



## Indigenous technologies for the management of termites in Tamil Nadu

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### ABSTRACT

Termites, one of the most polyphagous pests are destructive creatures of all cultivated crop plants throughout the world. An extensive survey was carried out in 10 districts of Tamil Nadu, India to document the Indigenous Technologies (ITKs) followed by farmers for the management of termites in agricultural field. Some of the indigenous technologies widely used by farmers, for the management of termites in different parts of Tamil Nadu were: irrigating the field, applying crude oil, pouring kerosene into termite mound, application of salt and destruction of termite mound. The documented ITKs can be impregnated as a control measure for termites in integrated management of termites.

**Key words:** ITK, Management, Survey, Termites

Termites, one of the most polyphagous pests are destructive creatures of all cultivated crop plants throughout the world. Termite infestation is inimical in loamy or light soil and dry areas where proper irrigation facilities are usually unavailable. The infestation of termites is more on *rabi* crops as compared to *kharif* crops. It feeds on cellulose rich roots of all the plants and as a result of infestation, the leaves begin to dry. Such plants can easily be uprooted from the soil (Shukla 2009). Severe losses were reported by termites on highly susceptible crops such as wheat and sugarcane in northern India, maize, groundnut, sunflower and sugarcane in southern India, tea in north eastern India and cotton in western India (Rajagopal 2002). Severe damage to wheat crop by termites was also documented from Madhya Pradesh, Uttar Pradesh, Gujarat and Rajasthan (Kumar and Pardeshi 2011). Infestation of termites was observed as much as 20- 25% in rainfed while 10% in irrigated crop (Sharma *et al.* 2009). About 300 termite species were recorded from India, of which 40 species were found injurious to economical plants which belong to three important genera; *Angulitermes*, *Microtermes* and *Odontotermes*, of which *Microtermes obesi* (Holm) and *Odontotermes obesus* (Rambur) account for almost 80 % of total losses in South Asia (Gavkare *et al.* 2014).

Narayanaswamy and Bhaskaran (1995) surveyed and categorized large number of indigenous insect control practices in Tamil Nadu. Most non-chemical control of termites on farmlands revolve around good silvicultural or

agronomic practices, physical destruction of termite mounds, biological control, and use of plant extracts and resistant species (Wardell 1987, Logan *et al.* 1990). However, none of these methods have been rigorously evaluated and their efficacy remains speculative. A key area that has yet to be adequately addressed in termite management is using indigenous technical knowledge (ITKs) accumulated by local communities. Such information is essential for priority setting and also for development of pest management strategies that meet local aspirations and are thus likely to be adopted by farming community (Chitere and Omolo 1993, Nyeko *et al.* 2002). In this background, the present study was taken up to document the ITKs followed by farmers for the management of termites.

### MATERIALS AND METHODS

In order to develop farmer friendly IPM practices, knowledge on the indigenous technologies adopted for termite management was found essential. An extensive field survey was conducted to document the different indigenous technologies adopted by farmers in Tamil Nadu for the management of termites. Questionnaire seeking information like indigenous technologies adopted by the farmer and description of those indigenous technologies adopted was prepared and field survey was carried out in ten districts of Tamil Nadu. Two blocks were selected from each district and from each block two villages were selected. 10 farmers from each village were given the survey sheet and as a whole, details were collected from four hundred farmers from 10 districts of Tamil Nadu. The details of the blocks surveyed under 10 different districts were given in Table 1.

### RESULTS AND DISCUSSION

The survey revealed the fact that more than 90% of

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Table 1 Surveyed districts and villages in Tamil Nadu

| District       | Block                          |
|----------------|--------------------------------|
| Coimbatore     | Thondamuthur<br>Kinathukadavu  |
| Erode          | Anthiyur<br>Bhavani            |
| Dharmapuri     | Palacode<br>Pennagaram         |
| Krishnagiri    | Krishangiri<br>Hosur           |
| Theni          | Uthamapalayam<br>Andipatti     |
| Madurai        | Melur<br>Vadipatti             |
| Dindigul       | Dindigul<br>Odanchatram        |
| Ramanathapuram | Mudhukulathur<br>Paramakudi    |
| Tirunelveli    | Cheranmadevi<br>Seidunganallur |
| Tuticorin      | Srivaigundam<br>Karungulam     |

the farmers are unaware of the indigenous technologies and they are solely dependent on chemicals for the management of termites. However some farmers are aware of ITK's and they are adopting certain indigenous technologies for the management of termites and those documented ITK's are listed in Table 2.

The most followed ITK for the management of termites in sugarcane and rice in Madurai, Theni and Coimbatore districts of Tamil Nadu is irrigating the fields, which was already reported by Kaur *et al.* (2008), where farmers in Malwa region of Punjab, India adopt this ITK for the termite management in wheat and sugarcane. Another documented ITK is placing common salt prior to planting of coconut seedling and sugarcane setts and this documented ITK was also followed by farmers of Bareilly, Uttar Pradesh to protect sugarcane setts from termites, where 1 kg of powdered salt is placed below the setts during planting and application of common salt in coconut basin to ward off termites documented by Bhaskaran and Narayanaswamy (1998) were in line with the present observation. In north Gujarat, to check termite infestation, ash and salt are mixed and layered on the storage site (Koradiya and Koradiya 1994) and farmers of Bareilly and Shahjahanpur districts in Uttar Pradesh, prevent the termite infestation in sugarcane by applying 2.5 kg of lime and 5 kg of salt to the soil of sugarcane fields also supports the present documentation.

The other ITK's documented during survey was using crude oil for the management of termites in Dindigul region of Tamil Nadu which was also been reported by Patel (1998), wherein farmers of Meshana, Gujarat applied oil waste for controlling termite menace in sandy regions. Various botanicals like castor, tobacco, calotropis and neem

Table 2 Documentation of ITK's for the management of termites

| Adoption of ITK's for the management of termites                                                                                           | Block and district                                                 |
|--------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------|
| Irrigating the field                                                                                                                       | Melur, Madurai<br>Uthamapalayam, Theni<br>Thondamuthur, Coimbatore |
| Splashing of crude oil in termite infested areas                                                                                           | Sembatti, Dindugal<br>Vadipatti, Madurai                           |
| Application of grease oil on tree trunks                                                                                                   | Sembatti, Dindugal<br>Andipatti, Theni                             |
| Pouring kerosene into termite mound                                                                                                        | Uthamapalayam, Theni                                               |
| Destruction of termite mound                                                                                                               | Karungulam, Tuticorin                                              |
| Application of salt and chilli powder in termite infested field and inside termite mound                                                   | Cheranmadevi,<br>Tirunelveli                                       |
| Breaking termite mound and allowing hen to feed on them as they are rich source of protein                                                 | Srivaikundam, Tuticorin                                            |
| Lighting chimney lamp attracts the alates. The alates are collected in the cloth placed around the chimney lamp and then consumed.         | Andipatti, Theni<br>Uthamapalayam, Theni                           |
| Blowing air into the termite holes and once the alate forms comes out they are consumed. This is followed during November- December months | Andipatti, Theni                                                   |
| Pouring crude oil into the mound                                                                                                           | Seidunganallur, Tirunelvi<br>Vadipatti, Madurai                    |
| Burning of sugarcane thrashes                                                                                                              | Melur, Madurai<br>Thondamuthur, Coimbatore                         |
| In sugarcane after 2-4 months, the old leaves are removed to prevent the termite attack                                                    | Bhavani, Erode<br>Anthiyur, Erode                                  |
| Pouring tobacco/ NSKE extract into the active termite mound                                                                                | Karungulam, Tuticorin                                              |
| Placing one kg of salt while planting coconut seedlings                                                                                    | Thondamuthur, Coimbatore<br>Pennagaram, Dharmapuri                 |
| 500 ml of chilli powder extract mixed with 10 litres of water and sprayed in the field effectively control termite                         | Cheranmadevi, Tirunelveli                                          |
| Dissolving camphor in water and pouring the extract into termite mound                                                                     | Cheranmadevi, Tirunelveli                                          |

leaf extracts were used for the management of termites and these documented ITK's are well supported by the ITK's recorded by Bhaskaran and Narayanaswamy (1998) and Shrivatsava *et al.* (2006). Pouring kerosene oil into the termite mound near the field was documented from Theni district which was also followed by the farmers of Gonda, Uttar Pradesh who use 2.5 l of kerosene oil per acre at the time of irrigation for termite management. Hens grown in

farm also help in controlling termite attack as they are fond of feeding termites in the field and using hens to feed on termites collected by placing bait in earthen pot was also reported by Bhaskaran and Narayanaswamy (1998).

### Conclusion

The indigenous technologies documented can be tested for their effectiveness in termite prone areas and as ITKs are organic in nature, they may be incorporated in IPM module for effective management of termites.

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