

cure. In recent years in Virginia an average of only 20 cases and one death per year have been reported.

Lyme Disease

Lyme disease is caused by the spirochete bacteria *Borrelia burgdorferi*. A tick must be attached for at least 24 hours in order to transmit the disease organism to the host. The disease initially develops as an oblong rash, usually 2 or more inches in



Figure 7. Lyme Disease rash.

size, with a clear center that develops at the site of the tick bite (Figure 7); however, only 70% of people develop this symptom. Within two days to a few weeks later people usually develop flu-like symptoms such as nausea, headache, fever, and general stiffness of the neck joints. Chronic symptoms of a small percentage of untreated people include arthritis and nervous system complications. In Virginia, about 125 cases per year are reported, mainly from the eastern and central parts of the state.

Prevention

- Always be alert for ticks during the spring and summer months (April through September) when they are most active.
- When possible, avoid tick habitats such as tall grass, leaf litter, bushes, and woods.
- Walk in the center of trails and avoid brushing against weeds and tall grasses.
- When working outdoors or in these areas, cover as much skin as possible. Wear long sleeve shirts tucked into pants, and long pants tucked into socks. Wear light-colored clothing with a tight weave to spot ticks more easily.
- When pruning bushes, weeding, or otherwise handling vegetation, wear light-colored gloves and check them often for ticks.
- Wear close-toed shoes or boots.
- Keep long hair pulled back.
- Avoid sitting directly on the ground or on open stone walls.
- Spray clothes with insect repellent containing DEET or Permethrin (only DEET can be used on bare skin, but not in high concentrations—follow manufacturer's directions).
- Spot check yourself and others frequently. Don't forget to

check pets! If one tick is found, check thoroughly—there may be others.

- After working outdoors, wash and dry clothing as soon as possible to eliminate unseen ticks. Shower and shampoo, and check skin thoroughly.
- Keep lawns mowed and underbrush cut and thinned.
- Clear brush and leaf litter around houses, stone walls, and at the edge of gardens.
- Stack woodpiles in an open, dry location preferably off the ground.

Tick Removal

If you do find a tick on your body, remove it as soon as possible. The best way to remove a tick is with a pair of fine-point tweezers. Grasp the tick by the head or mouthparts exactly where they enter the skin. Without jerking or twisting, pull firmly and steadily directly outward. Tick removal will take time, so be patient. Avoid touching the tick with bare fingers – use a tissue or glove to prevent disease transfer.

Do not squeeze the tick's body or use vaseline, a hot match, alcohol, or any other irritant in an attempt to kill or remove the tick. These methods will actually cause the tick to regurgitate, increasing the risk of infection from the bacteria located in the midgut.

Once the tick has been removed, place it in a vial or jar of alcohol to kill it. Label the jar with the date, body location where the tick was attached, and location where it may have been picked up. This information may be helpful to a doctor if signs of disease occur. Clean the bite wound with an antiseptic such as witch hazel, rubbing alcohol, or iodine.

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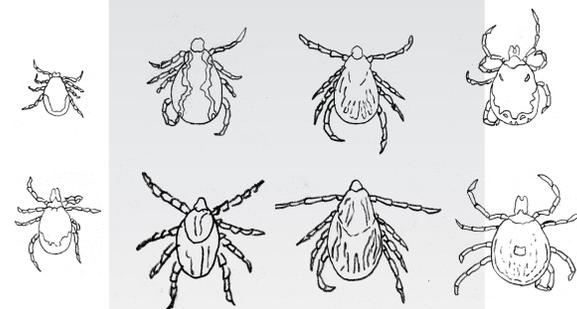
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Gardening and Your Health:



Ticks

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During early spring and summer, as the weather warms up and the garden springs back to life from its winter dormancy, many gardeners— and ticks— eagerly return to their outdoor activities. Gardeners should be aware of the risks and know how to protect themselves from becoming hosts to disease-carrying ticks.

Distribution and Hosts

The four most common ticks in Virginia that are encountered by humans are the lone star tick, the American dog tick, the brown dog tick, and the deer tick. The lone star tick is found predominately east of the Blue Ridge mountains. The American dog tick is found predominately west of the Blue Ridge mountains. The brown dog tick can be found throughout Virginia but tends to be uncommon. The deer tick is uncommon also and is found primarily in the northern and eastern sections of Virginia.

Identification

All ticks have eight legs in the adult stage, but have six legs as newly hatched larvae.

The American dog tick (Figure 1), *Dermacentor variabilis*, is about 5 mm long with short stout mouthparts. It is dark brown with light wavy lines or reticulations on its back.

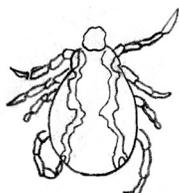


Fig 1. Mature American dog tick.

The lone star tick (Figure 2), *Amblyomma americanum*, is about 5 mm in length or less with long mouthparts. It is light reddish-brown with a central white spot on the back of most adults.

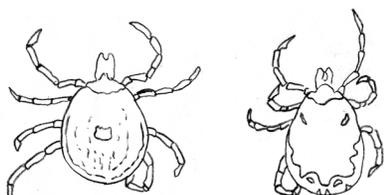


Fig 2. Mature Lone star tick (left – female; right – male).

The brown dog tick (Figure 3), *Rhipicephalus sanguineus*, is about 5 mm long with short, stout mouthparts. It is distinguished from the American dog tick by its dark reddish-brown color and lack of any white markings.



Fig 3. Mature Brown dog tick (left – female; right – male).

The deer tick (Figure 4), *Ixodes scapularis* (formerly *Ixodes dammini*), is a small tick about 2-3 mm in length with long mouthparts. It is off-white or reddish when fed and has black legs.



Fig 4. Mature Deer tick. (left – female; right – male).

The size of a tick varies with sex and lifestage (Figure 5).

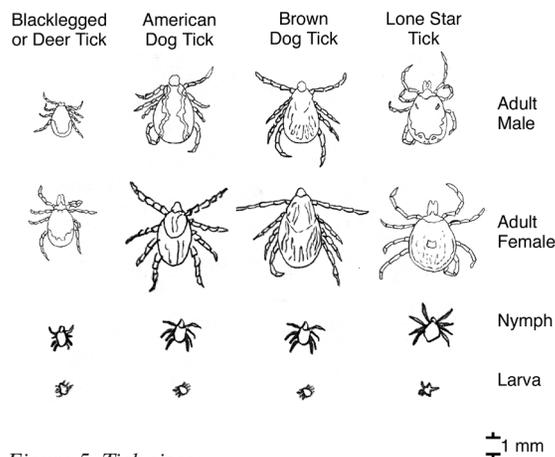


Figure 5. Tick sizes.

Life History

Ticks pass through three feeding stages: the larva, nymph, and adult. Typically, each stage feeds on a different host. Hosts include a variety of animals (e.g., mice, rabbits, deer), depending on the life stage. Humans are accidental hosts that are not part of the tick's natural life cycle. While feeding on a host, a tick becomes engorged with blood, then

drops off when finished. Once in a protected place, immature ticks molt to the next stage. Adult females produce eggs after their final blood meal.

Ticks generally live in shady, moist ground litter, but will climb to areas with tall grasses, bushes, brush, and woods in order to find host animals. They can also be found in lawns and gardens, on the edges of woodlands, and around stone walls where small rodents thrive. Ticks cannot jump or fly and generally do not drop from trees onto hosts; they are acquired through direct contact. When a tick finds a host, it will crawl to a protected area— often the groin, armpit, scalp, ears, back of knees, navel, or neck. Ticks generally wander for several hours before beginning to feed by inserting their mouthparts into the host's skin. If a tick is not detected, it will feed for several days before dropping off the host.

Description of Diseases

The brown dog tick is not known to carry any disease in Virginia. Both the lone star tick and the American dog tick are potential carriers of Rocky Mountain Spotted Fever (RMSF). The deer tick is a potential vector of Lyme disease. Only a relatively small percentage (4 to 10%) of any given tick population are actual carriers of a disease organism. In any case of suspected tick transmitted disease, consult with a physician.

Rocky Mountain Spotted Fever

RMSF is a disease caused by rickettsia bacteria. A tick needs to be attached for four to six hours in order to transmit RMSF to its human host. The first symptoms noticed are usually severe headache, chills, fever, muscle aches, nausea, vomiting, and other flu-like symptoms. These first symptoms usually start 2 to 12 days after the tick bite. By the third day after the bite, a red rash develops on the wrists and ankles, in most cases, and often spreads to the entire hand or foot (Figure 6). A blood test is needed to confirm the disease, and early use of antibiotics has a very high rate of



Figure 6. Rocky Mountain Spotted Fever rash on arm.