00 (36.870)	26.67 (31.091)
3	46.67 (43.089)	40.00 (39.232)	33.33 (35.264)
4	46.67 (43.089)	36.00 (36.870)	26.67 (31.091)
5	24.44 (29.631)	44.00 (41.554)	22.22 (28.126)
6	35.56 (36.604)	52.00 (46.146)	24.44 (29.631)
7	37.78 (37.925)	68.00 (55.550)	22.22 (28.126)
8	42.22 (40.525)	48.00 (43.854)	22.22 (28.126)
9	51.11 (45.637)	48.00 (43.854)	22.22 (28.126)
10	24.44 (29.631)	48.00 (43.854)	22.22 (28.126)
11	26.67 (31.091)	44.00 (41.554)	22.22 (28.126)
12	35.56 (36.604)	52.00 (46.146)	24.44 (29.631)
13	28.89 (32.513)	48.00 (43.854)	24.44 (29.631)
14	35.56 (36.604)	40.00 (39.232)	31.11 (33.902)
15	22.22 (28.126)	52.00 (46.146)	22.22 (28.126)
16	31.11 (33.902)	40.00 (39.232)	26.67 (31.091)
17	26.67 (31.091)	36.00 (36.870)	31.11 (33.902)
18	40.00 (39.232)	40.00 (39.232)	24.44 (29.631)
19	28.89 (32.513)	48.00 (43.854)	22.22 (28.126)
20	53.33 (46.911)	48.00 (43.854)	24.44 (29.631)
21	26.67 (31.091)	40.00 (39.232)	22.22 (28.126)
22	46.67 (43.089)	52.00 (46.146)	22.22 (28.126)
23	28.89 (32.513)	32.00 (34.450)	22.22 (28.126)
24	33.33 (35.264)	16.00 (23.578)	20.00 (26.565)

*Figures in the parentheses are arc sine transformed values

The data Tables (1, 2 and 5) and figures (1 and 2) shows that corynespora leaf spot incidence ranged from 19 to 59% and severity 22.22 to 53.33%, powdery mildew incidence ranged from 15 to 63% and severity ranged from 16 to 68%, leaf crinkle incidence ranged from 0.1 to 3% and MYMV incidence ranged from 4 to 43% and severity ranged from 20 to 33.33% and there was a significant and positive correlation between powdery mildew and corynespora leaf spot incidence (0.565) during *kharif* 2012-13 whereas PDI also had positive correlation with powdery mildew (0.096) and MYMV (0.172) though it is non significant but MYMV and leaf crinkle diseases showed negative correlation with corynespora leaf spot incidence. During *rabi* (Table 3, 4 and 6) (Fig 3 and 4) corynespora leaf spot, powdery mildew, leaf crinkle and MYMV disease incidence were in the range of 10 to 43%, 15 to 60%, 0.1 to 0.3% and 2 to 18% respectively and severity of these diseases ranged from 15.56 to 55.56%, 6.67 to 44.44% and 13.33 to 17.78% respectively. There was a negatively significant correlation between corynespora leaf spot and

Table 3. Incidence of corynespora leaf spot on black gram in relation to other foliar diseases during *rabi* 2012- 13

PLOT NO	CORYNESPORA	PM	LEAF CRINKLE	MYMV
1	43 (40.976)*	19 (25.842)	0.1 (1.812)	13 (21.134)
2	34 (35.669)	31 (33.833)	0 (0.000)	11 (19.370)
3	32 (34.450)	26 (30.657)	0.3 (3.140)	18 (25.104)
4	37 (37.465)	23 (28.658)	0.1 (1.812)	7 (15.342)
5	23 (28.658)	54 (47.294)	0.1 (1.812)	4 (11.537)
6	27 (31.306)	57 (49.024)	0 (0.000)	5 (12.921)
7	23 (28.658)	37 (37.465)	0.1 (1.812)	9 (17.458)
8	31 (33.833)	43 (40.976)	0 (0.000)	3 (9.974)
9	19 (25.842)	23 (28.658)	0 (0.000)	11 (19.370)
10	15 (22.786)	52 (46.146)	0 (0.000)	4 (11.537)
11	10 (18.435)	45 (42.130)	0 (0.000)	3 (9.974)
12	27 (31.306)	53 (46.720)	0 (0.000)	7 (15.342)
13	37 (37.465)	15 (22.786)	0 (0.000)	8 (16.430)
14	42 (40.397)	26 (30.657)	0 (0.000)	4 (11.537)
15	34 (35.669)	22 (27.972)	0 (0.000)	6 (14.179)
16	31 (33.833)	34 (35.669)	0 (0.000)	2 (8.130)
17	23.3 (28.862)	17 (24.350)	0.1 (1.812)	7 (15.342)
18	27 (31.306)	15 (22.786)	0 (0.000)	9 (17.458)
19	34 (35.669)	18 (25.104)	0 (0.000)	9.5 (17.952)
20	17 (24.350)	27 (31.306)	0 (0.000)	6 (14.179)
21	43 (40.976)	21 (27.275)	0 (0.000)	9 (17.458)
22	31 (33.833)	60 (50.768)	0 (0.000)	5 (12.921)
23	27 (31.306)	43 (40.976)	0 (0.000)	11 (19.370)
24	23 (28.658)	57 (49.024)	0 (0.000)	7 (15.342)

*Figures in the parentheses are arc sine transformed values

powdery mildew disease incidence (0.430) because of earlier occurrence of powdery mildew than corynespora leaf spot. There was no relationship of corynespora leaf spot with other foliar diseases because there was no cross protection among the diseases and the occurrence of diseases depends on the climatic conditions. Earlier studies showed the occurrence of corynespora leaf spot, powdery mildew and rust diseases with the intensity of 90, 80 and 90 per cent respectively on blackgram during 1994-95. The disease priorities on blackgram shifted from powdery mildew to wilt and now to corynespora leaf spot and rust diseases revealed the necessity of shifting priority of focus from powdery mildew to corynespora leaf spot and rust diseases due to excessive usage of fungicide to control powdery mildew which flared up corynespora leaf spot and rust diseases (Srinivasulu *et al*., 1996). Turechek and Madden (2000) reported that there was no relationship between mean disease incidence of leaf spot (*Mycosphaerella fragariae*) and leaf

Table 4. Disease severity of corynespora leaf spot on black gram in relation to other foliar diseases during *rabi* 2012- 13

PLOT NO	CORYNESPORA	PM	MYMV
1	55.56 (48.190)	13.33 (21.417)	15.56 (23.229)
2	35.56 (36.604)	26.67 (31.091)	17.78 (24.938)
3	26.67 (31.091)	15.56 (23.229)	15.56 (23.229)
4	28.89 (32.513)	13.33 (21.417)	13.33 (21.417)
5	24.44 (29.631)	33.33 (35.264)	13.33 (21.417)
6	20.00 (26.565)	37.78 (37.925)	13.33 (21.417)
7	20.00 (26.565)	20.00 (26.565)	17.78 (24.938)
8	37.78 (37.925)	26.67 (31.091)	15.56 (23.229)
9	17.78 (24.938)	20.00 (26.565)	13.33 (21.417)
10	15.56 (23.229)	8.89 (17.346)	13.33 (21.417)
11	17.78 (24.938)	11.11 (19.471)	15.56 (23.229)
12	26.67 (31.091)	15.56 (23.229)	17.78 (24.938)
13	35.56 (36.604)	13.33 (21.417)	15.56 (23.229)
14	51.11 (45.637)	11.11 (19.471)	17.78 (24.938)
15	35.56 (36.604)	6.67 (14.963)	15.56 (23.229)
16	40.00 (39.232)	11.11 (19.471)	13.33 (21.417)
17	51.11 (45.637)	26.67 (31.091)	15.56 (23.229)
18	35.56 (36.604)	15.56 (23.229)	13.33 (21.417)
19	22.22 (28.126)	22.22 (28.126)	15.56 (23.229)
20	42.22 (40.525)	17.78 (24.938)	15.56 (23.229)
21	31.11 (33.902)	11.11 (19.471)	13.33 (21.417)
22	42.22 (40.525)	35.56 (36.604)	13.33 (21.417)
23	31.11 (33.902)	44.44 (41.810)	15.56 (23.229)
24	42.22 (40.525)	42.22 (40.525)	13.33 (21.417)

*Figures in the parentheses are arc sine transformed values

Table 5. Correlation between corynespora leaf spot on blackgram with other foliar diseases during *kharif* 2012- 13

Variable	Correlation coefficient (r)	
	Per cent disease incidence	Per cent Disease Index
PM	0.565*	0.096
MYMV	-0.114	0.172
LEAF CRINCLE	-0.030	-

*Significant at 5% LOS T tab = 2.07

Table 6. Correlation between corynespora leaf spot on blackgram with other foliar diseases during *rabi* 2012- 13

Variable	Correlation coefficient (r)	
	Per cent disease incidence	Per cent Disease Index
PM	-0.430*	0.035
MYMV	0.296	0.172
LEAF CRINCLE	0.112	-

*Significant at 5% LOS T tab = 2.07

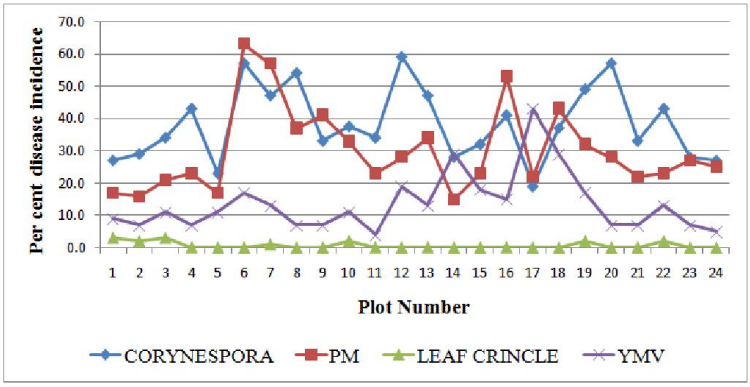

Fig. 1. Incidence of corynespora leaf spot on blackgram in relation to other foliar diseases during *kharif* 2012- 13

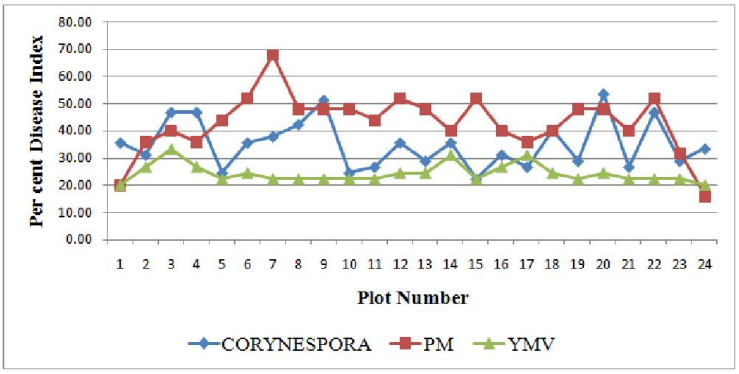

Fig. 2. Disease severity of corynespora leaf spot on blackgram in relation to other foliar diseases during *kharif* 2012- 13

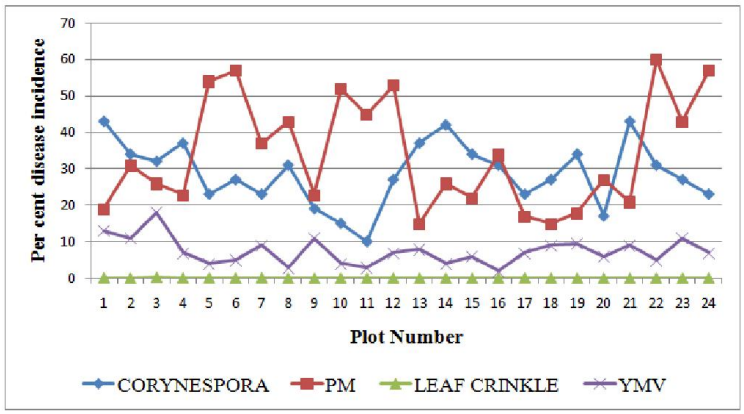

Fig. 3. Incidence of corynespora leaf spot on blackgram in relation to other foliar diseases during *rabi* 2012- 13

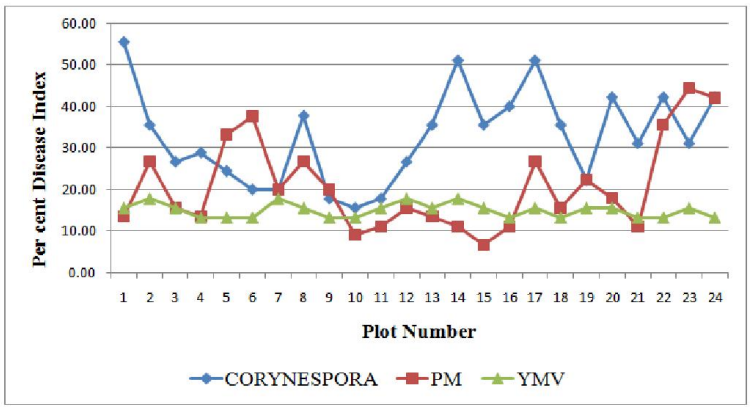

Fig. 4. Disease severity of corynespora leaf spot on blackgram in relation to other foliar diseases during *rabi 2012*- 13

blight (*Phomopsis obscurans*) of strawberry or between degree of heterogeneity of the two diseases of strawberry. There is no correlation between powdery mildew and cercospora leaf spot incidence, where powdery mildew disease initially appears on leaves, tender shoots, and scales on the flower buds when cercospora leaf spot appears on leaves of Crapemyrtle (Alabama A&M and Auburn Universities, 2004). Mourichon *et al*. (1997) observed sigatoka disease (*Mycosphaerella musicola*) and black leaf streak disease (*M. fijiensis*) appearance on the same leaf of banana because there was no relationship between these two ascomycetes fungi.

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