



Fact sheet

Prevent Tick Bites: Prevent Lyme Disease

Deborah Smith-Fiola, Former Ocean County Agricultural Agent & George C. Hamilton, Ph.D., Extension Specialist in Pest Management

Lyme disease is spread by the deer tick (now called the **black legged tick**). Ticks feed on the blood of animals, and *infected* ticks transmit the disease as they feed. Although the black legged tick prefers to feed on wild animals, especially mice and deer, they will also feed on dogs, cats, livestock, and humans.

The black legged tick is found in the shrubby understory of the forest, in high grassy areas, and in open fields. Ticks do not jump or fly—they crawl up vegetation and wait for an animal to brush against them. They then climb upon the animal and insert their mouth parts. They will feed on blood for 3 to 5 days. Following a blood meal, the tick swells to more than four times its normal size and then drops to the ground.

When people visit or live near the woods and other black legged tick habitats, they run a high risk of contracting Lyme disease. Ehrlichiosis and Babesiosis are other diseases vectored by ticks. For your own safety, become familiar with tick habits and habitats, and learn how to prevent tick bites.

Life Cycle

After hatching from an egg in late spring, the black legged tick goes through three life stages: larva, nymph, and adult. Each stage feeds only once and requires a different animal host. Black legged ticks take 2 years to complete their life cycle.

Larvae - are very small (about the size of a pin head). They feed in late summer on mice, shrews, chipmunks, voles, and other small animals. People rarely come in contact with larvae, as they live near ground level. Larvae pick up the disease from an infected animal.
Peak activity: August.



Actual Size

Nymphs-



Actual Size

are the size of a poppy seed. They sometimes appear translucent, with a dark head. Nymphs feed from mid-May through August on larger animals including birds, racoons, opossum, squirrels, cats, dogs, and humans.
Peak activity: late May to June.

Adults-

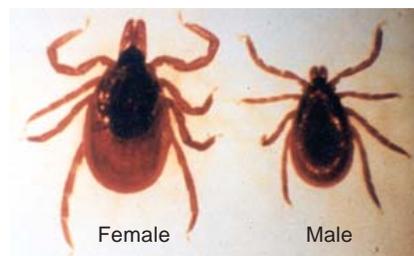


Actual Size

are the size of a sesame seed. Males are black; females have a brick-red abdomen. Females swell to 1/4 inch when fully engorged after feeding. Adults are active all winter, as long as temperatures are above freezing. They feed primarily on deer, but will also attack cattle, horses, dogs, and large animals. Humans are accidental hosts.
Peak activity: October\November and again in April.

As long as temperatures are above freezing, black legged ticks are active the entire year. **Peak activity months are May to June (nymphs), and October\November and again in April (adults).**

Note: Seventy percent or more of all Lyme disease cases occur from the bite of ticks in the nymph stage.



Black legged Tick (enlarged to show detail)



Tick Identification

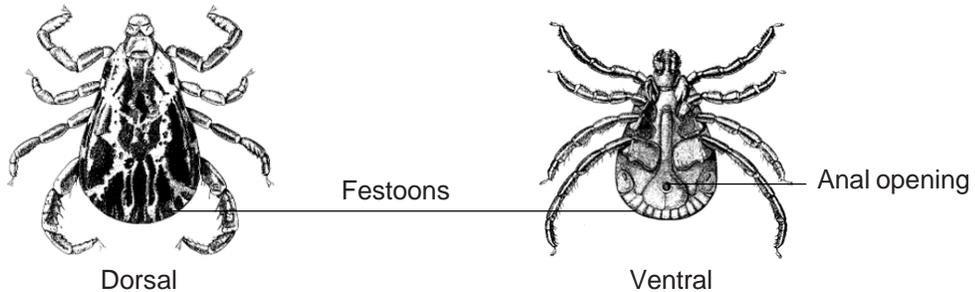
All ticks go through three growth stages (larva, nymph, adult) which differ in size. The easiest way to distinguish the black legged tick from other ticks is by size, shape, and coloration. All stages of the black legged tick have a black head and a black dorsal shield behind the head. The previous page has descriptions of each black legged tick lifestage.

All ticks have distinctive features that separate the tick species. The following drawings are greatly enlarged to show characteristics used for identification of hard ticks. Observing these features requires magnification.

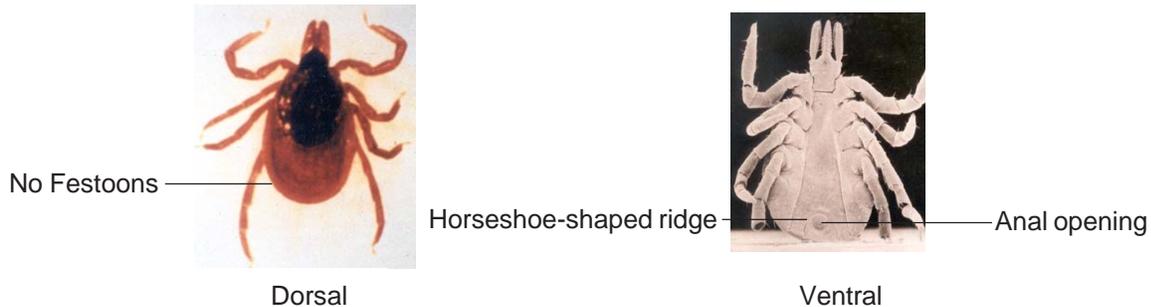
Festoons—ridges on the edge of the lower abdomen. Black legged ticks **do not** have festoons. Other common ticks **do** have festoons.

Anal Opening—looks like a “belly button” on the under side of a tick. It tends to be in the center of the body of most ticks. On the black legged tick, the anal opening is near the lower edge of the abdomen AND lies within a horseshoe-shaped ridge (see illustration).

A. Ticks that are *not* primary vectors of Lyme disease (American Dog Tick and Lone Star Tick)



B. Black legged tick (*Ixodes*; primary vector of Lyme disease; also vectors H. G. Ehrlichiosis)



(greatly enlarged drawings of adult females)



Lone Star Tick
Amblyomma americanum
(Vector of "Lyme-like" disease; H.M. Ehrlichiosis) Common south of Freehold, New Jersey. Very fast and aggressive. Red brown in color, tear drop shaped.



American Dog Tick
Dermacentor variabilis
(Vector of Rocky Mountain Spotted Fever) The largest tick found in New Jersey. Solid brown with mottled white dorsal shield. Oblong in shape.



Brown Dog Tick
Rhipicephalus sanguineus
An indoor species. It can survive outdoors during the summer.

Favorite Tick Habitats

Black legged ticks prefer to live in the woods. Dense, mature woods with a thick under growth of shrubs and small trees are their favorite habitat (85%). They are also found, to a lesser degree, along the edge of woods, where woods meet lawns, fields or landscaped beds. Very few (4 to 8%) are found in lawns, because properly mowed lawns are too hot and dry to sustain the tiny black legged tick. Ticks prefer the cool, moist woodlands where they have a better chance of finding an animal host.

Where you live, your hobbies, and your habits may influence your risk of a tick bite. Notice in particular these **high risk factors**:

- yard surrounded by dense woods
- bird baths, bird feeders
- outdoor pets that come indoors
- woodpiles, brush piles, rock walls
- swingsets; treehouses in the woods
- outdoor occupations: landscapers, utility line workers, farmers, etc.
- outdoor recreation: freshwater fishing, camping, hiking, hunting, etc.
- viewing deer in the yard

Many of these factors encourage wildlife near the home, and these animals may carry ticks. Mice, in particular, are known hosts of immature black legged ticks and carriers of Lyme disease. Reduce, remove, or avoid these risk factors as much as possible.

Ticks: Disease Cycle

The risk of being bitten by an infected black legged tick is greatest in the summer months, especially in late May and June, when the nymph stage is active. This is the time of year when people, notably children, are most active outdoors. Make a habit of thoroughly checking yourself and others daily for the tiny nymph after outdoor activities and vacations.

About 20 to 45% of the black legged ticks in New Jersey (depending on the lifestage and where they are found) are infected with and able to transmit Lyme disease. Newly hatched black legged ticks do not initially carry this disease; they pick it up from an infected animal. A preferred animal host is the white-footed mouse, the

primary reservoir host of the Lyme disease bacterium. Once a tick picks up the bacterium, it will retain it to its next stage, and be able to infect future host animals. Each lifestage of the black legged tick feeds on only one animal host.

Know the Early Signs of Lyme Disease

- headache
- flulike symptoms
- “bull’s-eye” rash (>2" in diameter)
- swelling and pain in the joints
- fatigue

Lyme disease symptoms mimic many other diseases. About 70% of Lyme disease victims will develop a rash within 2 days to 4 weeks. If untreated, more severe symptoms may develop—sometimes months to years later.

If you suspect Lyme disease, consult a physician **immediately**. Symptoms that progress very quickly could be the result of Ehrlichiosis (H.G.E.), another tick-borne disease.

Finding and Removing Ticks

Infected black legged ticks must feed for at least 24 hours before they can begin to transmit the Lyme disease bacterium. Therefore, you should **remove ticks as soon as possible**. Take a shower after outdoor activity and put clothes in the dryer (dry heat will kill ticks). Check your body thoroughly, paying close attention to the armpits, the groin, and neck. Use the buddy system! Look for ticks nightly, especially if you have young children.

Remove ticks with tweezers only (bent, “needle-nose” tweezers are best). Apply steady backward force until the tick is dislodged. Do **not** use alcohol, nail polish, hot matches, petroleum jelly, or other methods to remove ticks. These methods may actually traumatize ticks, causing them to regurgitate their gut contents, which may include the Lyme disease bacterium.

Save the live tick for identification by the Rutgers Cooperative Research & Extension office in your county.

Personal Protection

Outdoor pursuits need not be discontinued as long as precautions are taken to prevent a tick bite:

- avoid tall grass and shrubby areas
- wear light-colored clothing (ticks are easier to see)
- wear long pants *tucked into socks*
- widen trails through woods (to 6 feet)
- remove brushpiles
- keep turfgrass mowed
- thin out low shrub vegetation in woods
- wear a tick repellent

Repellents

Repellents are applied to clothing and/or skin and repel 82 to 100% of ticks. **Repellents** contain either the active ingredient **permethrin** (Duranon, Permethrin Tick Repellent, Permanone) labeled for clothing, **or** N,N-diethylmeta-tolumide, commonly called **DEET** (Off, Cutters, Muskol, etc) labeled for skin or clothing. *Follow label directions:* Apply to clothing until damp and allow to dry. Some slow release repellents are also available (Skeedattle) as well as botanical extracts (citronella, oil of peppermint).

Pesticides

If avoiding tick-infested areas is not possible, pesticide use may be justified. Reducing high risk factors should be the first alternative, including the use of deer repellents, deer resistant plants, and deer fencing.

If ticks are present, treat edge areas of the property (where turfgrass and woods meet) plus 12 feet into the woods to create a protective barrier. Shady areas of the lawn adjacent to the woods may also be treated.

READ AND FOLLOW ALL DIRECTIONS ON THE LABEL. Some insecticides authorized for tick control include:

- SEVIN (carbaryl)
- PERMETHRIN (a pyrethroid)
- TEMPO II (a pyrethroid)*

Granular insecticides provide good control of nymphs, since it penetrates foliage (liquids, if used, must be applied with enough pressure to disturb the leaf litter) Apply once a year (late May). Research shows >90% control of nymphs targeted in this lifestage with one properly timed granular treatment.

Liquid insecticides provide good control of **adult** ticks. Thoroughly spray on vegetation until run off. Apply after leaves have dropped from the trees in November, and/or in April before leaves appear. Control levels have reached 95% during these times.

DAMMINIX is a product that provides insecticide-laced nesting material to mice. It kills immature ticks feeding on mice in their burrows. Place it only in areas where mice frequent. Damminix may also be used in combination with the above insecticides and habitat modification.

For more information on Lyme disease, see your health care provider or call the N.J. Dept. of Health Lyme Disease Hotline: (800) 792-8831; the Lyme Disease Foundation (800) 886-LYME (www.lyme.org); or the American Lyme Foundation (914) 277-6970 (www.aldf.com); and information is also available on the Lyme Disease Network Website (www.lymenet.org).

This insecticide is for use **only by professional applicators.*

Mention or display of a trademark, proprietary product, or firm in text or figures does not constitute an endorsement by Rutgers Cooperative Research & Extension and does not imply approval to the exclusion of other suitable products or firms.

© 2005 by Rutgers Cooperative Research & Extension, (NJAES,) Rutgers, The State University of New Jersey.

Desktop publishing by Rutgers' Cook College Resource Center

Revised: March 2005

**RUTGERS COOPERATIVE RESEARCH & EXTENSION
N.J. AGRICULTURAL EXPERIMENT STATION
RUTGERS, THE STATE UNIVERSITY OF NEW JERSEY
NEW BRUNSWICK**

Distributed in cooperation with U.S. Department of Agriculture in furtherance of the Acts of Congress on May 8 and June 30, 1914. Rutgers Cooperative Research & Extension works in agriculture, family and community health sciences, and 4-H youth development. Dr. Karyn Malinowski, Director of Extension. Rutgers Cooperative Research & Extension provides information and educational services to all people without regard to race, color, national origin, gender, religion, age, disability, political beliefs, sexual orientation, or marital or family status. (Not all prohibited bases apply to all programs.) Rutgers Cooperative Research & Extension is an Equal Opportunity Program Provider and Employer.