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Chemical Control of Seed Midge (*Systole albipennis* Walker) Infesting Stored Fennel

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The fennel (*Foeniculum vulgare* Miller) is one of the important spices crops cultivated in Gujarat. The seed midge (*Systole albipennis* Walker) belonging to family eurytomidae, order hymenoptera, is a serious pest of stored fennel (Subba Rao and Bhatia, 1963; Gupta, 1962; Butani and Mittal, 1989). The infestation starts from field condition through deposition of eggs in immature fruits. The larvae continue to develop in seed and adults are found to emerge during storage. The infested seeds, show the circular exit holes through which the adults of the pest emerged out. Thus, this makes it difficult to identify the pest infestation under the field condition as well as during early stages of storage. The feeding by larva renders the seeds hollow and consequently reduced the weight of seeds. The infestation varies from 16 to 19 per cent and thus the value of seeds is reduced up to 40 per cent. (Butani and Mittal, 1989). According to Patel *et al.*, (1986) the pest activates from March to September in stored seeds and cause, as high as 20.7 per cent loss in weight of seeds. The pest can be managed by application of insecticides on standing crop which destroys the adult wasps depositing their eggs in immature seeds. The present study was therefore carried out to know the most effective insecticides against seed midge, *Systole albipennis* W.

The experiment was conducted at departmental farm, Junagadh in randomized block design with seven treatments including control and replicated thrice during the year 1990. The crop was seeded on 14-09-90. The first picking of seeds was made on 10-02-91. The variety used was PF-35. All other agronomical practices were adopted as per the recommnedations in vogue. The treatments tried were endosulphan 0.07 per cent, methyl parathion 0.025 per cent, monocrotophos 0.036 per cent, methyl-o-demeton 0.025 per cent, thiometon 0.03 per cent and DDVP 0.05 per cent. The first spraying was carried out at the time of emergence of flowers and the subsequent three at 15 days interval. Before flowering, the crop under experiment was kept free from insect-pests infestation i.e., jassids and thrips by spraying conventional insecticide dimethoate 0.03 per cent. The spray solution required was estimated by spraying the known quantity of water on control plot. After harvesting of crop, the sample of hundred grams of seeds of fennel was collected from

each plot of the treatments. The samples thus collected were kept under observations for the emergence of adult wasps up to nine months. Randomly, thousand seeds from each of the samples of 100 gms were observed for the infestation of midge. The seeds exhibiting circular exit holes were considered as infested seeds. The treatment wise per cent infestation

TABLE 1

Effect of different insecticides on perc ent infestation of midges (*Systole albipennis* Walker) and yield/ha in fennel seeds during storage.

Treatments	*Percentage of infestation due to seed midges*	*Weight of healthy seeds (kg/ha)*
1. Endosulphan 0.07 per cent	16.27* (7.85)**	1293.98
2. Methyl parathion 0.025 per cent	14.53 (6.29)	1386.57
3. Monocrotophos 0.036 per cent	17.12 (8.66)	1631.94
4. Methyl-o-demeton 0.025 per cent	18.67 (10.24)	1671.30
5. Thiometon 0.03 per cent	20.43 (12.19)	1578.70
6. DDVP 0.05 per cent	15.40 (7.05)	1230.32
7. Control	27.57 (21.42)	820.60
S. Em. ±	0.730	56.306
C. D. at 5%	2.250	173.511
C.V %	6.809	7.099

*Data after angular transformation.

**Figures in parentheses are retransformed values.

due to midge was worked out. The data thus obtained were subjected to statistical analysis after angular transformation. The weight of healthy seeds was estimated on the basis of per cent infestation. The result thus obtained are presented in Table 1.

The result (Table 1) showed that the insecticidal treatment have significantly reduced the infestation due to seed midge over control. The lowest per cent infestation was recorded in plots treated with methyl parathion 0.025 per cent (6.29 per cent) followed by DDVP 0.05 per cent (7.05 per cent), endosulphan 0.07 per cent (7.85 per cent), monocrotophos 0.036 per cent (8.66 per cent), methyl-o-demeton 0.025 per cent (10.24 per cent) and thiometon 0.03 per cent (12.19 per cent), while in control it was recorded as 21.42 per cent. However, the treatment of methyl parathion 0.025 per cent, endosulphan 0.07 per cent and DDVP 0.05 per cent were found equally effective in reducing the damage due to midges.

The result (Table 1) also showed that the yield of healthy seeds was significantly increased in all the insecticidal treatment over control. However, the highest yield of 1671.30 kg/ha was obtained in the treatment of methyl-o-demeton 0.025 per cent followed by monocrotophos 0.036 per cent (1631.94 kg/ha), thiometon 0.03 per cent (1578.70 kg/ha), methyl parathion 0.025 per cent (1386.57 kg/ha), endosulphan 0.07 per cent (1293.98 kg/ha) and DDVP 0.05 per cent (1230.32 kg/ha). While in control it was recorded as 820.60 kg/ha. The insecticides methyl-o-demeton 0.025 per cent, monocrotophos 0.036 per cent and thiometon 0.03 per cent were found equally effective in increase of weight of healthy seeds. Perhaps, this might be due to control of severe attack of aphids at flowering stage. Mittal and Butani, (1989) have also reported that the treatment of methyl parathion 0.025 per cent, endolsulphan 0.07 per cent and DDVP 0.05 per cent proved effective in control of aphids.

The insecticides applied at flowering stage on standing crop proved effective in minimization of infestation due to seed midges during storage of fennel. The treatment of methyl parathion 0.025 per cent, endosulphan 0.07 per cent and DDVP 0.05 per cent was found to be the most effective in reduction of damage due to midges. While the treatment of methyl-o-demeton 0.025 per cent, monocrotophos 0.036 per cent and thiometon 0.03 per cent proved effective in increasing the weight of healthy seeds. Thus, it can be concluded that these three treatments should be applied at flowering stage on standing crop of fennel to minimize the infestation due to seed midges during storage.

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