Eastern Subterranean Termite

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The eastern subterranean termite (*Reticulitermes flavipes* (Kollar)) is the most destructive of the insects that feed on wood and cellulose products in the United States. It damages houses and other buildings, utility poles and fence posts, furniture, books, papers, plastics, buried utility cables, and occasionally living shrubs, trees, and field crops. It is also the most common and widely distributed termite in North America. It ranges from Ontario, Canada, through the Eastern, Central, and Plains States to Mexico and northern Guatemala. It does not occur in the Far West.

This species is most abundant in regions having warm, humid climates, but it is not restricted to them. Modern building practices, such as the use of heated basements and slab-on-ground construction, favor the insects in areas where they were formerly of little importance.

Description

Subterranean termites are social insects that live in the ground. Each colony contains three forms or castes: reproductives, workers, and soldiers. The reproductives (sometimes called kings and queens) are the slender, winged forms seen at swarming time. They are brown or black, with soft bodies ⅜ to ½ inch in length. Unlike the other castes, these colonizing sexual adults have functional eyes. They also have two pairs of long-equal-sized, whitish, translucent wings[2] that are folded flat over the back when at rest (fig. 1).

Adult workers are soft, grayish white, and slightly less than ¼ inch long. They have saw-toothed jaws and are wingless and blind. They avoid dry air and are seldom seen unless dug out of their bur-

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[2] These equal wings help to distinguish termite kings and queens from flying ants, which have two pairs of transparent wings of unequal size. Termites of all castes have a thick waistline, ants, a very slender one.

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rows in earth or wood. They feed the reproductives and soldiers. Workers are the injurious caste and comprise the majority of termites in a colony.

Adult soldiers resemble workers, but are at least ¼ inch long and have large, yellowish heads with dark-brown jaws. Their jaws are used for defense rather than for cutting wood.

Habits

Subterranean termites usually swarm during warm, sunny days in early spring, but swarms are seen as late as October. After a short flight, the insects lose their wings and may be seen crawling in pairs on the ground, in or about buildings, or on other objects. When a pair finds a suitable nesting place in moist earth near a supply of wood, they enter, mate, and begin a new colony.

A few days after mating, the queen begins to lay eggs, which are yellowish white and kidney shaped. They hatch in 30 to 90 days, mostly into worker nymphs. Soldier and worker nymphs mature into adults in about 1 year, reproductive nymphs in 2 years. Within a few years, a colony may contain several thousand individuals.

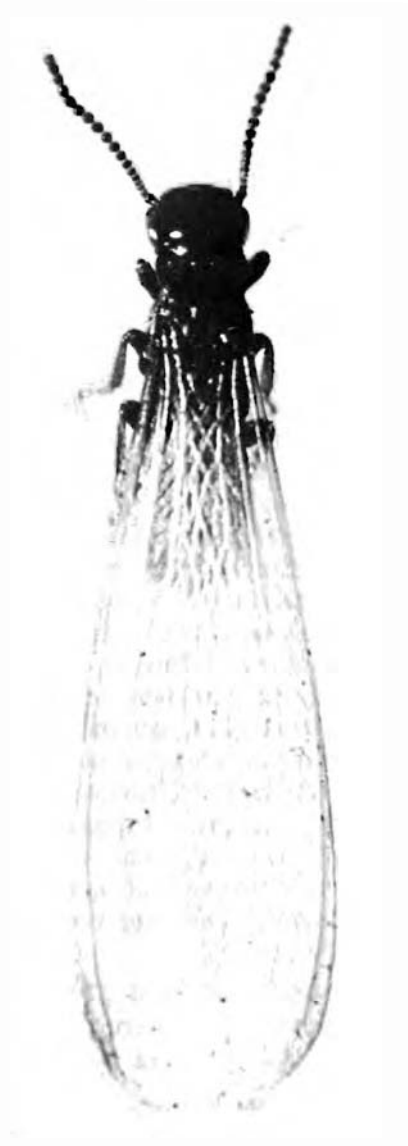

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Figure 1.—Adult reproductive termite (king or queen) with wings folded over back.

Evidence of Attack

Swarming of winged adults is often the first sign of a termite infestation. Discarded wings will be found inside a building where winged kings and queens emerge to seek sources of light. Earthen shelter tubes on foundations (fig. 2), water pipes, sills, or joists are sure signs of termites. These tubes are often concealed in cracks in the foundation or concrete floor, behind brick veneer walls, or within hollow-block or tile walls.

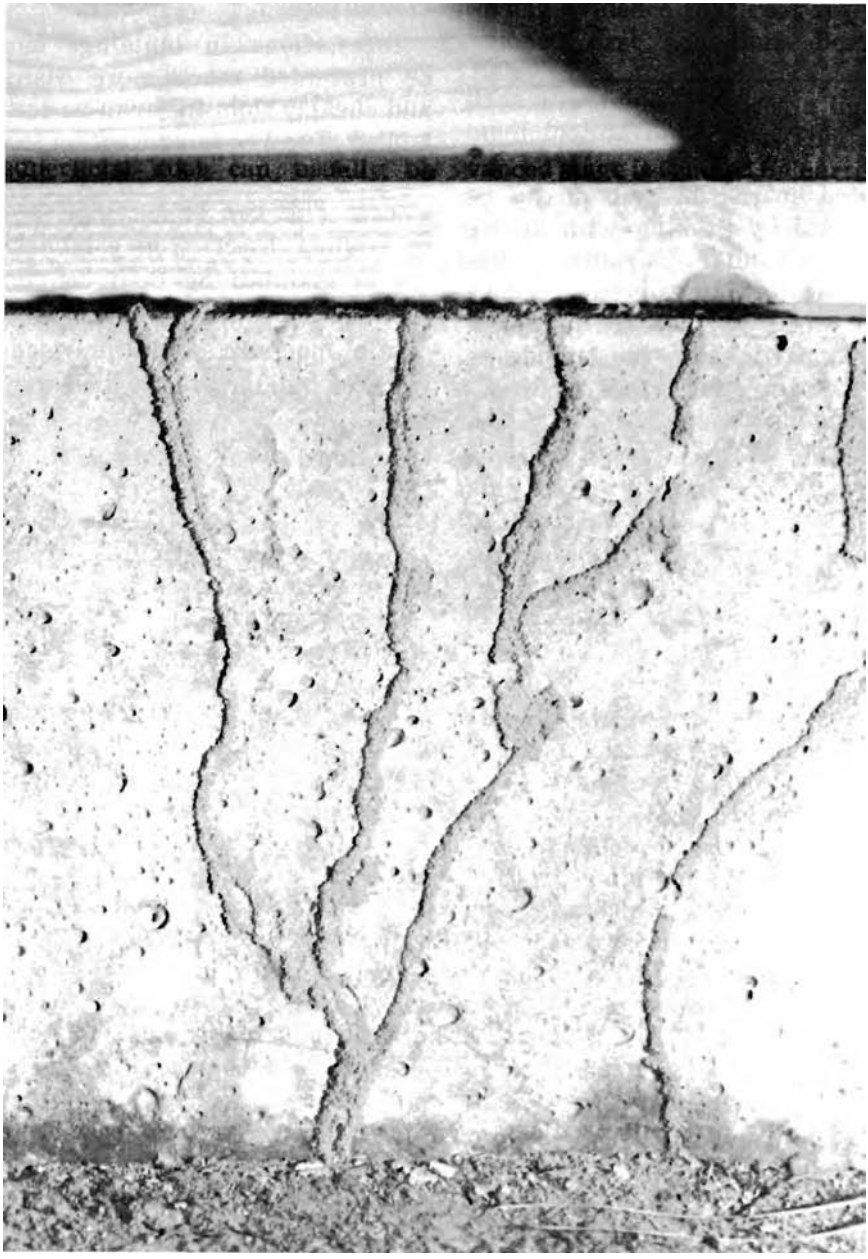

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Figure 2.—Termite shelter tubes on foundation.

Occasionally, the first evidence of attack is the sagging or collapse of weakened supporting timbers, floors, or stairways. Sometimes door frames or window facings crumble, exposing a

network of galleries lined with soil and excrement (figs. 3 and 4).

Termites always leave a shell of surface wood to protect them from exposure to dry air, but infested boards or timbers can be detected by probing with an ice pick or similar instrument. Subterranean termites neither reduce the wood to powder nor push wood particles to the outside as do certain other types of wood-boring insects.

Prevention

Infestations in buildings can be prevented much more easily and cheaply than they can be controlled. *The key to prevention lies in construction that discourages attack.* This can be accomplished by keeping insects from establishing or maintaining their contact between the soil, from which they obtain moisture, and the woodwork of buildings, on which they feed.

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Figure 3.—Pine 2x4 destroyed by termites.

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Figure 4.—Termites entered this house from a soil-filled porch.

Before a building is constructed, the site should be freed of all stumps, roots, and other wooden debris and graded to keep it dry. In buildings with crawl space, leave at least 18 inches of clearance between the bottoms of floor joists and the ground and make certain the space is well ventilated. Foundation piers or walls should be impervious to termites: poured, reinforced concrete is preferable. Where hollow-block or tile foundations are used, cap them with at least 4 inches of reinforced concrete. Provide access doors or openings to permit inspections. Do not bury scraps of lumber in the backfill adjacent to foundation walls or pillars nor beneath porch slabs. Remove all form boards and grade stakes. Use chemically treated wood for sills, plates, joists, headers, and subfloors where termite hazard is extreme. Wood that has been pressure treated with an approved preservative by a standard process is best.

In slab construction, fill all expansion joints with a material that is resistant to termites, such as roofing-grade coal-tar pitch, or a rubbery type bituminous sealer. Fill all openings around pipes and conduits with one of these sealers or with dense concrete mortar.

As a supplement to good construction, and as a further precaution against termite infestations, especially in regions where termites are abundant, it is advisable to treat the soil under

buildings with a chemical that is lethal to termites. Soil treatment is a particularly good precaution in slab construction, for buildings on slabs are very vulnerable to termites and remedial measures are difficult and expensive.

In comprehensive tests in southern Mississippi and in the Panama Canal Zone, where termite populations are very high, and also at Beltsville, Md., the Forest Service has found that several chemicals will give protection for many years when applied to the soil in proper dosages. The tests are continuing, and additional chemicals may be found effective. The formulations currently suggested are—

- Aldrin, 0.5 percent in water emulsion.
- Chlordane, 1.0 percent in water emulsion.
- Dieldrin, 0.5 percent in water emulsion.
- Heptachlor, 0.5 percent in water emulsion.

Chemicals should be applied before the slab is poured but after grading is complete. Where the fill is soil or unwashed gravel, give the entire area to be under the slab a dosage of at least 1 gallon per 10 square feet. If cinders, washed gravel, or similar coarse materials are used in the fill, increase the dosage to at least 1½ gallons per 10 square feet. Critical areas, such as along foundation walls, beneath attached porches or terraces, or around plumbing, should be additionally treated by the trenching method described later. Care must be taken to avoid disturbing the thin layer of treated soil or fill before the slab is poured.

The concentrations and dosages suggested should be the minimum where long-lasting protection is desired. Lowering the amount of chemical is poor economy, for the cost of the chemical is only a small portion of the total cost of treatment.

Control

The first step in controlling termites already present in a building is to find their points of entry. Sometimes structural repairs—such as replacement of damaged sills, joists, door frames, or sections of floors—will be necessary before control procedures are begun. All contacts between soil and wood must be broken. Earth-filled porches should be excavated and provided with access openings.

Infestations in slab-on-ground construction are difficult to control. One method consists of drilling holes about a foot apart through the concrete slab, adjacent to all cracks and expansion joints, and injecting a chemical into the soil beneath the slab. Another method is to drill through the foundation walls from the outside and force the chemical just beneath the slab along the inside of the foundation and along all cracks and expansion joints. Any of the formulations listed above will serve. They should be applied at the rate of at least 4 gallons per 10 linear feet of foundation or expansion joint.

To treat buildings having crawl spaces or basements, dig trenches adjacent to and around all piers and pipes and along the sides of foundation walls. Around solid concrete foundations without cracks the trenches should be 6 to 8 inches deep and wide. Chemicals should be poured in at the rate of 2 gallons per 10 linear feet of trench. Then, as the excavated soil is put back into the trench, it also should be treated at the rate of 2 gallons per 10 feet. This will give a total of 4 gallons per 10 linear feet of trench.

In brick, hollow-block, or concrete foundations that have cracked, dig the trench to, *but not below*, the footing. Then as the trench is refilled, treat the soil at the rate of 4 gallons per 10 linear feet *for each foot of depth*. For example, a trench 3 feet deep would require 12 gallons per 10 linear feet. Treat voids in hollow-block foundations at the rate of 2 gallons per 10 linear feet of wall, at or near the footing.

Repeated inspections may be desirable to keep the termites under control.

How To Mix Insecticides

Concentrated solutions of the chemicals usually can be purchased from feed and seed stores. When they are added to water in the correct proportions, they are ready to use. For example, if a 20-percent concentration is purchased, a 1-percent formulation can be made simply by adding 1 part concentrate to 19 parts water; also, a 0.5-percent formulation can be made by adding 1 part concentrate to 39 parts water.

Caution:

Pesticides used improperly can be injurious to man, animals, and plants. Follow the directions and heed all precautions on the labels.

Store pesticides in original containers under lock and key—out of the reach of children and animals—and away from food and feed.

Apply pesticides so that they do not endanger humans, livestock, crops, beneficial insects, fish, and wildlife. Do not apply pesticides in ways that may contaminate water supplies.

Avoid prolonged inhalation of pesticide sprays or dusts; wear protective clothing and equipment if specified on the container.

If your hands become contaminated with a pesticide, do not eat or drink until you have washed. In case a pesticide is swallowed or gets in the eyes, follow the first aid treatment given on the label and get prompt medical attention. If a pesticide is spilled on your skin or clothing, remove clothing immediately and wash skin thoroughly.

Do not clean spray equipment or dump excess spray material near ponds, streams, or wells. Because it is difficult to remove all traces of herbicides from equipment, do not use the same equipment for insecticides or fungicides that you use for herbicides.

Dispose of empty pesticide containers promptly. Have them

buried at a sanitary land-fill dump or crush and bury them in a level, isolated place.

NOTE: Some States have restrictions on the use of certain pesticides. Check your State and local regulations. Also, because registrations of pesticides are under constant review by the U.S. Department of Agriculture, consult your county agricultural agent or State Extension specialist to be sure the intended use is still registered.

PROTECT

Use Pesticides Safely

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