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Assessment of yield losses due to *Alternaria* leaf spot in various cultivars of mustard and repeseed

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Healthy and infected pods of 18 lines/varieties of mustard and rapeseed were assessed to elucidate the loss of grain yield. Seed/pod and seed weight/100 infected pods were highly reduced. The grain yield loss was found to vary from 28.6-71.4%.

Key words : *Alternaria brassicae*, mustard and rapeseed, variety, seed, pod, yield

INTRODUCTION

Mustard (*Brassica juncea* L.) and repeseed (*B. campestris* L. var. *sarson* Prain; *B. compestris* L. var. *dichotoma* Watt.) are the most important oilseed crops extensively infected with *Alternaria brassicae* from seedling to maturity stages of plant growth. The crop sown during rabi season (September - October) is highly prone to leaf spot under high humidity, warm weather with alternate period of rain and sunshine. *Alternaria* leaf spot of mustard occurs quite regularly every year resulting 35-46% yield loss (Kolte *et al.*, 1987). In certain cultivars of yellow sarson, the loss in yield may go to the extent of 70%. The present study, was carried out to assess the yield loss comparing healthy and infected pods and on the basis of seed weight as a parameter due to leaf spot caused by *Alternaria*.

MATERIALS AND METHODS

Eighteen lines/varieties (Table 1) of mustard and repeseed were grown in 2x 4 m of plot size with three replications in randomized block design during 1995-96 crop season. The seed was sown in rows spaced at 40 cm distance. The plant to plant spacing was maintained at 15 cm after thinning the excess germlings.

To assess the loss due to *Alternaria* leaf spot, 100 healthy and diseased mature pods of each variety of mustard and repeseed were randomly colleted. The healthy and diseased pods were categorised under various groups containing 1-5, 6-10, 11-15 and 16-20 seeds per pod. Seed weight of 100 healthy and diseased pods were also recorded to calculate the loss of seed weight.

Table 1 : Effect of *Alternaria* pod infection on yield in different varieties of mustard and rapeseed

Variety	Healthy pods				Seed weight/ 100 pods (g)	Diseased pod				Seed weight/ 100 pods (g)	Grain yield loss (%)
	No. of pods in various seed groups					No. of pods in various seed groups					
	1-5	6-10	11-15	16-20		1-5	6-10	11-15	16-20		
HOCN 6-2(Varuna)	0	14	48	38	4.0	22	45	26	7	2.0	50.0
HOCN 21-1 (RK-8605)	0	0	71	29	4.0	27	46	15	2	2.0	50.0
Kranti	0	4	59	37	4.0	26	64	10	0	2.0	50.0
Varuna 2-1	0	2	58	40	4.0	32	60	8	0	1.9	52.5
Varuna 2	0	6	55	39	3.5	55	45	0	0	1.0	71.4
Varuna 3-1	0	13	47	40	3.0	58	42	0	0	1.5	50.0
Varuna 3	0	1	53	46	4.0	22	59	16	0	1.5	62.5
Varuna C	1	6	69	24	4.0	22	67	11	0	1.5	62.5
Varuna A	0	7	50	43	4.2	26	54	17	3	2.0	52.4
Varuna 13	0	9	55	36	3.5	32	48	15	5	2.0	42.9
L 23	0	23	36	41	4.0	24	55	14	6	2.0	50.0
L 19	0	23	45	32	3.0	33	53	9	5	1.75	41.7
L 16	0	14	49	37	3.0	15	61	24	0	1.5	50.0
L 12	0	11	49	40	3.5	25	58	17	0	1.5	57.1
L 6B	0	9	55	36	3.5	25	50	20	5	2.5	28.6
L 6A	0	20	48	32	4.0	33	48	17	2	1.5	62.5
L 1	0	15	42	43	4.2	30	38	27	5	1.75	58.3
HUM 2-1	0	18	46	36	3.7	46	42	15	3	1.5	59.5

RESULTS AND DISCUSSION

The effect of *Alternaria* disease on pods of infected mustard is shown in Table 1. The result shows that the number of pods bearing various seed groups were highly different in healthy and diseased plants. In healthy plants the pods bearing 1-5 seeds were almost nil whereas, maximum number of pods (36-71%) contained 11-15 seeds followed by those (24-46%) bearing 16-20 seeds. In diseased plants pods were completely reversed to the healthy one in bearing the seed. The pods bearing 16-20 seed were almost nil in most varieties except a few having 2-6 pods. The number maximum of pods (38-67%) had 6-10 seeds followed by those (15-55%) containing 1-5 seeds. The group of pods having 11-15 seeds were absent in Varuna 2 and Varuna 2-1, varieties. The seed weight of one hundred healthy and diseased pods shown in Table 1 indicate 28.6 - 71.4% yield loss due to *Alternaria* leaf spot. It may be due to reduction in number of seed per pod and weight of seed itself. The variety Varuna 2 was highly affected and showed 71.4% loss of grain yield. On the otherhand minimum (28.6%) loss of grain yield was observed in variety L6B.

The loss of grain yield due to pod infection was maximum in yellow sarson (*Brassica campestris*) followed by brown sarson (*B. campestris*) and raya (*B. juncea*) (Kadian and Saharan, 1985). They further reported that deep lesions on the pods increased seed infection and decreased pod length, seed/pod and seed weight (per 100 pods). Field experiments over 5 consecutive seasons showed that infection by *A. brassicae* and *A. brassicicola* reduced seed weight per 100 pods and seed yield, causing losses of 46.57% in rapeseed and 35.38% in mustard (Kolte *et al.*, 1987). Crop sown in first week of November or earlier showed least infection by *Alternaria brassicae* in the field and gave highest seed yield while with delay in sowing, a progressive increase in disease severity and reduction in yield were observed (Howlider *et al.*, 1989). Chahal (1986) reported yield loss of 43.62% in *Brassica campestris* and 38.36% in Indian mustard due to infection by *A. brassicae*. The loss in oil from seeds of rape plants heavily infected by *A. brassicae* ranged from 14.58 to 35.97% depeding on the cultivar; YST-151, T-42 and K-88 were most severely affected. The loss of oil content in mustard ranged from 14.12 to 29.07% with the greatest losses in Varuna and least in Kranti (Ansari *et al.*, 1988).

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