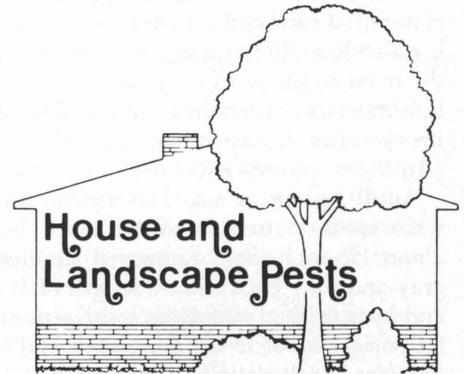


# Texas Agricultural Extension Service

*People Helping People*

## TICKS ATTACKING HUMANS

Philip J. Hamman\*



Residents of Texas, at one time or another, will experience the aggravation of tick bites. Knowledge of tick biology and habitats, as well as methods of tick control, can help you avoid this problem.

Most ticks are parasites of warm-blooded animals. Their bites are not only annoying and painful but may result in localized skin inflammation, secondary infection and possible introduction of disease-causing microorganisms.

Ticks are not insects but are closely related to mites, spiders and scorpions. Adult ticks have eight legs, while adult insects have only six. Also, the tick's body is fused into a single region instead of having the head, thoracic and abdominal regions typical of insects.

Ticks are grouped into two families: 1) the "hard ticks" (Ixodidae), which have a hard, smooth skin and an apparent head; and 2) the "soft ticks" (Argasidae), which have a tough, leathery, pitted skin and no distinguishable head. Although both groups contain species that attack humans and animals, some hard ticks are more of a problem in Texas and will be discussed in greater detail.

### Life Cycle

Ticks have four developmental stages: egg, six-legged larva, one or more eight-legged nymphs and adult. Hard ticks usually mate on the host animal. The female then drops to the ground and deposits from 3,000 to 6,000 eggs, which hatch into larvae or "seed ticks." Larvae climb nearby vegetation where they collect in large numbers while waiting for small rodents or other vertebrates to pass within reach. After a

blood meal on the host, the engorged larvae drop to the ground, shed their skins (molt) and emerge as nymphs. Like larvae, the nymphs await the passage of a host, engorge themselves with blood, drop to the ground, molt and become adults. Adult ticks seek host animals and, after engorgement, mate.

Male hard ticks usually mate with one or more females and then die, although some may live for several months. Females die soon after depositing their eggs in protected habitats on the ground. The life cycle requires from as little as 2 months to more than 2 years, depending on the species.

This life cycle is characteristic of tick species which commonly infest humans and their pets in Texas.

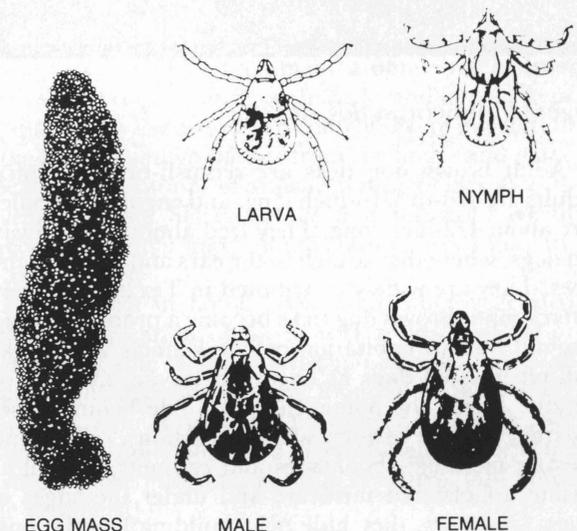


Figure 1. Typical developmental stages for ticks.

\*Extension urban entomologist, The Texas A&M University System.

However, some species feed as larvae, nymphs and adults on only one host during the life cycle.

## Common Species in Texas

The term "wood ticks" is applied to several species of hard ticks so similar in appearance and habits that it is difficult to distinguish one from another. In Texas, the most common of these are the American dog tick (*Dermacentor variabilis*), the brown dog tick (*Rhipicephalus sanguineus*) and the lone star tick (*Amblyomma americanum*).

Adult American dog ticks are chestnut brown with white spots or streaks on their backs. Unfed adults are about 1/8-inch long. Engorged females become slate gray and may expand to a length of 1/2-inch. Larvae and nymphs feed mostly on small rodents, while adults feed on dogs, cattle, other animals and humans. These ticks are widely distributed over the eastern two-thirds of Texas but are most abundant in coastal and other humid areas. They are attracted by the scent of animals, and humans most often encounter them near roads, paths, trails and recreational areas. Although present the year round, American dog ticks are usually most numerous in the spring.



Figure 2. American dog tick.

Adult brown dog ticks are reddish-brown. Unfed adults are 1/8-to 3/16-inch long, and engorged females are about 1/2-inch long. They feed almost exclusively on dogs, where they attach to the ears and between the toes. They are widely distributed in Texas and rarely attack man. Brown dog ticks become a problem in and around human habitation or dog kennels when ticks fall off infested dogs as engorged larvae, nymphs or adults. Inside the home, the ticks hide behind baseboards, window casings, window curtains, ceiling and picture moldings, bookcases and cabinets, as well as inside upholstered furniture and under the edges of rugs. Outdoors, they hide near building foundations, in crevices between porch floorings and sidings and beneath porches.

Adult lone star ticks are various shades of brown or tan. Females have single silvery-white spots on their backs and males have scattered white spots. Unfed adults are about 1/3-inch long, but after feeding females may be 1/2-inch long. Larvae and nymphs parasitize small wild animals, birds and rodents, while adults feed on larger animals. All three stages will bite humans. These ticks live in wooded and brushy areas of Texas and are most numerous in underbrush along creeks and river bottoms and near animal resting places. Lone star ticks are present throughout the year, but peak adult and nymphal populations may occur from March to May. A second nymphal peak may occur again in July or August, while peak larval activity is reached in mid-June or July.



Figure 3. Brown dog tick.



Figure 4. Lone star ticks.

## Disease Transmission

When feeding, the tick makes a small incision in the skin of the host and inserts barbed piercing mouthparts to remove the blood. Most species cause little or no pain to their hosts at the time of feeding, but some, such as the lone star tick, cause a painful wound.

Many disorders and diseases can be traced to tick bites, including 1) *dermatosis*, or inflammation,

itching and swelling at the site of the bite; 2) *envenomization*, or inoculation of toxic fluids; and 3) *exsanguination*, or anemia resulting from the loss of large amounts of blood because of a severe tick infestation.

Ticks can transmit diseases by infecting hosts with microorganisms carried on their mouthparts or in salivary fluids. Lone star and American dog ticks are carriers of Rocky Mountain spotted fever and tularemia. These diseases may be cured if promptly diagnosed. Humans, particularly those who work or vacation in heavily tick infested areas, who experience the onset of symptoms resembling a febrile (fever-like) disease and recall being bitten by a tick 10 to 14 days earlier should mention this association to their physician. Brown dog ticks carry diseases to humans and animals in Africa and the Mediterranean region but are not known to transmit human disease in the U.S.

### Tick Removal

Because tick movements and bites are seldom felt, careful and frequent examination for ticks on the body and clothing is imperative. Early removal is important since many disease organisms are not transferred until the tick has fed 2 to 8 hours. Always remove the tick with its mouthparts intact. Hasty removal of an attached tick can break off the mouthparts. Mouthparts left in the skin may cause secondary infection. To relax tick mouthparts for easy removal, touch the tick with a hot needle or a few drops of camphor, alcohol, turpentine, kerosene or chloroform. The best method is to grasp the tick firmly with tweezers and remove it with a slow, steady pull. Avoid touching the tick with your bare hands. If an infected tick is crushed between the fingernails the organism responsible for Rocky Mountain spotted fever may enter through a cut or abrasion.

### Tick Surveys

Sometimes information is needed about tick infestation in a given area — the presence or absence of ticks, tick density or tick species. To obtain this information, ticks can be removed from host animals in the area. Clues often can be obtained by studying past and current land uses. For example, if the land was once in agricultural production but has since been abandoned it probably supports a heavy population of field mice and, consequently, may be a tick-infested area. Immature ticks inhabit "mousy areas," while adults are abundant along trails traveled by humans and large animals. For a more complete survey, a small, square piece of white flannel cloth can be dragged slowly over low vegetation beside trails and roads. Waiting ticks will attach themselves to the cloth and can then be studied to determine the species and degree of infestation.

### Protection from Ticks

To obtain some degree of protection against ticks, keep clothing buttoned, shirt tails inside trousers and trouser legs inside tops of socks. A ring of masking tape with the sticky side out placed around the top of boots will trap ticks that are ascending to look for a site to attack. Do not sit on the ground or on logs in brushy areas.

Persons who must be in areas suspected of supporting infestations should examine their clothing, body and hair at least twice daily to remove ticks promptly.

Clear or burn brush along trails and cut weeds and grass in recreation areas. In residential areas, maintain closely cut and well-kept lawns to help control both ticks and their small rodent hosts.

Repellents containing diethyl-m-toluidide, dimethyl phthalate, dimethyl carbate or ethyl hexandiol will protect exposed skin but will not stop ticks from crawling under clothing to reach untreated portions of the body. Applying these materials to the entire body might prevent tick bites for a while, but such extensive treatments often are impractical and may be hazardous to health. Permanone®, a tick repellent containing a synthetic pyrethrin, may be applied to clothing (do not allow skin contact). Treatment with this product may provide protection for a day or longer.

### Tick Control

If a tick infestation occurs, treat the home, yard and pets at the same time. Examine dogs and cats frequently for ticks. See Extension publication L-1734 *External Parasite Control for Pets*. Continue treatments for as long as needed. Heavy infestations on pets should be handled by a veterinarian.

Light infestations in buildings usually can be controlled with a household residual spray (see Table 1). Apply the insecticides only as light, spot treatments to areas where ticks are found or suspected to be hiding. **DO NOT USE THESE CHEMICALS FOR TREATING PETS.** Treatment around baseboards, window and door casings, wallcracks and in pet sleeping quarters is necessary. To control severe infestation in the home, remove the pet from the house and make repeated applications of approved insecticides at 2- to 4-week intervals. Select a spray that does not have an objectionable odor and will not stain paints, wall paper, tile or rugs.

Tick control in home lawns and other vegetated areas usually can be obtained with residual sprays or dusts (See Table 1). Give particular attention to spray applications around building foundations and along roadsides, animal trails and paths used by people. See Extension publication B-1373 *House and Landscape Pests* for more information on pest control and pesticide products.

The status of insecticide label clearances is subject to change, and changes may have occurred since this

publication was printed. County Extension agents and Extension entomologists are notified as these changes occur.

The USER always is responsible for the effects of

pesticide residues on his own premises, as well as problems caused by drift from his property to that of others. *Always read and follow carefully all instructions on the product label.*

**Table 1. Suggested Pesticides for Tick Control**

<b>Chemical</b>	<b>Indoors</b>	<b>Outdoors</b>
chlorpyrifos (Dursban®) S,G	X	X
diazinon S, D, G	X	X
propoxur (Baygon®) S	X	X
carbaryl (Sevin®) S, D		X
pyrethrins S	X	
resmethrin S	X	
dichlorvos (Vapona®) S	X	

S = spray; D = dust; G = granule

The information given herein is for educational purposes only. Reference to commercial products or trade names is made with the understanding that no discrimination is intended and no endorsement by the Cooperative Extension Service is implied.

*Educational programs conducted by the Texas Agricultural Extension Service serve people of all ages regardless of socioeconomic level, race, color, sex, religion, handicap or national origin.*

Issued in furtherance of Cooperative Extension Work in Agriculture and Home Economics, Acts of Congress of May 8, 1914, as amended, and June 30, 1914, in cooperation with the United States Department of Agriculture. Zerle L. Carpenter, Director, Texas Agricultural Extension Service. the Texas A&M University System.