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Strategy for chemical management of powdery mildew in *Cucumis sativus* L.

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ABSTRACT

Cucumber (*Cucumis sativus* L.) is an important cucurbitaceous vegetable crop. Cucumber crop is attacked by various plant diseases, among them Powdery Mildew of cucumber caused by *Erysiphe cichoracearum* is an important disease which effect a large area of the cucumber crop. An experiment was laid down at Vegetable Research Farm, Kalyanpur, Kanpur for disease management by chemicals and observations on disease intensity and yield was recorded in consecutive years (2011-12 and 2012-13). It is evident that minimum disease intensity (6.85% and 7.35%), maximum edible fruit yield of cucumber (221.36 and 216.19 q/ha) and maximum C: B ratio (1:2.90) were recorded in treatment (T_5) three foliar sprays of Bayliton (0.2%) at 10-12 days intervals from initiation of the disease followed by treatment (T_1) three foliar sprays of Tridemorph (calexin 0.1%), which gave (10.15 and 8.65%) disease intensity, (204.12 and 209.62q/ha) edible fruit yield and C: B ratio (1:2.45).

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INTRODUCTION

Cucumber (*Cucumis sativus* L.) is an important cucurbitaceous vegetable crop. It is thought to be one of the oldest vegetable cultivated by man with historical records dating back 5,000 years. The crop is the fourth most important vegetable after tomato, cabbage and onion in Asia, however, second Western Europe in tropical Africa. Cucumber (*Cucumis sativus* L.), is rich in phosphorus, potassium and oxalic acid and is popularly used in salads. Its seeds are diuretic, tonic and refrigerant. The odorous principle of *Cucumis sativus* L. is extractable with alcohol and is used in certain bouquet perfumes (Pandey, 2000).

Cucumber (*Cucumis sativus* L.) belongs to the family *Cucurbitaceae*. The family has two subfamilies and includes 118 genera and 825 species. This family is important for edible fruits, seeds and major food crops are produced in the tropical, subtropical and temperate regions (Judd *et al.*, 2008).

The original cucumber species is found wild in Himalaya in northern India. When grafting is used, it is to produce plants with roots that are resistant to some soil-borne diseases, caused by e.g. *Fusarium* spp., *Verticillum* spp. and *Pythium* spp., and to create plants

Table 1 : Average disease intensity and yield for two years with C:B ratio

Sr. No.	Treatments	DI (%)		Yield (q/ha)		C:B ratio
		2011-12	2012-13	2011-12	2012-13	
1.	Tridemorph (calexin 0.1%)	10.15 (18.55)	8.65 (17.07)	204.12	209.62	1:2.45
2.	Flusilazole (Cursor 0.1%)	10.50 (18.88)	9.00 (17.42)	148.52	164.02	1:2.65
3.	Tebuconazole 0.1%	11.05 (19.39)	9.55 (17.97)	124.61	140.11	1:2.35
4.	Sodium bisulphate 0.25%	16.52 (23.96)	15.02 (22.78)	111.27	126.77	1:2.10
5.	Bayliton 0.2%	6.85 (15.12)	7.35 (15.69)	221.36	216.19	1:2.90
6.	Difneconazole 0.05%	12.06 (20.29)	10.56 (18.93)	120.16	135.66	1:1.64
7.	Wettable sulpher 3.0%	13.95 (21.91)	12.45 (20.63)	97.09	112.59	1:1.87
8.	Carbedazim 0.1%	15.75 (23.36)	14.25 (22.15)	88.19	103.69	1:1.72
9.	Neem oil 0.25%	16.93 (24.27)	15.43 (23.11)	76.52	92.02	1:1.40
10.	Control	41.66 (40.18)	40.16 (39.30)	36.21	51.71	1:1.15
	CD (P=0.05)	1.88	1.96	15.48	16.40	
	CV	4.82	5.27	7.29	7.01	

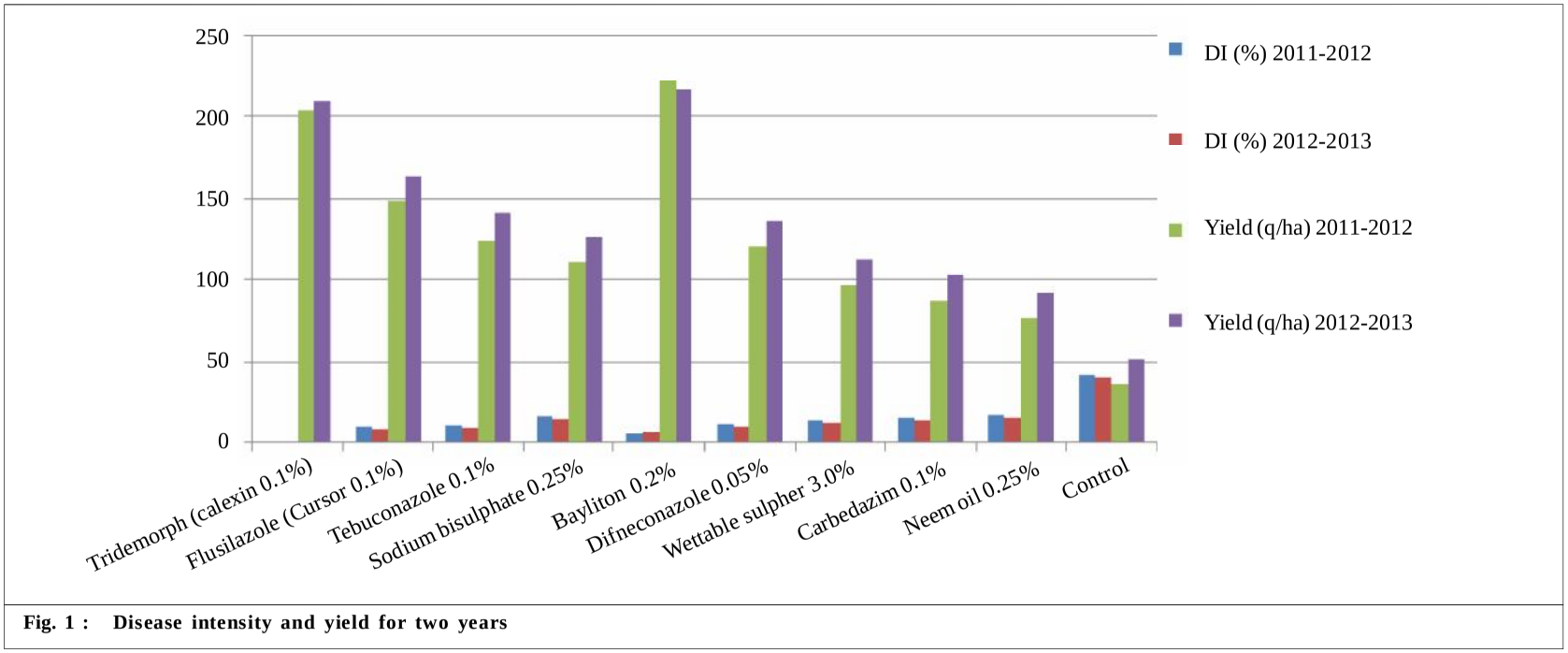

Fig. 1 : Disease intensity and yield for two years

with more robust root systems, which results in better vegetative growth. Seeds can be sown in different substrates (Molen, 2007 and 2008). Cucumber crop is attacked by various plant diseases, among them Powdery Mildew of cucumber caused by *Erysiphe cichoracearum* is an important disease which effect a large area of the cucumber crop. Powdery mildew can appear in most parts of the cucumber plant, but is most common in young tissues on the upper surface of the leaves (Agrios, 2005). The root is not infected and fruits are free of visible infection (Sitterly, 1978). The first signs of infection are circular white spots, appear in both the upper and lower surfaces of the leaf (Robinson and Decker- Walters, 1997).

MATERIAL AND METHODS

The experiment was conducted at Vegetable Research Farm, Chandra Shekhar Azad University of Agriculture and Technology, Kanpur during two consecutive years (2011-12 and 2012-13). The experiment was laid out on Randomized Block Design (RBD) with three replication. The soil of experimental plot was sandy loam in nature, well drained with low C:N ratio. The plot size was 3 x 2 m. The recommended agronomical practice was followed to raise the crop healthy. Foliar spray of nine fungicides *viz.*, Tridemorph (calexin 0.1%), Flusilazole (Cursor 0.1%), Tebuconazole 0.1 per cent, Sodium bisulphate 0.25 per cent, Bayliton 0.2 per cent, Difneconazole 0.05 per cent, Wettable sulpher 3.0 per cent, Carbendazim 0.1 per cent and Neem Oil 0.25 per cent applied for two times at 10-12 days interval from the initiation of the disease. A set of unsprayed field plots served as control. Disease intensity was recorded on the basis of percentage of infected leaf area after 10 days of last spraying. Then statistically analyzed. The percentage of the disease over control was calculated as follows.

$$\text{Per cent disease control} = \frac{\text{Disease intensity in control - Disease intensity in treatment}}{\text{Disease intensity in control}} \times 100$$

The yield (q/ha) of *Cucumis sativus* also recorded in plot and then statistically analyzed.

RESULTS AND DISCUSSION

An experiment was laid down at Vegetable Research Farm, Kalyanpur, Kanpur for disease management by chemicals and observations on disease intensity and yield was recorded in consecutive years (2011-12 and 2012-13). The trial comprised of nine treatment *viz.*, Tridemorph (calexin 0.1%), Flusilazole (Cursor 0.1%), Tebuconazole 0.1 per cent, Sodium bisulphate 0.25 per cent, Bayliton 0.2 per cent, Difneconazole 0.05 per cent, Wettable sulpher 3.0 per cent, Carbendazim 0.1 per cent, and Neem Oil 0.25 per cent for foliar sprays. The average disease intensity, edible fruit yield and C:B ratio recorded were summarized in Table 1 and Fig. 1 showed that all the treatment tested was significantly effective in reducing Powdery mildew of cucumber percentage over control. It is evident that minimum disease intensity (6.85% and 7.35%), maximum edible fruit yield of cucumber (221.36 and 216.19 q/ha) and maximum C: B ratio (1:2.90) were recorded in treatment (T_5) three foliar sprays of Bayliton (0.2%) at 10-12 days intervals from initiation of the disease followed by treatment (T_1) three foliar sprays of Tridemorph (calexin 0.1%), which gave (10.15 and 8.65%) disease intensity, (204.12 and 209.62q/ha) edible fruit yield and C: B ratio (1:2.45). The similar data on chemical control of powdery mildew in cucumber reported by Katsube (2001); Khan (1999) and Chaudhry *et al.* (2009).

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