

# Subterranean Termites

## Introduction

Termites are the single greatest pest in the United States which causes billions of dollars in damage each year to homes and structures. In their natural habitat they perform the important task of breaking down the large quantities of dead and fallen trees and sources of cellulose that continuously accumulate in the forests. Unfortunately they also attack wooden structures, and if left uncontrolled, will cause weakening of the structure due to their feeding habits. Other wood product can also be attacked under the right condition, like clothing, shoes, books, magazines, cardboard, furniture, etc.

Termites have survived for over 55 million years. They are social insects which contributed to their successful existence. Termites live in colonies which makes them different to non-social insects like beetles, spider or cockroaches.

Each termite in the colony performs a specific job that benefits the colony as a whole. In the termite colony, an entire group or caste of termites is responsible for feeding their parents and siblings, while another caste is responsible for reproduction. Because of this division of labor, the colony of individuals functions as a single animal.

## Establishment of Colonies

In the San Francisco Bay Area on a warm day after rain, homeowners may see large numbers of winged insects. These are most likely subterranean termite swarmers. They are new termite kings and queens which must leave their colony in order to mate and create new colonies of their own.

The termite swarmers pair up and search for a place to begin a new family. Their wings break off shortly after landing and the new king and queen enter the soil to start their colony. The parental king and queen can survive for decades and produce huge colonies with thousands of offspring.

The subterranean termite most commonly found in the Bay Area is the western subterranean termite, *Reticulitermes Hesperus*. Colonies take years to mature and contain 60,000-250,000 individuals but colonies in the millions are possible.

## **Castes**

### *Primary Reproductives:*

As mentioned above, mature subterranean termite colonies will produce large numbers of winged swarmlers or “alates” that will eventually become king and queen termites. These royal termites are dark-colored and are the only caste with functional eyes. The king termite remains virtually unchanged after losing his wings. However, the queen changes physically to the largest individual of the colony when she becomes an egg-laying machine producing sometimes thousands of eggs in a single day.



### *Secondary Reproductives:*

If the king or queen should die, other individuals within the colony will start to develop functional reproductive organs to take their place. Secondary reproductives are light in color but they are larger than workers and never develop wings.



### Worker Caste:

The caste found in the infested wood are the subterranean termite workers. They are responsible for all the labor in the colony. The workers care for the young, repair the nest, build foraging tunnels and tubes, locate food, feed and groom the other castes and each other. The youngest perform the tasks inside the colony like feeding, grooming and caring for the young, while the older more expendable workers take on the hazardous jobs of foraging and nest building. The termite workers are both male and female but they are functionally sterile. They are milky white in color and have no wings or eyes. The body of the termite worker is soft, but its mouthparts are very hard and adapted for chewing wood.



### Soldier Caste:

Soldier termites are responsible for guarding the colony and its occupants. They defend the colony against aggressive ants, foreign termites and other insects. When foraging, tubes or galleries are broken into the soldiers congregate around the break to stand guard against invaders. Soldiers are similar to the termite workers in that they are blind, soft-bodied and wingless. However, the soldiers have an enlarged, hard, yellowish-brown head which has been modified for defense. The head has a pair of very large mandibles or jaws that are made to puncture, slice and kill enemies (primarily ants). However, the large mandibles prevent the soldiers from feeding themselves, so they must rely on the workers for food.



## **Behavior**

It is not known exactly how subterranean termites locate sources of food. It is believed termites come in contact with food sources in the process of foraging a network of tunnels. The foraging range of a single termite colony is difficult to predict. Some larger colonies may forage over areas the size of a football field.

Termites produce chemicals called pheromones while foraging. These pheromones are basically odors that send messages to other termites in the colony. When a food source is located, the pheromones odor trail is intensified to recruit other termites to the feeding site.

Subterranean termites also forage above ground for sources of food like wood in homes and other structures. In order to protect themselves from predators and to maintain their connection to the soil, termites build long tubes out of mud and fecal material. These exploratory tubes are very easy to see and are one of the best ways to identify a potential termite infestation. Once a source of wood has been located, the termites establish more permanent working tubes. These utility tubes are highways running from the underground termite galleries directly to the food source.



## **Moisture Needs**

Subterranean termites are constantly at risk of drying out; this is why they must live in the soil. Soil has the capacity to hold water for a long period of time and keep the colony moist. When a utility tube becomes damaged, the worker termites will labor desperately to repair it. The termites located above ground will often die of dehydration, if the tube is beyond repair. However, on some occasion subterranean termite colonies do become established above ground. These above ground infestations are found in structures with chronic moisture problems. Chronic problems include flat roofs where debris and moisture have been allowed to accumulate, leaking pipes or areas with no ventilation.

## **Nutrition and Feeding**

Subterranean termites can chew through and damage many materials, but they can only obtain nutrition from cellulose. Within the termite stomach are single-celled organisms called protozoa. The protozoa produce enzymes that digest cellulose causing the break down of wood particles to simpler compounds that termites can absorb as food. Foraging worker termites feed directly on wood or other cellulose material and then return to the nest and feed the immature termites, soldiers, and reproductives.

## **Swarming Behavior**

Swarming is the termite method of dispersal and establishing new colonies. Winged reproductive swarmers emerge from the colonies at certain times of the year when conditions are suitable. Peak swarming season for the subterranean termites in the Bay Area is early spring and late fall during the daylight hours on warm sunny days following a rain. Swarmers are attracted to light so when they emerge indoors they will be seen flying to windowsills and open doors. These flights are often the first indication to homeowners that they have a subterranean termite infestation.

