



Best Management Practices For Brown Dog Ticks



**STAMP
OUT
TICKS**





Heavy infestation of BDT on the ear of a dog.



At left: The black-legged tick (*Ixodes scapularis*). Its mouthparts are twice the length of BDT's. At right: The BDT has no markings on its back.

The **brown dog tick (BDT)** can be a serious pest in homes with pets. These Best Management Practices are designed to support cooperation between homeowners and pest management professionals in order to prevent and control BDTs.

Understanding brown dog ticks

Ticks are not insects; they are more closely related to spiders and mites. Pet dogs are the usual tick host. The brown dog tick is an "obligate three-host tick." This means that **larva, nymph** and **adult** ticks must acquire a blood meal from the dog before proceeding to the next developmental stage. One female tick carrying eggs into your home can result in **5,000** more ticks if left unchecked.

The brown dog tick is the only tick that can successfully complete its life cycle inside a home, particularly in the southeastern United States. This makes BDT a concern not only for dogs, but for people as well.

Recognizing the BDT

The BDT gets its name from being reddish-brown; otherwise it is unremarkable in description. A tick with any kind of white markings on its back is not the BDT. The black-legged tick, also known as the "deer tick," does not have marking on its back, but its mouthparts are almost twice as long as BDT mouthparts.

The TickApp is a tool to help you recognize differences between BDT and other ticks. It was developed to provide citizen consumers and professional practitioners a convenient guide to identify ticks impacting humans, livestock, companion animals, and wildlife. Use the TickApp online at <http://tickapp.tamu.edu>.

How does an infestation start?

A dog brings in one or more adult ticks from outdoors. Following a blood meal a female tick drops off, oviposits up to 5,000 eggs in a single mass, and dies. The larvae that emerge

Female ticks with egg masses. Engorged females are about the size of raisins.

immediately seek shelter in cracks or crevices such as baseboards or furniture, but also commonly move *en masse* up walls and congregate in the corners of ceilings. These larvae eventually find the dog and receive their first blood meal. The larvae go largely unnoticed because they are about the size of a pencil tip.

The larvae then drop off into the surrounding area, molt to the nymphal stage, and again seek the dog for a second blood meal. At this point owners occasionally notice the ticks, but they usually go unnoticed.

After they molt to the adult stage, the ticks find the dog for a third and final blood meal. Ticks are noticed at this stage for two reasons: 1) Adult females engorge to the size of a raisin and are often located on or near the dog's head, or 2) adults are seen crawling on floors actively looking for the dog. This "predatory" behavior is somewhat unique to ticks.

Typically, residents do not notice these ticks until they have completed a full generation. Often, overlapping generations of ticks occur in homes, so **tick numbers can quickly multiply into the thousands**.

A factor complicating BDT management is the ability of this tick to survive without a host for several months during each of its three life stages, thereby negating the "wait-it-out" strategy of starvation by absence of hosts. An unfortunate side effect occurs when the dog is considered the culprit of the infestation and is removed from the home: The tick can complete its life cycle on rodents. Furthermore, when dogs are not present, ticks use humans as hosts. Cats rarely are used as hosts.

How can I prevent an infestation?

Regular **inspection of your dog and its resting areas** are key to tick prevention. Mechanically remove ticks from your dog: Use tweezers to grasp as closely as possible to the dog's skin and around the mouthparts of the tick, and pull the tick straight out. This can be difficult. Areas to check frequently are the head, neck, inside and outside the ears, between the toes, under the tail, and around the rear-end area of the dog.

How can I control an infestation?

The earlier you can catch an introduction of ticks into a home the easier it will be to implement a control program. Here's why: By movement of the dog or the ticks themselves, BDT can be distributed throughout the home and yard, essentially ending up anywhere the dog has access, including beds, cars, couches, kitchens, etc. Additionally, BDTs spend over 95% of their time off their host, which means they will be in the surrounding environment. Thus, we recommend an Integrated Pest Management (IPM) approach to BDT control.

IPM is a process, not a miracle. IPM is a method of pest control that provides sustained relief from pests because it relies on identifying the behavior that caused the pest infestation and changing that behavior to avoid future infestations. Satisfactory tick control will require that the homeowner and



A six-legged larval BDT, left, is about the size of a pencil tip. At right is an eight-legged BDT nymph.



The recurved hooks on the mouthparts help ensure that the tick is anchored to the host, which makes ticks difficult to remove.





Inspect your dog for ticks, and remove ticks with tweezers

pest management professional (PMP) work together. The process of IPM generally requires thorough inspection and proper identification of the pest, developing a management plan, implementation of the plan and evaluation of the effectiveness of that plan. The foundation of all successful IPM programs is effective communication between homeowner and PMP.

We recommend the IPM approach on the back page for BDT, ideally to be done on the same day. Expect to repeat this process several times. Because these ticks spend 95% of their time off host, hidden behind walls and in furniture, infestations of BDT can take six months to a year to eliminate, even with acaricide applications. (Acaricides are pesticides designed to kill ticks and mites. Many acaricides are also insecticides.) One must be vigilant year-round, as a single female escaping can restart the elimination clock.

Inspection tip: Because eggs are laid as a batch, and larvae cluster until their first feeding, if ticks are in clusters they are usually the larval form.

Brown Dog Tick by the numbers

- 1:** the number of females needed to start or restart an infestation
- 2 to 4:** the number of generations per year that can be completed by BDT
- 3:** the number of hosts, usually dogs, BDT requires to complete its development
- 4:** the number of developmental stages that a tick undergoes (egg, larva, nymph, adult)
- 6:** the number of legs of a larval tick
- 8:** the number of legs of a nymphal or adult tick
- 5,000:** the average number of eggs that one female tick lays

Days of feeding on host

- 5 to 21 days:** the time it takes a female tick to feed on a host before dropping off to digest her blood meal. She then finds a protected place to lay her eggs.
- 3 to 10 days:** larval feeding period before dropping to molt into a nymph
- 3 to 11 days:** nymphal feeding period before dropping off to molt into an adult

Development times

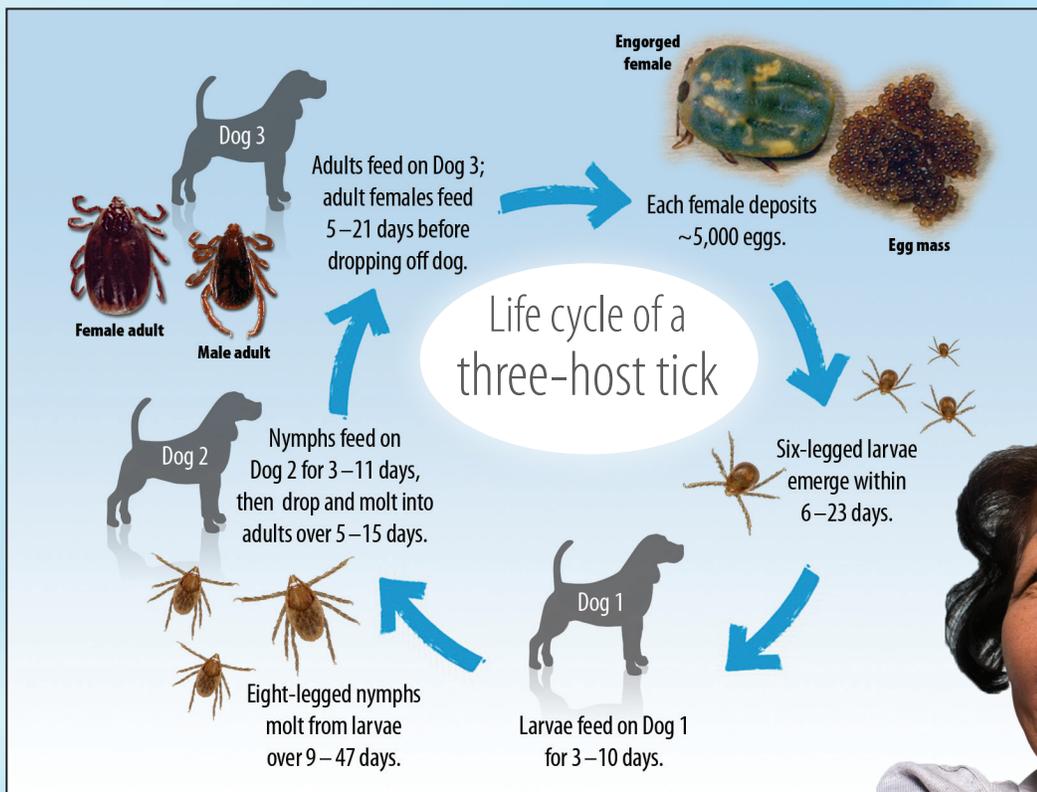
- 6 to 23 days:** egg development period before larvae emerge
- 5 to 15 days:** larval molting period
- 9 to 47 days:** nymphal molting period
- 63 to 91:** days to complete development, egg to adult, under favorable conditions for the tick

Survival time without food

- 6 months:** survival time for unfed nymphs
- 19 months:** survival time for unfed adults

Temperature and humidity

- 68 to 86°F (20 to 30°C):** the optimal temperature for egg-laying
- 68°F and 85% RH:** conditions for maximal nymphal survival



Sample Integrated Pest Management Plan

Pets

1. Inspect pets as they enter. Use good lighting.
2. Do a daily “tick check” and removal. Pay particular attention to the head, neck, ears, between toes, under the tail, and back end of dog. Larger ticks can often be discovered by passing fingers through the dog’s coat. Combing a dog’s coat with a metal louse comb may aid in finding small ticks.
3. On-pet interventions.
 - a. Resistance to permethrin has been found in many tick populations, which means that products will no longer kill ticks effectively in resistant populations.
 - b. Owners should consult with veterinarians or University of Florida EDIS publications for alternative on-animal treatments.
 - c. The insect growth regulators such as methoprene will not kill ticks, nor does the insecticide imidacloprid.
 - d. Some pet breeds and animals with health problems are sensitive to certain pesticides, and your veterinarian should be consulted.
 - e. Owners wishing to bathe their pets should do so three to five days prior to an on-animal intervention and should bathe no more than once a month. More frequent bathing risks removal of some or all of the acaricide, which will allow for survival of ticks and contributes to the development of acaricide resistance (see below).
4. Evaluate the effectiveness of on-pet interventions. Are the ticks dead or are they completing their feeding cycle? Ticks often do not die quickly following acaricide exposure, but they should not complete blood-feeding if on-animal treatments are working correctly.

The home: Focus on pet resting areas and cleaning

1. Inspect pet resting areas using a strong flashlight.
2. Keep the relative humidity low when possible. Desiccation decreases tick survival.
3. Indoor tick management can be aided by steam cleaning upholstery, cracks and crevices where they may hide. Be careful about the surfaces that you chose to steam clean as the steam can damage.
4. Consider using a detergent to clean pet resting areas on surfaces that can be washed in this manner. (Note: If areas are to be treated with a pesticide later, all detergent must be removed with water rinses. Pesticide-treated areas should not be cleaned with detergents until shortly before the next pesticide application is to be made, as this will simply remove most of the pesticides and encourage resistance selection.)
5. Wash and thoroughly dry suspected bedding if possible.
6. Remove indoor harborage as feasible.
7. Evaluate the effectiveness of cleaning. Sanitation is IPM.

Remove potential harborage

1. Cut back shrubs as far back as possible.
2. Keep grass cut as low as possible. Cutting back shrubs and keeping grass low will help in creating desiccating conditions, making tick survival difficult. It will also help acaricide applications, when needed, penetrate into areas where ticks live.

Insecticidal treatments

1. Call a professional pest control operator.
2. Use products according to the label.
 - a. Understand that broadcast treatments will not last long in our sun and summer rains.
 - b. Please do not ask pest management professionals to “spray everything.” They are limited to the lawful application of acaricides and insecticides.
3. Rotate classes of acaricide to delay the onset of acaricide resistance. Please check our website, <http://pmu.ifas.ufl.edu/ticks.shtml>, or contact your local county extension office for up-to-date recommendations.

What is insecticide resistance?

Insecticide Resistance Action Committee (IRAC) definition of insecticide resistance is “a heritable change in the sensitivity of a pest population that is reflected in the repeated failure of a product to achieve the expected level of control when used according to the label recommendation for that pest species.”

Do we have tick populations that are resistant to insecticides and acaricides?

Yes. In a laboratory testing of field-collected ticks, nine different tick colonies were evaluated for resistance to permethrin. Each of these populations demonstrated the capability of survival at chemical application rates exceeding what would be applied in homes at allowable pest management applications. Five colonies of ticks have tested for fipronil resistance. Out of those colonies, two out of five colonies demonstrated tick survival at a dose that indicated resistance, demonstrating the possibility of chemical control failure in pest management applications.

How do I know I am dealing with a resistant population of ticks?

If ticks have been treated with the same product over and over without a decrease in tick numbers, you may have a resistant tick population. If you find blood-fed ticks on your dog or in your home within a few weeks of treating the dog, resistance may be present.

How do I avoid acaricide resistance?

1. Use nonchemical interventions such as daily tick removal and vacuuming to remove ticks from the environment, paying particular attention to pet resting areas.
2. For both on-animal and in-home pesticide applications, follow the reapplication directions on the label, and rotate active ingredients.

For additional information please visit our website and contact your local county extension office, <http://solutionsforyourlife.ufl.edu/map>

