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INTENSITY OF INSECT PESTS ON MUNG BEAN CULTIVARS IN ARID RAJASTHAN

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Mung bean [*Vigna radiata* (L.) Wilczek] is an important pulse legume of Rajasthan, especially as an integral part of the arid and semi-arid cropping systems (Shankarnarayan and Lahiri, 1978). Due to financial constraints, only 5 to 6% of the growers use plant protection measures in only 1.5% of the total area under mung bean in Rajasthan (Acharya, 1985). Therefore, use of varieties with low incidence of insect pests is recognized as the most important component of the integrated pest managment in such situations. Incidence studies of pests on different genotypes help identify suitable varieties to be included in breeding programmes. Screening of mung bean genotypes has been reported for *Euchrysops cnejus* Fabricius and *Madurasia obscurella* Jacoby (Srivastava, 1975b), *Bemisia tabaci* Gennadius (Chhabra et al., 1980) and *Tarsonemus* mite (Singh and Chauhan 1984). However, no such work has been reported against important weevil pests like *Myllocerus maculosus* Desbrochers (Srivastava et al., 1975a and *Cyrtozemia cognata* Marshall (Pal, 1972) especially in arid regions of Rajasthan. In arid regions the intensity of pests usually remains low and varietal reaction to different pests is often distinct. Field screening of 24 cultivars was, therefore, attempted on the basis of intensity of different pests.

The varieties were sown on July 19, 1985 in 2.4m x 4m plots in a randomized block design with three replications at the Research Farm of the Central Arid Zone Research Institute, Jodhpur. The sowing was done in rows 40 cm apart. keeping plant to plant distance 15 cm approximately, with the usual cultural practices and raised as a rainfed crop. During the crop season (meteorological weeks 28 - 36) the rainfall was only 127.1 mm, with a rainless period from July 21 to August 2 and no rains after August 19.

Populations of leaf weevils (per plant) and jassids (all stages) per trifoliate were recorded on 10 plants selected at random in each plot at the peak period of incidence on August 26, 1985. per cent damage by the pod borer *Lampides boeticus* (Linn.) was worked out from pickings done on September 4, 1985 when most of the pods were fully developed and maturity started setting in. Fifty pods were picked at random in each plot, brought to the laboratory and individual pods carefuly opened up and

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examined for the borer damage and/or the presence of borer larvae. The data were subjected to analysis of variance.

The average intensity of infestation of the grey weevil (*M. maculosus*), black weevil (*C. cognata*). jassids (*Empoasca kerri* Pruthi) and the per cent incidence of the lycaenid pod borer *L. boeticus* (as per cent pods damaged) on 24 cultivars of mung bean are presented in Table 1. In the arid western Rajasthan, with low and erratic rainfall pattern mid-season droughts are frequent. The dry conditions result in a relatively lower level of most pest populations than in other regions. The mean number of weevils per 10 plants varied from 6.66 to 15.0 (overall mean 10.8) for *M. maculosus* against a relatively higher range of 13.0 to 23.3 (overall mean 16.8) for *C. cognata*. The number of *E. kerri* per trifoliate ranged widely on different cultivars from 1 to 5.33 (overall mean 2.66). Similarly mean per cent pods damaged by *L. boeticus* varied from 2.66 to 29.33 (overall mean 6.94).

Intensity of *M. maculosus* per plant, through at a lower edge and range, was statistically at par in most of the cultivars but significantly higher than most others in 'ML 26/10-3', 'ML 131' and 'P 101'. Minimum infestation was in cv 'K 85', 'ML 56' 'ML 229', 'ML 322', 'S8', and 'UPM 71-1-1'. The overall intensity of the black weevil *C. cognata* was 38.7% higher than that of *M. maculosus* but there was no significant difference in its incidence on different cultivars, although it was relatively more on 'ML 26/10-3', 'ML 326', 'P 101', 'P 104' and 'PDM 14'. Srivastava (1975a) reported preponderance of *M. maculosus* on mung bean in comparison to other legumes but the intensity of the pest was not pointed out. In the present studies, its intensity was very low and less than that of *C. cognata* under arid conditions of western Rajasthan where mung bean is a poor choice for *M. maculosus* (Verma, 1987)

Most of the cultivars had comparable infestations of jassids except that 'P 103' and 'P 105' had significantly higher jassid counts than 'UPM 79-3-4', 'S 8' and 'PDM 54'. Minimum infestation was seen also in 'PDM 14'.

Mean per cent damage to pods by the lycaenid borer *L. boeticus* was higher (> 10%) in 'P 105'. 'ML 5', and 'PDM 14', the highest damage in 'P 105' was statistically significant in relation to all other cultivars tested. The pod borer damage was also significantly higher in 'P 109' and 'S 8' than in 'ML 229'. 'UPM 79-3-4', 'P 103', 'P 104' and 'DM 1' although all these cultivars had less than 10% pods damaged by the pod borer.

Incidence of insect pests thus varied on different cultivars. Some cultivars like 'P 101', 'P 105', 'P 109' and 'PDM 14' had relatively higher incidence of most of the pests observed. Variety 'ML 5' supported moderate number of foliar pests but the intensity of pod borer *L. boeticus* was very high. 'P 104' had low incidence of all the pests except jassids. 'ML 229', and 'UPM 71-1-1' had, in general, a low incidence

of all the pests observed. Jassids and pod borers are economically the most important pests. The varieties 'ML 229', 'P 103', 'UPM 79-3-4', 'S 8', ML 267', 'P 102' and 'PDM 54', supporting a low population level of these pests are regarded as promising for arid regions from the point of their reaction to pest incidence.

Table 1. Intensity of *Myllocerus maculosus* Desb., *Cyrtozemia cognata* Mshl., *Empoasca kerri* Pruthi and *Lampides boeticus* Linn. on 24 cultivars of mung bean in kharif, 1985 at CAZRI, JODHPUR (Means of 3 replications)

Cultivar	*M.maculosus* (no./10 plants)	*C. cognata* (no./10 plants)	*E. kerri* (no./trifoliate)	*L. boeticus* (%incidence)
DM-I	10.00 (3.240) ab	16.6	2.66 (1.656)	3.33 (10.40)
K 851	6.66 (2.643) a	16.6	2.33 (1.544)	6 00 (14.05)
ML 5	10.0 (3.240) ab	13.3	2.66 (1.761)	16.00 (23.55)
ML 26/10-3	15.0 (3.902) c	20.0	2.00 (1.470)	4.00 (11.28)
ML 56	6.66 (2.643) a	16.6	2.00 (1.321)	6.66 (14.19)
ML 131	15.0 (3.902) c	20.0	2.33 (1.642)	4.00 (11.28)
ML 229	6.66 (2.636) a	15.0	2.33 (1.678)	2.66 (9.27)
ML 267	10.0 (3.240) ab	16.6	1.66 (1.678)	4.66 (12 03)
ML 322	6.66 (2.43) a	13.33	3.00 (1.858)	6.00 (14.03)
ML 326	10.0 (3.240) ab	23.33	2.00 (1.581)	7.33 (15.33)
ML 337	13.33(3.669) a	16.66	3.66 (2 037)	7.33 (15.68)
MUG 125	10.0 (3.240) a	16.66	4.33 (2.180)	7.33 (15.60)
P 101	15.0 (3.902) c	22.33	3.00 (1.426)	6.66 (14.93)
P 102	10.0 (3.240) ab	13.33	1.66 (1.440)	5.33 (12.91)
P 103	13.33 (3.704 bc	16.66	5.33 (2.377)	2.66 (9.27)
P 104	11.66 (3.472) bc	23.33	4.00 (2.121)	3.33 (10.15)
P 105	11.66 (3.472) bc	13.33	5.33 (2.377)	29.33 (17.77)
P 109	10.0 (3.240) ab	15.0	2.66 (1.774)	9.33 (17.77)
PDM 14	10.0 (3.240) ab	20.0	1.33 (1.290)	14.66 (22.45)
PDM 54	10.0 (3.240) ab	13.33	1.33 (1.178)	4.00 (11.28)
PDM 62	10.05 (3.240) ab	16.66	2.33 (1.678)	5.33 (12.91)
S 8	6.66 (2.643) a	13.33	1.66 (1.253)	8.66 (17.10)
UPM 71-1-1	6.66 (2.643) a	15.0	3.33 (1.932)	4.00 (11.28)
UPM 79-3-4	13.33 (3.704) bc	16.66	1.00 (1.171)	2.66 (9.27)
CD (P=0.05)	0.656	ns	0.840	5.09
S Em +	0.237		0.303	1.837

Figures in parentheses: * $\sqrt{n+0.5}$; ** Angular transformed; Figures followed by same alphabets in a column are statistically at par

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