



***In vivo* Evaluation of Chemicals and Plant extracts against powdery mildew of Black gram and green gram**

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Abstract

Present experiment was conducted in field by using susceptible varieties of Black gram and Green Gram to evaluate the relative efficiency of chemicals and plant extract against powdery mildew fungi Diseases of black gram and green gram i.e., powdery mildew of black gram and green gram. During 2015-16 & 2016-17. In this session measured the temperature and relative humidity ranges between 10-22 °C and wet weather near about 85 to 90%. Because powdery mildew fungi favorable condition for growth, development, reproduction and disease development on host plant. Observed First symptoms appeared on plant 22 days after germination i.e., White powdery patches appear on leaves and other green parts. Observation was recorded on disease incidence and disease severity before 1st spray, 2nd spray and 3rd spray of chemicals and plant extract at different concentration range. It was confirmed that all used different concentrated chemicals and plant extracts capable to reduce disease incidence and severity as compared to the unsprayed plants i.e., control.

Keywords; Susceptible varieties, powdery mildew disease, Chemicals, plant extracts, disease incidence.

Control over disease

Introduction

Powdery mildew of Black gram and green gram disease is the major biotic stress which constrains the production and productivity of these crops. Powdery mildew of Black gram and green gram caused by *Erysiphe polygoni* and *Erysiphe polygoni* D.C which favored by ranges between 10-22 °C and wet weather near about 85 to 90% Condition. The disease has been reported from all over world including India,

Thailand, Philippines, Sri Lanka, Taiwan, Colombia, Ethiopia, Thailand, Korea and U.S.A. In India reported this disease in Maharashtra, Karnataka, Madhya Pradesh, Andhra Pradesh and Rajasthan.

Production losses on farmer field range 20-40% and 100% when it occurs at the seedling stages in green gram (Reddy *et al*, 1994). Singh *et al*. (1991) reported 12.5 to 85.7% losses in yield on twenty mung bean varieties due to powdery mildew from Chhattisgarh State. Barak *et al*. (1979) reported that application of systemic fungicide Bayleton (triadimefon) at 500 g/ha through the trickle irrigation system each week for three months gave outstanding control of *Leveillula taurica* on *Capsicum anum*.

Therefore, it is need to develop strategies for management of powdery mildew by plant breeding technique develop resistant varieties and also use low-cost chemicals and plant extracts to minimize the disease incidence and protect the production cost as well as environment. Present studies showed that, effective control of powdery mildew with different concentration of fungicides that are Bavistin_50% WP (0.05% and 0.10%), Bayleton 25% WP (0.05% and 0.10%) and Mancozeb 75% WP (0.3 and 0.5%) and plant extract i.e Lantana leaf extract 5% and 10% datura leaf extract 5% & 10.

Material and Methods

Present investigation was conducted at local village of Manora District Washim, Maharashtra. Experiment repeating twice during year 2015-16 and 2016-17. In field of Black gram and green gram susceptible cultivars appearance of powdery on the leaves and Observations were recorded on per cent disease severity once before first spray. Chemicals and plant extract suitable for control and screening of promoting cultivars for resistant against powdery mildew fungi.

Preparation of chemicals

Table 1 *In vivo* evaluation, fungicides used and the concentration tested has been given in table.

Sr.No.	Name of fungicide	Conc %
1.	Bavistin_50% WP	0.05
		0.10
2.	Bayleton 25% WP	0.05
		0.10
3.	Mancozeb 75% WP	0.3
		0.5
4.	Distilled water (Control)	Control

Preparation of plant extracts

Healthy plants of lantana camera and datura plant was collected from local field and area, each plant leaves washed with running water then surface sterilized with 70% alcohol then washed in sterile distilled water and macerated with sterile distilled water at 1:1 (w/v) ration using mortal and pestel. The plant extract was filtered through whatman no. 1 filter paper. The filtrate plant extract considered as 100% concentration

(Gangwar S.K,*et al.*,2000; Vidyasagar G.M.*et.al.*, 2001). From this concentrated extract desired concentration was taken i.e.,5 and 10 % respectively.

Sr.No.	Name of fungicide	Conc %
1.	Lantana leaf extract	5
		10
2.	Datura leaf extract	5
		10
3.	Distilled water	Control

Application of chemicals (fungicide) and plant extract in field of susceptible cultivars of Black gram and Green Gram.

The application of chemicals (fungicides) and plant extract was conducted Black Gram (TAU-1) and Green Gram (K-851) susceptible cultivars grown in soil plot with different line. each line sowing 1000 seeds . 22 days after germination white patches appear on leaves of cultivars and were recorded disease incidence and disease severity before applying chemicals and plant extract, Observations were recorded on per cent disease severity once before first spray, before 2nd spary, before 3rd spray and after 3 rd spray at 60 DAS.

Disease incidence and Severity analysis

In all experiments, disease incidence (percentage) and severity were assessed at 2-day intervals. Severity of symptoms on individual plants were rated on a scale from 0–4 according to the percentage of foliage with yellowing or necrosis in acropetal progression: 0 = 0%, 1 = 1–33%, 2 = 34– 66%, 3 = 67– 100%, 4 = dead plant. Incidence and severity data (0–4 scale) within a pot were used to calculate a disease intensity index (DII) by the equation: $DII = [(\sum Si \times Ni) / 4 \times Nt] \times 100$ and percent disease control was calculated using another formula (Munshi N.A, *et al* , 1994)

$$\text{Percent disease control (PDC)} = \frac{\text{Control PDI} - \text{Treatment PDI}}{\text{Control PDI}} \times 100$$

Results and Discussion

In *in vivo* experiment was conducted to evaluate the effect of chemicals (fungicides) and plant extract against powdery mildew of Black Gram and Green Gram during 2015-16&2016-17. Disease severity and disease incidence before spray of chemicals and plant extract were recorded range 32 to 42%. In both susceptible cultivars found that Bavistin 50% WP with concentration was most effective afer 3rd spray on control of powdery mildew, followed by Balyton 25% WP with concentration 0.10 % was effective for reduction of disease severity after 3rd spray but least effective low conc. of mancozeb also plant extract,

Lantana camera extract with concentration 10% was considerable effect on control of powdery mildew on both crops' cultivars summarized in **table 1&2**.

Agrawal (1989) reported the effective control of disease with two sprays of bavistin @ 500 ppm at 15 days interval starting on the appearance of the first symptoms. Pawar *et al.* (1985a) noticed that among eight fungicides tested on chilli (*Capsicum annuum*) against *L. taurica*, Bayleton 25 WP at 0.05%, Saprol 20% EC at 0.15 per cent and Karathane 48% EC (dinocap) at 0.1 mildew %. Proved most effective in controlling the disease and increasing the yield.

Audichya and Thakare (2000) reported carbendazim @ 0.05% to be most effective for control of powdery mildew in opium poppy.

Table. 1. Evaluation of different concentration of chemicals/ fungicides and plant extracts for management of powdery mildew on Black Gram Cultivar (TAU-1).

Name of chemicals/ Fungicide	Conc %	Powdery mildew disease incidence (%)			
		Before spray	After 1 ^s spray	After 2 nd spray	After 3 rd spray
Bavistin 50% WP	0.05	39	34	25	11
	0.10		29	18	07
	Unsprayed		46	53	59
Bayleton 25% WP	0.05	38	31	26	12
	0.10		27	22	09
	Unsprayed		43	54	61
Mancozeb 75% WP	0.03	34	29	25	14
	0.05		23	19	11
	Unsprayed		40	51	63
<i>Lantana Camera</i> extract	5%	37	34	29	18
	10%		31	21	13
	Unsprayed		43	56	63
<i>Metal dutura</i> extract	5	39	32	25	15
	10		27	22	16
	Unsprayed		45	57	63

Table. 1. Evaluation of different concentration of chemicals/ fungicides and plant extracts for management of powdery mildew on Green Gram Cultivar (K-753)

Name of chemicals/ Fungicide	Conc %	Powdery mildew disease incidence (%)			
		Before spray	After 1 ^s spray	After 2 nd spray	After 3 rd spray
Bavistin 50% WP	0.05	41	32	23	12
	0.10		28	17	10
	Unsprayed		48	57	67
Bayleton 25% WP	0.05	43	37	27	18
	0.10		29	22	12
	Unsprayed		49	64	69
Mancozeb75% WP	0.03	41	37	26	17
	0.05		31	25	13
	Unsprayed		47	56	62
<i>Lantana Camera</i> extract	5%	42	39	28	21
	10%		33	22	14
	Unsprayed		49	54	59
<i>Metal dutura</i> extract	5	43	38	29	20
	10		34	23	15
	Unsprayed		46	58	61

Conclusion

Experiment indicates that, management of powdery mildew fungi on Black Gram and Green Gram, Bavistin 50% WP with concentration 0.10% response to reduction of disease severity after 1st spray upto 3rd at the intervals of 8 days in each spray.

Similar trends found in both cultivars after spraying of chemicals and plant extract. If the increasing concentration of chemicals/ fungicides and plant extract 3 spray at 8 days intervals may help for maximum reduction of disease severity but production cost increased.

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