



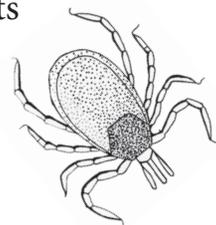
# Protect Yourself FROM TICKS

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**Ticks** are one of the most important groups of arthropods in Georgia due to their disease transmitting capabilities. In Georgia, ticks are known to transmit several diseases, with Rocky Mountain Spotted Fever and Lyme disease being the most common. Tularemia is a long-recognized disease also transmitted by ticks, as are the more recently recognized diseases Anaplasmosis, Human Ehrlichiosis (pronounced err-lick-e-o-sis) and Southern Tick-Associated Rash Illness (STARI). Ticks can also cause infections if their mouthparts break off when they are removed from the skin and can leave persistent welts resulting from reactions to their saliva. If tick populations are high in recreation and camping areas, participation may drop off, causing monetary loss to the leisure industry. Costs to control ticks in yards and homes and on pets and people can also be significant.



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## TICKS THAT BITE

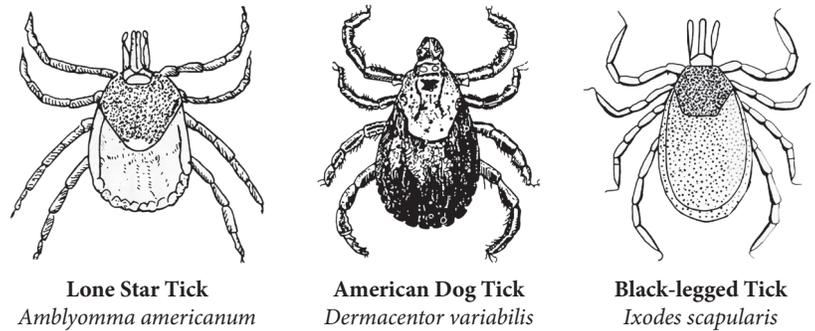
Three tick species are most commonly associated with humans in Georgia: the **Lone Star tick** (*Amblyomma americanum*), **American dog tick** (*Dermacentor variabilis*) and **black-legged tick** (*Ixodes scapularis*).

The Lone Star tick has unusually long mouthparts. The female has a single white spot in the middle of her back, while the white markings on the male are diffuse.

Common hosts include large animals such as livestock, dogs, deer and humans as well as smaller animals such as birds and rodents. Lone Star ticks are particularly common in brushy, bottomland areas where deer are prevalent.

The American dog tick has shorter mouthparts and both males and females have diffuse white markings on their backs. Dogs are the preferred host, but this tick will feed on a variety of large animals, including humans.

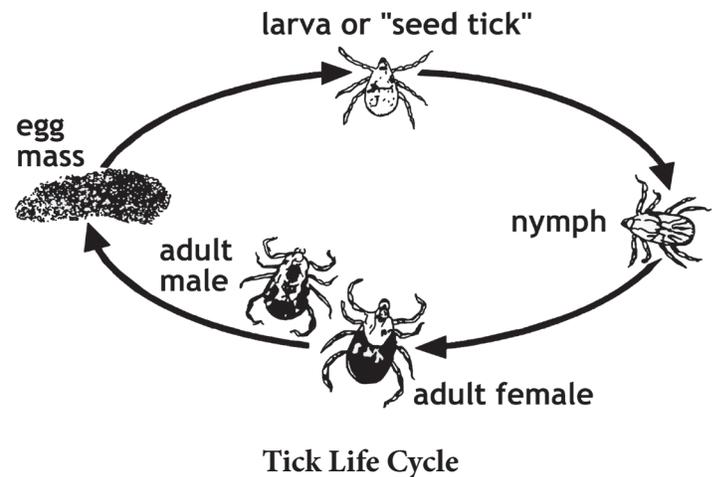
The black-legged tick is smaller than the other two ticks and has no white markings on its back. This tick is common on white-tailed deer, dogs, birds, humans and other large mammals as well as a variety of small rodents.



## LIFE CYCLE

All three tick species develop through a similar life cycle. Each stage must have a blood meal for the tick to mature into an adult and lay eggs for the next generation. The adult female is fertilized by the male while she is engorging with blood on her host. She will then drop off the host and, in about three to 10 days, begin laying approximately 6,000 eggs in a mass.

Within two weeks to several months, depending on the environment, the eggs hatch into six-legged larvae called “seed ticks.” Seed ticks will usually be concentrated in the area where the eggs were laid; consequently, unsuspecting hosts can become infested by significant numbers of larvae.



The “seed” or larval ticks will typically climb up a blade of grass and wait for a host – usually a small rodent. After engorging with blood, the larval tick will drop off the host, shed its skin (molt) and change into an eight-legged nymph. The nymph will seek another host, engorge with blood, drop off, molt and develop into the adult stage. Adult ticks usually prefer to feed on large animals such as deer, horses, dogs or humans. Ticks are very adept at locating a host by detecting exhaled carbon dioxide and body warmth. Feeding is usually painless to the host and may take several days for completion. Larval, nymph and adult ticks can each survive up to a year waiting for a host.

Ticks survive best in high grass or brushy areas that are also attractive to their hosts. Game trails and large deer populations are often associated with large tick populations. Ticks also need a high level of moisture for survival. Bottomlands where high humidity, thick vegetation and high deer populations often occur are typically preferred tick habitats. Conversely, dehydration from hot, dry weather combined with short grass that has little or no mulch can be fatal to ticks.

All three stages of the Lone Star and black-legged ticks will feed on humans and other large animals. The American dog tick feeds on humans only in the adult stage.

## DISEASES

*Rocky Mountain Spotted Fever:* The most important tick-borne disease in the southeastern U.S. continues to be Rocky Mountain Spotted Fever, which is caused by *Rickettsia rickettsii*, a rickettsial or bacteria-like organism. Rocky Mountain Spotted Fever has a fatality rate of three to five percent, with two-thirds of the cases occurring in children under the age of 15. This disease is characterized by a sudden onset of chills, fever, headache and bloodshot eyes. The name “spotted fever” refers to the rash that appears two to four days after the onset of fever. The rash characteristically starts on the hands and feet as small, flat, pink spots that do not itch and gradually spreads to most of the body. Rocky Mountain Spotted Fever can be easily misdiagnosed as measles. Diagnosis is aided by a history of a recent tick bite and confirmed by a blood test. Antibiotics provide effective treatment. The American dog tick is the primary vector.

*Lyme Disease:* Lyme disease was first recognized in Georgia in 1987. While cases occur all over the state, the largest numbers occur in the northern half of the state. The black-legged tick is the primary vector, especially in the nymphal stage. Its small size (1/16 inch) probably contributes to the failure to detect the nymph while feeding.



Actual black-legged tick size

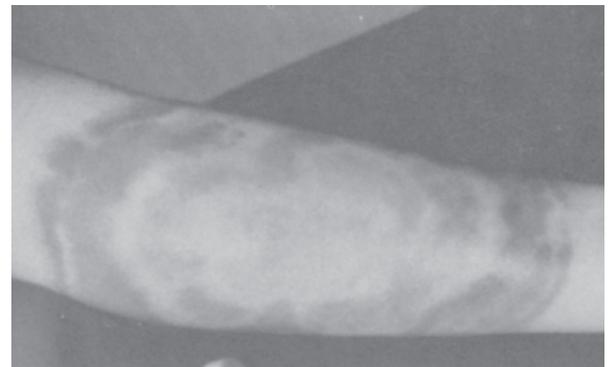
The cause of Lyme disease is the bacteria *Borrellia burgdorferi*. The initial sign of Lyme disease infection is a ring-like swollen rash, known as “erythema migrans,” that appears at the site of the tick bite within three to 22 days. The rash usually has a bright red outer ring with a lighter center ring. The rash is frequently accompanied by joint pain and flu-like symptoms (fever, headache, stiff neck, muscle pain and sometimes nausea). While the rash is very helpful for diagnosis, it does not develop in all cases. If you develop flu-like symptoms, joint pain or a rash a few days to a month after a tick bite, consult your physician for a diagnosis. A blood test taken three to six weeks after symptoms develop can help confirm the disease. If a blood test is taken too soon for antibodies to develop, the test may show a false negative test result. While it is desirable to begin antibiotic treatment soon after symptoms develop, this manner of treatment can also produce a false negative evaluation. Lyme disease is easily treated in the early stages with antibiotics; if delayed, treatment can be more difficult.

The later stages of Lyme disease can begin weeks or even years after being bitten by an infected tick and can be very serious. This stage of the disease can be easily misdiagnosed because it mimics a variety of cardiovascular, arthritic and neurological diseases. Joint pain can be severe, with permanent destruction of bone and cartilage of the joints if left untreated. No deaths have been reported due to initial infection, but complications may affect the life span of some individuals. Personal protection, early diagnosis and quick treatment are your best defense against Lyme disease.

*Other Diseases Transmitted by Ticks:* Tularemia is a relatively rare but potentially serious tick-transmitted disease that has been recognized in the southeastern U.S. for many years. Anaplasmosis, Human Ehrlichiosis and Southern Tick-Associated Rash Illness are all relatively rare, but still potentially serious diseases.

All four of these diseases are believed to be of bacterial origin, commonly produce an influenza-like illness and can be readily treated with antibiotics.

A newly reported phenomena associated with tick bites is “Tick Induced Mammalian Meat Allergy”. In rare cases individuals have developed allergic reactions to red meat after being bitten by the Lone Star tick. People react to a carbohydrate in the meat that is very similar to those found in saliva from a previous tick bite. Symptoms include hives, rash, stuffy/runny nose and nausea. These symptoms are difficult to associate with the red meat ingestion due to it taking several hours for the response to occur. These reactions may be recede over time as long as the individual is not bitten by another tick. This is just another good reason to avoid tick bites!



Typical Lyme disease rash

## PERSONAL PROTECTION

The best way to avoid tick bites and tick-borne diseases is to stay in areas where the vegetation is open or maintained below ankle height. When on wooded trails, in high grass or in brushy areas, it is imperative to take personal precautions. Avoiding vegetation that brushes against the body, especially the legs, is essential to avoiding host-seeking ticks. Otherwise:

1. Wear long pants. Tuck the pant leg into your socks and tuck your shirt under your belt. The tick will move up toward the head where detecting it is easier. You don't want the tick to get under your clothing where detection is more difficult.
2. Use a repellent. Repellents containing "DEET" are available in many brands and formulations. Liquid formulations of DEET can be rubbed on the skin and will normally provide protection for several hours. DEET in aerosols can be sprayed on clothing as well as skin for added protection. Permanone<sup>®</sup>, a repellent containing the insecticide permethrin, comes only as an aerosol and is only approved to be sprayed on clothing. It is long-lasting and not only repels but also kills ticks. The best combination is to put DEET on skin (as directed on the label) and Permanone<sup>®</sup> on clothing.
3. Check yourself for ticks at least twice a day. There is evidence that the longer an infected tick feeds, the greater the chance it has of transmitting a disease to you. Early removal is good prevention.
4. Remove embedded ticks with forceps, cloth or paper wrapped around the tick as near to the point of attachment as possible. Use a firm, steady pull. Do not jerk or twist because you may break off the mouthparts and get the site infected. Do not use unprotected fingers. Apply a disinfectant to the site immediately after removing a tick and diligently wash your hands with hot, soapy water.

## AREA CONTROL

Around your house, you can treat your dog with an approved pesticide for ticks, keep the grass cut short, fence the yard to keep out other dogs that bring ticks in, and use a pesticide in the yard as needed to reduce tick populations. Refer to the current *Georgia Pest Management Handbook* for the most up-to-date and effective pesticide recommendations. A dog can serve as a reservoir for both Lyme disease and Rocky Mountain Spotted Fever. While dogs do not seem to be affected by Rocky Mountain Spotted Fever, they can suffer joint pain from Lyme disease.

Georgia has many beautiful outdoor recreation areas, and its citizens should continue to enjoy them. Taking a few precautions and being aware of the symptoms of tick-borne diseases such as Lyme disease, Rocky Mountain Spotted Fever and the other, less-common diseases should give you good protection against ticks and tick-borne diseases.

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