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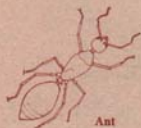


WOOD DAMAGING INSECTS IN THE HOME

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MANY MICHIGAN HOMES play host each year to bark beetles, long-horned and metallic wood-borers, carpenter ants, household and lawn ants, powder pest beetles and termites. To get rid of these unwelcome guests, follow the control instructions given below for the particular insect causing your trouble. If other suggestions are given in addition to the use of insecticides, follow them carefully for they can be equally as important as the use of a chemical in solving your problem.



Ant



Termite

Ants are found in most places where man lives. They are easily recognized by their threadlike waist (abdominal petiole) made up of one or two nodes or swellings. The waist connects the abdomen and the thorax. The thorax, which is just behind the head, bears the wings and legs. The abdomen is the last part of the body and is behind the thorax.

The narrow, threadlike waist of ants distinguishes them from termites. Termites are broadly joined at the thorax and abdomen. At certain seasons of the

year (especially spring and fall) ant colonies produce winged reproductive forms, which swarm to new locations to build nests. Very often, winged ants are thought to be termites; however, the narrow waist of the ant is a sure means for identification.

CARPENTER ANTS

Carpenter ants are a common problem in Michigan. You will find them destroying dead heartwood in living trees, logs, house timbers or almost any wood material. These ants, however, do not damage structural timbers as much as termites do.

Carpenter ants generally restrict their wood damage in houses to a door jamb, a window sill, or a corner section of a foundation plate. However, on one occasion a nest of them was found in a floor joist in the center of an upstairs bedroom. This indicates the many places in which they nest and the difficulty that may be encountered in finding these nests.

The galleries of the nest (concentrated area of tunnelings) are clean and almost polished in appearance and are cut across the grain of wood. The sawdust made by these insects is coarse and stringy. Usually this sawdust is not in the nest, or around the galleries, because of the ants' habit of casting it out of this area.

By contrast, termite galleries are tunneled with the grain of the wood and tend to be rough, tooth-notched, and occasionally coated with a yellowish corky-muddy, material which is often black-specked (see Figure below). Termites leave no sawdust.

Carpenter ants enlarge their galleries for nests. Gallery-making is normally done by the workers. Unlike termites, which eat wood, the carpenter ants remove coarse sawdust from the wood with their mouth parts but do not eat it; they cast it aside as



Termite damage. Note the "shelving" of the wood. Especially on the lower part of the picture, observe the corky material. This is yellowish and often black-specked. Carpenter ants "shelve" wood by feeding similar to termites, but a sawdust is present with carpenter ants, absent with termites. The sawdust of carpenter ants is coarse and often held together by a webbing secreted by the insects.

sawdust. Their food consists of plant juices, particles of foods, other insects, and "honeydew" secreted by scale insects and aphids.

Carpenter ants are dark brown to black. They are the largest of our Michigan ants, with the workers ranging in size from about one-fourth to one-half inch long. These are the big, black ants that you see wandering around pavements, lawns, trees, and wood of all kinds. During late spring and early summer the winged forms appear. They swarm and establish new colonies at this time.

Carpenter ants often have their nests in rotten parts of trees in the yard. The workers (wingless ants) travel from these nests into houses during the summer, causing annoyance. These foraging workers do not necessarily establish new colonies although they can, under some conditions.

Control

There are several control measures for carpenter ants but first the nest must be found, if possible. This may be difficult. Ants tend to travel along well-established runways, and you may be able to locate the nest by taking time to note where the ants come from and where they return. Applying an insecticide to these runways helps control or even eliminate them in some cases. If such emergency methods fail, find the nest and try the following treatments.

Inject 5 percent pentachlorophenol oil solution into the nest. A ½ percent Baygon aerosol may also be used.

For treating areas where carpenter ants are moving about in buildings, use water solutions of 2 percent ronnel (Korlan); or ½ percent Diazinon or 3 percent malathion. When using water solutions of insecticide, be sure to test the spray on a small area first, as the spray solution may stain painted surfaces and carpeting.

If you prefer, use a dust of either 4 or 5 percent malathion; or ¾ or 1 percent rotenone; or 2/10 percent pyrethrum. Rotenone dust is especially useful for treating ant runways.

For treating carpenter ant-infested trees and wood in the yard, spray with 3 tablespoons of 25 percent wettable malathion powder to 1 gallon of water. Firewood may be treated, but generally if it is stored away from house walls, and burned within one week of bringing it in the house, no insect problems should be encountered.

COMMON HOUSEHOLD AND LAWN ANTS

Everyone is familiar with these insects. They look like carpenter ants in shape, but they are much smaller. They may be black, brown, red or

yellowish. Ants invade buildings in search of food and to establish nests.

NOTE: Unlike the carpenter ants, these household and lawn ants do not damage wood. Their control is included here for convenience. Some may eat sweets, while others eat fats, or both kinds of food. Once they are established in a building, it may be hard to get rid of them.

In addition to the ants that infest buildings, some infest lawns. Ant control should begin with the lawn, progress to the foundations and porches, and end up inside the building.

Control

1. **Lawns:** Treat the top of anthills with 5 percent malathion dust; or 25 percent malathion wettable powder; or 50 percent carbaryl (Sevin) wettable powder.

After applying ONE of these materials, rake it into the top of the anthill with a garden rake. Rake the hills every day or two. Repeat treatments 7 to 10 days if ants are still active. Controlling ants in lawns may take a long time, so keep at it.

2. **Foundations and porches:** In 1 gallon of water, use 8 tablespoons of 25 percent malathion wettable powder. Spray the foundation and base of porches. Also, spray or dust the grass and shrub area a few feet away from the foundation with one of the same materials.

3. **Inside buildings:** Apply a dust of either 1 percent rotenone; or 5 percent malathion; or 5 percent methoxychlor plus one-tenth percent pyrethrins plus 1 percent piperonyl butoxide, along baseboards and behind kitchen stove. Where a dust is objectionable, apply ½ percent Baygon solution in water. Do not mist-spray near a flame or pilot light.

4. **Baits:** Baits can also be used. If possible, buy a prepared bait containing both sweet and fat ingredients or you may be disappointed when sweets-loving ants fail to eat a fat-containing bait. Inside houses, place baits in ant runways where children will not find them.

Note: Buy baits in safety-type containers. Some baits are available in tin cans which have small holes punched in them to allow the ants to get at the bait.

Ant control in buildings usually is not easy. Therefore, keep at it, and do not become discouraged too soon.

TERMITES

Termites are important wood-destroying pests in Michigan. The word "Termite" comes from the Latin word *Terme*, meaning wood-worm. (See the introduction to ants, page 2 for information on how to tell termites from ants on the basis of body form.) Most

Michigan termites are subterranean (under ground forms) and must have contact with moist ground in which to build their nests.

The food of subterranean termites is largely cellulose and comes from many sources. In fact, termites will eat all materials made from plants or cellulose-containing plant products.

Subterranean termites are most abundant in moist, warm soils containing plenty of food. Such conditions are found beneath poorly ventilated buildings, scraps of lumber, stumps covered by fill, grape roots (usually in old abandoned vineyards), or any part of a wood structure close to the ground, such as porches, foundation sills, or steps.

Termites travel from nests in the soil through a brownish, corklike tube to their food supply. When, through control measures, the contact between the nest in the ground and the wood upon which they feed is broken, termites die.

Termites feed on the inside of sills, studding, floors, subfloors, casings, baseboards, and other wood structures. They tunnel these parts of a house leaving in many cases only thin shelves of the harder part of the wood. Inside the galleries, the wood is rough, tooth-notched, and occasionally coated with yellowish-corky, muddy material which is often black-speckled.

Termites rarely appear on the surface except when they are winged and swarming, usually in April or May following a warm rain. However, they can occur in summer and fall. If the wood upon which they are feeding is broken through, they immediately seal the opening with a brownish, corklike material. Termites do not leave sawdust as do powder-post beetles and carpenter ants. Also, there are no small openings to the outside of the wood as in the case of powder-post beetles.

Control

Home owners should be constantly on the lookout for termites. An easy way to locate termite damage in sills, floor joists, and studdings is to plunge an ice

pick or screwdriver into the wood. If the wood is solid, the ice pick or screwdriver probably will not go very far into it. On the other hand, if the pick enters easily, you should inspect all wood carefully for termites. Also, look for mud tubes from the soil, across the foundation to the wood. These can be seen in crawl spaces or basements—across foundations or in block voids.

When you find insect-damaged wood, be absolutely sure the insects are still present and, if so, whether or not they are termites. In any case, do not panic! Determine the extent of the damage by probing with an ice pick or screwdriver as mentioned above.

When a termite infestation is present, you have 2 choices: (1) rely on the services of a qualified experienced termite control operator or (2) attempt to control them yourself. The first choice, in most cases, is preferred. "Do it yourself" termite control is seldom satisfactorily achieved.

While termite control can be fairly expensive, the cost is usually justified in the special equipment such as concrete drills, pressure applicators, etc., technical knowledge and experience, large volumes of chemical and time required to properly apply the treatments. Special attention should be given to termite-proofing chemicals and structures built into buildings on "floating" concrete slabs. If the slab cracks, even as little as 1/32 of an inch, the termites are afforded a well protected, hidden, direct route to and from their food source.

If this is your first encounter with termites, take your time in selecting a qualified and experienced termite control company. Termites work slowly and the chances of the building falling down in an additional 2 to 3 weeks or even months are indeed extremely slim. A logical way to select a company is to: (1) choose several companies (2 or more) and establish their credibility through the Better Business Bureau or Chamber of Commerce. (2) obtain both damage and cost estimates from several companies. (3) obtain references from the companies and check the references as thoroughly as possible. (4) compare your notes on the various companies and make your final decision. Above all, do not be panicked into an immediate "off the cuff" treatment. The time spent in following the above procedure is time well spent and necessary when engaging any type of service.



Winged form of the termite (left) and ant (right). Only the right side wings are shown. Note that the front and rear wings of the termite are almost identical in length and width. However, ants, have front wings much longer and wider than the hind wings.

BARK BEETLES

Bark beetles or scolytids, and some bostrichid beetles occasionally tunnel the bark or wane of exposed floor joists, rafters, studding and sheathing, especially of new houses, or where older houses have been remodeled with new lumber. These



The adult is 1/12 to 1/5 inch long.

beetles limit their taste almost entirely to the bark. If they enter the wood, it is only for very short distances. They normally do not tunnel the wood as do the true powder-post beetles. The annoyance stops when they have consumed the bark or if the bark is mechanically stripped from the lumber.

The true powder-post beetles and the beetles that infest only bark have one thing in common. They both produce a fine sawdust or wood powder about the texture of wheat flour. The powder will be the same color as the bark and wood from which it is produced.

The color of the sawdust plus a close inspection of the places where the beetle grubs are working will tell immediately the kind of problem you have. See the section on powder-post beetles for a description of the damage done by these insects.

Control

Strip the bark from the exposed lumber of the house. If this is impractical, treat the bark with a 5 percent pentachlorophenol oil solution plus 2 percent pine oil; or 100 percent pine oil.

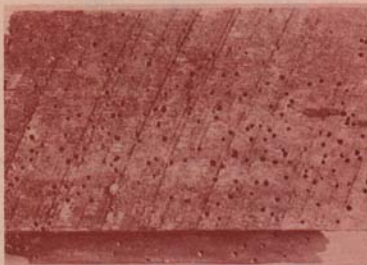
See the Section on warnings for instructions on how to use these materials safely. Also see the Section on powder post beetles for additional insecticides, literature and references about bark beetle control.

POWDER POST BEETLES

Powder post beetles include several small, brownish, dry wood-eating insects ranging in size from one-twelfth to one-fifth inch long. Three families, Lyctidae, Anobiidae, and Bostrichidae, are most common in Michigan.

Powder post beetles were so named because the wood upon which they feed is gradually eaten into a fine, flourlike powder. The Lyctus types feed primarily on hardwoods; the Anobiids prefer to attack softwoods, such as conifers. They can damage and, in some cases, eventually destroy (by completely tunneling) all exposed wood in houses, including furniture and paneling. Severe damage may take many years to materialize. A case of this kind usually results from failure to apply early remedies. Watch for "shot holes" in the wood.

The Lyctus powder post beetles are usually brought into buildings in lumber which has been



When adult Powder Post beetles emerge, some species leave small holes (shot holes) about the size of a pin in the surface of the wood; others make holes the size of pencil lead. Note the tunneling is to both wood and bark, but primary concern is the damage to the wood.

stored in yards or at building sites. They may also be present in furniture, wood paneling, and firewood. Damage is usually confined to the starch-rich sapwood of large-pored hardwoods such as ash, hickory, oak, walnut and cherry. The hardwood floors of new homes are commonly attacked.

You can easily recognize the work of powder post beetles. When the adults emerge, usually in June, some species leave small holes about the size of a pin in the surface of the wood; others make holes the size of pencil lead. From these holes, a fine, powderlike sawdust sifts almost constantly as each successive brood of larvae carry on their destructive feeding. Normally, these insects have a 1-year life cycle; this means that the adults will appear only once each year. And because of this habit the larvae have a feeding period of many months.

Control

The sooner these insects are controlled, the better. Delay only makes the damage greater. But, regardless of how urgent the problem seems to be, understand what you are doing before going ahead with powder-post beetle control.

Treat the surface of infested but unfinished wood such as floor joists before the adults appear in June. Use 5 percent pentachlorophenol. Also, 100 percent pine oil can be used. These materials may remove wax from floors. Simply re wax following the drying of the chemical. Do not walk on the treated floor for several hours or until it is thoroughly dry.

Treat about 100 square feet of wood surface with 1 gallon of one of these materials. Apply until the wood surface is wet, no more. Repeat the treatment

until the required 1 gallon to 100 square feet is applied, or until the wood will not take up more.

Note: See the Section on warnings for safe use of these materials in homes.

Paint or varnish all furniture and wood surfaces. This will not stop the damage done by the grubs already in the wood, but it will discourage adult egg laying for any other brood. This method is not a good solution to powder-post damage, **unless the adult emergence holes are kept covered with paint or varnish.** Lyctus-type powder-post beetles normally do not reinfest filled wood.

Fumigation may be advisable in cases of severe powder-post beetle damage, especially where other methods have failed or where rapid elimination of the insects is desired. Furthermore, fumigation has advantages where it is hard to apply other treatments, especially in cramped crawlspaces or other space-limited areas. However, remember that **fumigation for powder-post beetles or any other insect should be done only by an experienced, certified pest control operator.** Also fumigation does not prevent reinfestation of wood if it is exposed afterward to adult powder-post beetles. Fumigants are highly poisonous, and people can be easily killed by them unless proper precautions are taken.

WOOD BORERS

Many species of the long horned and metallic wood borers lay eggs in crevices of bark after trees are felled but before they are sawed into lumber. The life cycle may be as long as 3 or more years for some species. Because of this, ample time exists for lumber to be used in houses before the grubs pupate and adult beetles emerge.

The cross section of the log shows the characteristic shape and nature of the tunneling of larvae of metallic wood-boring beetles. The larval tunneling of long-horned wood borers is similar, but for the most part larger in diameter and more rounded than oval.

Inasmuch as long horned and metallic wood borer adults need bark on which to lay eggs, direct infestation of wood in houses is very doubtful. Of course a few exceptions to this exist. For example, the old house borer infests barkless wood, laying eggs in cracks and natural checks of boards. Occasionally it is a structural pest of buildings in the east. In Michigan it is seen very rarely. If tunneling (wood-boring) similar to the characteristics described here occurs in buildings 5 to 10 years old, do not disregard it. The damage could be more important than the usual long-horned or metallic wood-borer beetle damage to new buildings, although the old house borer can infest new houses.



Feeding damage of buprestid (metallic wood-borer) larvae. The tunnels may be as much as 1/4 inch or more in diameter. The larval feeding damage of long-horned beetles is similar to the buprestids, but generally larger in diameter and less oval.

To be sure about old house borer damage to buildings, identification of the adult borer is a must. The insect's tunnels are of little value since they resemble damage of other long-horned beetles.

Firewood is an important source of all kinds of long-horned and metallic wood-borer adult beetles in homes. When these beetles occur, especially in basements, suspect firewood. Storing it outside the home usually eliminates the problem.

INSECTICIDES

For good insect control, learn how to use insecticides (chemicals) effectively. Most are available in several formulations, each with its own use for control in and around houses. Those discussed are the more common formulations. For others, read the label on the container for instructions on use.

Emulsifiable Concentrates

Emulsifiable Concentrates are liquids. They must be mixed with water, turning it milky (the emulsion). They are generally not used inside buildings. Apply them only outdoors to both plants and foundations. Be careful when applying to tender flowers and shrubs. They may injure these plants. In concentrated form Emulsifiable Concentrates are dangerous if spilled on clothing and skin. Change clothing. Use masks and protective clothing while spraying, especially if applying dangerous materials over a long period of time. Remember, a water mixture with an emulsifiable insecticide may stain, so test small areas first before spraying.

Solutions

Solutions are also liquids. They differ from emulsions in that they are used as bought and are not mixed with water. They are made with refined (deodorized) kerosene or similar materials, plus an insecticide. Use them indoors to control household insects. Do not apply to plants since they cause severe injury. Like emulsions, solutions are dangerous if spilled on clothing and skin. Immediately wash off with soap and water. Change clothing. For other instructions, see *Emulsifiable Concentrates* above.

Wettable Powders

These are similar to dusts. (See below.) They contain a higher percentage of chemical, however. For some purposes, they are used as bought in place of dusts. However, wettable powders are usually mixed with water and applied as sprays. The spray is seldom used indoors, but is useful when applied outdoors. Avoid breathing or getting powder (or spray) on the skin. Use masks and protective clothing, especially if applying dangerous materials over a long period of time.

Dusts

Dusts are dry powders which normally contain a lower percentage of insecticide than wettable powders. They are used as bought and are not mixed with water. Use them both indoors and outdoors where effective.

Aerosols

Aerosols are liquids held under pressure in a container. When released, usually by pressing a button, some kinds form a "gas," others a spray. "Gas-producing" types are for control of flying insects (such as flies), liquid for those that crawl or run on floors (such as ants). Gas aerosol treatments do not last long. For this reason, they are not dependable where long-lasting control is needed. Choose either gas or spray, or both, to fit your needs.

Fumigants

Fumigation is a very dangerous insect-control method. *To safeguard human life is the first requirement in its use.* If the factors of this important consideration are not understood or cannot be followed, fumigation should not be used by home owners. Use the services of professional pest-control operators.

A fumigant kills insects as a gaseous (volatile) form. At the moment of use, it is either a solid, a liquid, or a gas. Once applied it normally becomes volatile and moves as a gas throughout the area to be treated. Some fumigants are heavier than air and move downward. Fumigants are used mainly to treat (large or small) enclosed spaces, food or clothing, or hard-to-get-at places in buildings and other situations.

Note: Aerosols are not true fumigants. In a gas-forming aerosol, the insecticide is distributed through an area by a gas-forming chemical which may or may not control insects itself. On the other hand, the fumigant applied and the gas it forms are the same material only in a different chemical form, similar to water and steam. Consequently (with some exceptions of course), aerosols may be reasonably safe to use. Fumigants never are.

EQUIPMENT

All types of insecticide application equipment have faults as well as good features. Careful study of your insect control jobs will help you buy and use equipment effectively.

The compressed air sprayer, the quart-sized sprayer, the aerosol, and the paint brush are probably the best kinds of equipment for home owners to use for control of household insects. These, however, may not be large enough or well enough adapted for hard-to-get-at termite and carpenter ant problems. Poor equipment can lead to control failures. Hence, determine your equipment needs in advance of actual control of the insects.

Compressed Air Sprayer

The water capacity of a compressed air sprayer is usually 3 to 4 gallons. Air is pumped into the tank, thus forcing the spray out when the nozzle is opened. A compressed air sprayer is ideal for outdoor application of wettable powders and emulsions. Its use indoors is limited if a lot of water is used with the insecticide. Shake a compressed air sprayer every few moments when using a wettable powder.

Quart-sized Sprayer

The quart-sized sprayer is a compressed air type. Air must be pumped continuously into this sprayer while it is in use. The quart-sized sprayer is satisfactory for applying emulsions and solutions but not for wettable powders. It can be used both indoors and outdoors for treating small areas. (Note: Where higher pressure is needed for good application, this type of sprayer has limited use.)

Aerosols

To many people, the term aerosol has come to mean both the container and its contents. The container part of the aerosol is a single unit made of metal. At its top is a push button for releasing the insecticide. The insecticides and propellant are mixed before placing in the canister. Use the unit as purchased and then discard, although some of the larger sizes may be refilled.

Aerosols should not be heated since they can explode. It is advisable to have them at room temperature before using.

Paintbrush

An inexpensive paintbrush can be used to apply insecticide solutions to baseboards, screens, and other similar areas inside buildings. A light film is usually sufficient. Thoroughly clean the paintbrush before using it to paint.

WARNINGS

1. Inside buildings, apply dichlorvos, Diazinon, and most malathion formulations to small areas only (such as baseboards). Do not apply to entire rooms or buildings. **Note:** Ronnel (Korlan) and some weak malathion preparations (those containing less than 2% of the chemical) can be applied more safely over a large area. Safer still are rotenone and pyrethrum preparations providing they do not contain materials more poisonous than methoxychlor and piperonyl butoxide. Some malathion formulations have a rather bad odor.

2. Avoid using any material suggested in this folder around food or where children can get into them. Do not allow children on insecticide-treated grass until 3 days after applying.

3. Avoid breathing sprays or dusts. A handkerchief fitted to the face will help prevent excessive breathing of these materials. However, in cases of undue or long exposure, use suitable protective masks.

4. If emulsions or concentrated wettable powders

are spilled on the skin, wash immediately with soap and water.

5. Do not use insecticides around open flames (such as pilot lights), electrical wiring, or on asphalt floor coverings. Avoid the use of insecticides which may stain or spot fabrics. This warning also applies to pentachlorophenol.

6. Outdoors, avoid heavy applications, to tender flowers and shrubs, especially emulsions. Read labels to avoid using any material specified as damaging to certain plants.

7. When applying pentachlorophenol:

a. Protect the skin on both hands and face. Use oil-resistant rubberized gloves and mask when applying this material.

b. Have plenty of ventilation.

c. Avoid using it where its strong odor would be objectionable, especially around food.

d. Use it for combination dry rot and powder-post beetle or bark beetle control. If insect control is your only problem then use one of the other suggested insecticides.

8. Do not apply any insecticide listed in this folder to vegetables and fruits, or to garden soils unless the label or an up-to-date Michigan State University Cooperative Extension literature says you can safely do so.

9. Read the label on the package for each material used. Follow the directions.