



Drywood Termites

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In nature, termites are scavengers that feed on wood, paper and other materials that contain cellulose. This process returns nutrients to the soil; however, when termites invade buildings, they can cause serious structural damage. In fact, termites cause billions of dollars worth of damage each year in the United States.

Distribution

Drywood termites are found throughout Texas, with the highest concentrations along the Gulf Coast (Fig. 1).

Subterranean termites are also found throughout Texas, (see Texas Cooperative Extension bulletin B-368, "Subterranean Termites") and are easy to distinguish from drywood termites. Subterranean termites live in the soil, while dry-



Figure 1. Distribution of drywood termites in Texas.

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wood termites live in sound, dry wood above ground level. They need no contact with soil because the wood they digest provides moisture needed to survive.

Life cycle

Like ants and bees, termites are social insects that form colonies (Fig. 2). A pair of reproductive termites, called a female or "queen" and a male or "king" mate and start a new colony or nest in a suitable wood habitat. In structures,

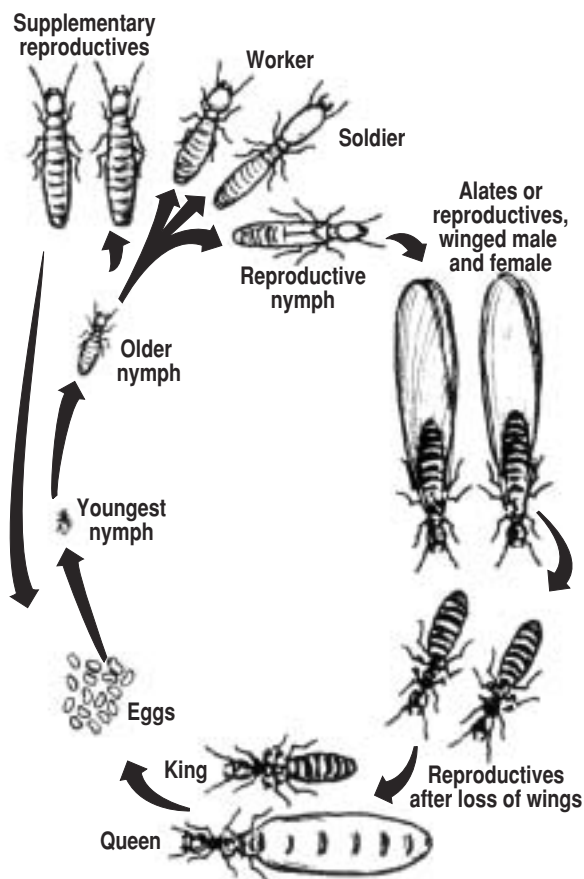


Figure 2. Termite life cycle.

drywood termites prefer to nest under wooden roof shingles, eaves or siding. The pair mates and the queen begins to lay eggs.

When the newly hatched termites are large enough to consume wood, they form a wingless worker caste that forages, tends to the nest and feeds the other termites. It is the workers that damage wood.

When workers mature, they can become either soldiers or reproductives. The soldier caste protects and defends the colony from outside invaders such as ants and other termites. In late August and early September, reproductives develop wings and swarm from the nest. Within a few minutes after swarming, the male and female termites pair up, shed their wings and begin to search for a suitable nest site.

Ants often swarm at the same time of year as termites do. It is easy to distinguish ants from termites using the information in Figure 3.

Identification

There are three common species of drywood termites in Texas. They can be identified by looking for particular characteristics on either reproductives (swarmers) or soldier termites.

Reproductives of the most common species, *Incisitermes snyderi*, are $\frac{7}{16}$ inch long; light yellow with clear, uniformly transparent uncolored wings; and they swarm at night (Fig. 4a).

Reproductives of the second species, *Cryptotermes brevis*, are similar to *Incisitermes snyderi*. The third species, *Incisitermes minor*, is slightly longer ($\frac{9}{16}$ inch); and reproductives have dark bodies and yellow, brown or colorless wings; and they swarm in the daytime (Fig. 4b). Soldiers of both *Incisitermes* species are about $\frac{5}{16}$ inches long and have dark yellow-brown heads armed with strong mandibles projecting to the front.

Soldiers of the genus *Cryptotermes* have black, square shaped heads with very short mandibles.



Figure 4a. Reproductive of the species *Incisitermes snyderi*.



Figure 4b. Reproductive of the species *Incisitermes minor*.

Soldier termites never have wings (Fig. 5, left) but do have large mandibles with teeth which differentiates them from subterranean termites. Worker termites are smaller than soldiers and have soft, white bodies (Fig. 5, right).

Signs of infestation

Usually, the first sign of a drywood termite infestation is the presence of winged reproductives swarming from small openings (kick holes) in the surface of wood. These termites lose their wings quickly after swarming, but the wings are important for proper identification of drywood termites.

If swarmers are found inside a structure, then the colony is almost certainly in the structural timbers of the building. If termites are found outdoors, they may have come either from within the structure or from nearby timber or brush.

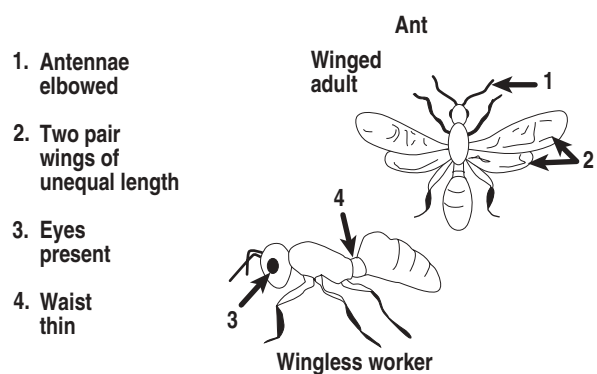
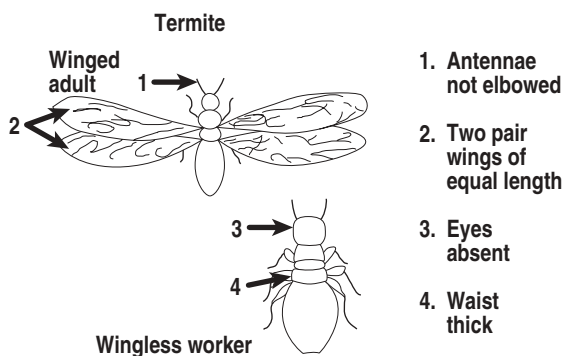


Figure 3. A comparison of termites and ants.

The swarmers are attracted to light and can enter homes from the outside. To confirm an infestation, search for termite bodies and wings in light fixtures and cobwebs and on window sills.

Because drywood termites live within the wood, they produce fecal pellets (Fig. 6). During an inspection, look for piles of fecal pellets near infested wood. The pellets are generally the color of the wood on which the termites feed. These pellets are about $\frac{1}{32}$ inch long and modest magnification will show long dimples or flutes down each surface. The pellets appear to be six-sided, blunt at one end and pointed at the other.

Fecal pellets of this size and shape are unique to drywood termites and can be dislodged from the kick holes by tapping gently on the wood. In addition to structural lumber, drywood termites can invade wooden furniture. Again, these termites produce fecal pellets that can be used to diagnose an infestation.



Figure 5. Soldier (left) and worker (right) termites.

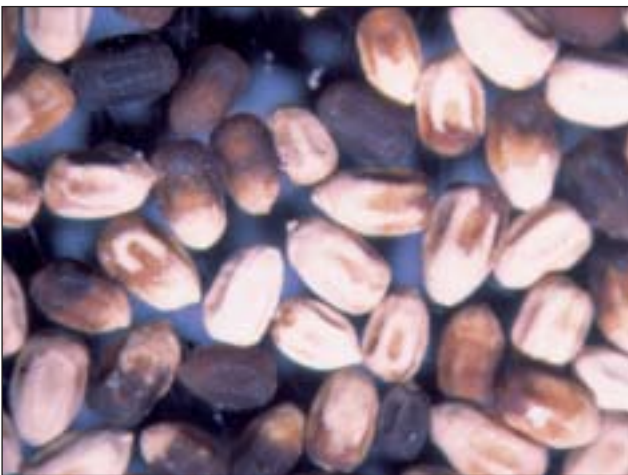


Figure 6. Termite fecal pellets.

Characteristics of damaged wood

A drywood termite infestation can be confirmed by inspecting the structural wood in the building (Fig. 7). These termites consume both the soft springwood and the harder summerwood of timbers, giving their galleries a smooth sculptured appearance. The galleries also contain fecal pellets.



Figure 7. Wood damage.

These characteristics can help distinguish drywood termite damage from that caused by other kinds of termites. For example, subterranean termites usually consume only the springwood, leaving alternating layers of damaged and undamaged wood. The galleries of the subterranean termite also contain soil. Formosan termites consume summerwood, as do drywood termites, but their galleries contain no fecal pellets.

Before buying antique and other used furniture, inspect it for signs of termite infestation or damage. Look for holes or accumulations of drywood termite pellets under the furniture, in drawers or on interior horizontal surfaces.

Prevention

It is very hard to keep drywood termites out of wood frame structures. One way is to use non-wooden building materials. Any exposed wood should be painted or sealed to keep termites from entering. Wood that is pressure treated with alkaline copper quaternary (ACQ) or sodium borate (SBX) also resists invasion. Treating wood with silica aerogel dust or com-

pounds that contain boron will keep drywood termites from penetrating wood surfaces, as long as a sufficient concentration of chemical is used.

Drywood termites enter structures through attic and foundation vents, under eaves and fascia boards, and through gaps around doors and windows (Fig. 8). Attic and crawl space vents can be covered with 20-mesh screen wire to prevent drywood swarmers from entering those areas. Use caulk around doors and windows and at all construction joints.

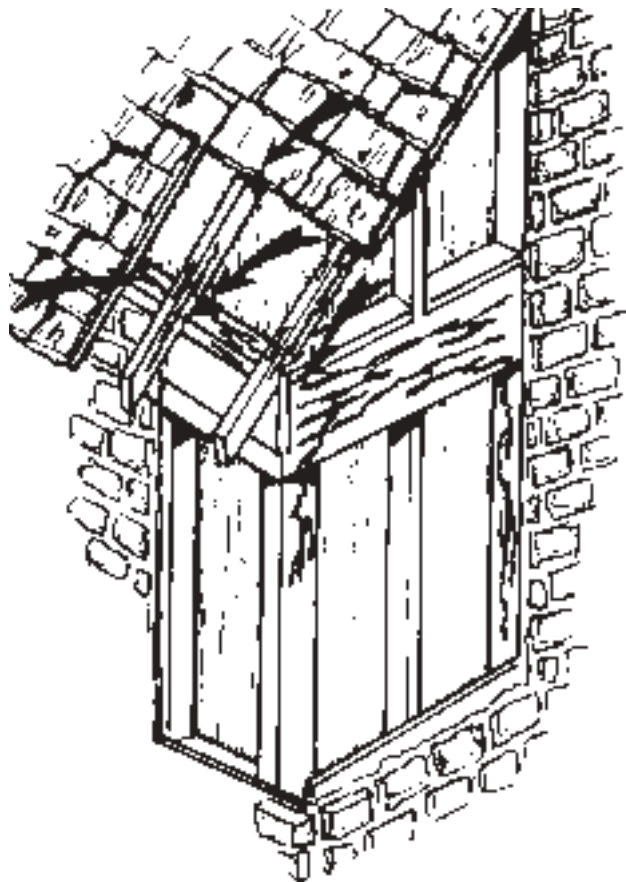


Figure 8. Termite entry points.

Inspection

A thorough inspection is necessary to confirm a drywood termite infestation, assess the damage, and determine the correct treatment (Fig. 9). Inspections should be conducted by professional pest control specialists licensed by the Texas Structural Pest Control Board in the category of Termites or Structural Fumigation.

The shingles and roof structure should be inspected for depressions that indicate weak or collapsed areas. Fascia boards and eaves should be inspected for "kick holes" ($\frac{1}{16}$ " diameter holes used by the termites to push

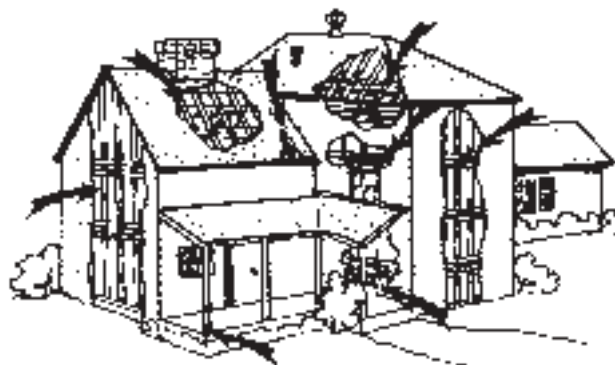


Figure 9. Inspection points.

fecal pellets from their galleries). These areas should also be checked for spider webs that might have trapped swarming termites, their wings or fecal pellets. Wood siding should be inspected along its lower edges for drywood termite damage. Horizontal surfaces, such as the upper surface of the ceiling in the attic, should be inspected for accumulations of fecal pellets.

In pier and beam construction, check sills and floor joists for damage and the soil beneath them for fecal pellets.

Indoors, check light fixtures, spider webs, and windowsills for dead swarmers or discarded wings. **It is important to properly identify termites before starting treatments.** Identification is based on wing veins, the mandibles (mouthparts) of the soldier caste and the presence fecal pellets.

Treatment

When infestations are limited, infested wood can simply be removed and replaced. For more extensive infestations, chemical treatments may be necessary. **Drywood termite treatments must always** be done by a certified professional pest control operator. There are several treatment methods.

Wood removal and replacement. If **all** of the infested wood can be located, it can be removed and replaced with sound wood. Inspect replacement wood to be sure it is insect-free. Use kiln-dried wood if possible or consider using chemically treated wood or non-cellulose building materials.

Pesticide injection. Infested wood can be drilled and injected with pesticides. Pesticides enter the termite galleries and kill the colony. The challenge is to locate and treat **all** the colonies in the structure. This is difficult to accomplish, and missed infestations will continue to spread within the structure.

Borate treatments. Surface treatments with borates may help prevent subsequent infestations but will not kill the drywood termites already in the interior of structural timbers. Liquid or foam borate solutions may provide control if **all** drywood termite galleries can be located, drilled and treated. The major limitation with this procedure is the inadequate penetration of the borates into seasoned, dry wood.

Excessive cold or heat. Using liquid nitrogen to lower the temperature in the center of an infested timber to -15 degrees F can be effective for termite control. Another method is to raise the temperature in the center of infested timbers to 135 degrees F for at least 60 minutes. When these temperatures can be reached and maintained for the prescribed length of time, either method kills termites inside wood.

Because there are risks to the structure and its contents, only professional pest control specialists licensed in termite or structural fumigation should perform these procedures. This procedure has not yet been approved for use in Texas.

Electricity. An electrical device (Electrogun®) is available to treat the surface and the interior of infested wood. Researchers report that the device will kill drywood termites within 1 to 2 feet of the site treated. The nearly impossible challenge is to find all the infestations in order to treat them. This equipment is only available to licensed pest control operators.

Microwaves. Exposing infested timbers to microwaves at 700 watts will kill termites. The range of this treatment is limited and may not be practical in most situations. This equipment is only available to licensed pest control operators.

Whole structure fumigation

The most effective treatment for structural infestations of drywood termite infestations is tent fumigation. To do this, the structure is covered with tarps and a toxic gas is released within the sealed structure (Fig. 10). The gas penetrates infested timbers and kills the termites. Fumigants are extremely toxic and the law requires that the structure be kept under constant guard during fumigation.



Figure 10. Covered structure fumigation.

The gas dissipates from the structure when the fumigation ends and the tarps are removed. The whole process may require several days, depending on local conditions and the fumigant used. The structure cannot be used or occupied during treatment. Tent fumigation gives no residual protection against termite re-infestation. This procedure can only be performed by professional pest control specialists, who are licensed in the Termite or Structural Fumigation category.

Effectiveness of treatments

Research has shown that only fumigation at the proper chemical concentration, is likely to kill all the termites in a structure. If even a few termites survive, they can tend the eggs and sustain the colony. It is difficult to verify the effectiveness of drywood termite treatments because these insects are concealed inside wood.

Read and understand the contract and warranty to regarding the effectiveness and any limitations on the longevity of the treatment. Hire only reputable, licensed and insured companies to perform drywood termite control. Though no method is foolproof, microwave motion detectors, acoustical detectors and infrared cameras can help verify termites have been killed. To verify the treatment's success, remove all signs of infestation, such as pellet accumulations, at the time of treatment, then watch for swarming or pellet production for several months.

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Revision