IANR NebGuide
University of Nebraska Lincoln
Published by University of Nebraska–Lincoln Extension, Institute of Agriculture and Natural Resources

G1062
(Revised November 2006)

Termites

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This NebGuide provides information on biology and control of subterranean termites.

Termites feed on wood and serve an important function in nature by converting dead trees into organic matter. Unfortunately, the wood in buildings is equally appetizing to termites and they can cause serious damage to residential and commercial buildings. Two species of subterranean termites found in Nebraska are the eastern subterranean termite and the arid land subterranean termite. Both of these species have similar biology.

Biology

Subterranean termites are ground-inhabiting, social insects living in colonies. The colony or nest of subterranean termites may be up to 18-20 feet below the soil surface to protect it from extreme weather conditions. These termites travel through earthen (mud) tubes to reach food sources above the soil (ground) surface. The mature termite colony has three castes: a) reproductives (king and queen), b) soldiers, and c) workers. The colony reaches its maximum size in approximately 4 to 5 years and it may include 60,000 to 200,000 workers. Winged males and females from a parent colony emerge in flight or swarm.

The winged reproductives are dark brown to brownish black and they have two pairs of equal size wings extending well beyond the body. Swarms are common in spring and fall, especially after a rain. After a flight, the winged males and females return to the ground and shed their wings. The wingless males and females pair off and search for sources of wood and moisture in soil. The royal couple digs a chamber in the soil near wood, enters the chamber and seals the opening. After mating, the queen starts laying eggs. The queen may survive up to 25 years and she may lay more than 60,000 eggs in her lifetime. The eggs are yellowish white and hatch after an incubation period of 50 to 60 days.

Full-grown workers are soft-bodied, wingless, blind and creamy white. In early stages, they are fed predigested food by the king and queen. Once workers are able to digest wood, they provide food for the entire colony. The workers undertake all the labor in the colony such as obtaining food, feeding other caste members and immatures, excavating wood, and constructing tunnels. Workers mature within a year and live from 3 to 5 years.

Soldiers are creamy white, soft-bodied, wingless, and blind. The head of the soldier is enormously elongated, brownish, hard and equipped with two jaws. Soldiers must be fed by workers as they are incapable of feeding themselves. They are less numerous in the colony than workers and their sole function is to defend the colony against invaders. Soldiers mature within a year and live up to 5 years.

Difference Between Termites and Ants

Flying ants and swarming termites are often difficult to recognize apart. Termites have relatively straight, beadlike antennae while ants have elbowed antennae *(Figure 1)*. The termite has two pair of wings (front and back) that are almost equal length and size. The ant also has two pair of wings but of unequal size; the front wings are much larger than the hind wings. The abdomen of the termite is broadly joined to the thorax (chest) while the abdomen and thorax of the ant are joined by a narrow waist called a petiole.

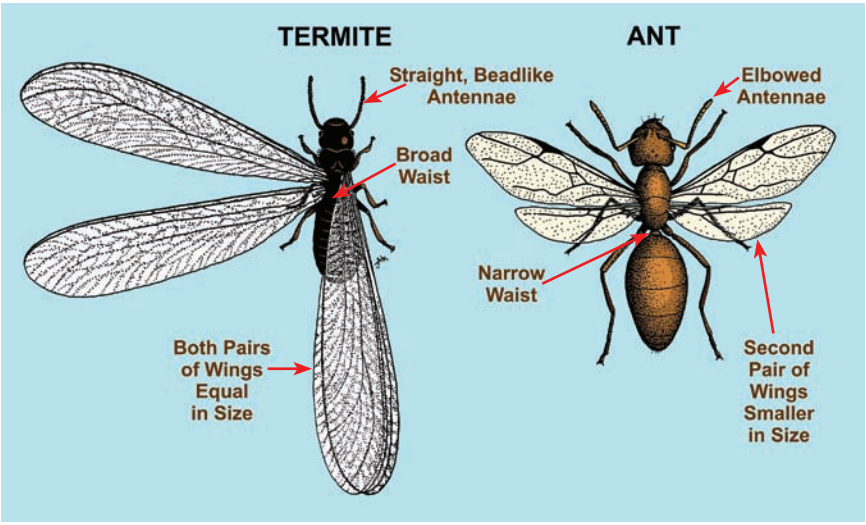

Figure 1. Difference between termite and ant.

Feeding Habits

Subterranean termites feed exclusively on wood and wood products containing cellulose. Termites have protozoa (microorganisms) in their intestines which provide enzymes to digest cellulose. Although termites are soft-bodied insects, their hard, saw-toothed jaws work like shears and are able to bite off extremely small fragments of wood, a piece at a time. Termites often infest buildings and cause damage to lumber, wood panels, flooring, sheetrock, wallpaper, plastics, paper products, and fabric made of plant fibers. Their most serious damage is in the loss of building structural strength. Other costly losses include attacks on flooring, carpeting, art work, books, clothing, furniture and valuable papers. Subterranean termites feed on dead parts of trees but are not known to attack live trees.

Communication in the Colony

Termites communicate primarily by secreting chemicals called pheromones. Each colony develops its own characteristic odor. An intruder is instantly recognized and an alarm pheromone is secreted that triggers the soldiers to attack the intruder. When a worker finds a new source of food, it recruits others to that food source by laying a chemical trail. The proportion of termites in each caste within the colony is also regulated chemically. Nymphs or immatures can develop into workers, soldiers or reproductive adults, depending on the colony needs.

Sound is another means of communication. Soldiers and workers may bang their heads against the tunnels. The resulting vibrations are perceived by others in the colony and serve to mobilize the colony to defend itself. Mutual exchange of foods enhances recognition of colony members.

Evidence of Termite Infestations

- Wood damaged by termites always has remains of mud tubes attached to wood galleries or tunnels in an irregular pattern. The tunnels may contain broken mud particles with fecal materials. In the case of an active colony, white termites may be found in infested wood.
- The presence of flying winged males, females or their shed wings inside the building indicates an infestation.
- Another indication is the presence of mud or shelter tubes extending from the ground to woodwork or on foundation walls. Workers travel periodically via shelter tubes to their nest to regain moisture and perform feeding duties. Each mud tube is approximately the diameter of a lead pencil.

How Old is the Damage?

Based on normal termite feeding activity, it takes 3 to 8 years to cause appreciable damage. Some predictions suggest that, under ideal conditions, a termite colony of 60,000 workers may consume one-foot length of 2" x 4" pine in 118 to 157 days. In Nebraska, the extent of damage may be different because of reduced feeding activity during the cold season.

Inspection for Subterranean Termites

Termite damage may be located by probing wood with a screwdriver, ice pick or knife. Start any inspection in the basement and use a bright flashlight. Look for mud tubes and the activity of swarmers. If it is necessary, seek help from a professional pest control operator or advice from experienced entomologists. A qualified professional inspector should inspect the exterior and interior surfaces of the foundation, particularly construction where wood is on or near the soil. Mud tubes are solid evidence of termite activity. Other sites requiring inspection are:

a) wood construction in basement and crawl space (if present);
b) sills, joists, support posts, basement window frames, wood under porches;
c) hollow blocks, cracks in the cement or brick construction and expansion joints; and
d) scrap wood on ground, old tree stumps, fence posts, and exterior frames of basement windows.

Additional tools used by a professional termite inspector may include:

- Moisture meter,
- Termatrac®
- PestFinder®
- Acoustical emission device
- Boroscope and Videoprobe
- Infrared camera
- Microwaves motion detector
- Termite-sniffing dogs (some companies have successfully used termite-sniffing dogs).

The inspector should be able to determine if termites are active or not, how old the damage may be, and if chemical treatment is necessary.

Useful Information If Termite Treatment is Necessary

Do not panic. There is no need to be frightened or alarmed if termite activity is found in your home and termite treatment is inevitable. Termites work slowly and the structure will not be extensively damaged or collapse overnight.

Take your time to make a sound decision. Do not allow anyone to force you to make quick decisions. If you decide to hire a commercial pest control company, seek two or more treatment cost estimates. It is important to request the plan of work revealing sites of termite activity and treatment procedures. Ask for written information on chemical treatment procedures, repair of wood work, warranties, copies of insecticide labels and other pertinent information. Compare bids before making decisions. Ask about liability insurance.

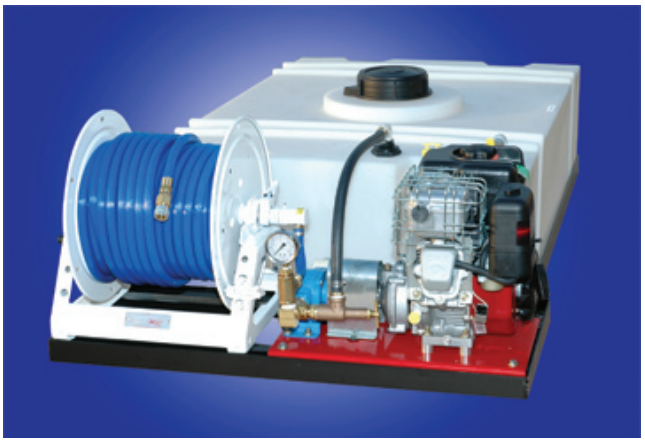

Figure 2. Termite rig: fiberglass tank, engine, pump, pressure gauge and hose. Source: Oldham Chemical Co.

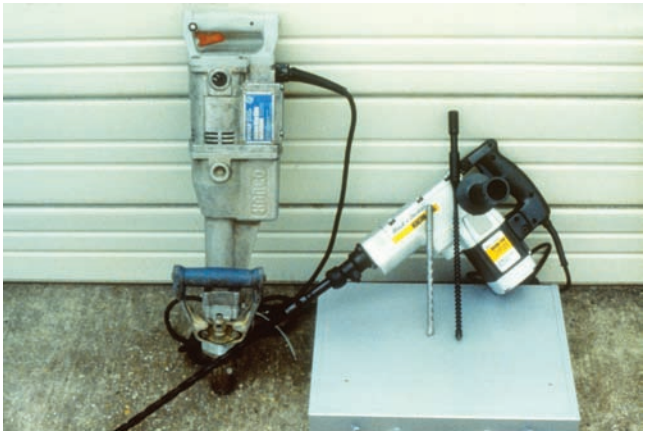

Figure 3. Hammer drills with long bits for drilling through concrete slabs. Source: B & G Equipment Co.

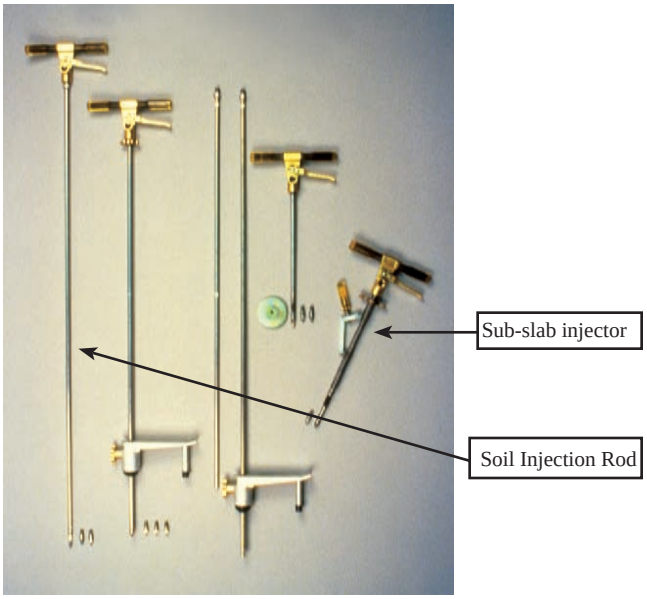

Figure 4. Versa-Tip tools. Source: B & G Equipment Co.

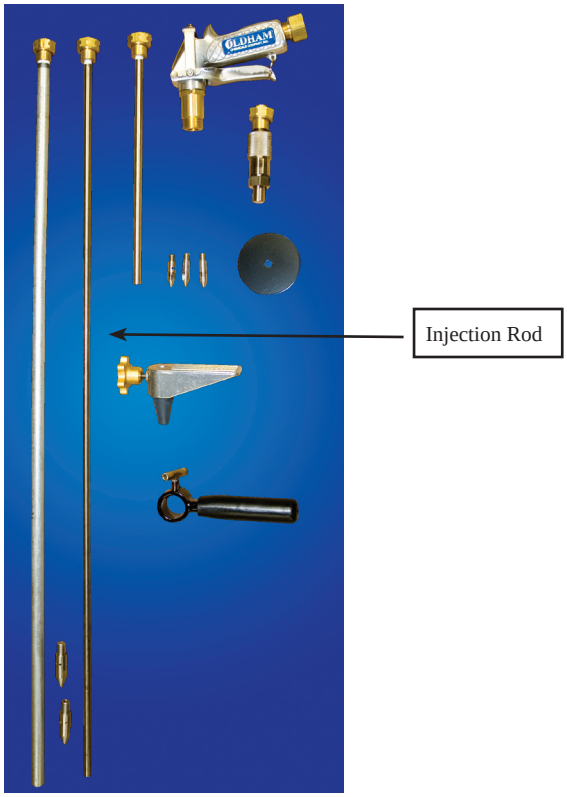

Figure 5. Rodding tools. Source: Oldham Chemical Co.

Be aware of situations where:

a) someone says that a structure will be treated with a secret chemical formula,
b) the company has no business address and no listed phone number, and
c) the company has no liability insurance.

Please refer to a NebGuide G1647, *How to Select a Pest Control Company*.

Termite Control

When you seek bids from a professional pest control operator, you may be given a choice of insecticide barrier or baiting system treatments.

Insecticide treatments allow for establishing a continuous chemical barrier between the termite colony (usually in the soil) and wood in a building. Sometimes a secondary termite colony may exist above the soil (in the roof or other areas with a constant moisture supply) that requires additional treatment. Insecticide barriers may be established during or after the building construction. In an existing building, termite treatments may involve any of the following procedures: a) mechanical alterations, and/or b) use of an insecticide for treating the soil, foundation and wood. **In most cases, it is beyond the ability of an untrained person to attempt termite treatment**, unless it is a spot treatment or a person has work experience in this area.

Generally, termite treatment should be performed by professional pest control operators (PCOs). Termite treatment requires special tools such as hammer drills, sub-slab injectors, rodding devices, a termite rig (engines equipped

with pumps, hose unit, tank, etc.), and protective equipment *(Figures 2-5)*.

Several insecticides (termiticides) are registered in Nebraska for termite control under various brand names. These insecticides contain the following active ingredients: bifenthrin, chlorfenapyr, cypermethrin, fipronil, imidacloprid and permethrin. In general, all of these insecticides control termites if they are applied properly.

Several bait systems are also available for termite control, and some are effective if properly. The chemical present in baiting system is usually slow-acting and takes a little bit longer to control the termite colony. The bait products contain the following active ingredients: diflubenzuron, hexaflumuron, sulfluramid and noviflumuron. Some of these baits are available only through commercial pest control professionals. Over-the-counter bait products may not provide satisfactory termite control. Make sure to discuss and understand the contract and conditions involved in use of baits for termite control if you hire a pest control professional.

Please check with the Nebraska Department of Agriculture for currently registered liquid termiticides and bait products for termite control.

Caution

1. Do not apply insecticides when soil is frozen or water-soaked (saturated). Frozen or saturated soil will not permit adequate absorption for uniform distribution of insecticide.
2. Do not permit humans and pets to contact treated surfaces until dry.
3. Before using insecticides for termite control, always READ, UNDERSTAND AND FOLLOW all label directions.
4. Keep all pesticides in original containers, out of reach of children and do not contaminate food, feed and water.
5. Do not plant food crops in treated soil.
6. Do not allow children and pets to play in treated soil.

The applicator is responsible for effects of insecticide use. The information provided in this publication does not supersede the insecticide label specifications. In case of an emergency, you may call:
CHEMTREC (Pesticide Emergency Network) Phone No. (800) 424-9300.
or
Nebraska Regional Poison Control, based at Children's Hospital in Omaha, (800) 222-1222.

Reference to commercial products or trade names is made with the understanding that no discrimination is intended of those not mentioned and no endorsement by University of Nebraska–Lincoln Extension is implied for those mentioned.

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1991, 2002, Revised November 2006