

## Assessment of Loss in Grain Yield by Sorghum Shoots Fly, in Certain Varieties and Hybrids

By

M. S. VENUGOPAL<sup>1</sup>, M. MANI<sup>2</sup> and K. NATARAJAN<sup>2</sup>

### ABSTRACT

The susceptibility of 19 varieties and nine hybrids of sorghum to shoot fly, *Atherigona varia soccata* (Rond.) was studied. Among the varieties N.J. 1953 recorded the minimum of 1.4 per cent and 302 recorded the maximum of 8.4 per cent under protected conditions, and N.J. 1953 registered the lowest incidence of 9.9 per cent under unprotected conditions. In case of hybrids SPH 4 showed the maximum of 34.7 per cent damage under unprotected conditions. The yield loss due to shoot fly damage was also found to be significant.

### INTRODUCTION

Among the many pests, the shoot fly, *Atherigona varia soccata* (Rond.) is a serious pest causing severe damage by cutting the main shoot at the seedling stage resulting in dead heart formation. Ponnaiya (1951), Rao and Rao (1956), Jain and Bhatnagar (1962), Singh *et al.* (1968) and Jotwani and Srivastava (1970) have studied the varietal resistance in sorghum lines to this pest. The present investigation was carried out with 19 varieties and 9 hybrids for their reaction to shoot fly under protected and unprotected conditions and to assess the loss in grain yield in these varieties.

### MATERIALS AND METHODS

The varieties/hybrids were grown in *Kharif* (1974) in two separate blocks in three replications. In one block

carbofuran 3 per cent G was applied in the soil at 3 g/metre row and the other block kept as unprotected. Prophylactic measures for stem borer and midge were adopted in both the blocks with the recommended insecticides. Observation on the shoot fly damage was made on 28th day after germination by counting the total and affected plants showing dead hearts and the percentage of infestation was calculated. The yield of grain was recorded in all the varieties/hybrids under protected and unprotected conditions.

### RESULTS AND DISCUSSIONS

The shoot fly infestation was low in the treated block in all the varieties and hybrids than in untreated block. A minimum of 1.4 per cent damage was recorded in N.J. 1953 while the

1—3 Department of Entomology, Tamil Nadu Agricultural University, Coimbatore-641 003

TABLE Shoot fly damage and loss in grain yield in certain sorghum lines

Entries	% shoot fly damage		Grain yield (Q/ha)		% loss
	Treated	Untreated	Treated	Untreated	
370	3.3 (10.4)	19.0 (28.9)	33.8	21.6	36.1
171	6.2 (13.7)	13.6 (21.4)	10.5	6.8	35.2
302	8.4 (16.5)	25.6 (30.2)	12.5	2.4	80.1
303	3.8 (10.8)	27.6 (31.7)	7.8	1.9	75.6
296	6.7 (14.9)	23.2 (28.7)	27.8	20.2	27.3
269	5.8 (13.2)	13.8 (21.6)	27.6	19.7	35.8
146	2.1 (7.6)	16.1 (23.4)	41.2	30.9	25.0
168	4.9 (12.1)	22.0 (27.5)	38.7	28.6	26.0
713	2.8 (9.3)	19.9 (26.4)	37.3	27.5	26.2
555	4.2 (11.6)	11.3 (19.6)	22.6	8.8	61.0
604	3.1 (10.0)	9.9 (18.2)	37.2	22.4	39.8
329	4.0 (10.8)	12.7 (20.6)	33.4	16.8	49.7
SB 411	1.7 (7.2)	14.4 (22.3)	52.1	34.8	33.2
H 107	3.2 (10.2)	19.5 (26.1)	36.3	22.2	38.8
N.J. 1953	1.4 (6.5)	9.9 (17.9)	39.0	33.9	13.1
CS. 3541	4.6 (11.8)	17.4 (24.3)	36.1	32.4	36.1
22. E	3.7 (10.2)	31.0 (23.1)	53.8	25.5	29.3
K3 Local	5.0 (12.8)	13.6 (21.4)	17.5	15.3	12.8
Swarna	3.9 (10.6)	26.5 (30.4)	42.2	17.8	57.8
CSH. 1	3.3 (9.9)	31.0 (33.5)	38.8	23.2	40.2
CSH. 2	6.5 (14.7)	32.3 (34.6)	60.2	41.2	31.5
CSH. 4	5.2 (12.3)	18.2 (25.5)	45.1	34.1	24.3
CSH. 5	3.2 (10.0)	26.0 (30.3)	76.7	48.2	37.4
2219A x CS. 3541	5.6 (13.5)	20.1 (26.6)	57.2	38.8	32.1
3660A x 370 (SPH. 1)	3.6 (10.5)	21.1 (27.1)	56.5	35.1	37.8
3660A x 1324 (SPH.2)	3.5 (10.4)	18.8 (25.5)	62.7	47.4	24.0
3660A x 232 (SPH.3)	3.2 (9.9)	22.0 (27.6)	62.6	47.0	24.9
2077A x CS3541 (SPH.4)	5.1 (12.8)	34.7 (35.2)	57.3	37.3	34.9
C.D. (P=0.05)	Not significant	6.8	11.2	9.9	

Figures in parantheses are transformed values

maximum damage of 8.4 per cent was observed in 302 (Table). However, there was no significant difference between the varieties/hybrids. In the case of untreated, the infestation ranged from 9.9 (NJ, 1953; 604) to 34.7 (SPH.4) per cent and the differences between the varieties/hybrids were significant. NJ, 1953 was quite promising and recorded the lowest damage both in treated and untreated conditions and the yield loss was also minimum. The yield loss was found to be significantly higher in all varieties and hybrids in untreated block as compared to treated block. Reduction in yield was found to be highest in 302 (80.1%) and 303 (75.6%), and lowest in NJ, 1953 (13.1%) among the 19 varieties tested while the hybrid SPH<sub>2</sub> recorded the minimum of 24.0 per cent reduction. Schuster *et al.* (1975) compared the field resistance of peanut varieties to the lesser grain borer, *Elasmopalpus lignosellus* (Zeller) under protected and unprotected conditions and reported similar observations.

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