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Survey the Infestation of Termite in Wheat in Semi-arid Region of Rajasthan

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Abstract: A survey on termite infested wheat fields at seedling and maturity stages was carried out during rabi, 2021-22 and 2022-23 at different locations in five tehsils of Jaipur district. The average plant damage due to termite varied from 2.82 to 4.88% and 3.32 to 5.56% at seedling stage and 18.40 to 27.36% and 19.80 to 28.63% at crop maturity stage in 2021-22 and 2022-23, respectively. Maximum termite infestation damaging 4.88 and 5.56% (at seeding stage), 27.36 and 28.63% (at maturity stage) in wheat crop was recorded in Chomu tehsil during 2021-22 and 2022-23 respectively while the minimum damage was recorded in Dudu tehsil which ranged from 2.82 and 3.32% (at seedling stage) 18.40 and 19.80% (at crop maturity stage) during both years, respectively.

Key words: Wheat, survey, plant damage, termite, Jaipur.

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Wheat [*Triticum aestivum* (L.) Em. Thell] belongs to the family Gramineae, is believed to have originated from South West Asia. It is an important staple food crop. It contains 78.10% carbohydrates, 14.70% protein, 2.10% fat and 2.10% minerals besides considerable proportions of vitamins (thiamine and vitamin B). It also provides 20% of total calories for humans (Kumar *et al*., 2011). It ranks first in the world among cereals both in respect of an average 222.21 mha and production 779.03 mt. In India, it is cultivated in 30.54 mha with the production of 106.41 mt and productivity of 3484 kg ha^{-1}. Rajasthan ranks fourth in the total production of wheat among the wheat-growing states. The area under wheat crop in Rajasthan is about 2.58 mha with the production of 9.82 mt and productivity of 3806 kg ha^{-1} (Anonymous, 2021-22). Wheat crop is attacked by 24 species of insect-pests out of them, the termite is the major pest of this crop. In India, estimated losses caused by termites are reported to range between 10 and 50% (Remadevi *et al*., 2008). The most common species of termite are *Microtermes obesi* and *Odontotermes obesus* which cause almost 80% of total losses in South Asia (Rajagopal, 2002; Dhadwal *et al*., 2014 and Rana *et al*., 2021). The status of termites in wheat fields can be assessed through survey. It provides essential information for understanding the diversity of termites in semi-arid region of Rajasthan in wheat crop and can also provide needful understanding to develop appropriate management strategies under prevailing climate conditions. Hence, the present study was taken up to investigate the

Table 1. The infestation of termite in wheat crop in Jaipur district of Rajasthan during rabi, 2021-22

Tehsils	Villages	Per cent plant damage at seedling stage	Average	Per cent plant damage at maturity stage	Average
Sambhar Lake	Kajipura	3.40	4.11	19.60	21.51
	Itava	4.49		23.45	
	Khandel	5.20		22.10	
	Samota ka bas	3.34		20.91	
Jobner	Dehra	4.60	4.44	26.10	25.33
	Dhani boraj	5.72		25.48	
	Baberwalon ki Dhani	3.84		24.23	
	Jorpura	3.60		25.50	
Bagru	Chitroli	2.54	2.87	21.56	19.94
	Begus	3.00		18.28	
	Sangria	3.14		20.40	
	Dambhi kala	2.80		19.53	
Dudu	Gadoti	2.40	2.82	17.26	18.40
	Mokhampura	3.22		19.04	
	Gangati	2.98		17.10	
	Savarda	2.70		20.22	
Chomu	Ghinoye	5.50	4.88	26.35	27.36
	Nangal-Bharda	4.24		28.91	
	Aantpura-Jetpura	5.68		26.64	
	Deogudha	4.10		27.56	

termite infestation in different locations of Jaipur district of Rajasthan.

Materials and Methods

The survey on termite infestation in wheat crop was conducted in Jaipur district representing semi-arid region of Rajasthan at different locations i.e. five tehsils (Sambhar Lake, Jobner, Bagru, Dudu and Chomu), four villages from each tehsil and five farmers from each village, during two consecutive years i.e., rabi, 2021-22 and 2022-23 were selected. To record the observations, 10 spots were selected randomly from each field at different locations. The observations on termites were recorded by counting total and infested plants from a 1.0 m^2 area of each spot at the seedling stage and crop-maturity stages.

Results and Discussion

The location-wise periodical data on termite infestation in wheat crop are presented in Table 1 and 2 and graphically depicted in Figure 1.

The data presented in Table 1 and Figure 1 during rabi, 2021-22 showed that the average termite infestation in wheat crop at different locations of Jaipur district varied from 2.40 to 5.72% plant damage at seedling stage and 17.10 to 28.91% at maturity stage. The maximum termite damage of 27.36% was recorded in Chomu tehsil followed by Jobner (25.33%), Sambhar Lake (21.50%) and Bagru (19.94%) and minimum was in Dudu (18.40%). The data recorded confirms that the overall mean incidence of termite damage of wheat crop in Jaipur district was 22.40%. During rabi, 2022-23 the data presented in Table 2 and Figure 1 revealed that the average termite infestation in wheat crop at different locations of Jaipur district varied from 2.12 to 6.15% at seedling stage and 18.30 to 29.43% at maturity stage which was slightly higher than that recorded in rabi, 2021-22. The maximum termite damage of 28.63% was recorded in Chomu thesil followed by Jobner (27.15%), Sambhar Lake (22.91%) and Bagru (21.87%) and minimum was in Dudu (19.80 %). The data recorded confirms that the overall mean incidence of termite damage of wheat crop in Jaipur district was 24.07%. Results of the present study are in conformity with that of Verma *et al*., (2001) who observed that maximum termite incidence (49%) and yield reduction (32.60%) were observed in

Table 2. The infestation of termite in wheat crop in Jaipur district of Rajasthan during rabi, 2022-23

Tehsils	Villages	Per cent plant damage at seedling stage	Average	Per cent plant damage at maturity stage	Average
Sambhar Lake	Kajipura	4.54	4.42	20.52	22.91
	Itava	3.19		24.47	
	Khandel	4.78		23.72	
	Samota ka bas	5.18		22.92	
Jobner	Dehra	5.40	5.36	28.12	27.15
	Dhani Boraj	6.15		25.88	
	Baberwalon ki Dhani	5.10		26.32	
	Jorpura	4.78		28.30	
Bagru	Chitroli	3.10	3.48	23.62	21.87
	Begus	2.46		20.34	
	Sangria	3.46		21.40	
	Dambhi kala	4.89		22.12	
Dudu	Gadoti	2.12	3.32	18.30	19.80
	Mokhampura	3.78		20.14	
	Gangati	4.10		19.42	
	Savarda	3.28		21.35	
Chomu	Ghinoye	4.87	5.56	28.40	28.63
	Nangal-Bharda	5.48		27.95	
	Aantpura-Jetpura	6.12		29.43	
	Deogudha	5.78		28.76	

pulses in the Bagpat district but in Meerut and Muzaffarnagar districts, there was less than 15.00% termites infestation causing 19.00% yield reduction in different crops. Patel and Patel (2003) reported that the infestation of termites was 23 to 34% in Kagzi lime orchard. Sharma *et al.* (2004) revealed that the damage was lower in clay and black soil, high in sandy loam soil and severe in red soil corroborating the present findings. Joshi *et al.* (2005) reported loss of 15-25% of maize yield by termites. Gadhiya (2012) reported termite infestation at AAU, Gujarat, the overall infestation ranged from 8 to 17%. Further, Pandey (2012) carried out a survey in major chickpea-growing areas of Uttar Pradesh. Observations revealed that termite caused 25-26% of plant damage per m^2 at different locations surveyed. Kumar *et al.* (2020) observed average termite damage from 7.85 to 16.47% in different tehsils of the Bikaner district; the lowest termite damage was found in Khajuwala tehsil and the highest termite

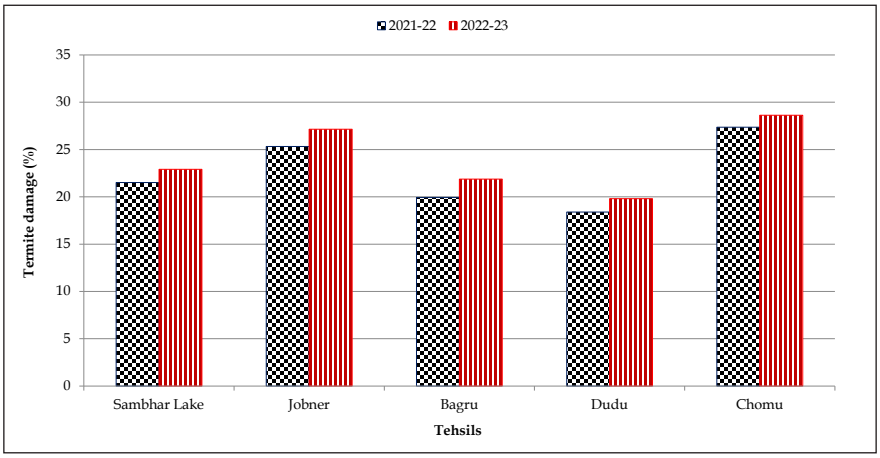

Fig. 1. The infestation of termite in wheat crop in Jaipur district of Rajasthan during Rabi, 2021-22 and 2022-23.

damage was found in Bikaner tehsil of the Bikaner district. According to AICRP on wheat and Barley progress report (Anonymous, 2021) due to termite infestation about 10.33% plant damage was reported in Durgapura (Jaipur). Meena (2023) reported average plant damage ranging from 9.87 to 14.21% in different wheat fields; the overall infestation was highest i.e.14.21% at Sahapura tehsil of Jaipur district whereas, it was lowest i.e. 9.87% at Kotputli tehsil of Jaipur district also corroborates the present findings.

Conclusion

Survey for two consecutive years in Jaipur district of Rajasthan for termite infestation in wheat crop showed an average damage of 23.23%. Wheat fields of Chomu tehsil were more prone to termite damage whereas leasst damage was seen in Dudu tehsil during both the years of survey. There is need to provide effective management strategies in highly affected areas to reduce damage by termites in wheat crop and in-turn to enhance the productivity.

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