Int.J.Curr.Microbiol.App.Sci (2018) Special Issue-7: 3542-3544

International Journal of Current Microbiology and Applied Sciences
ISSN: 2319-7706 **Special Issue-7 pp. 3542-3544**
Journal homepage: http://www.ijcmas.com

Original Research Article

Screening of Different Wheat Genotype against *Rhizopertha dominica* Feb.

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A B S T R A C T

Laboratory assessment of 30 wheat genotypes on the basis of grain damage was carried out against *Rhizopertha dominica* Feb. The significant differences were observed among the tested wheat genotypes of 60,120 and180 days.All the 30 tested genotypes were found highly tolerant and tolerant level against *R. dominica* upto 60 and120 days of storage. None of the genotypes were found highly tolerant at 180 days of storage. However, none any genotypes were showed highly susceptible and susceptible level of seed damage due to *R.dominica* upto whole experimental period.

Keywords

Screening, Genotypes, Rhyzopertha dominica Feb.

Introduction

Wheat is an important crop for all small and marginal farmers in India. Importance of wheat in Indian agriculture is second next to rice. Wheat contributes about 34% of total food grain production of country (Anonymous, 2010)

Wheat crop is relatively safe from insect in field but the seed of wheat suffer relatively high losses during storage. In stored wheat,a number of insect pest *Sitotrogacerelella* Olive, *Ephestiacoutella walker* Olive, *Rhizopertha dominica* Feb., *Tribolium castaneumclae*, *Trogoderma granarium* (Everest) are found to damage the grains. Among these, lesser grain borar, *Rhizopertha dominica* is major insect pest of wheat and also known Australian wheat weevil. Kashyap *et al.,* (2002) reported the *Rhizopertha dominica* (61.50%) followed by *S. oryzae* (59.30) infested farmer's save wheat seed sample most. Among the various pest management components, the use of resistant varieties under 1 PM seems to be one of the most effective, eco-friendly and cheapest methods to prevent the loss due to insect- pest in the field as well as in storage. In view of above mentioned facts the present investigation was carried out toidentify the tolerant genotypes against lesser grain borer.

Materials and Methods

Thirty wheat genotypes (table-1) were collected from wheat breeder of Genetics and Plant Breeding, Department of G.P.B., NDUA&T Kumarganj, Faizabad. The experiment was carried out in CRD (Complete Randomized Design) with 3 replications. Five hundred gram of disinfested seed of each variety in each replication were packed in jute bags after

releasing the five pairs of *R. dominica* and were kepton rack under ambient condition in seed entomology laboratory for observation of damage percent at 60,120& 180 Days After Storage (DAS).

For observing seed damage, hundred seeds from each replication of each variety were randomly selected and carefully examined with magnifying lens (10X). Healthy and damaged seed were separatedat 60, 120 &180 DAS to work out the percent damage with following formula:

$$\text{Percent damage} = \frac{Number of\ damaged\ seeds\ in\ sample}{Total\ number\ of\ seeds\ in\ sample} \times 100$$

On the basis of seed damage per cent genotype were categorized in different category (Kumar, 2008).

Results and Discussion

Screening of the wheat genotypeson the grain damage basis (Table -3) during storage against *R. dominica* clearly indicates that out of total 30 tested genotype 50 per cent genotype (PBW-443, PBW-502,NW1012, NW-1076, NW-2036, RAJ-3077, RAJ-4120, UP-1761, HD-2307, HD-2643, HD-2733, HR-1744, HP1761, K-8962, HALNA) were found highly tolerant (0 < 1%) and remaining 50 per cent varieties were recorded as tolerant (1-5%) upto 60 DAS. At 120 DAS, only one genotype; NW-2036 was categorized as highly tolerant (0<1%) and reaming 29 genotypes were found. All the tested genotypes were found tolerant (1-5%) upto 180 days of storage. None of the genotypes tested were categorized under susceptible (>5-9&) and highly susceptible (> 9%) level of grain damage upto 180DAS. Singh *et al.*, (2003) reported the extent of damage caused by *R. dominica* feb. on wheat cultivars viz.; LKO-1, HI-1077, GW-173, RAJ-3077, DL-8033, Kalyan Sona, HD-2236, and GW-190 at different intervals after the release of the test insect. Tiwari and Sharma (2002) and Kumar (2008) grain moisture increased and germination per cent decrease with an increase of grain damage during the increase of storage period under experiment which similar with the work of Sayad *et al., (*2006).

Table.1 Laboratory assessment of wheat genotype against *R. dominica* Feb.

Treatment	Varieties	Treatment	Variety
T_1	PBW- 154	T_{16}	UP- 2338
T_2	PBW- 373	T_{17}	UP- 2425
T_3	PBW- 443	T_{18}	HD- 2307
T_4	PBW- 502	T_{19}	HD-2329
T_5	CBW- 38	T_{20}	HD -2643
T_6	DBW- 14	T_{21}	HD-2733
T_7	HUW - 234	T_{22}	HD- 2824
T_8	HUW- 468	T_{23}	HP- 1633
T_9	MW-1012	T_{24}	HP- 1744
T_{10}	MW- 1076	T_{25}	HP- 1761
T_{11}	MW- 1067	T_{26}	K- 8962
T_{12}	MW- 2036	T_{27}	KRL- 210
T_{13}	RAJ- 3077	T_{28}	KO- 307
T_{14}	RAJ- 3765	T_{29}	HDR- 77
T_{15}	RAJ- 4120	T_{30}	HALNA

Table.2 Different categories of seed damage

Category	Seed damage %
Highly tolerant (HT)	0- <1
Tolerant (T)	1-5
Susceptible	>5-9
Highly susceptible	Above 9

Table.3 Varietal reaction of different wheat genotype on the basis of grain damage due to *R. dominica* Feb.

Category	Grain damage %	Days After Storage (DAS)		
		60	120	180
Highly tolerant	0 <1 %	PBW-443, PBW-502, NW-1012, NW-1076, NW-2036,RAJ-3077, RAJ- 4120, UP-2338, HD-2307, HD-2643, HD-2733, HP-1744, HP-1761, K-8962, HALNA	NW-2036	Nil
Tolerant	1- 5%	PBW-154, PBW-373, CBW-38, DBW-14, HUW-234, HUW-468, NW-1067, RAJ-3765, P-2425, HD-329,	Remaining all 29 varieties	All varieties

The data presented in Table 2 under field conditions clearly indicated that during both the years percent disease incidence was 30.4 and 32.6 respectively. The mean PDI of all treatments (fungicides) was significantly reduced as compared to control. Maximum PDI among treatment was recorded in Thiram (13.0%) and Carboxin (10.5%) whereas, minimum PDI was observed in Vitavax Power (5.0%) and Mancozeb (5.4%). Maximum increase in yield (Kg/ha) was recorded in Vitavax Power (7.48 q/ha) followed by Mancozeb (6.77 q/ha). Vitavax power is found effective in checking *Alternaria* blight of Ashwagandha, whereas, spray of Mancozeb was found most effective (Kathal and Gupta, 2017).

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