

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 pavement. 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 (cont.)

Pests	Pesticide	Application and Remarks	
Mosquito Larvae	temephos	<p>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. Polluted water usually requires a higher rate of pesticide than required for clean water. Temephos is harmful to fish; keep out of lakes, ponds, and streams. Use methoprene in small bodies of water not known to be fish habitats. Small backyard ponds should be checked for mosquito larvae.</p> <p>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.</p>	
			Abate EC (43%)
			Abate 1 SG Granules
	methoprene		Aquaprene Tossits (1.8%)
			Altosid XR Briquets (2.1%)
	Altosid SR 20 Liquid Concentrate (20%)		
	Altosid XR-G Granules (1.6%)		
	Biologicals: <i>Bacillus thuringiensis</i> (Bt), methoprene Gambusia fish		
Red Imported Fire Ants	<p>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). 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 bait formulation products available for fire ant control in Virginia.</p>		
	fipronil	MaxForce FC Fire Ant Bait (0.00045%) ¹	
	indoxacarb	Advion Fire Ant Bait ¹ (0.045%)	
	hydramethylnon	Amdro Fire Ant Bait Granules (0.73%)	
		Amdro Kills Fire Ants Yard Treatment Bait (0.036%, methoprene 0.0172%)	
	acephate	Ortho Orthene Fire Ant Killer (50%)	
	Zeta-cypermethrin	Amdro® QuickKill Fire Ant Mound Drench (0.35%)	
Spiders	<p>Indoors: Insecticidal dusts</p> <p>Outdoors: Pesticide sprays have been proven to have very limited efficacy. Use a vacuum or broom to eliminate webs and remove spiders.</p>	<p>Indoors: Spiders, egg sacs, and webs can be removed with a vacuum. Dispose of bag immediately.</p> <p>Outdoors: 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.</p>	

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.

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Table 6.1 - Recommended Insecticide and Control Use (cont.)

Pests	Pesticide	Application and Remarks
Ticks (outdoor areas)	esfenvalerate	Conquer (3.48%) Eliminator Ant, Flea & Tick Killer II Concentrate (0.425%)
	permethrin	Martin's Permethrin SFR (36.8%) Bonide® Ant, Flea & Tick Killer Granules (0.25%)
	bifenthrin	Bifen I/T (7.9 %) Eliminator Ant, Flea & Tick Killer Plus Granules (0.1%)
	cypermethrin ¹	Demon® Max (25.3%)
	carbaryl	Sevin® Concentrate Bug Killer (22.5%)
Yellow jackets (ground nests)	prallethrin	PT Wasp-Freeze II (0.1%)
	tetramethrin	Wasp-X Wasp & Hornet Spray (0.5%. Etofenprox 0.5%, piperonyl butoxide 1%) Bonide Wasp & Hornet Killer (0.1%, perme- thrin 0.25%, piperonyl butoxide 0.5%)
	geraniol	EcoEXEMPT Jet (2.0%, 2-phenethyl propionate 3.0%)
	cyfluthrin	Tempo® Dust (1.0%)
	pyrethrins (wasps only)	PT 565 Plus XLO® (0.5%, piperonyl butoxide 1.0%, n-Octyl bicyclohep- tene dicarboximide 1.0%) CB 80 Extra (0.5%, piperonyl butoxide 4.0%)
		<p>Sprays can be applied to grassy and bushy areas near the house or kennels, the edges of lawns and gardens, and under porches.</p> <p>Outdoors (area control of ticks): Do not spray plants with cypermethrin. Mow areas around the house, to reduce tick habitat. Ticks require high humidity to survive and thus are most often found in grassy, brushy, wooded, and shaded areas. Reducing the humidity in these areas by keeping grass wellclipped, removing brush, and pruning trees to allow more sunlight to penetrate to the soil surface will discourage ticks from becoming established in these areas. Insecticide sprays could be sprayed with limited results but modifying the habitat is a more permanent approach to tick management</p> <p>Above-ground nests: Aerosols can be used for a quick knockdown of the nest. You can spray as far away as 15-20 feet. These quick-kill wasp aerosols have oily bases, so care should be taken to not stain surfaces.</p> <p>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.</p> <p>Below-ground nests: Treat the nest first with aerosols. When aerosol is dry, apply an insecticidal dust in the opening. The dust will prevent future yellow-jacket emergence. Check the nest the following day to see if the insects are dead (can be verified by lack of activity). Repeat if necessary.</p> <p>Outdoors/Indoors: Apply insecticide to the nest entrance at night. Do not cover the nest with soil. Wear protective clothing (and a bee veil) at all times during treatment.</p> <p>Baits and Lures: Baited traps can be used when pesticide application is undesirable. Traps should be checked and cleaned daily. Lure traps can be used to reduce the number of localized foraging workers. The most common lure in traps, heptyl butyrate, attracts primarily the western yellow jacket and not other species. Meat such as chicken can be added as an attractant and will improve catches of the German yellow jacket and <i>Vespula vulgaris</i>. The meat must be replaced frequently because yellow jackets aren't attracted to rotting meat. Lures need to be replaced periodically; follow trap directions regarding replacement. To reduce the number of yellow jackets foraging in specific areas such as patios, picnic tables, concession stands, and dumpsters, place the traps around the periphery. In large areas such as parks, place traps about 200 feet from the area to be protected and about every 150 feet along the circumference. In backyards, place them along the edge of the property line as far away from patios or other protected areas as possible.</p>

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Wood-Destroying Insects

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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 understanding of the 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

Pests	Pesticide	Application	Nonchemical Control and Remarks
Termites (subterranean)	Soil Treatment:		Subterranean termites feed on materials containing cellulose and have strict moisture requirements. Prevent infestations by eliminating food and moisture resources. <ul style="list-style-type: none"> • Repair structural and plumbing leaks. • Pull all mulch and landscaping back at least 6 inches from the foundation. • Remove piles of trash and debris from around the home. • Remove dead tree stumps from the yard. • Keep firewood stacked away from the structure. • Make sure downspouts are long enough to exist water away from the foundation. • Keep gutters clean. • Avoid direct wood-to-ground contact when building porches or decks. • Siding, brick veneer, or foam insulation should not extend below the soil grade. Termite control is a job for professional pest control operators. Homeowners do not have the training, experience, or equipment. Termite baits that can be purchased at home stores for consumers have not been proven to prevent or remediate termite infestations.
	indoxacarb	Arilon (20%) ¹	
	permethrin	Prelude (25.6%) ¹	
	cypermethrin	Demon Max (25.3%) ¹	
	imidacloprid	Premise 75 (75%) ¹	
	fipronil	Termidor SC (9.1%) ¹	
		Termidor HE (8.73%) ¹	
	Baits:		
	noviflumuron	Recruit HD (0.5%) ^{1 2}	
		Recruit IV AG (0.5%) ^{1 2}	
hexaflumuron	Recruit IV (0.5%) ^{1 2}		
	diflubenzuron	Shatter (0.5%) ^{1 3} Advance (0.25%) ¹	
Powderpost beetles (and old house borers)	disodium octaborate	BoraCare (40%)	
	tetrahydrate	Tim-bor (98%) Jecta (40%)	
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 (<i>cont. to page 6-6</i>)			Controlling powderpost beetle and old house borer infestations is a job for a professional pest control operator. Painting wood surfaces will prevent beetles from reinfesting wood but will not prevent existing larvae from continuing to feed inside the wood and later emerging as adults.

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 to be effective. Thus they are not appropriate for homeowner use.

² Used with Sentricon Termite Baiting System

³ Used with Hex-Pro Termite Baiting System

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Table 6.2 - Recommended Insecticide Use (cont.)

Pests	Pesticide	Application	Nonchemical Control and Remarks
Powderpost beetles (and old house borers) (cont.)	disodium octaborate	BoraCare (40%)	to the surface of the wood. Surface application will kill adult beetles. Insecticide will continue to 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.
	tetrahydrate	Tim-bor (98%) Jecta (40%)	
Carpenter ants	Baits, aerosols, insecticide sprays		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.
	Perimeter treatments:		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. Note that perimeter pesticide application laws have recently changed to protect ground water and pollinating insects. Pesticide can no longer be applied along concrete surfaces where there is risk of storm run-off. Also pesticides cannot be applied when pollinators are present. Read all pesticide labels carefully.
	indoxacarb	Arilon (20%) ¹	
	fipronil	Termidor 80 WG (80%) ¹	
imidacloprid	Premise 75 (75%) ¹		
	Lambda-cyhalothrin	Demand CS (9.7%) ¹	
Carpenter bees Note: Male bees cannot sting. Female bees will only sting if intentionally provoked.	Sprays and dusts:		Apply insecticide to the entry holes or galleries as soon as bee activity is observed (spring and early summer). Apply spray to areas known or suspected to be targets of carpenter bees (e.g. soffits and eaves). Be aware that we are trying to protect our pollinators so when applying any type of insecticide for bee control, be careful not to let any pesticides drift onto flowers or other locations where non-carpenter bees will visit.
	cyfluthrin	Tempo 1% Dust (1%) ¹	
	Lambda-cyhalothrin	LambdaStar UltraCap (9.7%) ¹	
	imidacloprid	Premise 2 (21.4%) ¹	
	Site Treatment:		The Premise label allows for preventative application to building surfaces (soffits, eaves, trim, etc.) as part of an exterior spot 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.

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Household Insects

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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 speck-like feces in the mattress seams and tufts) prior to unpacking or sleeping in the bed. In the home, 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 removing clutter alone, the removal of hiding places 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 important that you not bring other people's furniture, used furniture, or other peoples' belongings into your home unless you know they are bed bug free.

Control using heat: Because bed bugs and their eggs are unable to withstand temperatures above 122°F, properly executed heat treatments are very effective in killing bed bugs and controlling infestations. Heat treatments can be applied as whole-room, whole-home, and chamber treatments. Unfortunately, the equipment required for these treatment methods can be prohibitively expensive, and therefore, many pest control companies are unable to offer heat treatment services.

Control in beds and bedding: All bedding should be dried in a clothes dryer for at least 30 minutes 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, insecticide 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 encasement to prevent any surviving bed bugs from getting off the mattress and biting. Encasing the mattress will also prevent it from becoming reinfested with any 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. Then, you can treat the inside of the wood frame and along the slats and bed-springs with a labeled insecticide. Cover box springs with a bed bug-proof mattress encasement after treatment. Inspect the headboard and bed frame for bed bugs. Remove (either by vacuuming or with an adhesive lint roller) or kill any live bugs that are found, then treat the headboard and bed frame with an desiccant dust insecticide, following all label instructions.

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 could be hiding. Remove or kill any live bed bugs that are found (either by vacuuming or with an adhesive lint roller). In areas where bed bug evidence (cast skins, feces, or live bugs) is found, remove all clothing and lin-

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ens, placing them in a sealed plastic bag until they can be put into a hot dryer. Carefully inspect all personal items from areas where you found bed bug evidence. Portable heat chambers are now available for treating personal items and pieces of furniture. Dispose of unnecessary or unsalvageable items by taking them outside and prepare the rest for cleaning or treatment with an appropriately labeled insecticide. 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 desiccant 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 a limited number of 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 center 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>.

Controlling Insects

Table 6.3 - Recommended Use

Pests	Prevention	Pesticide	Application
Ants	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.	Perimeter Sprays: fipronil imidacloprid indoxacarb Lambda-cyhalothrin	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. Indoors: Spray baseboards, cracks, door frames, and window sills.
Asian lady beetles	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.	Micro-cap formulation: Lambda-cyhalothrin	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.

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² Professional Use Outdoors

³ Home Use

Table 6.3 - Recommended Use (cont.)

Pests	Prevention	Pesticide	Application
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	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.
		Baseboard sprays: bifenthrin Talstar P (0.06%) ¹ deltamethrin Suspend SC (0.06%) ¹ Lambda-cyhalothrin Demand CS (0.03%) ¹ Crack and crevice: bifenthrin Talstar P (0.06%) ¹ deltamethrin Suspend SC (0.06%) ¹ Lambda-cyhalothrin Demand CS (0.03%) ¹ Wall Voids: diatomaceous earth MotherEarth D (100%) silica gel CimeXa (100%)	
Bed bugs	Although bed bugs cannot be eliminated by removing clutter, limiting the available hiding places 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.	Professional-use Residual Products	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.
		Crack and crevice: bifenthrin Talstar P (0.06%) ¹ deltamethrin Suspend SC (0.06%) ¹ Beta-cyfluthrin Tempo SC Ultra (0.05%) ¹ Lambda-cyhalothrin Demand CS (0.03%) ¹ Combination products: acetamiprid bifenthrin Transport GHP (0.11%) ¹ imidacloprid Bedlam Plus (0.4%; 0.05%) ¹ phenothrin Tandem (0.13%) ¹ Lambda-cyhalothrin thiamethoxam Beta-cyfluthrin Temprid SC (0.15%) imidacloprid Pressurized insecticides: dinotefuran PT Alpine chlorfenapyr PT Phantom phenothrin Bedlam (0.4%) ¹ Desiccant dusts: diatomaceous earth PT Alpine dinotefuran diatomaceous earth MotherEarth D (100%) silica gel CimeXa™ (100%)	
Boxelder 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 (0.03%) ¹ fipronil Termidor 80 WG (0.06%) ^{1,2} deltamethrin Suspend SC (0.06%) ¹ indoxacarb Arilon (0.1%) ¹	Indoors: Vacuum individual insects when they appear. Outdoors: Apply preventative perimeter spray mid to late August. Note that perimeter pesticide application laws have recently changed to protect ground water and pollinating insects. Pesticide can no longer be applied along concrete surfaces where there is risk of storm run-off. Also pesticides cannot be applied when pollinators are present. Read all pesticide labels carefully.

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² Professional Use Outdoors

³ Home Use

Table 6.3 - Recommended Use (cont.)

Pests	Prevention	Pesticide	Application
Brown mar-morated stink bugs (BMSB)	Stink bugs begin aggregating on structures soon after the first cool day in September. Prior to September, plug openings in windows and vents that could provide the bugs with entry to the structure.	Perimeter applications (1st week of September): indoxacarb bifenthrin acetamiprid	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. Note that perimeter pesticide application laws have recently changed to protect ground water and pollinating insects. Pesticide can no longer be applied along concrete surfaces where there is risk of storm run-off. Also pesticides cannot be applied when pollinators are present. Read all pesticide labels carefully.
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	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 dust and lint 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 residual	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.

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² Professional Use Outdoors

³ Home Use

Table 6.3 - Recommended Use (cont.)

Pests	Prevention	Pesticide	Application
Clover mites	<p>Indoors: Clover mites should be removed with a vacuum to reduce red smears and stains.</p> <p>Outdoors: A 5-ft band of bare soil around the foundation will discourage mite infestation. .</p>	<p>Perimeter Spray:</p> <p>indoxacarb Arilon (0.1%)¹</p> <p>Lambda-cyhalothrin Demand CS (0.03%)¹</p> <p>fipronil Termidor 80 WG (0.06%)^{1 2}</p> <p>imidacloprid Temprid SC (0.15%)</p>	<p>Indoors: Direct spray onto mites in cracks and other areas where they hide.</p> <p>Outdoors: 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. Note that perimeter pesticide application laws have recently changed to protect ground water and pollinating insects. Pesticide can no longer be applied along concrete surfaces where there is risk of storm run-off. Also pesticides cannot be applied when pollinators are present. Read all pesticide labels carefully.</p>
Cluster flies	<p>Seal all possible routes of entry, screen vents, and install door sweeps. Vacuum or trap flies with light traps or sticky traps.</p>	<p>Perimeter Spray:</p> <p>indoxacarb Arilon (0.1%)¹</p> <p>Lambda-cyhalothrin Demand CS (0.03%)¹</p> <p>fipronil Termidor 80 WG (0.06%)^{1 2}</p> <p>imidacloprid Temprid SC (0.15%)</p>	<p>Early autumn application should be made to the perimeter of the structure to prevent adult fly entry.</p> <p>Note that perimeter pesticide application laws have recently changed to protect ground water and pollinating insects. Pesticide can no longer be applied along concrete surfaces where there is risk of storm run-off. Also pesticides cannot be applied when pollinators are present. Read all pesticide labels carefully</p>
Cockroaches	<p>Using a vacuum is ideal for removing cockroaches and their debris when doing an initial clean out. Sticky traps can be used to monitor cockroach populations and detect infestations. Increasing sanitation will also prevent cockroaches from becoming established.</p>	<p>Gel baits</p> <p>Bait stations</p> <p>Boric acid powder</p> <p>Aerosol sprays</p> <p>Desiccant dusts</p>	<p>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 and desiccant dusts in cracks and crevices where cockroaches hide.</p>
Crickets	<p>Eliminate moist harborage areas near structures. Crawl spaces should be ventilated and dry. Entry points should be sealed.</p>	<p>Perimeter Sprays:</p> <p>indoxacarb Arilon (0.1%)¹</p> <p>Lambda-cyhalothrin Demand CS (0.03%)¹</p> <p>fipronil Termidor 80 WG (0.06%)^{1 2}</p> <p>imidacloprid Temprid SC (0.15%)</p> <p>Indoors:</p> <p>Aerosol Sprays</p>	<p>Indoors: Use aerosol to knockdown and kill individual crickets.</p> <p>Outdoors: Spray windows, doorways, and other entry sites. Apply to foundation interior walls, window wells, subfloor crawl spaces, under garbage cans, at door thresholds, etc.</p>

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² Professional Use Outdoors

³ Home Use

Table 6.3 - Recommended Use (cont.)

Pests	Prevention	Pesticide	Application
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 the outside of house. Items such as tarps, boards, and firewood provide harbor-age 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: indoxacarb Arilon (0.1%) ¹ Lambda-cyhalothrin Demand CS (0.03%) ¹ fipronil Termidor 80 WG (0.06%) ^{1,2} imidacloprid Temprid SC (0.15%)	Remove all mulch, plant debris, and organic material from around foundation to reduce moisture.
Fleas Note: Resistance to spot-on products is starting to become more prevalent in fleas; 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/month) will often eliminate indoor flea problems.	Spot-on treatments (available at local animal clinics) imidacloprid K-9 Advantix II permethrin pyriproxyfen fipronil Fronline Plus (s)-methoprene selamectin Revolution Indoors: Insect growth regulators Nylar™ Surge (1.3%) (s)-methoprene Precor IGR Concentrate (1.2%) pyriproxyfen Archer (1.3%) Desiccant dusts Outdoors: Nylar Surge (1.3%) pyriproxyfen Archer (1.3%) esfenvalerate Virbac Yard Spray (0.44%)	Indoors: Apply insect growth regulators to carpets in rooms where flea infestation is apparent. Apply desiccant dusts in larval habitats like carpet edges and pet bedding. Apply in animals' sleeping quarters and replace old bedding with clean, fresh, untreated bedding. Outdoors: Treat infested areas of lawn, under dog houses (thoroughly clean the inside of dog houses regularly), and under porches with an insect growth regulator.

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² Professional Use Outdoors

³ Home Use

Table 6.3 - Recommended Use (cont.)

Pests	Prevention	Pesticide	Application
Flies	Good sanitation and tightly fitting 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	Discard infested foods and keep uninfested food in containers with tightly-fitting lids. .	None	Indoors: Thoroughly clean infested shelves. Cover shelves with clean, fresh shelf paper or foil.
Long-horned beetle	These beetles frequently hitchhike into the home via firewood. It is wise to store firewood outdoors to prevent beetle emergence in the home.	None	Indoors: Usually, individual beetles can simply be picked up with a vacuum cleaner and then discarded.
Millipedes	Indoors: Millipedes that stray into the home can be picked up with the vacuum, or they can be collected with a broom and dust pan, and then discarded. Outdoors: Remove sources of moisture such as excessive mulch, decaying grass, leaves, etc., from around the house foundation. Double-sided tape placed along entryways can limit access into the structure.	Cypermethrin ¹ (0.1%) microencapsulations wetable powder dusts in drier areas	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.
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 sprays according to label directions. Repellent: Use Deet or ethyl hexanediol aerosol according to the directions. Outdoors: Homeowner applications of mosquito control measures outdoors are discouraged due to concerns over water contamination and the impact on non-target animals.

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² Professional Use Outdoors

³ Home Use

Table 6.3 - Recommended Use (cont.)

Pests	Prevention	Pesticide	Application
Pantry and stored-food pests	Either destroy the infested products, or savage them by heating in an oven at 130° F for 30 minutes or super-cooling by placing in a deep freezer at 0° F for 4 days. Store insect-free foods in containers with tightly-fitting lids.	Aerosol sprays Boric acid powder	Indoors: Remove all items from infested location and thoroughly clean shelves. Labeled insecticides 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 pest management professional immediately. .	Outdoors: Baits Mound drenches	For colony control outdoors: See Insects in Recreational Areas, p. 6-1. For indoor infestation, call a pest management professional 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: Pyrethroid Microencapsulation	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 foundation.	Desiccant dusts	Indoors: desiccant dusts may be used along exterior doorways and basement windows (on the inside) to prevent 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. Note that the brown recluse spider is not native to Virginia." Bites (and other wounds) of many kinds are often misdiagnosed by medical doctors as brown recluse spider bites.	Repellents for personal protection Microencapsulations wetttable powder	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.
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.	carbaryl pyrethroid sprays	Sevin Dust (5.0%) Outdoors: Treat 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	Outdoors: Locate nest entrance during the day. Treat nest at night when most insects are inside. Wear protective clothing.

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