Madras Agric. J., 98 (4-6): 178-179, June 2011
https://doi.org/10.29321/MAJ.10.100271

Short Note

Field Screening of Promising Castor Cultures against Capsule Borer, *Conogethes punctiferalis* and Leafhopper, *Empoasca flavescens*

M. Suganthy*
Department of Agricultural Entomology
Tamil Nadu Agricultural University, Coimbatore - 641 003

Studies were carried out on castor at Tapioca and Castor Research Station, Yethapur, Salem District, Tamil Nadu to find out the resistant sources against capsule borer and leafhoppers Among the eight entries screened, capsule damage ranged from 0 to 11.5 % in the primary spikes as against 35.7 % in the check TMVCH 1. The damage ranged from 0 to 10.8 % in the secondary spikes as against 26.7 % in the check. Maximum capsule damage was observed in RG 3089 (11.5 and 10.8 % in the primary and secondary spikes, respectively), followed by RG 2813, which recorded 5.4 and 6.2 % capsule damage in the primary and secondary spikes, respectively. RG 2770, RG 2776, RG 2778 and RG 2849 were completely free from capsule borer damage.

Key words: Castor, screening, capsule borer, leafhoppers, plant characters

Castor, *Ricinus communis* Linn. is widely grown under rainfed conditions. In Tamil Nadu, the castor hybrid, TMVCH 1 and the varieties TMV 5 and TMV 6 are widely grown as pure crop during kharif season in Erode, Salem, Namakkal and Dharmapuri due to their high seed and oil yield and heavy demand for castor oil in many industries. With the introduction of hybrid castor, TMVCH 1, cultivation is on the increase under irrigated and rainfed condition in Tamil Nadu. More than 60 insect pests cause in heavy yield loss. The leaf hopper, *Empoasca flavescens* F. is the most important sucking pest causing severe hopper burn damage (Jayaraj, 1967), resulting in poor formation of capsules.

The castor shoot and capsule borer *Conogethes punctiferalis* G. is a serious pest of all India importance attacking castor from flowering stage onwards. The freshly hatched larvae feed on greenish coat of the capsule and enter the capsule by boring at the pedicellar or stigmatic end. Castor beans are bored through caruncle. At the site of entry, a silken gallery is made in which excreta and frass are accumulated. As the damage advances, a characteristic webbing of capsules along with excreta and frass is seen. When inflorescence is attacked at the time of emergence, it withers and dries away and the terminal shoot also gets killed. Though the borer can bore in to the tender shoots, it has preference for capsules.

Plant morphological characters are involved in imparting resistance against leafhoppers and capsule borer (Jayaraj, 1968). Hence, the present study was undertaken to screen the resistant sources in castor against capsule borer and leafhopper.

*Corresponding author email: suganthyento@rediffmail.com

Materials and Methods

Germplasm accessions of castor were screened against leafhoppers and capsule borer with TMVCH 1 as check during kharif 2006 with eight promising entries *viz*., RG 2770, RG 2776, RG 2778, RG 2786, RG 2813, RG 2820, RG 2849 and RG 3089. Each accession was sown in a single row of 5 m length with the spacing of 90 x 60 cm and replicated thrice. Single row of susceptible / local check TMVCH 1 was grown on both the sides of test entries in sandwich method.

Leaf hopper numbers were recorded from three leaves per plant on ten randomly selected plants in each entry where each plant was considered as a replicate. The leaves were selected as one from top (excluding two top most leaves), middle (medium matured leaves) and bottom (leaving two bottom most leaves) on the main shoot. The percentage leaf area burnt (hopper burn injury) was also recorded in 0-5 scale.

Capsule borer damage, was recorded both in the primary and secondary spikes and expressed as damage per plant. Data were subjected to statistical analysis (Panse and Sukhatme, 1978).

Results and Discussion

Capsule damage was in the range of 0 to 11.5 per cent in the primary spikes as against 35.7 per cent in the check TMVCH 1(Table 1). While, the

Table 1. Screening of germplasm entries of castor against capsule borer and leafhoppers (Kharif '06)

Entries	Leafhopper		Damage by capsule borer		Plant characters	
	Population (No./3 leaves/plant)	Damage (grade)	Primary spike (%)	Secondary spike (%)	Bloom	Spike & capsule
RG 2770	9.0	0.3	0.0	0.0	Triple	Compact, spiny
RG 2776	10.3	0.3	0.0	0.0	Triple	Compact, spiny
RG 2778	23.7	0.3	0.0	0.0	Double	Compact, spiny
RG 2786	9.0	0.3	3.7	2.8	Triple	Compact, spiny
RG 2813	14.8	0.3	5.4	4.2	Double	Compact, spiny
RG 2820	89.0	2.0	8.9	9.4	Zero	Compact, spiny
RG 2849	31.7	0.7	0.0	0.0	Double	Compact, spiny
RG 3089	29.0	1.0	11.5	10.8	Double	Compact, spiny
TMVCH 1	8.3	0.3	35.7	26.7	Triple	Compact, spiny

*Mean of observations from 10 randomly selected plants.

damage was in the range of 0 to 10.8 per cent in the secondary spikes, as against 26.7 per cent in the check TMVCH 1. Maximum capsule damage was observed in RG 3089 (11.5 and 10.8 % in the primary and secondary spikes, respectively), followed by RG 2820, which recorded 8.9 and 9.4% capsule damage in the primary and secondary spikes, respectively. These two entries (RG 3089 and RG 2820) were with double and zero bloom, respectively and the capsules in the spike were compact and spiny, that favoured infestation by capsule borer. RG 2770, RG 2776, RG 2778 and RG 2849 were completely free from capsule borer damage (0 per cent in both the primary and secondary spikes) RG 2786 and RG 2813 recorded less than 5 per cent capsule damage.

RG3089 recorded the maximum number of leafhoppers (89 per plant) and maximum hopper burn injury grade of 2.0, followed by RG 2849 (31.7 per plant), RG 3089 (29 per plant) and RG 2778 (23.7 per plant). Entries with triple bloom *viz*., RG 2770, RG 2776, RG 2786 recorded minimum number of leafhoppers per plant (9, 10.3 and 9 per plant, respectively) with the lowest hopper burn injury grade of 0.3 (Table 1).

The results obtained by Dorairaj *et al*. (1963) indicated triple bloom varieties of castor to be more resistant to jassid, compared to no bloom and single bloom varieties. The preferred varieties in general had broader leaves, since they afford more protection and shelter to jassid from hot conditions. Jayaraj (1967) also proved that the antibiosis component of resistance in certain castor varieties affected significantly the biology of the insect.

Castor varieties with double and triple blooms were more susceptible to whiteflies (David and Radha, 1964) and mites (Chandrasekharan *et al.,* 1964). and the castor varieties which were resistant to jassids are susceptible to whiteflies and *vice versa*.

References

Chandrasekharan, N.R., Navakodi, K., Shetty, B.K. and Ramaswamy, N.M. 1964. A preliminary study on the varietal resistance in castor to attack by mites. *Indian Oilseeds J.,* **8**: 46-48.

David, B.V. and Radha, N.V. 1964. Castor whitefly, *Trialeurodes ricini* Misra and its control. M*adras Agric.J.*, **51**: 90-91.

Dorairaj, M.S., Savithri, V. and Aiyadurai, S.G. 1963. Population density as a criterion for evaluating varietal resistance of castor (*Ricinus communis* L.) to jassid infestation. *Madras Agric.J.,* **50**: 100.

Jayaraj, S. 1967. Hopper burn disease of castor bean varieties caused by *Empoasca flavescens* (Fabr.) in relation to the histology of the leaves. *Phytopathology,* **58**: 397-406.

Jayaraj, S. and Basheer, M. 1964. Biological observations on the castor leafhopper, *Empoasca flavescens* (F) (Jassidae: Homoptera). *Madras Agric.J.,* **51**: 89-90.

Singhri, S.H., Bagan, J.S. and Yadava, T.P. 1973. Note on varietal susceptibility in castor to shoot and capsule borer, *Dichocrocis punctiferalis* Guen. (Lepidoptera: Pyralidae). *Indian J. Agric. Sci.,* **2**:269-270.

Received: March 4, 2011; Accepted: June 20, 2011