SHORT COMMUNICATION

SCREENING OF SORGHUM GENOTYPE ENOTYPES FOR SHOOT FLY, *ATHERIGONA SOCCATA* RONDANI (DIPTERA: MUSCIDAE) OVIPOSITIONAL BEHAVIOR

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Abstract: The twenty five sorghum genotypes evaluated against shoot fly, genotypes SU 1394, SU 1397 and SU 1400 performed better being less preferred for oviposition on the 14th and 21st day after germination with a mean oviposition of 55.77 and 61.14, 56.84 and 60.00 and 54.75 and 61.33 per cent, respectively and next to resistant check IS 2312.

Keywords: Shoot fly, Oviposition, Dead heart

INTRODUCTION

Sorghum, *Sorghum bicolor* (L.) Moench is an important cereal crop in Asia, Africa, and Australia. It is grown all over the world and is a staple food and fodder Crop in India. The losses due to insects have been estimated to be over US$ 1000 million annually in the semi-arid tropics. Among cereals, sorghum is the fourth most important crop after rice, wheat and maize in India. The major sorghum growing areas are in the states of Maharashtra, Andhra Pradesh, Karnataka, Gujarat, Tamil Nadu and Rajasthan. Insect pests play an important role in lowering the yield of sorghum. The shoot fly and stem borer are the key pests in most of sorghum growing area. Of which, the shoot fly, *Atherigona soccata* Rondani is considered to be the most severe pest in Rajasthan as well as in India causing tremendous damage at the seedling stage by killing the central shoot. Acknowledge of the mechanisms and the factors contributing to host-plant resistance to insects is useful in deciding suitable selection criteria and breeding methods for the genetic improvement of sorghum for resistance to insects (Sharma, 1993).

MATERIAL AND METHOD

A field trail was conducted the Instructional Farm at Rajasthan College of Agriculture, Udaipur during *kharif* 2011 in a Randomized Block Design with 3 replications. Sowing was done in four rows plots with 3.75 meter length. The row to row distance was maintained at 45 cm while plant to plant distance was maintained at 15 cm. The plot size was maintained 3.75m x 1.80m = 6.75 m^2. Twenty five experimental genotypes were tested under natural conditions of shoot fly infestation together with one resistant check and one susceptible check. Manual thinning operation was carried out 10 days after germination to maintain 30 plants in each row.

Twenty five experimental genotypes included were as SU 1382, SU 1383, SU 1384, SU 1385, SU 1386, SU 1387, SU 1388, SU 1389, SU 1390, SU 1391, SU 1392, SU 1393, SU 1394, SU 1395, SU 1396, SU 1397, SU 1398, SU 1399, SU 1400, SU 1401, SU 1402, SU 1403, SU 1404, IS 2312 (resistant check) and DJ 6514 (susceptible check).

Oviposition. The total count of plants with shoot fly eggs from 20 tagged plants (5 plants per row) from each genotype were recorded on 14th and 21st day after germination.

$$\text{Oviposition} \quad \% = \frac{\text{Number of plants with eggs}}{\text{Total number of plants observed}} \times 100$$

Dead hearts. Dead hearts formed due to shoot fly infestation was recorded on 20 tagged plants on 28th day after germination and the data were expressed as a per cent of dead heart.

$$\text{Dead heart} \quad \% = \frac{\text{Number of plants with dead heart}}{\text{Total number of plants observed}} \times 100$$

RESULTS AND DISCUSSION

It is evident from Table 1 that the maximum per cent oviposition was recorded in the susceptible check DJ 6514 (65.95); whereas, the minimum was recorded in the resistant check IS 2312 (53.73). The mean oviposition varied from 54.75 (SU 1400) to 62.29 (SU 1382). Among the test entries, SU 1400 was found better and closely at par to resistant check IS 2312. The genotype SU 1382 has maximum oviposition followed by SU 1385 and SU 1401 which were found significantly more oviposition than the remaining genotypes. SU 1389, SU 1399, SU 1400, SU 1402, SU 1394 and SU 1393 identified the less susceptible genotypes among the rest of the genotypes except DJ 6514. Though, SU 1382, SU 1385 and SU 1401 were found significantly at par with susceptible check DJ 6514 while remaining were significantly better over DJ 6514.

The data recorded 21st day after germination revealed that the maximum oviposition was recorded in the susceptible check DJ 6514 (71.95), while the minimum was recorded in the SU 1397 (60.00). Among the test entries, SU 1400 and SU 1383 were better over the rest of the genotypes and equal to resistant check IS 2312. The genotype SU 1401 had

the maximum oviposition followed by SU 1389 and SU 1391 which have significantly more oviposition and susceptibility towards resistance over the genotypes. SU 1394, SU 1383, SU 1386, SU 1397 and SU 1400 which were the least susceptible over the rest of the genotypes. Genotype SU 1397 was found most promising among rest of the genotypes.

The data on dead heart formation revealed that the maximum percentage of dead hearts were recorded in the susceptible check DJ 6514 (59.86), whereas the minimum was recorded in the resistant check IS 2312 (27.85). The dead heart formation in all the tested genotypes were significantly lower than susceptible check (Table 1). The per cent dead heart ranged from 36.90 (SU 1384) to 47.07 (SU 1393 and SU 1396). Among the test entries SU 1384, which was statistically at par with the SU 1383, SU 1402, SU 1403, SU 1392, SU 1391 and SU 1387 while SU 1384 and SU 1404 were performed significantly better over SU 1388, SU 1389, SU 1390, SU 1393, SU 1396, SU 1398, SU 1399, SU 1400 and SU 1401.

The present findings are in confirmation with Singh and Jotwani (1980); Krishananda *et al.* (1970); Ameta and Dadheech (2001), who reported that least eggs in resistant varieties in comparison to susceptible ones. Somashekhar (1985); Khandare and Patil (2010) reported that IS 2312 and IS 5490 recorded minimum number of eggs per plant followed by SPV 221, SPV 105, SPV 247 and SU 774.

Table 1: Effect of different sorghum genotypes on oviposition of Shoot fly corresponding to dead heart during, *kharif*, 2011

Genotypes	**14th Days after germination**	**21st Days after germination**	**Mean dead heart (%) at 28th day after germination**
	Oviposition	**Oviposition**	
SU 1382	62.29 (78.33) **	63.55 (80.00)	42.92 (46.39)
SU 1383	59.05 (73.33)	61.33 (76.67)	40.82 (42.78)
SU 1384	56.84 (70.00)	64.81 (81.67)	36.90 (36.06)
SU 1385	61.22 (76.67)	62.48 (78.33)	42.30 (45.33)
SU 1386	57.91 (71.67)	62.29 (78.33)	46.00 (51.65)
SU 1387	60.07 (75.00)	63.86 (80.00)	39.54 (40.53)
SU 1388	60.07 (75.00)	63.55 (80.00)	44.63 (49.36)
SU 1389	55.77 (68.33)	68.66 (86.67)	44.07 (48.37)
SU 1390	56.84 (70.00)	66.14 (83.33)	44.29 (48.69)
SU 1391	57.98 (71.67)	67.40 (85.00)	39.48 (40.52)
SU 1392	61.14 (76.67)	63.55 (80.00)	37.57 (37.19)
SU 1393	56.84 (70.00)	62.29 (78.33)	47.07 (53.34)
SU 1394	55.77 (68.33)	61.14 (76.67)	41.02 (43.14)
SU 1395	56.96 (70.00)	66.26 (83.33)	44.56 (44.05)
SU 1396	60.07 ()75.00	66.84 (83.33)	47.07 (53.34)
SU 1397	56.84 (70.00)	60.00 (75.00)	41.45 (43.83)
SU 1398	57.98 (71.00)	64.69 (81.67)	44.76 (49.60)
SU 1399	54.89 (66.67)	63.93 (80.00)	43.63 (47.62)
SU 1400	54.75 (66.67)	61.33 (76.67)	44.96 (49.92)
SU 1401	61.14 (76.67)	70.11 (88.33)	43.68 (47.70)
SU 1402	55.77 (68.33)	63.43 (80.00)	40.58 (42.32)
SU 1403	56.84 (70.00)	65.19 (81.67)	37.77 (37.52)
SU 1404	58.93 (73.33)	64.81 (81.67)	36.97 (36.18)
IS-2312 (R)	53.73 (65.00)	61.14 (76.67)	27.85 (21.91)
DJ-6514 (S)	65.95 (83.33)	71.95 (90.00)	59.86 (74.75)
S.Em.±	1.977	2.692	2.210
CD(5%)	5.622	7.655	6.285
CV (%)	5.881	7.237	9.057
Correlation Co-efficient (r)			

* 1 = Light green leaf with shining 2 = Medium green leaf with shining 3 = Dark green leaf without shining

** Figures in parentheses are angular re-transformed per cent values

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