# Nuisance Insects of the House and Yard

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Insects in Recreation Areas

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Red Imported Fire Ants

Quarantine Information: Red imported fire ant (RIFA) colonies can be found throughout the southeastern United States from Texas through Florida, extending as far north as Oklahoma and Virginia. In 2009, several counties in Virginia were placed under the Federal Fire Ant Quarantine. This quarantine means that the Virginia Department of Agriculture and Consumer Services (VDACS) will no longer be responsible for treating fire ant mounds in those areas. Fire ant control will now be the responsibility of those citizens living in the quarantine locations. A current map of all quarantined locations within the U.S. may be viewed at http://www.aphis.usda.gov/plant_health/plant_pest_info/fireants/downloads/fireant-2.pdf. In Virginia, RIFA colonies are now established throughout Hampton Roads. Individual RIFA colonies have also been documented in the greater Richmond area and as far west as Montgomery County.

Note that RIFA infestations occurring outside of the quarantined areas in Virginia should still be reported to the VDACS Office of Plant & Pest Services at (804) 786-3515, or visit the VDACS website at http://www.vdacs.state.va.us/. Individuals and commercial pest control operators residing outside of the quarantined area should not attempt to treat fire ant infestations.

Warnings: RIFA are a common nuisance around dumpsters, trash cans, kitchen gardens, and areas where pets are fed and watered. Fire ants can also be a threat to small, young or confined pets. Puppies and kittens playing outdoors should be supervised in locations where fire ants are present. Likewise, dogs tied in the yard must have enough lead to allow them to move 10 or more yards in any direction to escape a fire ant attack. Dogs confined in runs should never be tied up.

Habitat

RIFA seldom colonize indoor areas. Fire ants prefer to construct mounds in areas that are open and exposed to the sun. They are often found in cultivated fields or pastures. They are rarely found in wooded locations with heavy tree canopy. In urban areas, they will nest in cemeteries, parks, playing fields, and yards. RIFA will also nest within the walls of structures and under sidewalks, concrete slabs, and roadways. If the nest site is later abandoned, the soil may shift, causing cracks or occasionally the collapse of the sidewalk. Colonies have also been found inside cars, tractors, and recreational vehicles. RIFA are attracted to electrical currents and will nest in and around heat pumps, junction boxes, traffic lights, and similar devices. Nesting RIFA have been known to cause electrical fires because they often chew on electrical wiring.

RIFA mounds in the yard are unsightly and will spread within a few months if there is no effort to eliminate them. However, the mounds must be treated properly or else the mound disturbance may cause the colony to split, resulting in two or three mounds. If you believe you have discovered a RIFA nest and live in the quarantine area, we recommend that you contact a pest control company immediately. Failure to eradicate an entire nest will result in the local establishment and spread of RIFA in a very short period of time.

Chemical Control

The following section describing RIFA control techniques is to be used for fire ant control in the quarantine areas of Virginia. Individual mound treatments and baiting can both be employed to mitigate infestations in small areas (e.g., the area surrounding a single building or an urban playground). Whatever product you might choose to apply, please read and follow the label directions exactly. Improper pesticide applications have been responsible for a significant portion of fire ant spread within the U.S.

Mound Treatments

When treating individual fire ant mounds, it is extremely important that the mound remain undisturbed prior to treatment. Drenches, dusts or granules must come in direct contact with the ants to be effective. Disturbing the mound may cause the workers to move the queen or even the entire colony to another location. Individual mound treatments may take the form of a drench, where the mound is flooded with a large volume of liquid insecticide labeled for this purpose. This is the fastest acting method of fire ant management. Unfortunately, the queen may be located too deep in the soil to be destroyed by the insecticide, in which case control will only be temporary. Injection devices to aid in the deep penetration of liquid insecticide are readily available for professional pest control personnel, but these devices are not designed for homeowner use.

For more detailed information see the Red Imported Fire Ant (RIFA) publication: http://pubs.ext.vt.edu/444/444-284/444-284.pdf
### Table 6.1 - Recommended Insecticide and Control Use

<table>
<thead>
<tr>
<th>Pests</th>
<th>Pesticide</th>
<th>Application and Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Outdoor Ants</strong></td>
<td></td>
<td>A general control program for ants is not recommended. If they are a serious pest, the nests should be located and removed. Foraging ant trails should be baited.</td>
</tr>
<tr>
<td>Outdoor Ants</td>
<td>For colony control, ant species must be identified before a proper bait can be selected. Ants are finicky eaters and may prefer either a sweet or protein-based bait. Once the ant is identified, put out an appropriately labeled bait where foraging ants are seen.</td>
<td></td>
</tr>
<tr>
<td>Chiggers</td>
<td></td>
<td></td>
</tr>
<tr>
<td>carbaryl</td>
<td>Sevin 22.5% Concentrate</td>
<td>Treat grassy areas, especially those not regularly mowed. Spray sites where pest is present. Mow areas around house. Spray every 4 to 8 weeks, as needed. Repellents will prevent attack; apply to socks and/or pants, cuffs, waist, and sleeves.</td>
</tr>
<tr>
<td>cypermethrin</td>
<td>Demon EC 0.1%</td>
<td>Usually best as emulsion. Need thorough and uniform distribution. Apply to outside surfaces and cracks and crevices where chiggers may hide. Also apply along fence lines and around sheds, barns, carports, and other outdoor structures. Avoid spraying plants with cypermethrin.</td>
</tr>
<tr>
<td>Blood-feeding Flies</td>
<td></td>
<td></td>
</tr>
<tr>
<td>(Deer Flies, Adult Mosquitoes, Black Flies)</td>
<td>resmethrin</td>
<td>Outdoors: Good sanitation and tight screens are sound preventive control measures. Use of the fly swatter is still practical. Do not contaminate food or utensils with insecticides.</td>
</tr>
<tr>
<td>tralomethrin 0.03%</td>
<td>Home Insect Control</td>
<td></td>
</tr>
<tr>
<td>bifenthrin 0.05%</td>
<td>Home Defense</td>
<td></td>
</tr>
<tr>
<td>Mosquito Adults</td>
<td>Repellents for personal protection</td>
<td>Use Deet or ethyl hexanediol</td>
</tr>
<tr>
<td>D-CIS/Trans Allethrin 0.25%</td>
<td>Mosquito Repellent Coils</td>
<td>Indoor: Use aerosol spray according to label directions. Spray shrubs, flowers, and trees for resting mosquitoes. Wear light colored clothing, limit outdoor activity in evening. Avoid using “Bug Zappers” which are generally ineffective against mosquitoes.</td>
</tr>
<tr>
<td>Aerosol Sprays</td>
<td></td>
<td>Outdoor: It is imperative to remove clutter and debris that can collect and hold rainwater. These items become prime habitats for container breeding mosquitoes.</td>
</tr>
<tr>
<td>D-CIS/Trans Allethrin 0.143%</td>
<td>Flying Insect Killer</td>
<td></td>
</tr>
<tr>
<td>Permethrin 0.15% Plus</td>
<td>Hot Shot Flying Insect</td>
<td></td>
</tr>
<tr>
<td>Mosquito Larvae</td>
<td>temphos</td>
<td>Apply larvicides based on inspection of breeding sites and not on a routine basis. Open bodies of water, such as large ponds and streams, are not mosquito-breeding areas and should not be treated. Poolluted water usually requires a higher rate of pesticide than required for clean water. Temphos is harmful to fish; keep out of lakes, ponds, and streams. Use methoprene in small bodies of water not known as fish habitats. Small backyard ponds should be checked for mosquito larvae. Remove outdoor breeding sites: water-holding containers such as old tires, cans, and buckets. Change water in bird baths and pet dishes frequently. Make sure gutters are not clogged.</td>
</tr>
<tr>
<td>methoprene</td>
<td>Altosid Briquets Altosid SR 10 Altosid Granules</td>
<td></td>
</tr>
<tr>
<td>Biologicals: Bt and methoprene</td>
<td>Gambusia fish</td>
<td></td>
</tr>
</tbody>
</table>

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1Professional Use: These products are not restricted use but are designated as professional use because they are more potent and require specialized training, application equipment, or personal protective equipment that make them unsuitable for homeowner applications.
**Table 6.1 - Recommended Insecticide and Control Use (cont.)**

<table>
<thead>
<tr>
<th>Pests</th>
<th>Pesticide</th>
<th>Application and Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Red Imported Fire Ants</strong>&lt;br&gt;<em>(If you live outside of these locations (James City and York counties, and the cities of Chesapeake, Hampton, Newport News, Norfolk, Poquoson, Portsmouth, Suffolk, Virginia Beach, and Williamsburg) do not attempt to treat fire ants yourself but call the Department of Agriculture Office of Plant and Pest Services immediately (804/786-3515 in Richmond or 757/562-6637 in Franklin).)</em>&lt;br&gt;If you live within those counties and cities listed above, you are in the fire ant quarantine area and may treat the fire ants yourself. Because the quarantine is new as of 2009, there are only a few products available for fire ant control in Virginia. The products that are available at this time are bait formulations, specifically MaxForce Fire Ant Bait1 (fipronil 0.00045), Advion Fire Ant Bait1 (indoxacarb 0.045%) and Amdro Ant Block (hydramethylnon 0.88%). Amdro Yard Treatment (0.036% hydramethylnon)&lt;br&gt;Ortho Orthene Fire Ant Killer (50% acephate)</td>
<td><strong>Pests</strong></td>
<td><strong>Pesticide</strong></td>
</tr>
<tr>
<td>Indoors:</td>
<td>Bait formulations</td>
<td>Baits must be kept cool and dry. Do not store baits next to repellent or smelly insecticides or cleaning agents. Apply baits carefully according to the label directions. Be sure to apply the bait around the mound rather than on top of it. Fire ants forage out from the sides of their mound and will collect the bait near their foraging tunnels. Placing bait on top of the mound will incite the ants' defense response. The ants will attack aggressively but will not pick up the bait. Do not attempt using home remedies (applications of boiling water, diesel fuel, grits, gasoline, etc.) to kill a fire ant mound. Most home remedies will only disrupt the fire ant colony, causing it to split. This results in two additional mounds springing up right next to the treated mound a month or two after treatment. If home remedies were effective, we would not have fire ants infesting the entire southeastern United States. The Ortho product is applied as drench treatment to individual mounds. Read the product label for directions. There are currently no biological control agents that are effective for preventing fire ants spread.</td>
</tr>
<tr>
<td>Indoors:</td>
<td>Ortho Orthene Fire Ant Killer (50% acephate)</td>
<td>Spiders, egg sacs, and webs can be removed with a vacuum. Dispose of bag immediately.</td>
</tr>
<tr>
<td><strong>Spiders</strong>&lt;br&gt;Indoors:</td>
<td>Insecticidal dusts</td>
<td><strong>Outdoors</strong>: Pesticide sprays have been proven to have very limited efficacy. Use a vacuum or broom to eliminate webs and remove spiders. <strong>Outdoors</strong>: Turn off outdoor lights that attract spider food (insects). Practically all spiders in Virginia are harmless. The only exceptions are the black widow and brown recluse spiders, which are poisonous. However, these spiders hide and are not often affected by sprays.</td>
</tr>
<tr>
<td><strong>Ticks</strong>&lt;br&gt;(outdoor areas)</td>
<td>cypermethrin1</td>
<td>Demon TC 25.3%</td>
</tr>
<tr>
<td></td>
<td>permethrin 0.25%</td>
<td>Eliminator Garden Dust or Spray</td>
</tr>
<tr>
<td></td>
<td>permethrin 2.5%</td>
<td>Eliminator Outdoor Insect Killer</td>
</tr>
<tr>
<td></td>
<td>carbaryl 21.3%</td>
<td>Sevin Liquid Brand Carbaryl Insecticide 2</td>
</tr>
<tr>
<td><strong>Wasps And Hornets</strong>&lt;br&gt;pyrethroids</td>
<td>aerosol sprays Wasp and Hornet Killer</td>
<td>Outdoors/Indoors: Locate nest entrance during daylight hours. Apply pesticide at night when most insects will be in the nest. Wear protective clothing. Remove above ground nests when activity ceases. For nests below ground, apply insecticide to entrance at night. Wear protective clothing at all times during treatment.</td>
</tr>
<tr>
<td>tetramethrin 0.2%</td>
<td>aerosol spray Wasp and Hornet Killer</td>
<td>Outdoors/Indoors: For nests below ground, apply insecticide at night to entrance. Do not cover with soil. Wear protective clothing and a bee veil. Baited traps can be used when pesticide application is undesirable. Traps should be checked and cleaned daily.</td>
</tr>
<tr>
<td>carbaryl</td>
<td>Sevin Dust 5% Baited Traps (Grenadine)</td>
<td></td>
</tr>
<tr>
<td>Yellow jackets&lt;br&gt;(ground nests)</td>
<td>carbaryl</td>
<td>Sevin Dust 5% Baited Traps (Grenadine)</td>
</tr>
<tr>
<td>tetramethrin 0.2%</td>
<td>aerosol spray Wasp and Hornet Killer</td>
<td></td>
</tr>
</tbody>
</table>

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Wood-Destroying Insects

Dini M. Miller, Extension Entomologist, Virginia Tech

Control of wood-infesting insects is best accomplished by a professional pest control operator. The information below is intended to provide a homeowner with some control methods and materials, but not all the steps are included. Read product labels. Most termite control chemicals are only available to professionals. For information on identifying termite infestations see the publication: Signs of Subterranean Termite Infestation (http://pubs.ext.vt.edu/444/444-501/444-501.pdf). For information on choosing a termite control option see the publication: Subterranean Termite Treatment Options (http://pubs.ext.vt.edu/444/444-500/444-500.pdf). Information on selecting a pest control company can be found in Section 1 of this guide.

Table 6.2 - Recommended Insecticide Use

<table>
<thead>
<tr>
<th>Pests</th>
<th>Pesticide</th>
<th>Application</th>
<th>Nonchemical Control and Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>Termites (subterranean)</td>
<td>Soil Treatment:</td>
<td>Soil Treatment: Soil adjacent to the house foundation must be soaked with insecticide. A “V”-shaped trench is dug against the foundation at least 1 foot deep to get total insecticidal penetration to the footing. Concrete floors, patio, walks, etc., are drilled at 12-inch intervals and the chemical injected under pressure. Caution must be taken not to damage heat pipes, vapor barriers, etc., located under the slab. In trenches: 4 gal of solution/10 linear ft. per foot of depth to the footer (to a max of 4 ft) applied on each side of foundation and around piers. Under concrete slabs: 1 gal solution/10 sq ft of fill surface.</td>
<td>Subterranean termites feed on materials containing cellulose and have strict moisture requirements. Prevent infestations by eliminating food and moisture resources.</td>
</tr>
<tr>
<td></td>
<td>Arilon</td>
<td>Soil Treatment: Soil adjacent to the house foundation must be soaked with insecticide. A “V”-shaped trench is dug against the foundation at least 1 foot deep to get total insecticidal penetration to the footing. Concrete floors, patio, walks, etc., are drilled at 12-inch intervals and the chemical injected under pressure. Caution must be taken not to damage heat pipes, vapor barriers, etc., located under the slab. In trenches: 4 gal of solution/10 linear ft. per foot of depth to the footer (to a max of 4 ft) applied on each side of foundation and around piers. Under concrete slabs: 1 gal solution/10 sq ft of fill surface.</td>
<td>• Repair structural and plumbing leaks.</td>
</tr>
<tr>
<td></td>
<td>(Indoxacarb 0.05%)</td>
<td>Soil Treatment: Soil adjacent to the house foundation must be soaked with insecticide. A “V”-shaped trench is dug against the foundation at least 1 foot deep to get total insecticidal penetration to the footing. Concrete floors, patio, walks, etc., are drilled at 12-inch intervals and the chemical injected under pressure. Caution must be taken not to damage heat pipes, vapor barriers, etc., located under the slab. In trenches: 4 gal of solution/10 linear ft. per foot of depth to the footer (to a max of 4 ft) applied on each side of foundation and around piers. Under concrete slabs: 1 gal solution/10 sq ft of fill surface.</td>
<td>• Pull all mulch and landscaping back at least 6 inches from the foundation.</td>
</tr>
<tr>
<td></td>
<td>Permethrin (Prelude)1</td>
<td>Soil Treatment: Soil adjacent to the house foundation must be soaked with insecticide. A “V”-shaped trench is dug against the foundation at least 1 foot deep to get total insecticidal penetration to the footing. Concrete floors, patio, walks, etc., are drilled at 12-inch intervals and the chemical injected under pressure. Caution must be taken not to damage heat pipes, vapor barriers, etc., located under the slab. In trenches: 4 gal of solution/10 linear ft. per foot of depth to the footer (to a max of 4 ft) applied on each side of foundation and around piers. Under concrete slabs: 1 gal solution/10 sq ft of fill surface.</td>
<td>• Remove piles of trash and debris from around the home.</td>
</tr>
<tr>
<td></td>
<td>Cypermethrin (Demon TC)1</td>
<td>Soil Treatment: Soil adjacent to the house foundation must be soaked with insecticide. A “V”-shaped trench is dug against the foundation at least 1 foot deep to get total insecticidal penetration to the footing. Concrete floors, patio, walks, etc., are drilled at 12-inch intervals and the chemical injected under pressure. Caution must be taken not to damage heat pipes, vapor barriers, etc., located under the slab. In trenches: 4 gal of solution/10 linear ft. per foot of depth to the footer (to a max of 4 ft) applied on each side of foundation and around piers. Under concrete slabs: 1 gal solution/10 sq ft of fill surface.</td>
<td>• Remove dead tree stumps from the yard.</td>
</tr>
<tr>
<td></td>
<td>Imidacloprid (Premise)1</td>
<td>Soil Treatment: Soil adjacent to the house foundation must be soaked with insecticide. A “V”-shaped trench is dug against the foundation at least 1 foot deep to get total insecticidal penetration to the footing. Concrete floors, patio, walks, etc., are drilled at 12-inch intervals and the chemical injected under pressure. Caution must be taken not to damage heat pipes, vapor barriers, etc., located under the slab. In trenches: 4 gal of solution/10 linear ft. per foot of depth to the footer (to a max of 4 ft) applied on each side of foundation and around piers. Under concrete slabs: 1 gal solution/10 sq ft of fill surface.</td>
<td>• Keep firewood stacked away from the structure.</td>
</tr>
<tr>
<td>Baits:</td>
<td>Fipronil (Termidor)1</td>
<td>Soil Treatment: Soil adjacent to the house foundation must be soaked with insecticide. A “V”-shaped trench is dug against the foundation at least 1 foot deep to get total insecticidal penetration to the footing. Concrete floors, patio, walks, etc., are drilled at 12-inch intervals and the chemical injected under pressure. Caution must be taken not to damage heat pipes, vapor barriers, etc., located under the slab. In trenches: 4 gal of solution/10 linear ft. per foot of depth to the footer (to a max of 4 ft) applied on each side of foundation and around piers. Under concrete slabs: 1 gal solution/10 sq ft of fill surface.</td>
<td>• Make sure downspouts are long enough to direct water away from the foundation.</td>
</tr>
<tr>
<td></td>
<td>Noviflumuron (Sentricon)1</td>
<td>Soil Treatment: Soil adjacent to the house foundation must be soaked with insecticide. A “V”-shaped trench is dug against the foundation at least 1 foot deep to get total insecticidal penetration to the footing. Concrete floors, patio, walks, etc., are drilled at 12-inch intervals and the chemical injected under pressure. Caution must be taken not to damage heat pipes, vapor barriers, etc., located under the slab. In trenches: 4 gal of solution/10 linear ft. per foot of depth to the footer (to a max of 4 ft) applied on each side of foundation and around piers. Under concrete slabs: 1 gal solution/10 sq ft of fill surface.</td>
<td>• Keep gutters clean.</td>
</tr>
<tr>
<td></td>
<td>Sulfluramid (First Line)1</td>
<td>Soil Treatment: Soil adjacent to the house foundation must be soaked with insecticide. A “V”-shaped trench is dug against the foundation at least 1 foot deep to get total insecticidal penetration to the footing. Concrete floors, patio, walks, etc., are drilled at 12-inch intervals and the chemical injected under pressure. Caution must be taken not to damage heat pipes, vapor barriers, etc., located under the slab. In trenches: 4 gal of solution/10 linear ft. per foot of depth to the footer (to a max of 4 ft) applied on each side of foundation and around piers. Under concrete slabs: 1 gal solution/10 sq ft of fill surface.</td>
<td>• Avoid direct wood-to-ground contact when building porches or decks.</td>
</tr>
<tr>
<td></td>
<td>Dimilin (Exterra)1</td>
<td>Soil Treatment: Soil adjacent to the house foundation must be soaked with insecticide. A “V”-shaped trench is dug against the foundation at least 1 foot deep to get total insecticidal penetration to the footing. Concrete floors, patio, walks, etc., are drilled at 12-inch intervals and the chemical injected under pressure. Caution must be taken not to damage heat pipes, vapor barriers, etc., located under the slab. In trenches: 4 gal of solution/10 linear ft. per foot of depth to the footer (to a max of 4 ft) applied on each side of foundation and around piers. Under concrete slabs: 1 gal solution/10 sq ft of fill surface.</td>
<td>• Siding, brick veneer, or foam insulation should not extend below the soil grade.</td>
</tr>
<tr>
<td></td>
<td>Diflubenzuron (Advance)1</td>
<td>Soil Treatment: Soil adjacent to the house foundation must be soaked with insecticide. A “V”-shaped trench is dug against the foundation at least 1 foot deep to get total insecticidal penetration to the footing. Concrete floors, patio, walks, etc., are drilled at 12-inch intervals and the chemical injected under pressure. Caution must be taken not to damage heat pipes, vapor barriers, etc., located under the slab. In trenches: 4 gal of solution/10 linear ft. per foot of depth to the footer (to a max of 4 ft) applied on each side of foundation and around piers. Under concrete slabs: 1 gal solution/10 sq ft of fill surface.</td>
<td>• Keep firewood stacked away from the structure.</td>
</tr>
</tbody>
</table>

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### Table 6.2 - Recommended Insecticide Use (cont.)

<table>
<thead>
<tr>
<th>Pests</th>
<th>Pesticide</th>
<th>Application</th>
<th>Non-chemical Control and Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>Powderpost beetles and old house borer</td>
<td>Disodium Octoborate Tetrahydrate (BoraCare)(^1) (Tim-Bor)(^1) (Jecta)(^1)</td>
<td>If infestation is contained, removal and replacement of infested wood is recommended. If the infestation is widespread, a professional pest control operator can apply a surface treatment or an injection treatment. With a surface treatment, liquid insecticide is applied to the surface of the wood. Surface application will kill adults as they emerge and will slowly penetrate the wood to kill the larvae. Injection treatment consists of drilling the wood and injecting the product into the drilled holes. The injection treatment will kill beetle larvae in the wood and will last several years.</td>
<td>Controlling powderpost beetle and old house borer infestations is a job for a professional pest control operator. Painting wood surfaces will prevent beetles from reinfecting wood but will not prevent existing larvae from continuing to feed inside the wood and later emerging as adults.</td>
</tr>
<tr>
<td>Carpenter ants</td>
<td>Baits, Aerosols, Insecticide Sprays</td>
<td>Locate the nest if possible (nests can often be associated with areas of high moisture). If the nest is found and can be exposed with minimal damage to the structure, aerosol sprays can be used to destroy the colony. If the nest cannot be located or exposed, baiting is the most effective means of carpenter ant control.</td>
<td>The most specific and effective carpenter ant baits are available only from a professional pest control operator. However, boric acid bait formulations labelled for carpenter ant control (Taro) can significantly reduce the foraging population.</td>
</tr>
<tr>
<td>Perimeter treatment</td>
<td>Indoxacarb (Arlon)(^1) Fipronil (Termidor)(^1) Imidacloprid (Premise)(^1) Lambda-cyhalothrin (Demand CS)(^1)</td>
<td>Apply a perimeter spray around the base of a structure. The spray typically is applied ~3 or more feet up the side of the structure, and to the soil or landscaping ~3 or more feet around the structure. However, the application area will change by product so you must read the label.</td>
<td>The perimeter spray should be applied by a pest-management professional with the proper equipment. The application should be made in the early spring when ant populations are low. One application should last all season.</td>
</tr>
<tr>
<td>Carpenter bees</td>
<td>Pyrethroid sprays and dusts: Imidacloprid spray (Premise 2)(^1)</td>
<td>Apply insecticide to the entry holes or galleries as soon as bee activity is observed (spring and early summer).</td>
<td>Leave treated galleries open for 24 to 48 hours to ensure adult bees contact treated galleries. Afterward (48 hours), gallery entrance holes can be sealed with putty or caulk.</td>
</tr>
<tr>
<td>Site treatment with</td>
<td>Pyrethroid sprays, Imidacloprid spray (Premise 2)(^1)</td>
<td>Apply spray to areas known or suspected to be targets of carpenter bees (e.g. soffits and eaves).</td>
<td>The Premise label allows for preventative application to building surfaces (soffits, eaves, trim, etc.) as part of a perimeter treatment. Carpenter bees are territorial, often returning to wood that they infested in previous years. Therefore, applications should be made to these areas in early summer, or as soon as bee activity is observed. Contact your professional pest control company if you have a recurring infestation.</td>
</tr>
</tbody>
</table>

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Improving the sanitation and maintenance in and around the home is the best way to prevent household insect and spider pests. Outdoor clutter and debris that harbor pests should be removed. Pest entry should be reduced by sealing holes and cracks around plumbing lines and windows. Indoors, proper sanitation, food storage, and waste removal will deprive pests of food and water resources. All of these measures will make the home inhospitable to pests limiting their survival.

### Bat Bugs

**Prevention:** Bat bugs inside a structure are typically the result of bats or birds roosting in the attic. If the bat bug population becomes very large, bugs will start to become a nuisance inside the home. Frequently, however, bat bugs become a problem after a bird or bat population has been removed from a structure. Bat bugs remaining in the empty roost no longer have a host to feed on so they move into the living space to feed on people. The best way to prevent a bat bug infestation is by eliminating access points around the structure to keep bats or birds from roosting inside. If a population of bats or birds has to be removed from a home, an effort should be made to clean out the nests and droppings (guano) left behind. Cleaning should only be performed while wearing a respirator because of the toxic fungal spores and bacteria associated with bat guano and bird droppings.

**Control:** Inspect infested rooms thoroughly, starting with electrical connections coming through the ceilings, then around the edges of the carpet, between the floorboards, and in drop ceilings, if applicable. Caulk and seal all openings that would allow bat bugs access to human living space. Vacuum the floors and closets thoroughly. Treat all areas where bat bugs are found with a labeled insecticide. A combination of insecticide products should be used simultaneously. Diatomaceous earth dust or another desiccant dust combined with a crack and crevice treatment is the best approach. All of these treatments should be applied by a professional.

### Bed Bugs

**Prevention:** Bed bugs are becoming an increasingly serious problem in the United States. Many home infestations result from traveling and staying in hotels (even five-star hotels), motels, and camps or lodges and bringing the bed bugs home in luggage or clothes. To prevent infestations that might result from travel, always inspect the mattress in your sleeping room for signs of bed bug infestation (live bugs or black specks (bug feces) in the mattress seams and tufts) prior to unpacking or sleeping in the bed. Good sanitation in the home, particularly the removal of clutter, will inhibit bed bug population growth and help to prevent bed bugs from becoming well established. Although bed bug populations cannot be eliminated by sanitation alone, removing clutter will make the environment less hospitable for bed bugs and much easier to treat with insecticides. It is essential that furniture, clothing, boxes, or other personal effects NOT be moved from an infested location to an uninfested location. Moving these items will simply spread the infestation because it is very difficult to determine if an item is free of all immature bed bugs and bed bug eggs. It is also essential that you not bring other peoples’ furniture, used furniture, or other peoples’ belongings into your home unless you know they are bed bug free.

**Control in beds and bedding:** All bedding needs to be washed and dried or just dried at a high temperature (130°F). Mattresses can be steam cleaned or washed thoroughly with soap and water and left outside to dry. If washing or steam cleaning is not possible, products that are labeled for mattress treatment can be applied to the mattress to kill the bed bugs. After cleaning or treating a mattress with an insecticide, it should be encased in a bed bug-proof mattress cover to prevent any surviving bed bugs from getting off the mattress and biting. Encasing the mattress will also prevent it from becoming reinfested with bed bugs still in the room. Box springs are a popular harborage for bed bugs. To treat the box springs, remove and discard the cloth backing to provide access to the inner frame so that you can treat the inside of the wood frame and along the slats and bedsprings with a labeled insecticide. Cover box springs with a bed bug-proof mattress cover after treatment. Inspect the headboard and bed frame for bed bugs and treat with a labeled insecticide.

**Control in infested rooms:** Inspect the room thoroughly by looking around the edges of the carpet, between the floorboards, behind photos or posters on the wall, along the door frames around closets, inside shoes that are worn infrequently, and in any other crack or crevice where bed bugs can hide. Remove all clothing and place in a sealed plastic bag until it can be put into a hot dryer. Remove all personal items from closets and drawers, disposing (outside) of all unnecessary items while inspecting and cleaning the rest. Treat furniture and other areas with a labeled insecticide. It is recommended that a combination of insecticide products be used simultaneously. A crack and crevice treatment, and a long term residual dust insecticide in wall voids is the best approach. The infested location should be treated at least three times at two-week intervals. All of these treatments should be applied by a professional.
Keep in mind that bed bug treatment is very difficult. Most pest management professionals have only recently learned how to treat for bed bugs. Also, there are only a few products labeled for bed bug treatment. There are even fewer low toxicity products that can be applied to mattresses or bedding. Bed bugs are hard to locate, hard to kill, and can live for several months without feeding so clutter removal, vigilance, and patience are absolutely necessary when attempting to control this pest.

**Red Imported Fire Ants (RIFA)**

Red imported fire ants (RIFA) rarely nest indoors, but if they do, you should call a professional pest control operator immediately. It has been documented that RIFA tend to enter structures during periods of heavy precipitation. RIFA are extremely aggressive and respond rapidly to any disturbance of the nest or a food resource. RIFA in structures can be very dangerous for small children or the elderly. A number of deaths have resulted from children or bedridden elderly adults being stung repeatedly by fire ants. Nursing homes and day care centers need to be particularly vigilant about keeping fire ants controlled both indoors and out (See Insects in Recreational Areas).

Red imported fire ant (RIFA) colonies can be found throughout the southeastern United States from Texas through Florida, extending as far north as Oklahoma and Virginia. In 2009, several counties in Virginia were placed under the Federal Fire Ant Quarantine. This quarantine means that the Virginia Department of Agriculture and Consumer Services (VDACS) will no longer be responsible for treating fire ant mounds in those areas. Fire ant control will now be the responsibility of those citizens living in the quarantine locations. A current map of all quarantined locations within the U.S. may be viewed at http://www.aphis.usda.gov/ppq/maps/fireant.pdf. In Virginia, RIFA colonies are now established throughout Hampton Roads. Individual RIFA colonies have also been documented in the greater Richmond area and as far west as Montgomery County. **Note that RIFA infestations occurring outside of the quarantined areas in Virginia should still be reported to the VDACS Office of Plant & Pest Services at (804) 786-3515 or visit the VDACS website at http://www.vdacs.state.va.us/**.

For more detailed information see the Red Imported Fire Ant (RIFA) publication: [http://pubs.ext.vt.edu/444/444-284/444-284.pdf](http://pubs.ext.vt.edu/444/444-284/444-284.pdf)

**Controlling Insects**

### Table 6.3 - Recommended Use

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<td><strong>Ants</strong></td>
<td>Eliminate food materials that attract ants into home. Follow good sanitary practices. Perimeter sprays applied by a professional pest control operator will significantly reduce pest entry.</td>
<td>Baits, Aerosol sprays Perimeter Sprays include: Fipronil (Termidor)² Imidacloprid (Premise)² Lambda-cyhalothrin (Demand CS)²</td>
<td>For colony control: Identify the type of ant and use a bait labeled for that species. Ants are finicky and may prefer a sweet or a protein-based bait. <strong>Indoors:</strong> Spray baseboards, cracks, door frames, and window sills.</td>
</tr>
<tr>
<td><strong>Asian lady beetles</strong></td>
<td>Seal all possible routes of entry, screen vents, and install door sweeps. Vacuum up live lady beetles that make their way indoors and dispose of the bag outdoors.</td>
<td>Micro-cap formulations of lambda-cyhalothrin (Demand CS³) work best</td>
<td>Pesticide applications to lady beetle entry points outside of the home need to be made the first week of October to be effective. If lady beetles are already entering the home, pesticide applications will not prevent their entry although they may die once inside.</td>
</tr>
</tbody>
</table>

¹ Professional Use: These products are not restricted use but are designated as professional use because they are more potent and require specialized training, application equipment, or personal protective equipment that make them unsuitable for homeowner applications.

² Professional Use Outdoors

³ Home Use
### Nuisance Insects of the House and Yard: Household Insects

#### Bat bugs

The best way to prevent a bat bug infestation is by eliminating access points around the structure to keep bats or birds from roosting inside. Bat bugs can become a problem after a bird or bat population has been removed from a structure. Bat bugs remaining in the empty roost no longer have a host to feed on so they move into the living space to feed on people. See previous pages for more information.

#### Professional-use Residual Products

**Baseboard sprays:** Pyrethroids (Bifenthrin 0.06%, Deltamethrin 0.06%, Lambda Cyhalothrin 0.5%)

**Crack and crevice:** Pyrethroids (Bifenthrin 0.06%, Deltamethrin 0.06%, Lambda Cyhalothrin 0.5%)

**Wall Voids:** Diatomaceous earth

All of these treatments should be applied by a professional. Treat all areas where bat bugs are found with a labeled insecticide. A combination of insecticide products should be used simultaneously. A desiccant dust combined with a crack and crevice treatment is the best approach.

#### Bed bugs

Although bed bugs cannot be eliminated by sanitation alone, removing clutter will make the environment less hospitable for bed bugs and much easier to treat with insecticides. It is essential that furniture, clothing, boxes, or other personal effects NOT be moved from an infested location to an uninfested location. Moving these items will simply spread the infestation as it is very difficult to determine if an item is free of all immature bed bugs and bed bug eggs. See previous pages for more information.

#### Mattress sprays:

Steri-Fab (isopropyl alcohol 60%), Deltamethrin (0.06%); d-Phenothrin (0.40%) Bedlam

#### Professional-use Residual Products

**Crack and crevice:** (all Professional use) Pyrethroids (beta-cyfluthrin, bifenthrin, lambda-cyhalothrin); Combination pyrethroid and neonicatinoids (lambda-cyhalothrin and thio-methoxam, beta-cyfluthrin and imidoclopid, bifenthrin and acetamiprid).

Aerosol (Chlorfenapyr 0.5%)<sup>1</sup>

**Wall Voids:** (all professional use) Diatomaceous Earth (Mother Earth D); diatomaceous earth combined with dinofuran (Alpine dust); silica aerogel dust (Cimexa)

At this time, there is no single control product for bed bugs that will eliminate an infestation. Bed bug treatment requires a variety of sanitation and exclusion methods as well as insecticide products be applied to infested rooms. These treatments will need to be applied multiple times, and at regular intervals. Use pitfall type monitors (Climbup®) to monitor for bed bugs where people are getting bitten but no bugs are seen.

#### Box elder bugs

Collect in vacuum cleaner or by broom and dust pan, and destroy. Plug openings in window sashes to prevent entry. Caulk cracks, etc. Spray only in areas inaccessible to children and pets.

**Perimeter applications:**

Lambda-cyhalothrin (Demand CS)<sup>1</sup>

Fipronil (Termidor)<sup>1</sup>

Imidacloprid (Premise)<sup>1</sup>

Indoxacarb (Arlon)<sup>1</sup>

**Indoors:** Vacuum individual insects when they appear.

**Outdoors:** Apply preventative perimeter spray mid to late August.

---

<sup>1</sup> Professional Use: These products are not restricted use but are designated as professional use because they are more potent and require specialized training, application equipment, or personal protective equipment that make them unsuitable for homeowner applications.

<sup>2</sup> Professional Use Outdoors

<sup>3</sup> Home Use
### Brown marmorated stink bugs (BMSB)
Sting bugs begin aggregating on structures soon after the first cool day in September. Prior to September plug openings in windows and vents that provide entry to these bugs.

**Perimeter applications made during the first week of September:**
- Fipronil (Termidor)¹
- Imidacloprid (Premise)¹
- Indoxacarb (Arilon)¹

**Indoors:** Vacuum up individual insects, but be aware stink bugs will make the vacuum smell strongly of their odor.

**Outdoor:** Well timed perimeter applications may help to reduce bugs indoors but cannot eliminate entry in most cases.

### Carpet beetles
Follow good housekeeping practices. Most infestations result from spilled, dry pet food in cupboards and other storage locations. Clean hot air registers and cold air ducts. Use vacuum cleaner regularly. Frequently remove and destroy disposable vacuum cleaner bag. Never allow clothing, rugs, etc., to lie in a pile neglected over a period of time.

**Preventative:** Naphthalene Residual: Pyrethroid microencapsulation or wettable powder Cypermethrin 0.0150-0.03%¹

**Indoors:** Treat rugs and carpets including baseboards evenly and lightly in areas of infestations. Store only previously cleaned clothing, etc., in air-tight closets or containers.

### Clothes moths
Follow good housekeeping practices. Clothing should be thoroughly brushed and hung outside in the sunlight. Dry cleaning kills these pests. Prevent lint and dust from accumulating. Clean hot air registers and cold air ducts. Use vacuum cleaner regularly. Frequently remove and destroy disposable vacuum cleaner bag. Never allow clothing, rugs, etc., to lie in a pile neglected.

**Preventative:** Naphthalene

**Indoors:** Store only previously cleaned clothing in air-tight closets and containers. Use moth crystals, balls, or flakes in garment bags and closets where clothes are kept. Replace periodically.

### Clover mites
**Indoors:** Clover mites should be removed with a vacuum to reduce red smears and stains.

**Outdoors:** A 5-ft band of bare soil around the foundation will discourage mite infestation.

**Perimeter Spray:**
- Indoxacarb (Arilon)¹
- Lambda-cyhalothrin (Demand)¹
- Fipronil (Termidor)¹
- Imidocloprid (Premise)¹

**Indoors:** Direct spray onto mites in cracks and other areas where they hide.

**Outdoor:** Prepare a 5 ft wide strip of bare soil next to the house foundation the first week of May. Apply to the bare soil as a barrier completely around the house. Spray house 2 ft up from foundation siding and soil out 6 inches to 1.0 ft from foundation.

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¹ Professional Use: These products are not restricted use but are designated as professional use because they are more potent and require specialized training, application equipment, or personal protective equipment that make them unsuitable for homeowner applications.

² Professional Use Outdoors

³ Home Use
### Table 6.3 - Recommended Use (cont.)

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<th>Pests</th>
<th>Prevention</th>
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<th>Application</th>
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</table>
| Cluster flies          | Seal all possible routes of entry, screen vents, and install door sweeps. Vacuum or trap flies with light traps or sticky traps. | Perimeter Spray:  
Fipronil (Termidor)  
Imidacloprid (Premise)  
Indoxacarb (Arilon)  
Lambda-cyhalothrin (Demand) | Early autumn application should be made to the perimeter of the structure to prevent adult fly entry. |
| Cockroaches or waterbugs | Using a vacuum is ideal for removing cockroaches and their debris when doing the initial clean out. Sticky traps can be used to monitor cockroach populations and detect infestations. Increasing sanitation will also prevent cockroaches from becoming established. | Gel Baits  
Bait Stations  
Boric Acid Powder  
Aerosol Sprays | Indoors: Apply in cracks and crevices and in other out-of-sight areas. Treat areas where pipes go through walls or floors. Treat cockroach runways under sinks and behind appliances. Place bait in cracks and crevices where cockroaches hide. |
| Crickets               | Eliminate moist harborage areas near structures. Crawl spaces should be ventilated and dry. Entry points should be sealed.| Indoors: Aerosol sprays  
Perimeter Spray:  
Indoxacarb (Arilon)  
Fipronil (Termidor)  
Imidacloprid (Premise)  
Lambda-cyhalothrin (Demand) | Indoors: Use aerosol to knock down and kill individual crickets.  
Outdoors: Spray windows, doorways, and other entry sites. Apply to foundation walls, window wells, subfloor crawl spaces, under garbage cans, at door thresholds, etc. |
| Drain Flies            | Sanitation is the best control measure. Clean away the gelatinous film from inside drains; clean garbage containers regularly. Do not allow wet lint to accumulate under washing machines. Avoid moist organic debris of any nature, especially in the basement. | Aerosol sprays  
Drain cleaners:  
Drain Gel  
Bacterial Foam Products | Indoors: Use aerosols for adult fly control. For control of fly larvae in infested drains, use a bacterial drain treatment product to eliminate breeding sites. To clean drains after treatment, use a stiff brush and hot water to remove any remaining biofilm. |
| Earwigs                | Remove excessive clutter from the ground around outside of house. Items such as tarps, boards, and firewood provide harborage for earwigs. Bait areas where earwigs are found most commonly. If a number of earwigs are found aggregating indoors, remove them with a vacuum and clean the area with soap and water. Cleaning will remove the pheromone chemicals that will attract other earwigs. | Perimeter Spray:  
Fipronil (Termidor)  
Indoxacarb (Arilon)  
Imidacloprid (Premise)  
Lambda-cyhalothrin (Demand) | Remove all mulch, plant debris, and organic material from around foundation to reduce moisture. |

1 Professional Use: These products are not restricted use but are designated as professional use because they are more potent and require specialized training, application equipment, or personal protective equipment that make them unsuitable for homeowner applications.  
2 Professional Use Outdoors  
3 Home Use
### Fleas

Note that flea resistance to spot-on products is starting to become more prevalent; however, treating the pet is still the most effective method of flea treatment at this time.

Spot-on treatments for pets are by far the most effective way of eliminating fleas. Regular applications (1/mo) will often eliminate indoor flea problems.

**Indoors:** Insect growth regulators include Nylar, Precor and Archer.1 Also desiccant dusts kill flea larvae. These include diatomaceous earth and silica gel. Immediate flea relief may require the use of a pyrethroid fogger. Do **not** use more than one fogger per room.

**Outdoors:** Nylar, Flea fix,1,2 Archer, Virbac yard spray.

### Spot-on treatments for pets are by far the most effective way of eliminating fleas. Regular applications (1/mo) will often eliminate indoor flea problems.

- Fipronil (Frontline)
- Imidacloprid (K-9 Advantix)

### Indoor use of insect growth regulators to carpet in rooms where a flea infestation is apparent. Apply desiccants in larval habitats like carpet edges and pet bedding. Apply in animal’s sleeping quarters and replace old bedding with clean, fresh, untreated bedding. Aerosol foggers kill adult fleas indoors.

- **Outdoors:** Treat infested areas of lawn, under dog houses (thoroughly clean the inside of dog houses regularly), and under porches with insect growth regulator.

- **Indoors:** First, thoroughly clean infested shelves. Cover shelves with clean, fresh shelf paper or foil.

- **Outdoors:** Use aerosols in the air when flies are present.

- **Outdoors:** Apply to walls adjacent to dumpsters or other breeding sites. Light traps used outdoors will catch flies. But they also may attract flies in from other areas.

### Fly Prevention

**Flies**

Good sanitation and tight screens and garbage can lids are sound preventative control measures. Use of fly swatter is still practical. Do not contaminate food or utensils with insecticides. Bag pet waste before putting in garbage pails.

**Residual formulations:** Microencapsulated or Wettable powder

**Quick knockdown:** Labeled pyrethroid aerosol sprays

**Indoors:** Use an aerosol spray in the air when flies are present.

**Outdoors:** Apply to walls adjacent to dumpsters or other breeding sites. Light traps used outdoors will catch flies. But they also may attract flies in from other areas.

### Flour, Grain Beetles

**Prevention**

Discard infested foods and keep uninfested food in tightly-fitting-lid containers.

**Indoors:** First, thoroughly clean infested shelves. Cover shelves with clean, fresh shelf paper or foil.

### Long-horned Beetles

These beetles frequently hitch-hike into the home via firewood. It is wise to store firewood outdoors to prevent beetle emergence in the home.

**Indoors:** Usually, individual beetles can simply be picked up with a vacuum cleaner and then the cleaner bag contents discarded.

### Millipedes

**Indoors:** Millipedes that stray into the home can be picked up with vacuum, or they can be collected with a broom and dust pan, and discarded.

**Outdoors:** Remove sources of moisture such as excessive mulch, decaying grass, leaves, etc., from around the house foundation. Double-sided tape placed along entry ways can limit access into the structure.

**Indoors:** Use aerosol sprays on individual millipedes.

**Outdoors:** Spraying pest entry sites may help but outdoor applications during a mass millipede migration will do little to stop their numbers.

---

1 Professional Use: These products are not restricted use but are designated as professional use because they are more potent and require specialized training, application equipment, or personal protective equipment that make them unsuitable for homeowner applications.

2 Professional Use Outdoors

3 Home Use
Nuisance Insects of the House and Yard: *Household Insects* 6-13

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<th>Pests</th>
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| Mosquitoes                   | Maintain good, tight-fitting screens on windows and doors. Remove or frequently empty any containers from premises that may hold rainwater. Clean out clogged roof gutters holding stagnant water. Backyard garden ponds can be stocked with predatory fish that feed on mosquito larvae. | Aerosol sprays Repellents for personal protection | Indoors: Use aerosol spray according to label directions.  
**Repellent:** Use Deet or ethyl hexanediol aerosol according to directions.  
**Outdoors:** Homeowner applications of mosquito control measures outdoors are discouraged due to concerns over water contamination and the impact on non-target animals. |
| Pantry and stored-food pests | Either destroy the infested products, or salvage them by super-heating in an oven at 130°F for 1/2 hour, or super-cooling by placing in a deep freeze at 0°F for 4 days. Store insect-free foods in containers with tight lids. | Aerosol sprays Boric acid dust | Indoors: Remove all items from infested location and thoroughly clean shelves. Labeled insecticide may be sprayed into cracks and crevices. Cover shelves with clean, fresh paper or foil before placing packages or food in the cupboard. |
| Red imported fire ants (RIFA)| RIFA rarely nest indoors, but if they do, call a professional pest control operator immediately. | Outdoors: Baits, mound drenches | For colony control outdoors: See Insects in Recreational Areas, p. 6-1. For indoor infestations, call a professional pest control operator immediately. |
| Silverfish                    | Remove potential sources of food and moisture. Seal cracks and crevices. Remove books, papers, and boxes that have been stored for long periods. | Residual formulations: Microencapsulation or Wettable powder | Infestations tend to be localized. Apply treatment to suspected harborage areas. Habitat modification can greatly enhance control. |
| Sowbugs                      | Reduce or eliminate moist areas around the home. Remove leaf piles, grass clippings, old boards, and excess ground cover. Caulk cracks around home foundations. | Insecticidal dusts | Indoors: Use a spray along doorways, basement windows, and other places of entry. |
| Spiders                      | Spiders can be successfully kept out of the house by careful screening, secure caulking, etc. Practically all spiders in Virginia are harmless. Exceptions are the black widow and brown recluse spiders, which are poisonous. | Repellents for personal protection. Microencapsulations and wettable powder formulations for treating surfaces. | Indoors: Remove spiders, egg sacs, and webs with a vacuum. Seal and dispose of the bag immediately. Appropriately labeled dusts may be used if desired.  
**Outdoors:** Remove clutter and debris in the yard where spiders can hide. Turn off outdoor lights at night. Lights attract insects that spiders use as food. |

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2 Professional Use Outdoors  
3 Home Use
## Ticks

- Keep grass cut to 3 inches or less. Trim vegetation along yard edges, paths, and trails. Remove garbage and wood piles to discourage rodent activity.
- 5.0% Sevin dust pyrethroid sprays

### Application

**Outdoors:** Treat perimeter and under dog houses. Applications to large outdoor areas are impractical because ticks are often concentrated in spot locations.

## Wasps and hornets

- Remove nest when no activity is observed.
- Aerosol sprays
  - Wasp and hornet killer

### Application

**Outdoors:** Locate nest entrance during the day. Treat nest at night when most wasps are inside. Wear protective clothing.

---

1 Professional Use: These products are not restricted use but are designated as professional use because they are more potent and require specialized training, application equipment, or personal protective equipment that make them unsuitable for homeowner applications.

2 Professional Use Outdoors

3 Home Use
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<td>Permethrin</td>
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<td>Phenothrin</td>
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<td>Powderpost beetle</td>
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<td>Pyrethroid</td>
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<td>Red imported fire ants</td>
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<td>Resmethrin</td>
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<td>Sowbugs</td>
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<td>Spiders</td>
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<td>Stored-food Pests</td>
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<td>Sulfuramid</td>
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