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Effect of hexaconazole on yield attributes of different cultivars of mustard in response to powdery mildew disease

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ABSTRACT

Fungicide treated plant (control) and naturally infected plants (Diseased) with powdery mildew of five brassica cultivars are under study. At harvest, siliquae per plant, the seeds per siliqua, and 1000 seed weight obtained from control plants were significantly higher than the diseased plants. The effect of powdery mildew on yield component of five mustard cultivars viz, V₂ (SKM-9801), V₁ (SKM-9804), GM-1, Varuna and Skm-9818 were observed. Finding showed that significant change in all yield quality characteristics. Yield component like no of siliqua/plant, number of seeds per siliqua and 1000 seed weight were higher in control with fungicide treated plant than the naturally infected diseased plant in all cultivars. Varietals differences were found to be non significant in No of seeds per siliqua and siliqua/plant where as test weight were found to be significant in all five cultivar. © 2010 Trade Science Inc. - INDIA

INTRODUCTION

Five cultivars of Indian mustard (*Brassica juncea*) were grown in field conditions in which two plots were kept one for natural infection of powdery mildew disease while other was given a treatment of fungicide Hexaconazole @ 1ml/L. to control the disease during rabi season 2000-2001. Powdery mildew caused by *Erysiphe polygoni*. DC is one of the major diseases among the leaf diseases. Powdery mildew of mustard (*Erysiphe polygoni*. DC) is an obligate parasite and may persist on the host plant of *Brassica* spp. and other weeds may carry the fungal mycelium during off season. All the above ground parts of the plants are covered with dirty white circular patches. In recent years, many pathologists reported that damage to mustard crop may be very severe (@ 17.4%) when disease appears in early stages of plant growth^[3].

The disease is successfully controlled by synthetic chemicals, however indiscriminate uses of such chemicals have created resistance in pathogen and environmental pollution becomes potential threat to human and animal health. Hence, efforts are being made to find out alternative, which may be safe and eco-friendly so, always need to develop a resistant cultivar.

MATERIALS AND METHODS

Number of siliqua per plant

The total number of siliqua collected from five selected plants was counted and Average value per plant was worked out and recorded for each plot.

Number of seeds per siliqua

Twenty siliqua were selected randomly from each plot and seeds were counted. Average seeds / siliqua

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were recorded.

Test weight (1000 seed weight)

A representative seed sample was randomly drowned from the produce of each plot and 1000 seeds were counted and weighed.

RESULTS AND DISCUSSION

The pattern of yield attributes

There was a heavy incidence of powdery mildew under natural condition on all the varieties (i.e. Diseased plants). Under protected condition with fungicide (hexaconazole@ 1ml/L), plants were showing fairly good control of the disease. (i.e. control plants).

The data of 1000 seed weight, No of seeds per siliqua and no of siliqua per plant in fungicide treated plant (control) and naturally infected plants with powdery mildew of five brassica cultivars are presented in TABLE 1.

Siliquae per plant

Result revealed that varietal differences were found to be non significant (TABLE 1) for siliqua/plant. The siliqua per plants in control treatment varied from 165.5-238.5. The higher count was recorded with the cultivar V₂ and minimum count with V₃. In case of diseased plants it was ranged from 165 to 219.5. Treatment differences were found to be significant though the interaction effect of Variety x Treatment found to be non significant. Overall it was observed from data that fungicide treated plants (Control) had higher siliqua per plant as compared with the diseased plants. Similar result was also obtained by Ayub et al.^[2] who studied losses due to powdery mildew of black gram and showed that the no. of pods/plant significantly higher in sprayed (Thiovit 80 WP) compared with unsprayed plants.

Seeds per siliqua

Varietal differences were found to be non significant for both control and diseased plants, though the cultivar V₃ and V₄ showed significantly higher count of seeds per siliqua in control plants.

At harvest, the seeds per siliqua obtained from control plants were significantly varied from cultivar to cultivar. Significantly higher value was recorded with the

TABLE 1 : Changes in mean value of yield attributes of mustard cultivars at harvest

Cultivar	Treatment	Number of Siliqua/plant	Number of Seeds/siliqua	1000 seed wt.(g)
V ₁ (SKM-9804)	Diseased	206.00	10.75	2.21
	Control	221.75	12.00	2.26
	(Mean)	213.37	16.37	2.23
V ₂ (SKM-9801)	Diseased	219.5	9.00	2.10
	Control	238.25	11.5	2.19
	(Mean)	228.87	10.25	2.14
V ₃ (VARUNA)	Diseased	165.0	9.25	1.96
	Control	165.5	13.25	2.03
	(Mean)	165.25	11.25	1.99
V ₄ (SKM-9818)	Diseased	197.50	8.00	2.09
	Control	217.25	11.75	2.18
	(Mean)	207.37	9.82	2.13
V ₅ (GM-1)	Diseased	203.25	11.25	2.37
	Control	229.60	12.00	2.48
	(Mean)	216.42	11.62	2.43
S	SEm.	0.896	0.038	0.028
	CD at 5 %	NS	NS	0.079
V	SEm.	0.567	0.12	0.017
	CD at 5 %	1.673	0.38	0.05
T	SEm.	1.267	0.18	0.039
	CD at 5 %	NS	0.54	NS
CV %		23.31	10.7	3.56

cultivar V₃ (13.25 seeds per siliqua) and minimum with V₂ (11.5 seeds per siliqua). Similarly, the seeds per siliqua obtained from diseased plants varied from 8.00-11.25 seeds per siliqua. Overall it was observed that seeds per siliqua obtained from control plant had significantly higher count as compared with the diseased plant. Similar results were also recorded by Sharma and Sharma^[4]. They found significant reduction in secondary branches, siliquae per primary and secondary branches infected plants with the *Sclerotinia sclerotiorum* compared to healthy plants of Indian mustard.

1000 Seed weight

The varietal differences for 1000 seed weight were found to be significant for all the cultivars (TABLE 1). Significantly higher value was recorded with cultivar V₅ (2.45g) and minimum with cultivar V₃ (2.03g) obtained from control plants, where as in diseased plant, it was ranged from 1.96 to 2.37g. Overall it was observed

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that test weight obtained from control plants had significantly higher value as compared to the seeds obtained from diseased plant. Similar findings were also made by Janoczak et al.^[1] in wheat infected with powdery mildew. Ayub et al.^[2] stated that the 1000 grain weight of black gram was significantly higher in sprayed (Thiovit 80 WP) plants as compared with the unsprayed plants (powdery mildew infected plants).

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