# STUDY ON THE EFFICACY OF DIFFERENT TERMITICIDES AGAINST TERMITES IN PESHAWAR AND FAISALABAD

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## ABSTRACT

The efficacy of Tenekil Plus 100% E.C, Termicid 48.5% E.C and Zanda 25% E.C were tested against termites using two methods of application, soil treatment and wood treatment at Pakistan Forest Institute (PFI), Peshawar and Punjab Forest Research Institute (PFRI), Gatwala, Faisalabad. Concentrations of 0.5 %, 1.0 % and 2.0 % of each termiticide were applied for soil and wood treatment. Result indicated that after 50 months of treatment to wooden stacks, Tenekil Plus 100% E.C. gave 98 % and 90 % protection in 2.0 % concentration at Peshawar and Faisalabad, whereas Zanda 25 % E.C at 2. 0 % provided 79 % and 76 % protection and Termicid 48.5 % E.C gave the same protection in 1.0 % in Peshawar and Faisalabad. In case of soil treatment only Tenekil Plus 100 % EC proved to be effective by providing 81 % and 79 % protection in Peshawar and Faisalabad respectively while the concentrations, 0.5 %, 1.0 % and 2.0 % of Termicid 48.5 % E.C and Zanda 25% E.C differed inconsiderably to soil protection in both localities. It can be concluded that Tenekil Plus 100 E.C. gave maximum protection at 2.0 % dose in both methods of application and in both localities.

## INTRODUCTION

Termites are social insects that live in colonies and have several hundreds to over a million termite individuals. Termite colony is composed of reproductives (queen and king) which are few in number within the termite colony. Termite produce winged reproductives which fly on certain period of the year. There are numerous apterous (without wings) non reproductive soldiers and workers in termite colony. Workers and soldiers are sexually immature and blind. Workers' main task is to feed the colony, construct galleries, hatch eggs etc while soldiers defend the colony from predators. All the colony members share food, water and shelter. All termites live in colonies within the confines of excavations within wood above-ground, or in subterranean and epigeal nest systems. They occur wherever there is timber, decaying wood, plant refuse or soil rich in humus on which they can feed (Harris, 1957; Krishna, 1970, Manzoor *et.al*. 2010). Subterranean termites are difficult insects to control because they have complex social patterns and form great extent colonies generally made of several thousands individuals with an outstanding ability to develop from one caste to another (Sheets et al., 2000).

Termites are known to cause tremendous losses to finished and unfinished wooden structures in buildings, besides loss in agriculture and forestry crops (Sen-Sarma *et al.* (1975). A total of 50 termite species have so far been recorded from Pakistan (Ahmad and Akhtar 1994). Termites can cause damage to crops, buildings, pasture and forestry as well as to non-cellulose materials such as dam linings and electrical cables. Surface soil mounds can also interfere with ploughing and grazing.

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In Nigeria, farmers have long recognized termite damage to crops and other materials, and have realized that termite damage is greater in the dry season or when crops are just planted (Malaka, 1972, 1983). Termites are the most destructive structural pest in the United States causing an estimated $2 billion in damage and control costs annually (Potter 1997). Therefore, the aim of our research was to determine the toxicity effect of three termiticides on mortality of termite workers and percent protection to wooden stacks.

## MATERIAL AND METHODS

In the present study termites control trials were established at Pakistan Forest Institute (PFI), Peshawar and Punjab Forest Research Institute (PFRI), Gatwala, Faisalabad to test new termiticides for evolving the effective termiticides in an effective and economical dose. Plots of 12x7 meter were prepared in these localities and trials were laid out in Randomized Complete Black Design. Experiment consisted of four treatments including control, replicated thrice. Wooden billets of poplar of 4x 6x 30 cm size were cut for the treatment. Each plot was divided into two equal halves. In each half portion 36 pits were made in the soil. According to the layout plane 27 treated and 9 untreated billets were installed in the pits in the left side half plot. In the right side half plot 27 pits were treated with the selected termiticides in three doses leaving 9 pits as control and the billets were installed in the treated and untreated pits. On the top of billets small boards were fixed showing the number according to the layout plane. Observations were taken for fifty months with each observation after one month interval from both of these localities.

Tenekil plus 100 % EC, Termicid 48.5 % E.C, Zanda 25 % E.C were tested at the dose rate of 0.5 %, 1.0 % and 2.0 % for evaluating their effectiveness.

## RESULTS AND DISCUSSION

Observations recorded on percent protection of stacks are presented in Table 1 and Table 2. All the test insecticides, protected stacks from termites attack, are statically significant. In PFI, after 50 months Tenekil Plus (2.0%) gave 98 % protection of stacks as against 17% protection in the control in case of wood treatment (Table 1.). Albeit all the insecticides have protected the stacks significantly higher over control, however the concentrations in trial did not differ significantly among themselves except Tenekil Plus (2.0%).

Table 1. Termite control trial at PFI, Peshawar

| Treatment | Dose (%) | % Protection afforded after 50 months | |
|---|---|---|---|
| | | Wood treatment ** | Soil treatment ** |
| Tenekil plus 100 % EC | 0.5 | 78 B | 65 BC |
| | 1.0 | 82 B | 78 AB |
| | 2.0 | 98 A | 81 A |
| Termicid 48.5% E.C | 0.5 | 63 C | 63 C |
| | 1.0 | 78 B | 60 C |
| | 2.0 | 58 C | 58 C |
| Zanda 25% E.C | 0.5 | 58 C | 58 C |
| | 1.0 | 58 C | 58 C |
| | 2.0 | 79 B | 58 C |
| Control | - | 17 D | 17 D |

- Critical Value for Comparison in wood treatment is 13.909 and soil treatment is 15.180.
** Significant at 5% level.
-. Figures in same column sharing same letters are non-significant

Table 2. Termite control trial at PFRI, Gatwala Faisalabad

| Treatment | Dose (%) | % Protection afforded after 50 months | |
|---|---|---|---|
| | | Wood treatment | Soil treatment |
| Tenekil plus 100 % EC | 0.5 | 74 BC | 67 CDE |
| | 1.0 | 76 B | 72 BC |
| | 2.0 | 90 A | 79 A |
| Termicid 48.5% E.C | 0.5 | 63 D | 62 EF |
| | 1.0 | 74 BC | 69 BCD |
| | 2.0 | 60 D | 60 F |
| Zanda 25% E.C | 0.5 | 61 D | 62 EF |
| | 1.0 | 65 CD | 64 DEF |
| | 2.0 | 76 B | 75 AB |
| Control | - | 11 E | 5 G |

- Critical Value for Comparison in wood treatment is 10.185 and soil treatment is 5.6364
** Significant at 5% level.
-. Figures in same column sharing same letters are non-significant

In wood treatment, Tenekil Plus 100 EC gave protection 78%, 82% and 98% at the concentration of 0.5, 1.0 and 2.0% respectively. Termicid 48.5 EC and Zanda 25 EC did not significantly differ in terms of percent protection to wooden stacks as Termicid provided 63, 78 and 58% followed by Zanda 58%, 58% and 79% at the rate of 0.5, 1.0 and 2.0 % respectively. In case of soil treatment maximum (81 %) and minimum (17%) recorded in Tenekil Plus and control respectively. There is no

difference of percent protection in case of Tenekil Plus at 0.5 and 1.0 % concentration as they provided 78 and 65 % of protection. Almost same percent of protection were observed in Termicid and Zanda (63%, 60%, and 58%).

In Faisalabad after 50 months of observation it was observed that Tenekil Plus 100 EC gave maximum (90%) protection to wooden stakes in 2.0% while Tenekil Plus and Zanda protected 76 % each at the dose of 1.0% and 2.0% respectively. So far individual comparison of different concentrations within insecticides is concerned there was insignificant difference among all test insecticides. The Termicid found to be least effective with 60 % protection to wooden stackes at concentration of 2.0%

Comparison of intra insecticide concentrations showed that Tenekil Plus, Termicid and Zand were non significant. Similarly inter insecticides comparison showed that Tenekil Plus (0.5%, 1.0%), Termicid and Zanda (0.5%, 1.0%, and 2.0 ) were inconsiderable among themselves. However Tenekil Plus (2.0%) concentration proved to be effective not only in wood treatment but also in soil treatment both in Peshawar and Faisalabad after 50 months of observation.

## REFERENCES

Ahmad, M. and M.S. Akhtar, 1994. Termites. In: *Insect Pest Management* ed. A.A.Hashmi. Islamabad: Pakistan Agricultural Research Council.

Harris, W.V., 1957. An introduction to Malayan termites. *Malay. Nat. J.,* 12: 20-32.

Malaka S.L.O., 1973. Observations on termites in Nigeria. Nigeria Field. 38: 24-40.

Malaka S.L.O., 1983. Economic importance of termites: Six case studies in Nigeria and Ghana. Niger. Field 47: 222-230.

Manzoor, F. and Naeem Mir, 2010. Survey of Termite Infested Houses, Indigenous Building Materials and Construction Techniques in Pakistan.

Krishna, K., 1970. Taxonomy, phylogeny and distribution of termite. In: *Biology of termites* (eds. K. Krishna and F.M. Weesner). Academic Press: New York and London. pp. 643

Potter, M. F., 1997.Termites. *In*: Mallis, A. Handbook of Pest Control. Eighth edition. Mallis Handbook &Technical Training Company. p.232-332.

Sen-Sarma P. K., Thakur, M. L., Mishra, S. C. and B. K. Gupta, 1975. Wood destroying termites in India. Forest Research Institute, Dehradun.187pp.

Sheets, J. J., Karr, L. L. and J. E. Dripps, 2000. Kinetics of uptake, clearance, transfer, and metabolism of hexaflumuron by Eastern subterranean termites (Isoptera: Rhinotermitidae). Journal of Economic Entomology, 93: 871-877.