LOSSES CAUSED BY MUSTARD APHID, LIPAPHIS ERYSIMI /KALT./ IN DIFFERENT BRASSICA GENOTYPES

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Mustard aphid, Lipaphis erysimi /Kalt./, the most important pest of rapeseed and mustard in India has been observed to cause as high as 80 per cent losses in seed yield /Bakhetia, 1983/. No comprehensive information is available on the relative susceptibility/resistance and losses caused by this pest to various commonly cultivated rapeseed and mustard genotypes. An experiment, therefore, was conducted to estimate the losses caused by this pest to various Brassica cultivars and to find out their relative resistance if any.

Material and methods

Studies were conducted during four consecutive crop seasons i.e. 1982-83 through 1985-86. Six genotypes i.e. two of Brassica campestris /BSH-1 and YSPb-24/, two of B.juncea sub sp. juncea /Prakash and RH-30/ and one each of B.napus /HNS-3/and Eruca sativa /T-27/ were grown in the field following normal recommended agronomical practices. These cultivars were planted in two sets of conditions i.e. protected and unprotected. The protected set was kept free from mustard aphid attack by spraying with oxy-demeton methyl 0.025% as and when needed. The pest incidence was kept under observation and at the first appearance of the pest, the first protective spray on protected set was applied. Aphid population was regularly recorded from the unprotected set throughout the crop growth period on ten randomly selected plants /top 10 cm main shoot/. After maturity the data on seed yield from the respective sets were recorded. Avoidable losses were worked out.

Results and discussion

The incidence of aphid was observed on all the genotypes, though the intensity of attack varied greatly. Maximum aphid infestation was recorded during 1985-86 when as many as 240 aphids per twig were observed on B. campestris var. yellow "sarson" /YSPb-24/ followed by 192 aphids on B.campestris var. brown "sarson" /BSH-1/. The variations in this pest incidence have been reported earlier too /Singh et al., 1984/.

Brassica campestris /BSH-1 and YSPb-24/ and B.napus /HNS-3/ cultivars were observed to be highly susceptible to mustard aphid. Fairly high population of this pest on B.juncea /Prakash/ was mainly attributed to its late maturity and attracted the pest from other cultivars approaching maturity. However, B.juncea cultivars could be placed in tolerant/resistant group along with T-27 of Eruca sativa which harboured minimum aphid population throughout these studies. Earlier workers also had observed B.juncea cultivars to be comparatively more tolerant/resistant than B.campestris cultivars /Singh, et al.,1973; Singh et al., 1984/.

The number of aphids harboured by various genotypes had direct effects on the seed yield from the respective crops. During 1985-86 when the pest incidence was most severe, minimum yield of 1.04 q/ha in HNS-3 cultivar was obtained from unprotected set as compared to 8.48 q/ha from the protected set /Table 2/. Barring E.sativa /T-27/ similar results from the other cultivars were obtained. Significantly higher seed yields were recorded from protected sets of every crop in comparison to their respective untreated sets. On the other hand when aphid incidence was very low /1983-84/, seed yield of 16.44 q/ha was obtained from unprotected sets of B.napus /HNS-3/ the most susceptible cultivar.

Aphid infestation had direct effect on yield from the protected and unprotected sets. During 1982-83 and 1985-86

when severe aphid incidence was recorded a maximum of 78 and 88 per cent yield losses, respectively, could be avoided by adopting control measures against aphid on HNS-3 /Table 3/. Similar was the case with BSH-1 and YSPb-24 cultivars of B.campestris group.

Critical perusal of the data on average avoidable losses revealed that B.napus /HNS-3/ cultivar proved to be the most susceptible affording as high as 61.32 per cent yield losses due to mustard aphid incidence. This was followed by B.campestris /BSH-1 and YSPb-24/ where the losses were 32 and 34 per cent, respectively. High susceptibility of B.napus was reported by Kalra et al./1987/, too, under laboratory condition. However, Gill and Bakhetia /1985/ reported a few strains of B.napus to be resistant as compared to B.campestris which had previously too, been reported susceptible to this pest /Bakhetia and Bindra, 1977/. The comparison of B.napus with B.juncea and B.campestris revealed that B.napus and B.campestris were much more susceptible than B.juncea. The least preferred host by this pest was E.sativa /T-27/ where only 16 per cent yield losses could be attributed to this pest. It is evident that B.juncea sub sp. juncea cultivars were quite tolerant, since 23 to 27 per cent yield losses were recorded on these crops, despite harbouring aphid population as high as 100 to 150 aphids per/10 cm top central twig.

There was a positive correlation /r=0.6951/ between the number of aphids infesting the crop and the yield losses.

Hence, it is concluded that none of the tested rapeseed and mustard genotype was free from mustard aphid, Lipaphis erysimi, infestation. However, E.sativa and B. juncea group of cultivars proved most tolerant to Lipaphis erysimi.

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Table 1. Season's peak aphid population / 10 cm long central twig.

Genotypes	1982-83	1983-84	1984-85	1985-86	Average
Brassica campestris var. brown "sarson" /BSH-1/	180.9	46.6	145.6	192.0	141.3
Brassica campestris var. yellow "sarson" /YSPb-24/	220.0	15.0	140.8	240.0	153.9
Brassica napus /HNS-3/	105.3	17.5	179.0	120.0	105.4
Brassica juncea sub sp. juncea /Prakash/	28.0	15.0	11.5	150.0	51.1
Brassica juncea sub sp. juncea /RH-30/	-	17.5	12.0	100.5	43.3
Eruca sativa /T-27/	18.2	5.0	5.0	13.5	10.4

Table 2. Yield performance of different genotypes under unprotected and protected conditions against Lipaphis erysimi /Kalt./

Genotypes	yield q/ha											
	1982-83			1983-84			1984-85			1985-86		
	UP	P	AV.	UP	P	AV.	UP	P	AV.	UP	P	AV.
B.campestris Var. brown "sarson" /BSH-1/	8,38	12,83	10,60	22,17	23,77	22,97	22,54	33,47	28,00	4,00	9,24	6,62
B.campestris Var. yellow "sarson" /YSPb-24/	8,42	16,59	12,50	24,65	26,27	25,46	27,22	33,79	30,50	2,67	6,95	4,81
B.napus /HNS-3/	2,86	13,11	7,98	16,44	20,61	18,52	9,49	22,96	16,22	1,04	8,48	4,76
B.juncea sub sp. juncea /Prakash/	13,01	16,90	14,95	23,27	26,50	24,88	28,19	34,76	31,47	9,62	16,10	12,86
B.juncea sub sp. juncea /RH-30/	-	-	-	24,64	28,99	26,81	36,94	44,35	40,64	7,90	15,90	11,90
Eruca sativa /T-27/	5,83	8,51	6,17	13,77	15,00	14,38	16,89	19,03	17,96	5,05	6,00	5,52
Average	7,70	13,59	-	20,82	23,52	-	23,55	31,39	-	6,04	10,44	-

UP = Unprotected set. , P = Protected set

C.D. /5%/				
Plant Protection/PP/	0,42	1,16	2,11	0,29
Genotypes /G/	0,58	0,62	1,22	0,48
PP x G	0,83	1,83	3,00	0,67

Table 3. Avoidable losses caused by Lipaphis erysimi /Kalt./in different Brassica genotypes.

Genotypes	1982-83	1983-84	1984-85	1985-86	Average
Brassica campestris var. brown "sarson" /BSH-1/	34.68	6.76	32.78	56.71	32.73
Brassica campestris var. yellow "sarson" /YSPb-24/	49.25	6.53	19.34	61.58	34.18
Brassica napus /HNS-3/	78.18	20.22	58.79	88.09	61.32
Brassica juncea sub sp. juncea /Prakash/	23.02	12.17	19.12	40.25	23.64
Brassica juncea sub sp. juncea /NH-30/	-	15.01	16.61	50.31	27.31
Eruca sativa /T-27/	30.90	8.17	10.95	15.83	16.44