



## Scorpion Control Protocol



It is generally accepted that there are 16 families, 154 genera, and 1,252 species of scorpions. At least 98 species belonging to 12 genera and five families are known to occur in the continental United States. Buthidae is the largest and most widespread (found throughout the world) scorpion family (79 genera and 700 species). Centruroides are crevice dwellers that commonly enter homes and they are the only buthid genus that naturally occurs in North America. Centruroides vittatus (Striped Bark Scorpion) is the most common scorpion in the United States.

### Life Cycle

Although scorpion males and females do have physical differences, it generally takes a specialist to reliably distinguish them. There are no uniform gender-specific, external physical characteristics for determining the sex that applies to all scorpions.

#### Males

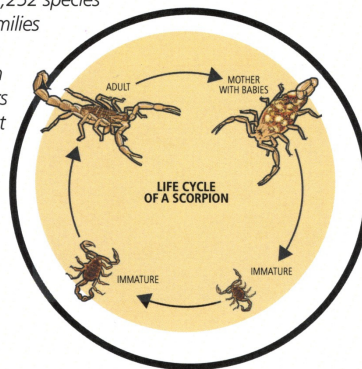
- Males are generally smaller and less robust compared to females of the same species.
- Males tend to be relatively more slender than females.
- Males generally undergo fewer molts than females.
- The sex ratio at birth is about equal.

#### Young

- First instars immediately crawl onto their mother's back where they remain without feeding. If removed they die without successfully molting.
- Depend on obtaining water from their mother's cuticle.
- Second instars in most cases leave the mother shortly after they molt. In other cases, the young may remain in the burrow with their mother, where she cares for them and may even feed them captured prey.
- Most species molt 5 or 6 times before becoming adults, although the number of molts varies from 4 to 9, depending on the species.

#### Adults

- Maturity is reached in as few as 6 months in some of the smaller species but may take as many as 3 to 7 years in some of the largest species. The mean developmental time for most other scorpions is about 3 years.
- Adults typically live 2 to 5 years.



### Understanding Scorpion Habits and Life Cycle

Scorpions are well adapted for surviving in a wide range of habitats, including deserts, grasslands, savannas and both temperate and tropical forests. In addition, they are found from intertidal zones at sea level to snow-covered mountains at elevations of over 5,500 meters, and in cave systems at depths of more than 800 meters. In large part, these adaptations are due to behavioral thermoregulation, low metabolic rates and high efficiency in conserving water.

- Most scorpions live on or very near the ground, where they typically are found under objects, in forest litter or excavated burrows.
- The major exception is the large and important family Buthidae in which the species are often excellent climbers.
- Upon entering houses, these species are likely to be seen on the walls and even ceilings, not infrequently gaining access to the upper floors of multistory buildings.
- Scorpions with large, robust pedipalps can often subdue their prey with little or no use of their venom.
- Smaller species with weaker, more slender pedipalps are far more dependent on stinging their prey.
- A well-fed scorpion can survive for months without further feeding.





# Scorpion Control Protocol

## Inspection

Scorpions fluoresce or glow under ultraviolet light so they are easy to find with the aid of a black light. The best time to inspect using a black light is during the summer between 8-11pm when the scorpions are actively foraging for food.

Inspect all potential harborage or breeding areas on the interior and around the perimeter of the home.

## Control Strategies

In temperate regions, the greatest number of complaints of scorpions entering homes is often seasonal, most commonly in the early spring and late fall. Heavy or frequent rains in the spring can saturate the soil and ground litter around building foundations, driving scorpions indoors as they search for drier sites. With the onset of colder weather in the late fall, scorpions are similarly apt to find their way indoors while seeking warmer temperatures.

- Inspection
- Sanitation & harborage removal (i.e., trash piles, stones, boards, firewood, landscape timbers, debris, etc.)
- Exclusion (i.e., seal openings or crevices in outside walls; place weather stripping around doors, windows and vents; install tight-fitting screens)
- Residual treatments

## Customer Communication

Appropriate measures can be taken to "scorpion-proof" buildings or otherwise significantly reduce the prospects of them entering homes.

- Entry can be discouraged by raising the floor level at least 20cm above ground.
- The installation of a horizontal row of glazed ceramic tiles on the vertical surfaces of steps and around the entire perimeter of a building also can provide a barrier that scorpions cannot readily climb.

- Worn weather stripping around doors and windows should be replaced, and potential entry sites around water pipes and electrical conduits in foundations should be sealed.
- Trimming plantings that touch buildings and removing piles of firewood, lumber, bricks and other materials that serve as harborage.
- The use of coarse bark mulches around plants near the foundation of buildings should be avoided.

## Pre-Treatment

- When working in enclosed areas, particularly in crawl spaces beneath homes, wear protective clothing, such as coveralls or long sleeves tucked into gloves and long pants tucked into boots.
- Keep bare hands out of places that you cannot see.
- Wear gloves when working outdoors in potential habitats such as rock gardens, or when moving wood.
- Do not use bare hands to turn over objects.

## Treatment Outdoors

**Liquid applications using Onslaught FastCap** at a rate of 1 oz. per gal of water per 1000 square feet.

### Apply as a crack & crevice or spot application

- Entry points such as doors, windows, garage doors and patios

### Apply as a broadcast, foliar or spot treatment

- Target areas previously noted during your inspection
- Ornamental plant areas adjacent to structures
- Surface areas under decks and balconies

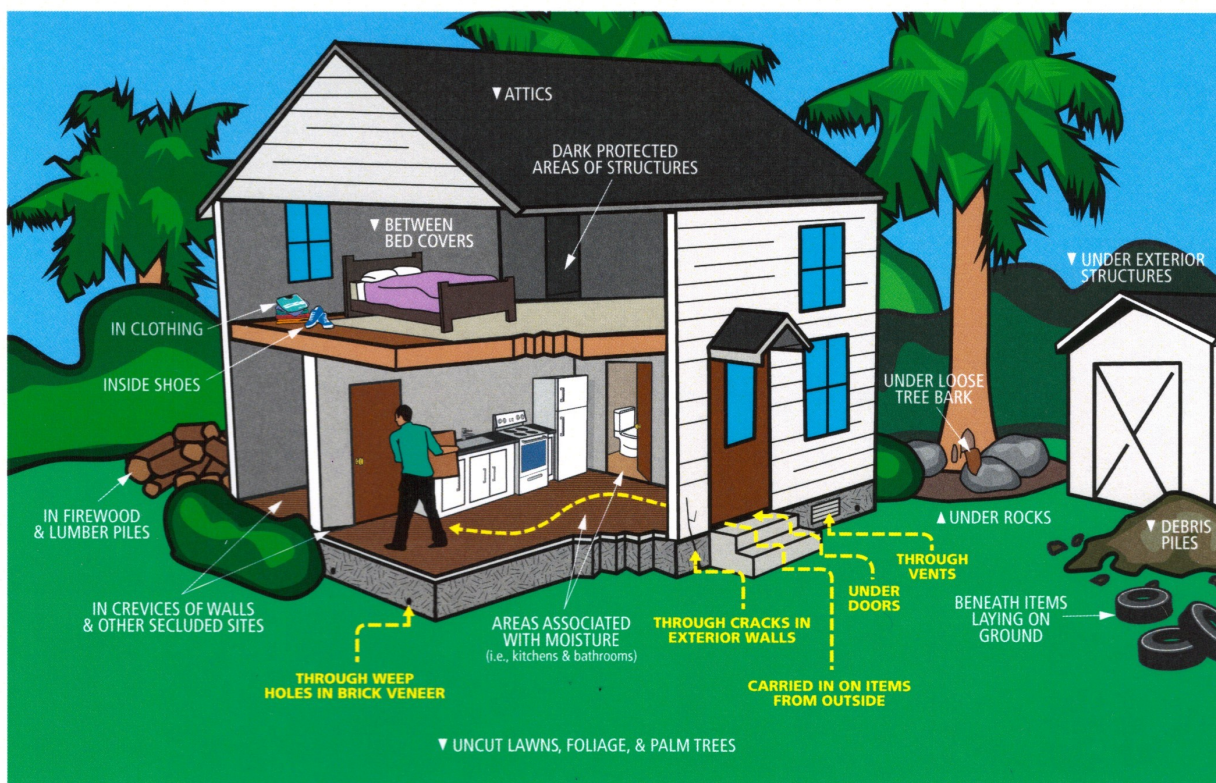
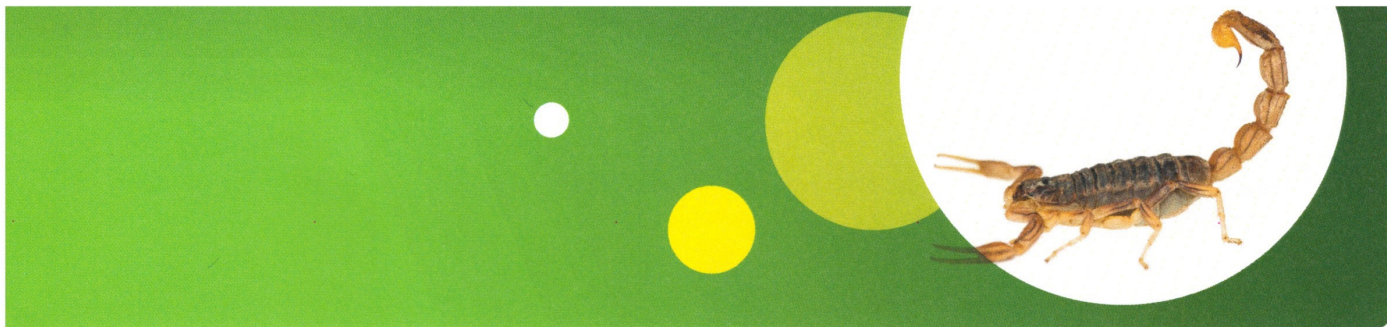
### Dust applications

- Behind siding, shutters in crawl space areas under homes.
- Voids of window and door framing.

### Granular applications

- Can be made to mulch beds and to limit drift during windy conditions.





## COMMON HARBORAGE SITES AND ENTRY POINTS

### INDOORS:

- Dark, protected areas of structures
- Inside shoes and in clothing
- Between bed covers
- Attics
- In crevices of walls and other secluded sites
- Areas associated with moisture (i.e., kitchens and bathrooms)

### OUTDOORS:

- Beneath items laying on the ground i.e. rocks, firewood, lumber piles, loose tree bark and debris piles
- Under exterior structures
- Uncut lawns, foliage and palm trees
- Eaves, weep holes and siding

### HOW THEY ENTER HOMES:

- Through cracks in exterior walls
- Under doors
- Through vents
- Carried in on items from outside
- Through weep holes in brick veneer





## Scorpion Control Protocol



### Treatment Indoors

#### Aerosol application using Shockwave® 1 Flushing, Killing & Residual Aerosol

- Flush out pests from clutter and hard to get to areas in living spaces, garages and outbuildings at a rate of 20 seconds per 100 square feet.

#### Liquid applications using Onslaught FastCap

at a rate of 1 oz. per gal of water per 1000 square feet.

- Apply as a broadcast surface, crack & crevice or spot treatment.
- Focus on areas where activity is known.
- Make applications to low traffic areas such as closets, under beds, behind and under furniture adjacent to walls.

#### Apply dust to:

- Plumbing area voids where pipes enter walls, under tubs, under toilets if not caulked properly.
- Void areas under cabinets.

### Post Treatment

- Glue board monitors can be placed along wall edges and under furniture to capture scorpions when they are foraging at night.
- Monitors may identify harborage areas missed during the initial inspection and indicate the need for additional control measures.
- Always be aware of product re-treatment intervals prior to reapplying.

### Featured Product Solutions



#### Onslaught® FastCap Microencapsulated Insecticide

- Specially formulated to kill scorpions fast and keep on killing for long-lasting control.
- **Pump or power sprayer rate:** 1 fl oz per gallon of water treats 1,000 sq ft



#### Shockwave® 1 Flushing, Killing & Residual Aerosol

- Rate: 20 seconds per 100 square feet
- Flushes pests from hiding to confirm their presence and determine their location.

**Contact Your Local Distributor Rep for More Information**



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