
SURVEY AND IDENTIFICATION OF TERMITES IN WHEAT CROP**GADHIYA, V. C., BORAD*, P. K. AND BHUT, G. D.**

*Department of Entomology, B. A. College of Agriculture,
Anand Agricultural University, Anand – 388 110, Gujarat, INDIA*

**E-mail: pkb5458@yahoo.com*

ABSTRACT

Of the surveyed 12 different wheat fields of Anand Agricultural University, Anand, the termite damage was noted after 4th week of sowing (52nd standard meteorological week) of wheat. The maximum infestation was observed during end of February (9th SMW), whereas, the lowest infestation was noticed at the end of December (52nd SMW). The termite species *Microtermes mycophagus* (Desneux), *Odontotermes* sp. nr. *redemanni* and *Odontotermes obesus* (Rambur) were found to be damaging the wheat crop. Among them, *Odontotermes obesus* (Rambur) was found as the dominant species of termite in wheat.

KEY WORDS: survey, identification, termite, wheat

INTRODUCTION

Wheat is the 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. There are many biotic constraints that hamper the production of wheat, of which, infestation of insect pests is major one. Wheat crop is

attacked by 24 species of insect pests (Singh, 1998). Of these, termite ranks first as a pest of wheat not only in India, but in 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 viz., *Odontotermes obesus* (Rambur) and *Microtermes obesi* (Holm) were found dominant (Chhillar *et al.*, 2006). The yield losses ranging 43 to 80 per cent in wheat were recorded due to termite damage (Roonwal 1979, Sattar and Salihah 2001 and Chhillar *et al.*, 2006). The wheat crop is damaged every year by this pest and economic loss is occurred to wheat growers. To know the status of the termites in wheat fields, a survey was carried out at AAU, Anand.

MATERIALS AND METHODS

A survey was conducted to know the infestation of termites on wheat crop at Anand Agricultural University, Anand during winter season of 2010-11. For recording termite damage in wheat, 12 fields were surveyed. From each field 10 spots of one m² area were selected randomly. From each spot, total and termite infested plants were counted at weekly interval. The termites from different wheat fields were collected and sent to the Dr. V. V. Ramamurthy, Principal Scientist, Division of Entomology, IARI, New Delhi for identification of the species.

RESULTS AND DISCUSSION

The wheat crop mainly suffered from termites belonging to order Isoptera. The activity of termite was found throughout the cropping season (Table 1). The termite damage (<1%) was noted first time after 4th week of sowing i.e. 4th week of December [52nd standard meteorological week

(SMW)] in fields 1 to 9, whereas it was found in field 10-12 during 5th week of sowing *i.e.* 1st week of January (1st SMW). The termite damage was observed 1.17 to 3.21 per cent during 1st week of January in all 12 fields with the highest (3.21%) in field number 7. The damage increased in all the evaluated plots in subsequent weeks. After six week of sowing *i.e.* 2nd week of January (2nd SMW), termite damage was noted between 2.47 (field no. 2) to 6.91 per cent (field no. 7) in different fields. After 7th week of sowing (3rd week of January *i.e.* 3rd SMW), the lowest (4.4%) damage was observed in field no. 2. The damage was in the range of 5 to 9 per cent in remaining plots except field no. 7, in which damage was above 10 per cent. The damage was between 5 to 10 per cent in field no. 1 to 4, 6 and 8 to 12, whereas it was between 10 and 14 per cent in field no. 5 and 7 after 8th week of sowing (4th week of January *i.e.* 4th SMW). After 9th week of sowing (5th week of January *i.e.* 5th SMW), the damage was in the range of 9 to 13 per cent in the entire field, except field no. 7, in which 16.83 per cent damage was noted (Table 4). After 10th week of sowing (1st week of February *i.e.* 6th SMW), the lowest (12.25%) and highest (27.38%) damage was noted in field no. 10 and 6, respectively. Termite damage was recorded between 15.16 (field no. 10) to 33.20 per cent (field no. 6) after 11th week of sowing (2nd week of February *i.e.* 7th SMW). After 12th week of sowing (3rd week of February *i.e.* 8th SMW), below 20 per cent damage was observed in field no. 10 and 11. The termite damage was in the range of 20 to 25 per cent in field no. 1 to 5, 8, 9 and 12. It was between 31.71 and 40.78 per cent in field no. 7 and 6, respectively. Termite damage was noted between 23.06 (field no. 10) to 47.24 per cent (field no. 6) after 13th week of sowing (4th week of February *i.e.* 9th SMW).

The lowest infestation was noticed in 52nd SMW (end of December) in all the fields. The maximum infestation was observed during 9th SMW (end of February) in all the fields during the year 2010-11. The overall infestation was higher in field no. 6 and 7 (15-17%) whereas, it was lower in field no. 10 and 11 (8-9%). Mehta and Verma (1968) calculated the loss due to termite up to 230 million rupees for all the agricultural crops. In wheat, yield losses of 80 (Roonwal, 1979), 43 (Sattar and Salihah, 2001) and 60 per cent (Kakde *et al.*, 2006) was reported due to termite infestation. Maximum termite incidence (49%) and yield reduction (32.6%) were observed in pulses in the Bagpat district, but in Meerut and Muzaffarnagar districts, there was less than 15 per cent termites infestation and 19 per cent yield reduction in different crops (Verma *et al.*, 2001). Patel and Patel (2003) reported that infestation of termites ranged between 23 to 34 per cent in Kagzi lime orchard. Loss of 15–25 per cent of maize yield and about 1478 million rupees was estimated in India (Joshi *et al.*, 2005).

The identified termite species *Microtermes mycophagus* (Desneux), *Odontotermes* sp. nr. *redemanni* and *Odontotermes obesus* (Rambur) were found to damage wheat crop in middle Gujarat. Of these, *Odontotermes obesus* (Rambur) was dominant species of termite in wheat. About 16 species of termite were found damaging the wheat crop in India. Out of these, two species viz. *Odontotermes obesus* (Rambur) and *Microtermes obesi* (Holm) were found dominant in Uttar Pradesh (Kishen *et al.*, 1972 and Chhillar *et al.*, 2006). Two most common species *M. obesi* and *O. obesus* were attacking the wheat crop in Northern India (Rajagopal, 2002).

CONCLUSION

The termite damage was noted after 4th week of sowing [52nd standard meteorological week (SMW)] in wheat. The maximum infestation was observed during end of February (9th SMW) whereas, the lowest infestation was noticed at the (52nd SMW) end of December. The higher infestation of termite in wheat was noticed during end of February. The termite species viz., *Microtermes mycophagus* (Desneux), *Odontotermes* sp. nr. *redemanni* and *Odontotermes obesus* (Rambur) were found damaging the wheat crop. Among them, *Odontotermes obesus* (Rambur) was found as the dominant species of termite in wheat.

REFERENCES

- Chhillar, B. S., Saini, R. K. and Roshanlal, K. (2006). Emerging Trends in Economic Entomology. Publ. by CCSHAU Press, Hissar, pp. 191-192.
- Geddes, A. M. W. and Iles, M. (1991). The relative importance of crop pests in South Asia. *Nat. Res. Inst. Bull.*, 39.
- Joshi, P. K., Singh, N. P., Singh, N. N., Gerpacio, R. V. and Pingali, P. L. (2005). Maize in India: Production systems, constraints, and research priorities. D. F. CIMMYT, Mexico, p. 22.
- Kakde, T. D., Siddhabhatti, P. M., Panchbhai, P. R. and Wadaskar, R. M. (2006). Comparative efficacy of candidate termiticides against worker termites, *Odontotermes obesus* (Rambur). *Resistant Pest Management Newsletter*, **16** (1) : 8-10.
- Mehta, P. K. and Verma, B. K. (1968). Plant protection. Farm information unit, Directorate of Extension, Agriculture Community Development and Cooperation, New Delhi, p. 587.

- Patel, P. S and Patel, G. M. (2003). Field survey on the intensity of major pest in kagzi lime orchards in North Gujarat. *Pest Management and Economic Zoology*. **11** (1) : 83-84.
- Rajagopal, D. (2002). Economically important termite species in India. *Sociobiol.*, **41** (1) : 33–46.
- Roonwal, M. L. (1979). Termite injuring crops, plantations and fruit and forest trees and their control. In termite life and termite control. Publ. by Scientific Publication, Jodhpur, p. 24.
- Sattar, A. and Salihah, Z. (2001). Detection and control of sub-terranean termites. Technologies for Sustainable Agriculture. Proceeding National Workshop September 24-26 NIAB, Faisalabad, Pakistan, p. 195-198.
- Singh, V. S. (1998). Pest management in wheat. *Indian Farming*, **1** (48) : 47-50.
- Verma, S., Yadav, P. R. and Singh, R. (2001). Distribution of termites and yield loss in potato-based cropping sequence in Western Uttar Pradesh. *J. Indian-Potato Asso.*, **28** (1) : 119-120.



Healthy wheat plant



Termite damaged wheat plant



Healthy root of wheat



Termite feed on wheat



Termite damaged wheat stem

Plate 1: Damage caused by termite in wheat

Table 1: Infestation of termites in various wheat fields

WAS	Month and week	SMW	Damage plant (%) due to termite in different fields											
			1	2	3	4	5	6	7	8	9	10	11	12
3	Dec. III	51	0	0	0	0	0	0	0	0	0	0	0	0
4	Dec. IV	52	0.52	0.22	0.28	0.29	0.48	0.48	0.27	0.68	0.28	0	0	0
5	Jan. I	1	2.42	1.17	1.71	1.99	2.28	2.23	3.21	2.44	2.04	1.43	1.39	1.21
6	Jan. II	2	5.29	2.47	3.58	3.86	4.51	4.7	6.91	5.02	3.88	3.3	3.07	3.16
7	Jan. III	3	8.25	4.4	5.77	6.7	7.48	7.32	10.83	7.99	5.36	5.98	5.31	5.93
8	Jan. IV	4	9.53	5.8	7.23	8.8	10.09	9.24	13.6	9.85	7.48	7.72	6.65	7.41
9	Jan. V	5	11.41	9.11	9.61	11.45	12.94	11.87	16.83	12.12	10.89	9.77	9.48	10.25
10	Feb. I	6	15.01	13.05	12.47	14.15	16.06	27.38	20.27	14.76	14.63	12.25	12.41	13.54
11	Feb. II	7	18.97	17.03	16.35	17.62	19.63	33.2	25.89	17.69	18.5	15.16	15.73	17.43
12	Feb. III	8	22.95	21.23	20.28	21.13	23.54	40.78	31.71	20.71	22.5	18.28	19.54	21.8
13	Feb. IV	9	27.55	25.83	25.11	24.93	28.3	47.24	37.91	23.93	26.67	23.06	23.98	26.39
Average			11.08	9.12	9.31	10.08	11.39	16.77	15.27	10.47	10.20	8.81	8.87	9.74

WAS: Weeks After Sowing

SMW: Standard Meteorological Week