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RESEARCH PAPER

Screening of sorghum genotypes against rice weevil (*Sitophilus oryzae* L.)

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Abstract : Research study on the screening of sorghum genotypes against rice weevil (*Sitophilus oryzae* L.) on stored sorghum was carried out during the year 2007-08 and 2008-09 at the Main Sorghum Research Station, Navsari Agricultural University, Surat, Gujarat state. Among twelve sorghum genotypes tested, the rice weevil preferred DJ 6514, SR 666, SR 1905 and SR 2460 genotypes for development as compared to other genotypes. On the basis of growth index and susceptible index, the genotypes SR 770, IS 6566, ICSV 700 and 168 II 108 were found less suitable. Among different varieties the sex ratio (male: female) ranged from 1:0.95 to 1:1.31. The genotype DJ 6514 was most susceptible genotype on the basis of damage, weight loss and population build up. The SR 770 maintained maximum germination per cent.

Key Words : Sorghum genotypes, Rice weevil, Screening

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INTRODUCTION

Damage due to insect-pests is one of the major limitations for low grain yield of sorghum. In India, nearly 32.1 per cent of the actual produce is lost due to insect-pests (Borad and Mital, 1983). Like many crops insect and mite pests are major constraints to higher yields in sorghum. The intensification of agriculture incorporating high yielding varieties coupled with improved agronomic practices and availability of other hosts create a congenial environment for the pests and results in the occurrence as regular one, nearly 150 insect species have been listed as pests of sorghum in India which attack from sowing to crop harvest in field and storage (Seshu Reddy and Davies, 1979). But only few of these are pests of economic importance. These pests infest sorghum crop at the different growth stages and take heavy fall in yield if they are not managed below economic injury level through well designed pest management strategies. Beside these entire pests the harvested sorghum grains are also attacked by storage pest during the storage. Among different storage pest, rice weevil, *Sitophilus oryzae* L. is major one. The most pre-requisite for developing resistant variety to a particular insect-pest is to identify resistant sources by screening the available germplasm. Hence, an investigation was carried out.

MATERIAL AND METHODS

Research studies on the screening of sorghum genotypes against rice weevil (*Sitophilus oryzae* L.) on stored sorghum were carried out during the year 2007-08 and 2008-09 at the Main Sorghum Research Station, Navsari Agricultural University, Surat, Gujarat state. Rice weevils were reared on grains of twelve different/ promising genotypes of sorghum replicated thrice to study the reaction of pest to different

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genotypes. For the purpose, freshly harvested grains of *Kharif* and *Rabi* seasons were secured from Main Sorghum Research Station, Navsari Agricultural University, Surat. These genotypes were SR 666, IS 6566, ICSV 700, 168 II 108, SR 770, SR 2460, GJ 36, GJ 38, IS 2312, DJ 6514, SR 1905 and SR 2804. The healthy, sound, unaffected grains of each genotype were dried in hot air oven for six hours at 42°C in order to eliminate the infestation by store grain pests. The moisture content of grains was 10.7 ± 2 per cent. For the study 100 g grains of each variety were kept in plastic bottle having 500 ml capacity. Five pairs of five days old weevils were introduced in each bottle and tops were kept covered with muslin cloth and tightly fixed with rubber band.

Developmental period and growth index :

To study the influence of sorghum varieties on larval and pupal development, the larvae were reared on the grains of twelve sorghum varieties and 100 grains of each variety were placed in specimen tube (diameter 3.5×7.5 cm) separately. Twenty five newly hatched larvae were released into each tube. The study was replicated thrice. The tube was covered with perforated lid and was kept in laboratory for the development of the larvae on the grains. After 10 days of release the grains were examined daily for the infestation up to pupal development and period from pupal development to adult emergence was considered as pupal period. The survival percentage and mean developmental period were worked out for each variety to calculate growth index. The growth index was calculated based on the formula described below :

$$\text{Growth index} = \frac{\text{Survival percentage}}{\text{Mean development period in days}}$$

Sex ratio :

The number of adults emerged in each variety were counted daily and male and female adults were separated to determine sex ratio in different varieties.

Fecundity and longevity :

The fecundity of female as well as longevity of male and female was also recorded for each variety separately.

Susceptibility index :

The susceptibility index of each variety was calculated by applying formula suggested by Dobie (1977) as below :

$$\text{Susceptibility index} = \frac{\text{Natural log } F}{D} \times 100$$

where,

F = Number of adults emerged

D = Mean developmental period

Germination test :

Seed germination test was carried out employing rolled paper towel test, described by International Rules for Seed testing (ISTA) (Anonymous, 1996). Germination was observed at monthly interval for six months.

Estimation of weight loss :

For loss estimation, 100 g of seeds of each variety were taken into plastic bottle of 500 g capacity, ten pairs of adults were released into the plastic bottle, open top of the plastic bottle was covered with muslin cloth and fastened with rubber band. Each treatment was replicated four times. Observation on seed damage and weight was recorded at monthly interval for six months. Weight loss was worked out by using the formula (Adams and Schulton, 1978) as below :

$$\text{Per cent weight loss} = \frac{(UND) - (DNU)}{U\,(ND + NU)} \times 100$$

where,

U - Weight of uninfected grains (g)

NU - Number of uninfected grains (n)

D - Weight of infested grains (g)

ND - Number of infested grains (n)

RESULTS AND DISCUSSION

Twelve sorghum genotypes were tested for their influence on some biological aspects of the pest. The observations on biological aspects, per cent weight loss, germination percentage, adult emergence, were taken into consideration to decide the susceptibility of sorghum genotypes to *S. oryzae*. Results on these parameters are presented in the Tables 1 to 6.

Developmental period and growth index :

The grub period (Table 1) on different genotypes of sorghum varied from 24.05 to 27.97 day. Grub period was shorter on genotype DJ 6514 (24.05 day) while, the longer grub duration ranged from 27.80 to 27.97 day was recorded on genotypes ICSV 700, IS 6566, 168 II 108 and SR 770. These genotypes were found at par with each other in view of grub duration. The larval period of 27.25 days on maize grains at temperature of 14 to 34°C and 55 to 88 per cent relative humidity was observed by Yevoor (2003). The pupal period ranged from 5.13 to 8.92 day on different genotypes of sorghum (Table 1). The lowest pupal period of 5.13 day was recorded on genotype SR 1905. The longer pupal period ranging from 8.72 to 8.92 day on genotypes IS 6566, ICSV 700, 168 II 108 and SR 770 which were at par with each other. The growth index was the highest in genotype DJ 6514 (2.05) which was at par with SR 666 (2.04), SR 2460 (2.00) and SR 1905 (1.95) which were found significantly higher over rest of the genotypes. The genotype SR 770 was found to be less suitable for *S. oryzae* as it showed the lowest growth index (1.17) and was at par with IS 6566 (1.18), ICSV 700 (1.20) and 168 II 108 (1.25). The observations revealed that

the sex ratio (male: female) ranged from 1:0.95 to 1:1.31 among different genotypes. Proportion of female was higher than male in almost all the genotypes except in SR 666 and GJ 36 and equal in IS 2312. The longevity of male and female were found lowest on 168 II 108 and SR 1905 genotypes, whereas highest longevity was found on genotype IS 2312.

Susceptibility index :

From the data (Table 2) it can be seen that the lowest number of adults were emerged in genotype IS 2312 (18.00 adult) which was at par with GJ 38 (18.38 adult), GJ 38 (18.67 adult), GJ 36 (19.00 adult) and SR 2804 (19.67 adult), respectively, and was significantly superior to rest of the genotypes. This was followed by ICSV 700 (26.00 adult), IS 6566 (26.33 adult), SR 770 (26.67 adult) and 168 II 108 (27.33 adult) which were at par with each other. The highest numbers of adults were emerged in genotype SR 1905 (45.67 adult) which remained at par with SR 666 (42.33 adult) and followed by SR 2460 (38.67 adult) and DJ 6514 (38.00 adult). The highest susceptibility index was found on genotypes SR 666 (15.33) which was at par SR 1905 (14.67), whereas the lowest susceptibility index was found on genotypes SR 770 (3.67).

Per cent grains damage :

At 30 days after storage, sorghum genotype 168 II 108 recorded significantly minimum grain damage of 21.33 per

Table 1 : Varietal influence on biological aspects of rice weevil, *S. oryzae*

Sr. No.	Variety	Grub period (days)	Pupal period (days)	Sex ratio (Male: Female)	Adult longevity (Days)		Survival %	Growth index
					Male	Female		
1.	SR 666	24.17	5.43	1:0.96	56.17	84.00	60.38	2.04
2.	IS 6566	27.82	8.72	1:1.24	56.33	84.17	43.00	1.18
3.	ICSV 700	27.80	8.87	1:1.31	56.50	84.50	44.00	1.20
4.	168 II 108	27.88	8.78	1:1.13	56.00	84.00	46.00	1.25
5.	SR 770	27.97	8.92	1:1.08	56.83	84.33	43.00	1.17
6.	SR 2460	24.47	5.23	1:1.07	56.17	85.00	59.47	2.00
7.	GJ 36	25.55	6.08	1:0.95	56.80	84.33	53.67	1.70
8.	GJ 38	25.37	6.23	1:1.25	56.83	84.00	53.33	1.69
9.	IS 2312	25.43	6.43	1:1.00	57.00	85.17	52.67	1.65
10.	DJ 6514	24.05	5.42	1:1.18	56.17	84.33	60.55	2.05
11.	SR 1905	24.43	5.13	1:1.31	56.00	84.50	57.65	1.95
12.	SR 2804	25.63	6.47	1:1.05	56.83	84.17	51.67	1.61
	S.E. ±	0.09	0.14	-	0.27	0.32	0.91	0.04
	C.D. (P=0.05)	0.28	0.41	-	NS	NS	2.66	0.10
	CV %	0.92	2.78	-	10.42	5.96	3.03	3.81

NS=Non-significant

Table 2 : Average number of adults emerged and susceptibility index of rice weevil, *S. oryzae* on different sorghum genotypes

Sr. No.	Variety	Average number of adults emerged	Susceptibility index
1.	SR 666	42.33	15.33
2.	IS 6566	26.33	9.00
3.	ICSV 700	26.00	9.33
4.	168 II 108	27.33	9.67
5.	SR 770	26.67	3.67
6.	SR 2460	38.67	11.83
7.	GJ 36	19.00	12.00
8.	GJ 38	18.67	12.83
9.	IS 2312	18.00	13.33
10.	DJ 6514	38.00	12.00
11.	SR 1905	45.67	14.67
12.	SR 2804	19.67	12.33
	S.E. ±	1.02	0.50
	C.D. (P=0.05)	2.99	1.49
	CV %	6.14	7.64

cent while maximum per cent damaged was noticed in DJ 6514 (55.00%). At 60 days after storage, maximum per cent grain damage was observed in DJ 6514 (70.67) while significant minimum damaged grains were noticed in IS 6566 (50.33%). At 90 DAS, cent per cent grain damage was found in genotype DJ 6514 and SR 2460. While, significantly minimum per cent of damaged grains was observed in GJ 36 (90.00%). The hundred per cent grain damage was found in all the genotypes after 120, 150 and 180 days of storage. There was not found any difference among genotypes of sorghum. The mean per cent grain damage data (Table 3) indicated that the most susceptible genotypes was DJ 6514 with 87.61 per cent grain damage, while 168 II 108 was the most resistance sorghum genotype (78.06%). The remaining genotypes react intermediate and found no significant differences.

Per cent weight loss :

The data (Table 4) on per cent weight loss in different genotype caused *S. oryzae* revealed that at 30 days after storage, sorghum genotype 168 II 108 recorded significantly minimum of 16.33 per cent weight loss whereas, maximum per cent of weight loss was noticed in DJ 6514 (50.00%). At 60 days after storage, maximum of 60.67 per cent weight loss was observed in DJ 6514 whereas, minimum of 40.33 per

Table 3 : Screening of sorghum varieties against rice weevil, *S. oryzae* on the bases of per cent grain damage

Sr. No	Variety	Per cent grain damage						
		30 DAS	60 DAS	90 DAS	120 DAS	150 DAS	180 DAS	Mean
1.	SR 666	42.43ef(45.00)*	55.73e(68.33)	80.54bc(97.33)	89.56a(100.00)	89.56a(100.00)	89.56a(100.00)	67.29ab(85.11)
2.	IS 6566	31.11c(26.67)	45.17a(50.33)	74.32ab(92.67)	89.56a(100.00)	89.56a(100.00)	89.56a(100.00)	62.24 ab(78.28)
3.	ICSV 700	28.56ab(23.00)	47.12ab(53.67)	76.19b(94.33)	89.56a(100.00)	89.56a(100.00)	89.56a(100.00)	62.37 ab(78.50)
4.	168 II 108	27.49a(21.33)	46.83ab(53.33)	75.46ab(93.67)	89.56a(100.00)	89.56a(100.00)	89.56a(100.00)	62.03a(78.06)
5.	SR 770	27.76ab(21.67)	47.12ab(53.67)	75.00ab(93.33)	89.56a(100.00)	89.56a(100.00)	89.56a(100.00)	62.10ab(78.11)
6.	SR 2460	45.97f(51.67)	52.65cd(63.33)	89.56d(100.00)	89.56a(100.00)	89.56a(100.00)	89.56a(100.00)	67.86 ab(85.83)
7.	GJ 36	37.70de(37.33)	50.77c(60.00)	71.56a(90.00)	89.56a(100.00)	89.56a(100.00)	89.56a(100.00)	64.30 ab(81.22)
8.	GJ 38	39.64e(40.67)	52.06cd(62.33)	75.00ab(92.33)	89.56a	89.56a(100.00)	89.56a(100.00)	65.35 ab(82.56)
9.	IS 2312	35.49d(33.67)	51.41cd(61.00)	72.54ab(91.00)	89.56a(100.00)	89.56a(100.00)	89.56a(100.00)	64.05 ab(80.94)
10.	DJ 6514	47.87fg(55.00)	57.23ef(70.67)	89.56d(100.00)	89.56a(100.00)	89.56a(100.00)	89.56a(100.00)	69.38 b(87.61)
11.	SR 1905	45.97f(51.67)	53.13d(64.00)	77.08bc(95.00)	89.56a(100.00)	89.56a(100.00)	89.56a(100.00)	67.29 ab(85.11)
12.	SR 2804	34.02cd(31.33)	50.94cd(60.33)	76.69bc(94.67)	89.56a(100.00)	89.56a(100.00)	89.56a(100.00)	64.16 ab(81.06)
	S.E. ±	1.05	0.72	1.54	–	–	–	2.08
	C.D. (P=0.05)	3.05	2.09	4.49	–	–	–	6.10
	CV %	4.90	2.44	3.42	–	–	–	3.61

* Figures in the parentheses are original values and those outside the parentheses are arcsine transformed values

Table 4 : Per cent weight loss of different varieties of sorghum due to *S. oryzae* infestation

Sr. No	Variety	Per cent weight loss						
		30 DAS	60 DAS	90 DAS	120 DAS	150 DAS	180 DAS	Mean
1.	SR 666	39.23g(40.00)*	49.78f(58.33)	52.65c(63.33)	52.12ab(62.33)	52.36a(62.65)	52.36a(62.65)	49.72ab(58.22)
2.	IS 6566	27.76c(21.67)	39.41a(40.33)	42.39a(45.33)	49.43ab(57.67)	52.36a(62.65)	52.36a(62.65)	44.08a(48.38)
3.	ICSV 700	25.10ab(18.00)	41.38ab(43.67)	44.31ab(48.67)	50.36ab(59.33)	52.36a(62.65)	52.36a(62.65)	44.54a(49.16)
4.	168 II 108	23.81a(16.33)	41.15b(43.33)	44.08ab(48.33)	50.01ab(58.67)	52.36a(62.65)	52.36a(62.65)	44.25a(48.66)
5.	SR 770	24.12ab(16.67)	41.38ab(43.67)	44.25ab(48.68)	49.78ab(58.33)	52.36a(62.65)	52.36a(62.65)	44.31a(48.77)
6.	SR 2460	43.68h(46.67)	46.89de(53.33)	49.78bc(58.33)	51.94bc(62.00)	52.36a(62.65)	52.36a(62.65)	49.66ab(58.11)
7.	GJ 36	34.63ef(32.33)	47.87ef(55.00)	45.00ab(50.00)	47.87b(55.00)	52.36a(62.65)	52.36a(62.65)	46.66ab(52.94)
8.	GJ 38	36.69f(35.67)	46.83cd(52.33)	49.12cd(57.33)	49.12bc(57.33)	52.36a(62.65)	52.36a(62.65)	47.70ab(54.66)
9.	IS 2312	32.39de(28.67)	45.57c(51.00)	48.45b(56.00)	48.45ab(56.00)	52.36a(62.65)	52.36a(62.65)	46.61ab(52.83)
10.	DJ 6514	45.00i(50.00)	51.18g(60.67)	52.36cd(62.65)	52.36ab(62.65)	52.36a(62.65)	52.36a(62.65)	51.41b(61.11)
11.	SR 1905	43.11h(46.67)	47.29e(54.00)	50.18bc(59.00)	50.77ab(60.00)	52.36a(62.65)	52.36a(62.65)	49.31ab(57.50)
12.	SR 2804	30.85d(26.33)	48.04ef(55.33)	45.17ab(50.33)	50.59ab(59.67)	52.36a(62.65)	52.36a(62.65)	46.61ab(52.83)
	S.E. ±	0.85	0.70	1.12	1.05	–	–	2.01
	C.D. (P=0.05)	2.47	2.03	3.26	3.10	–	–	5.88
	CV %	4.34	2.51	2.71	2.15	–	–	3.06

* Figures in the parentheses are original values and those outside the parentheses are arcsine transformed values

cent weight loss observed in IS 6566. At 90 days after storage, sorghum genotype IS 6566 recorded significantly minimum of 45.33 per cent weight loss. The highest weight loss was noticed in DJ 6514 (62.65%) and GJ 38 (57.33%). At 120 days after storage, sorghum genotype GJ 36 recorded significantly minimum of 55.00 per cent weight loss was observed while the highest weight loss was noticed in DJ 6514 (62.65%). At 150 and 180 days after storage, weight loss does not show any differences among sorghum genotypes. The mean per cent weight loss data (Table 4) indicate that the most susceptible genotype DJ 6514 with 61.11 per cent weight loss, while IS 6566 was the most resistance sorghum genotype where there was 48.38 per cent weight loss. The remaining genotypes reacting intermediate and found no significant differences.

Populations build up :

Significantly higher number of adults were emerged in DJ 6514 (123.33) while less number of adults were observed in SR 770 (61.00 adult) at 30 days after storage when five pairs of weevils were released at the beginning of storage (Table 5). The population build up was significantly more in DJ 6514 (278.67) after 60 days of storage whereas, it was less in SR 770 (217.33 adult). At 90 DAS population of live insects was minimum in SR 770 (370.00) while, maximum population was in DJ 6514 (436.00 adult). At 120, 150 and 180 DAS emergence of adults was significantly higher in DJ 6514 while, minimum adult emergence was observed in SR 770. The mean population buildup in different sorghum genotypes, the data (Table 5) indicated that the highest population buildup of *S. oryzae* was found in susceptible genotype is DJ 6514 with 547.56

Table 5 : Population buildup of *S. oryzae* on different sorghum genotypes

Sr. No.	Variety	Population buildup						
		30 DAS	60 DAS	90 DAS	120 DAS	150 DAS	180 DAS	Mean
1.	SR 666	122.33e	278.00f	434.67e	594.33g	803.33f	1020.67d	542.22d
2.	IS 6566	63.33a	219.33a	372.00a	524.00b	726.33a	930.33a	472.55a
3.	ICSV 700	62.67a	219.00a	371.33a	523.33a	726.00a	931.00a	472.22a
4.	168 II 108	61.67a	218.33a	371.33a	523.67a	726.33a	932.33a	472.28a
5.	SR 770	61.00a	217.33a	370.00a	521.67a	724.67a	930.00a	470.78a
6.	SR 2460	117.67d	273.33e	430.00d	584.67f	791.00d	1003.33c	533.33c
7.	GJ 36	95.67c	251.33c	408.00b	564.33c	770.67b	981.67b	511.95b
8.	GJ 38	94.67c	254.33d	412.00c	567.67d	772.33b	983.00b	514.00b
9.	IS 2312	97.67c	254.33d	411.67c	570.00e	774.67c	985.67b	515.67b
10.	DJ 6514	123.33e	278.67f	436.00e	596.00h	818.33g	1033.00e	547.56d
11.	SR 1905	117.00d	273.33e	428.67d	585.00f	794.67e	1004.00c	533.78c
12.	SR 2804	90.00b	246.00b	410.33b	567.67d	772.00b	983.00b	511.50b
	S.E. ±	0.87	0.96	0.83	0.78	1.71	2.16	2.32
	C.D. (P=0.05)	2.52	2.79	2.43	2.26	4.99	6.61	6.57
	CV %	3.55	3.41	2.64	2.23	4.44	4.89	3.95

Table 6 : Per cent germination in different sorghum genotypes infested by *S. oryzae*

Sr. No.	Variety	Per cent germination						
		30 DAS	60 DAS	90 DAS	120 DAS	150 DAS	180 DAS	Mean
1.	SR 666	32.39bc(28.67)*	22.79bc(15.00)	5.74b(1.00)	0.41a(0.00)	0.41a(0.00)	0.41a(0.00)	15.89ab(7.45)
2.	IS 6566	50.18g(59.00)	35.06f(33.00)	8.72bc(2.33)	0.41a(0.00)	0.41a(0.00)	0.41a(0.00)	23.34cd(15.72)
3.	ICSV 700	51.35gh(61.00)	35.85f(34.33)	6.55bc(1.33)	0.41a(0.00)	0.41a(0.00)	0.41a(0.00)	23.66cd(16.11)
4.	168 II 108	49.60f(58.00)	34.02ef(31.33)	8.13bc(2.00)	0.41a(0.00)	0.41a(0.00)	0.41a(0.00)	22.95cd(15.22)
5.	SR 770	52.36h(62.67)	35.67ef(34.00)	7.49bc(1.67)	0.41a(0.00)	0.41a(0.00)	0.41a(0.00)	23.89cd(16.39)
6.	SR 2460	33.40bc(30.33)	25.62c(18.67)	0.41a(0.00)	0.41a(0.00)	0.41a(0.00)	0.41a(0.00)	16.54ab(8.17)
7.	GJ 36	45.97de(51.67)	33.21e(30.00)	11.54d(4.00)	0.41a(0.00)	0.41a(0.00)	0.41a(0.00)	22.22cd(14.28)
8.	GJ 38	45.17d(50.33)	31.11de(26.67)	8.72bc(2.33)	0.41a(0.00)	0.41a(0.00)	0.41a(0.00)	21.30cd(13.22)
9.	IS 2312	43.11c(46.67)	30.41d(25.67)	7.49bc(1.67)	0.41a(0.00)	0.41a(0.00)	0.41a(0.00)	20.53c(12.34)
10.	DJ 6514	27.97a(22.00)	16.74a(8.33)	0.41a(0.00)	0.41a(0.00)	0.41a(0.00)	0.41a(0.00)	12.95a(5.06)
11.	SR 1905	32.14b(28.33)	21.72b(13.67)	5.74b(1.00)	0.41a(0.00)	0.41a(0.00)	0.41a(0.00)	15.56ab(7.17)
12.	SR 2804	45.17d(50.33)	32.14de(28.33)	6.55bc(1.33)	0.41a(0.00)	0.41a(0.00)	0.41a(0.00)	21.39cd(13.33)
	S.E. ±	0.58	0.95	1.27	–	–	–	2.05
	C.D. (P=0.05)	1.70	2.77	3.71	–	–	–	6.01
	CV %	2.38	5.57	5.51	–	–	–	6.49

* Figures in the parentheses are original values and those outside the parentheses are arcsine transformed values

adults and it was at par with SR 666 (542.22 adult). The most resistant sorghum genotype was SR 770 (470.78 adult).

Per cent seed germination in sorghum infested by *S. oryzae*:

At 30 days after storage (Table 6), SR 770 maintained maximum germination per cent (62.67) while, minimum germination was observed in DJ 6514 (22.00%). Minimum germination per cent was recorded at 60 DAS in DJ 6514 (8.33%) while maximum germination was observed in ICSV 700 (34.33%). The genotypes DJ 6514 and SR 2460 were recorded zero per cent germination after 90 days after storage. While, other genotypes were also recorded very low per cent of germination. After 120, 150 and 180 days of storage of sorghum, zero per cent germination was observed in all the genotypes. The mean per cent germination in different sorghum genotypes data (Table 6) indicated that the lowest per cent of germination in different sorghum genotypes was found in susceptible genotype was DJ 6514 (5.06) and it was at par with SR 1905 (7.17%), SR 666 (7.45%) and SR 2460 (8.17%). The highest per cent of germination was found in sorghum genotype SR 770 (16.39). Similar work related to the present work was also been done by Mishra *et al*. (1992); Park *et al.* (2003); Rao and Sarangi (1998); Singh and Satapathy (2003); Subramanyam and Hagstrum (1995) and Tewari and Tiwari (2008)

Summary :

Twelve sorghum genotypes were tested for their influence on some biological aspects of the pest. The observations on per cent grain damage, per cent weight loss, germination percentage and adult emergence were taken into consideration to decide the susceptibility of sorghum genotypes to *S. oryzae*. Grub period was shorter on genotype DJ 6514 (24.05 day). The longer grub duration ranged from 27.80 to 27.97 day was recorded on genotypes ICSV 700, IS 6566, 168 II 108 and SR 770. The longer pupal period ranging from 8.72 to 8.92 on genotypes IS 6566, ICSV 700, 168 II 108 and SR 770 which were at par with each other. The lowest pupal period of 5.13 day was recorded on genotype SR 1905. The growth index was the highest in genotype DJ 6514 (2.05). The genotype SR 770 was found to be less suitable for *S. oryzae* as it showed the lowest growth index (1.17). Thus, on the basis of growth index, the genotypes DJ 6514, SR 666, SR 2460 and SR 1905 were more suitable for *S. oryzae*, whereas SR 770, IS 6566, ICSV 700 and 168 II 108 were less suitable for it. Proportion of female was higher than male in almost all the genotypes except in SR 666 and GJ 36 and equal in IS 2312. The highest susceptible index was found on genotypes SR 666 (15.33). The most susceptible genotypes was DJ 6514 with 87.61 per cent grain damage, while 168 II 108 was the most resistance sorghum genotype (78.06%). The remaining genotypes were intermediate and did not find any significant difference. The mean highest population buildup of *S. oryzae* was found in susceptible genotype was DJ 6514 with 547.56 adult. The lowest per cent of germination in different sorghum genotypes was found in susceptible genotype was DJ 6514 (5.06) while, highest per cent of germination was found in sorghum genotype SR 770 (16.39).

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