

Susceptibility of wheat cultivars against termite

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Received : 17 January, 2017

ABSTRACT

To know the susceptibility of wheat cultivars against termite, an experiment was carried out at Anand Agricultural University, Anand during *rabi* season of 2010-11. Of the 14 cultivars of wheat screened for their relative susceptibility against termite, cultivars GW 411, Lok-1 and VA-07-13 were found superior to suppressing the termite damage and produced higher yield of grain and straw of wheat. The wheat cultivars GW 407, GW 391, GW 410, GW 273, GW 400 and GW 406 were less susceptible to termite incidence, whereas cultivars Raj-1555, GW 496, GW 396, GW 366 and GW 322 gave poor performance against termite. The evaluated cultivars did not affect the population of termite but prevented them from feeding on root/stem. Less termite population was observed in Raj-1555, whereas it was higher in the Lok-1. There was no detrimental effect of screened wheat cultivars on the number of tillers per plant in wheat.

Key words: Wheat, termite, susceptibility and cultivars

Wheat is second important staple food crop after rice. Its value in human diet, both as a source of carbohydrates and protein, and its baking qualities make it relatively more important crop than other cereal grains. Wheat crop is attacked by 24 species of insect pests (Singh, 1998). Among these, termite is rank first as a pest of wheat not only in India but South Asia too (Geddes and Iles, 1991). About 16 species of termite were found to damage the wheat crop in India, of these two species, *Odontotermes obesus* (Rambur) and *Microtermes obesi* (Holm) were found dominant (Chhillar *et al.*, 2006). The yield losses were recorded 43 to 80 per cent in wheat due to termite damage (Sattar and Salihah 2001 and Chhillar *et al.*, 2006). Considering the importance of the pest, a study was carried out to know the susceptibility of wheat cultivars against termite.

MATERIALS AND METHODS

A field experiment was taken at Anand Agricultural University, Anand during *rabi* season of 2010-11. The wheat crop sown during 1st December 2010 at a distance of 30 cm between rows using different 14

wheat cultivars (Table 1). The gross and net plot area was 4 x 3 m and 3 x 2 m respectively. Different 14 cultivars were screened in a Randomized Block Design replicated three times. For recording observations on termite incidence, infested and healthy plants were counted at weekly interval from 3 m length (each of 1 m) of the net plot area starting from one week of germination till the harvest of the crop. The eucalyptus sticks were installed at a depth of 15 cm in each net plot and termite counts were recorded from the sticks at weekly interval and again reinstalled the sticks. The tillers of different cultivars were also recorded from randomly selected 10 plants from each net plot at 28 days after germination. The grain and straw yield of each cultivar was recorded from net plot area after harvesting and separating the grain. The whole experimental plot was kept free from any pesticide application.

RESULTS AND DISCUSSION

Tillers

The tiller counts were found non-significant (Table 1), indicates that no detrimental effect of screened wheat cultivars on the number of tillers per plant in wheat. The tillers were observed between 2.40 and 3.60 per

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Table 1 Susceptibility of wheat cultivars to termites

Cultivars	No. of tillers/ plant	Termite damaged plants (%)	No. of termites/stick	Yield(kg/ha)	
				Grain	Straw
GW- 273	2.47	13.96 (5.82)	6.62 (43.32)	2922.22	3568.89
GW- 322	2.80	21.34 (13.24)	6.46 (41.23)	2100.00	2581.67
GW- 366	3.20	23.77 (16.25)	6.48 (41.49)	1211.11	1458.33
GW- 391	2.87	12.20 (4.47)	6.56 (42.93)	3038.89	3710.00
GW- 396	2.73	20.78 (12.59)	6.59 (42.93)	2027.78	2444.44
GW- 400	3.37	14.59 (6.35)	6.50 (41.75)	2205.56	2693.89
GW- 406	2.40	16.09 (7.68)	6.61 (43.19)	2122.22	2571.94
GW- 407	3.13	11.63 (4.06)	6.44 (40.97)	3061.11	3703.61
GW- 410	2.83	13.89 (5.76)	6.50 (41.75)	2983.33	3625.28
GW- 411	3.60	9.09 (2.50)	6.52 (42.01)	3961.11	4825.56
GW- 496	3.40	22.79 (15.00)	6.60 (43.06)	1244.46	1531.39
Lok- 1	3.33	9.76 (2.87)	6.67 (43.99)	4083.33	4951.67
Raj- 1555	3.13	18.37 (9.93)	6.42 (40.72)	2088.89	2552.22
VA-07-13	3.13	9.97 (3.00)	6.55 (42.40)	3866.67	4676.11
S. Em. $\pm$	0.25	0.72	0.09	255.35	304.20
C. D. at 5%	NS	2.02	NS	742.46	884.48
C. V. %	14.41	9.70	10.03	16.77	16.44

Figures in parentheses are retransformed values; those outside are arcsine value.

plant in the evaluated cultivars. The lowest (2.40) number of tillers was observed in the cultivars GW 406, while it was highest (3.60) in cultivars GW 411.

Termite damage

Fourteen different cultivars of wheat were screened for their relative susceptibility against termite in a field

during *rabi* 2010-11. Pooled over period results (Table 1) of termite damage in wheat revealed that the lowest (2.50%) damage was observed in GW 411 and it was at par with Lok-1 (2.87%) and VA-07-13 (3.00%). Wheat cultivars GW 407 was observed equally susceptible to later two cultivars. Wheat cultivars GW

391 (4.47%), GW 410 (5.76%) and GW 273 (5.82%) were equally damaged by termites. cultivars GW 400 (6.35%) was found equally susceptible to later two cultivars but at par with GW 406 (7.68%) in their susceptibility. The termite damage was 9.93 per cent in Raj-1555 and it was significantly less than remaining cultivars. GW 396, GW 322 and GW 496 exhibited termite damage between 12.59 and 15.00 per. Among the evaluated cultivars of wheat, the highest (16.25%) damage was noted in GW 366 and it was at par with GW 496 (15.00%). Godhani and Koshiya (1991) and Shukla (2008) reported that the wheat variety Lok-1 was less susceptible to termites.

Termite population

Termite populations on eucalyptus sticks were recorded after one week of sowing till the harvest of the crop. The termite population were found non significant throughout the study period as well as in pooled over period analysis, indicates that different cultivars not affects the population of termite but cultivars prevents them to feed on root/stem. Pooled over period results (Table 1) revealed that the lower (40.72) termite population was observed in Raj-1555, whereas it was higher (43.99) in the Lok-1. Remaining cultivars of wheat had termite population between 40.97 and 43.32 per stick.

Grain yield

The different cultivars of wheat tested against termites for their susceptibility showed that the higher (4083.33 kg/ha) grain yield was harvested from Lok-1 (Table 1) and it was statistically at par with GW 411 (3961.11 kg/ha) and VA-07-13 (3866.67 kg/ha) and found significantly superior than rest of the cultivars. The cultivars GW 407, GW 391, GW 410 and GW 273 produced 3061.11, 3038.89, 2983.33 and 2922.22 kg/ha grain, respectively. The wheat grain production was statistically equal in cultivars GW 400 (2205.56 kg/ha) and GW 273 (2922.22 kg/ha). The grain yield harvested more or less equal from GW 406 (2122.22 kg/ha), GW 322 (2100 kg/ha), Raj-1555 (2088.89 kg/ha) and GW 396 (2027.78 kg/ha). Among the tested cultivars, the lower (1211.11 kg/ha) grain yield was recorded in GW 366 and it was at par with GW 496 (1244.45 kg/ha). Godhani and Koshiya (1991) and Shukla (2008) reported that the wheat variety Lok-1 was less susceptible to termites and produced higher

yield. Satapathy *et al.* (1990) also noticed higher yield of Lok-1.

Straw yield

The higher (4951.67 kg/ha) straw yield (Table 1) was harvested from Lok-1 and it was statistically at par with GW 411 (4825.56 kg/ha) and VA-07-13 (4676.11 kg/ha) and they were significantly superior to rest of the cultivars. The cultivars GW 391, GW 407, GW 410 and GW 273 produced 3710, 3703.61, 3625.28 and 3568.89 kg/ha of straw, respectively. The straw yield was between 2450 and 2700 kg/ha in GW 400, GW 322, GW 406, Raj-1555 and GW 396 and they were at par with each other. Of the evaluated cultivars, the lowest (1458.33 kg/ha) straw yield was noticed in GW 366 and it was at par with GW 496 (1531.39 kg/ha). Godhani and Koshiya (1991) and Shukla (2008) reported that the wheat variety Lok-1 was less susceptible to termites and produced higher yield.

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