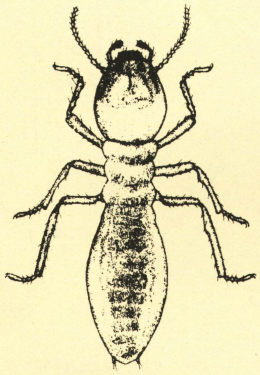
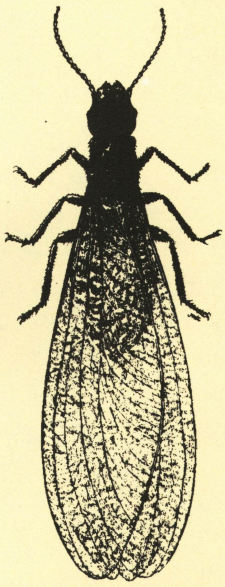
Subterranean Termites

H. W. Homan and F. W. Merickel

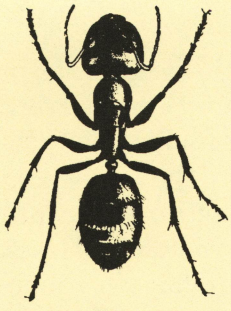
Subterranean termites are well known for damaging houses, garages, barns, sheds, and any wood that comes in close contact with soil, including fence posts, electric poles, and tree stumps. Subterranean termites are found statewide in Idaho except for the Panhandle and high mountain country. Termites are beneficial when they decompose dead trees and provide nourishment from the decomposed wood for new forests, but are extremely damaging when they attack our houses and buildings. Subterranean termites do not live in buildings, but return to the soil daily unless the structural wood is damp.



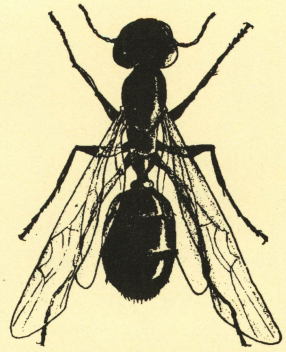
Termite worker



Winged termite



Carpenter ant worker



Winged carpenter ant

Fig. 1. Termites are often confused with carpenter ants.

Discovery

A homeowner is usually unaware of a termite infestation until finding one or more of the following conditions:

- hundreds of smoky winged adults emerging in or around a house,
- a mud tube under or on a wall of the house touching the soil,
- an area of the floor sags a little when stepped on,
- when remodeling, the homeowner finds a piece of lumber with termites and galleries where termites have been feeding in the wood,
- piles of small sand-like pellets along a wall, door, windowsill, or baseboard that reappear a few days after cleaning.

How to tell an ant from a termite

The easiest way to tell an ant from a termite is to look at its waist between the thorax and abdomen. The ant has a constricted, wasp-like thin waist while the termite's waist is broadly joined to the abdomen. Termites are usually a creamy-white color while ants are brown or black. The termite has straight antennae and the ant has an elbowed, L-shaped antennae. If the termite is winged, all four wings will be of equal length and about twice as long as the body. If the ant is winged, the fore wings will be longer than the back wings, and only slightly longer than the body (fig. 1).

University of Idaho College of Agriculture

Cooperative Extension System ❖ Agricultural Experiment Station

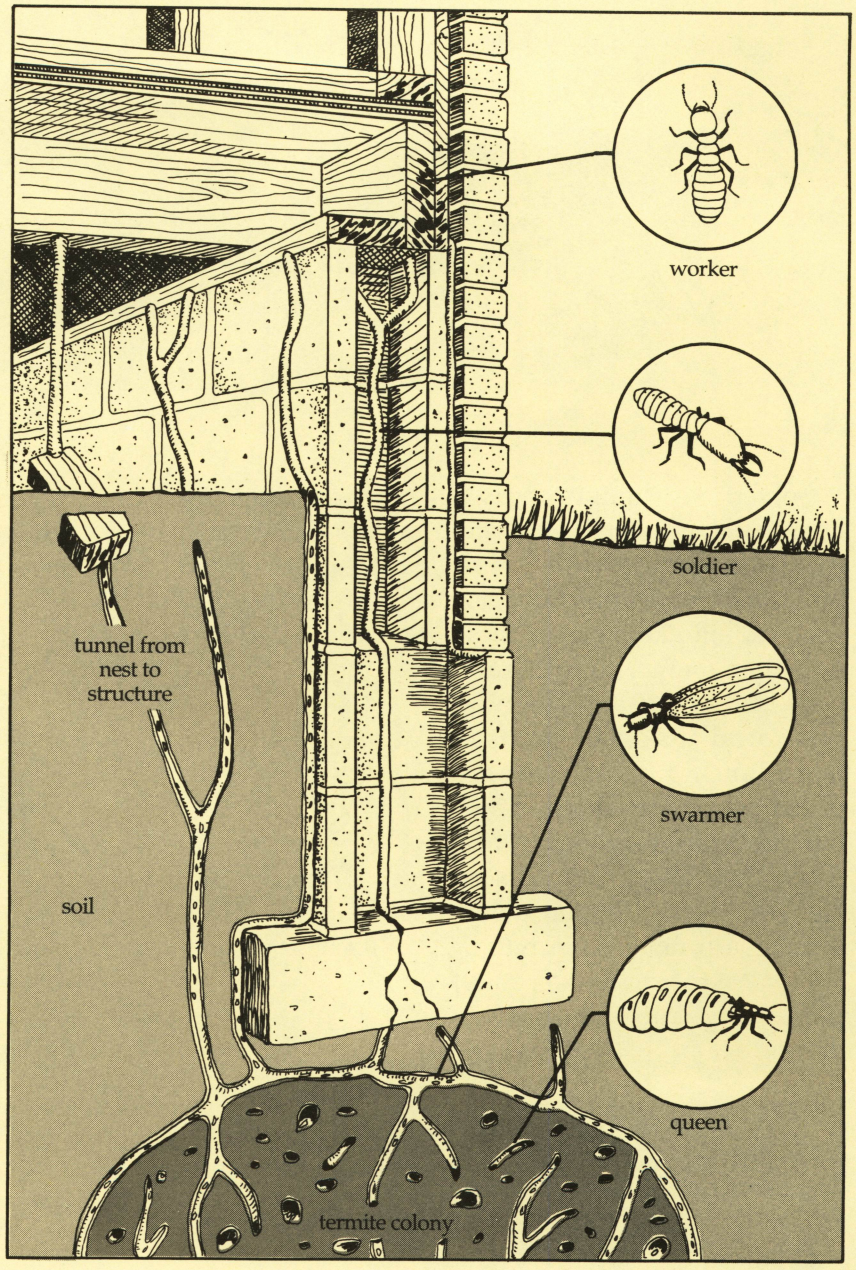
CIS 1002

Where to look

Most termite infestations occur in the basement, just above the crawl space, right above the slab, or near the steps. You will need a flashlight and an ice pick, awl, or thin screwdriver to check mudsills, studs, joists, subflooring, and floors. The sharp tool can easily penetrate wood that has been mined. Wood such as posts, steps, door frames, and trim embedded in an earth or concrete floor, are especially susceptible to termite infestation. Damage is most often found around furnaces, hot water heaters, and water pipes where conditions are warm and moist during cold months. If you find damage, check the structure extensively to estimate the extent of the damage (fig. 2).

Recent technology includes some novel ways to detect termite infestations, including:

- using beagles trained to detect the presence of termites by their odor,
- using gas detectors to sense termite odors is useful in slab-type structures but will not work outside or in crawl spaces,
- using an electronic acoustical unit with two sensors will detect termite activity within 1.5 feet if it is functioning properly.



Termite biology

Termites are social insects with a predetermined division of labor known as the caste system. There are four castes: *queens, workers, soldiers,* and *reproductives.* A large, dark queen that produces eggs is the colony mother except in some large colonies where there can be satellite queens. The workers are creamy-white with a dark head and no eyes. They forage for food containing cellulose, repair the earthen tunnels and nest, and tend and feed the young nymphs when they hatch. The soldiers are the same color as the workers but have an enlarged head and jaws. They protect the colony and foragers from nest invaders. The reproductives are darker, $\frac{3}{8}$-inch long with two, equally sized smoky, transparent wings. They emerge after a spring rain to fly away, mate, and start new colonies. Fortunately, they establish very few nests due to predation and lack of suitable habitats.

The worker termites usually stay in contact with the soil through earthen tubes. These tubes maintain temperature and moisture to keep the workers from dehydrating when foraging, while also protecting them from enemies. The tubes are made of earth, fecal material, and saliva.

Colonies build slowly at first; it usually takes about 10 years after the house is constructed before damage occurs (unless it is built on or near an established colony.) When the wood moisture of the structure remains higher than 15 percent, secondary colonies may exist without soil contact.

Termites are active all year; however, activity is slower during the cooler months if the house and nest are not heated. The workers are never seen unless their tubes are broken or the galleries are exposed. During late winter or early spring, the reproductives may be seen swarming indoors around windows and lights.

Control

If you find you have a termite infestation in your home, remember, the colony has probably been in the house 10 to 15 years and will not be destroyed tomorrow. Take your time in assessing the termite damage and evaluate the control alternatives.

Repair and prevention

There are many precautions for structurally preventing termite infestation. Basically, do not allow wood to contact the soil. Consider the following options:

- ✓ provide adequate ventilation and drainage for basements and crawl spaces,
- ✓ landscape water runoff away from the foundation. Gutters, down spouts, and drains should be installed correctly and kept functional,
- ✓ fill all cracks and voids in the foundation with concrete. Fill the top tier of blocks with concrete if you have a block foundation,
- ✓ remove all wooden debris from the building vicinity. Replace any wooden posts, steps, trellises, or other structures in contact with the soil, with concrete, metal, plastic, or pressure-treated lumber, and
- ✓ replace any badly damaged timbers with sound materials or pressure-treated lumber.

Physical barriers

Physical barriers can bar termites from entering new construction and certain older homes. This practice uses sand particles between 1.2 mm and 1.7 mm. This size of sand particle is too small for termites to go between and too large for them to move with their mouth parts, or *mandibles*. Sieve the sand using a small screen size 12 to 16 or Tyler screens size 10 to 14. Place a layer of sand at least 4 inches thick and 24 inches wide next to the interior house foundation and around any supports under the house. You must follow these precautions for prevention and periodically make sure there is a continuous barrier between the soil and house. The outside of the foundation needs to be treated with an insecticide barrier as described under *chemical control*. Homes built on slabs or with basements cannot use barriers effectively.

Installing stainless steel wire mesh around the foundation and pillars has reportedly been effective in Australia, although no data is available from the United States. We don't recommend this technique until appropriate effectiveness data is collected.

Biological control

Beneficial predatory nematodes are available to suppress active termite colonies. Apply to the soil or directly to the termite's mud tubes. The theory is for the nematodes to multiply and disperse to infest and kill most of the termites in the colony. They cannot be used as a preventative control measure because the nematodes do not survive without hosts. Poor results occurred in some cases where the wrong nematode strain was used. The nematodes may not survive shipment from the laboratory to the consumer or retailer and are already dead when introduced to the termite colony. Soil type, temperature, soil moisture, and season of the year can greatly affect success.

Other methods

Heat fumigation can kill termites in walls. Structure temperatures must stay between 140 and 150°F to kill the termites. Some problems with this method are:

- even when using fans, it is very difficult to get the interior wood to the critical temperature of 120°F,
- if temperatures reach 160°F, the heat may damage many articles within the structure, and
- termites in the soil during treatment will not be killed and that is where most of the colony is located.

Heat fumigation, however, may effectively kill drywood termites. Inject liquid nitrogen into wall voids to lower the temperature to -120°F, which kills drywood termites. High voltage and microwave machines can be effective for easily accessible, drywood termite infestations.

Borate solutions can be injected into new or unpainted wood making the wood toxic as well as a termite repellent. Inject borate solutions into sound and in

fested wood. Sealers are suggested after treating outside walls and areas where moisture may be present. Borates are colorless, odorless and have a very low toxicity to mammals, however, more research on its effectiveness is needed.

Baits are food laced with an insecticide, disease organism, or growth inhibitor, that attract termites. They are currently in the experimental stage and hold future promise

Chemical control

When chemical control is used, a continuous barrier of insecticide is placed between the building and the soil. Termites will be poisoned as individuals move from the soil to the building. This is very difficult to do because the person who treats needs to know the soil types, yearly moisture conditions of the soil, unusual construction of the structure, drain locations, well locations, irrigation practices, landscaping, and other problems. Extra care should be taken around foundations with cracks, steps, garages, and slab type structures because they may need drilling to inject insecticide under them. Any gap in the treatment can still allow termites to enter the structure freely.

A homeowner who considers all the problems of a do-it-yourself treatment will probably elect to have the termite treatment done by a professional service. We suggest you contact three licensed pest control services for control estimates. There may be a price difference and sometimes the least expensive may not provide adequate termite control and the most expensive may be overkill. If you hire a professional service, be sure they use an odorless formulation.

Effective products for controlling termites include: Baygon, boric acid, Demon, Dragnet, Dri-die, Dursban, Equity, Ficam, Flee, Tempo, and Torpedo.

Trade names – To simplify information, trade names have been used. No endorsement of named product is intended, nor is criticism implied of similar products not mentioned.

Groundwater – To protect groundwater, when there is a choice of pesticides, the applicator should use the product least likely to leach.

The authors – Hugh W. Homan, Extension entomologist, Moscow; Frank W. Merickel, W. F. Barr Museum curator, Moscow. Both are in the University of Idaho Department of Plant, Soil, and Entomological Sciences.

Artwork courtesy of Lorraine Ashland.

Issued in furtherance of cooperative extension work in agriculture and home economics, Acts of May 8 and June 30, 1914, in cooperation with the U.S. Department of Agriculture, LeRoy D. Luft, Director of Cooperative Extension System, University of Idaho, Moscow, Idaho 83844. The University of Idaho provides equal opportunity in education and employment on the basis of race, color, religion, national origin, gender, age, disability, or status as a Vietnam-era veteran, as required by state and federal laws.

1,500 9/93

50 cents