

## Efficacy of some fungicides against downy mildew of cucumber

SK GUPTA and KUMUD JARIAL\*

Directorate of Extension Education

Dr YS Parmar University of Horticulture and Forestry, Nauni, Solan 173230 HP

\*Institute of Biotechnology and Environmental Science, Neri, Hamirpur 177001 HP

Email for correspondence: skguptamp@rediffmail.com

### ABSTRACT

Seven fungicides have been tested on cucumber against downy mildew caused by *Pseudoperonospora cubensis* namely Amistar (azoxystrobin), Curzate (cymoxanil + mancozeb), Ridomil MZ (metalaxyl + mancozeb), Blitox-50 (copper oxychloride), Indofil M-45 (mancozeb), Companion (mancozeb + carbendazim) and Shield during 2006-07. Spray application of each fungicide was started in the 1<sup>st</sup> week of July and in all three sprays were given at 14 days interval. Data were also recorded in terms of fruit yield per plot and data of two years were pooled and analyzed. Among all the fungicides tested Ridomil MZ proved the best in managing the disease up to maximum level (73.75%) during both the years with lowest disease severity value of 16.11 per cent. As far as fruit yield was concerned it was recorded to be more in the plots with lesser disease severity and vice-versa. Pooled fruit yield for both the years was maximum (6.858 kg/plot) in the plots sprayed with Ridomil MZ non-significantly followed by in those sprayed with Shield (6.523 kg/plot) and Blitox-50 (5.942 kg/plot).

**Keywords:** Cucumber; downy mildew; fungicides; disease; efficacy

### INTRODUCTION

Cucumber (*Cucumis sativus* L) is an important vegetable crop of Himachal Pradesh. Due to varied agro-climatic conditions in the state the crop is also sown as off-season vegetable bringing lucrative returns to the farmers. Present studies were conducted at the experimental farm of Department of Plant Pathology, Dr YS Parmar University of Horticulture and Forestry, Nauni, Solan, HP where crop is

grown from May to October every year. During its cultivation the crop is attacked by many diseases out of which downy mildew caused by *Pseudoperonospora cubensis* is an important disease (Gupta et al 1993). The disease can be kept under control with the fungicidal sprays (Gupta and Shyam 1998, Sharma et al 2003). Various fungicides have been tested in Himachal Pradesh from time to time against this disease (Gupta et al 1993, Sharma et al 2003) but the disease still appears regularly

in the state causing huge economic losses to the farmers. Keeping this in view present investigations were conducted with an objective to evaluate the comparative efficacy of some fungicides against the disease.

### MATERIAL AND METHODS

To study the efficacy of seven fungicides viz Amistar (azoxystrobin), Curzate (cymoxanil + mancozeb), Ridomil MZ (metalaxyl + mancozeb), Blitox-50 (copper oxychloride), Indofil M-45 (mancozeb), Companion (mancozeb + carbendazim) and Shield against the disease an experiment was conducted in Randomized Block Design at Experimental Farm, Department of Plant Pathology, Dr YS Parmar University of Horticulture and Forestry, Nauni, Solan, HP during the cropping seasons of 2006 and 2007 and each treatment was replicated thrice. Twenty five days old plants of cucumber cultivar Khira-75 raised in polybags were transplanted in the plots of size 4.5 x 1.5 m at a distance of 1.5 x 1.5 m in the month of May during both the years. Spray application of each fungicide was started in the 1<sup>st</sup> week of July and in all three sprays were given at 14 days interval. Three plots kept untreated served as control. Observations were recorded in terms of disease severity on 0-4 scale for downy mildew (Thind et al 1991) and final per cent disease severity was calculated as per the formula given by McKinney (1923). Data

were also recorded in terms of fruit yield per plot and data of two years were pooled and analyzed.

### RESULTS AND DISCUSSION

Data presented in Table 1 reveal that all the fungicides were able to manage the disease as compared to untreated control during both the years. Among all the fungicides tested Ridomil MZ proved the best in managing the disease up to maximum level (73.75%) during both the years as is evident from lowest pooled disease severity value (16.11%) in the plots sprayed with Ridomil MZ which was statistically at par with those sprayed with Shield (19.73%) while Amistar was recorded to be least effective exhibiting only 32-57 per cent disease control. Rest of the fungicides exhibited intermediate levels of disease severity and control. As far as fruit yield was concerned it was recorded to be more in the plots with lesser disease severity and vice-versa. Pooled fruit yield for both the years was maximum (6.858 kg/plot) in the plots sprayed with Ridomil MZ non-significantly followed by in those sprayed with Shield (6.523 kg/plot) and Blitox-50 (5.942 kg/plot). Control plots yielded minimum fruits (3.029 kg/plot) during both the years followed by Companion (3.917 kg/plot) and Amistar (4.392 kg/plot) treated plots.

Ridomil MZ has been reported to be effective against cucumber downy

Table 1. Effect of fungicides on severity of downy mildew and yield of cucumber

Treatment	Mean disease severity (%)			Disease Control (%)	Fruit Yield (kg/plot)		
	2006	2007	Pooled		2006	2007	Pooled
Amistar	52.72 (0.1%)	30.00 (46.65)	41.39 (33.16)	32.57 (37.18)	4.717	4.067	4.392
Curzate	33.33 (0.25%)	26.67 (35.26)	30.00 (27.71)	51.13 (31.49)	6.000	4.350	5.175
Ridomil MZ (0.25%)	22.22 (28.03)	10.00 (18.44)	16.11 (23.24)	73.75	7.017	6.700	6.858
Blitox-50	30.55 (0.3%)	16.67 (33.51)	23.61 (24.05)	61.54 (28.78)	6.217	5.667	5.942
Indofil M-45	36.11 (0.25%)	21.67 (36.91)	28.89 (27.71)	52.94 (32.31)	5.533	4.217	4.875
Companion	41.67 (0.25%)	26.67 (40.21)	34.17 (31.07)	44.33 (35.64)	4.371	3.517	3.917
Shield	27.78 (0.4%)	11.67 (31.76)	19.73 (19.89)	67.86 (25.83)	6.817	6.230	6.523
Control	69.45 (56.49)	53.33 (46.91)	61.39 (51.70)		3.200	2.858	3.029
CD <sub>0.05</sub>		4.92				1.063	

74

Efficacy of fungicides

Figures in parentheses are arc sine transformed values.

mildew by various workers earlier also (Gupta et al 1993, Gupta and Shyam 1998, Sharma et al 2003) and it exhibited maximum disease control (73.75%) during present studies also. However Amistar and Curzate did not prove effective during present investigations although these fungicides have been reported to be effective (87.8% disease control) against cucumber downy mildew by Robak (2001). Thind et al (2004) has also reported Amistar to be effective against this disease. Lesser disease control exhibited by these two fungicides during present studies can be attributed to the presence of certain highly virulent strains of pathogen in this area.

## REFERENCES

- Gupta SK and Shyam KR 1998. Protective activity of fungicides against downy mildew of cucumber. *Plant Disease Research* **13**(1): 60-61.
- Gupta SK, Shyam KR and Dohroo NP 1993. Effect of fungicides on severity of downy mildew and yield of cucumber (*Cucumis sativus* L) in Himachal Pradesh. *Pestology* **17**(3): 37-39.
- McKinney HH 1923. Influence of soil temperature and moisture on infection of wheat seedlings by *Helminthosporium sativum*. *Journal of Agricultural Research* **26**: 195-217.
- Robak J 2001. An attempt at integrated control of downy mildew (*Pseudoperonospora cubensis*). *Journal of Vegetable Crop Production* **7**(2): 21-32.
- Sharma DR, Gupta SK and Shyam KR 2003. Studies on downy mildew of cucumber caused by *Pseudoperonospora cubensis* and its management. *Journal of Mycology and Plant Pathology* **33**(2): 246-251.
- Thind TS, Mohan C, Prem Raj and Arora JK 2004. Activity spectrum of strobilurins, a new generation of eco-fungicides against some fungal pathogen. *Indian Phytopathology* **57**(1): 104-106
- Thind TS, Singh PP, Sokhi SS and Grewal RK 1991. Application timing and choice of fungicides for control of downy mildew of musk melon. *Plant Disease Research* **6**: 49-53.

*Received: 8.7.2013*

*Accepted: 12.11.2013*