



Ticks on the Farm: Tips to Protect Yourself & Your Animals

Cheryl Frank Sullivan

Research Assistant Professor

University of Vermont

College of Agriculture & Life Sciences

Department of Agriculture, Landscape &
Environment

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University of Vermont
College of Agriculture and Life Sciences

Specialize in Integrated Pest Management (IPM)



Conservation biological control
(habitats to attract & sustain
beneficial insects in agroecosystems)



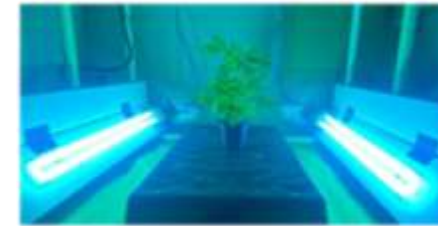
Hemlock woolly adelgid &
other invasive pests.



Ticks



Maple Production
Pests (pear thrips,
maple leaf cutter)



UV-C irradiation



Saffron



Photo by Michelle Brunell

Greenhouse ornamentals
& high tunnel vegetables

**Primary emphasis on biological control
(parasites, predators and pathogens)**

High Tunnel Habitat Plantings



[PROJECT LINK](#)



Tick on Farms Survey Says

48% identified a black legged tick correctly; 15% were unsure.

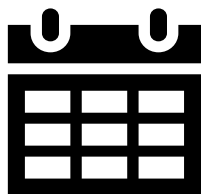
American dog tick



Bed bug

Blacklegged tick

When asked which seasons blacklegged ticks were the most active in the Northeast, although ticks can be active year-round with temps above freezing and no snow, peak activity is spring and fall and, only 25% selected that option.



28% answered correctly that both adult & nymph blacklegged ticks transmit Lyme disease; 19% were unsure.



70% strongly agree/somewhat agree that ticks and tick-borne diseases are increasing on their farm/property; 69% strongly agree/somewhat agree that ticks are an occupational hazard.

When asked about how ticks and tick-borne diseases (TBD) have impacted them or their agricultural operations, the top responses were:

- spent money on personal protection against ticks, treating animals for suspected TBD & on themselves and/or their family to treat for a TBD.
- avoid working on their farm in areas where they know ticks are most active.
- avoid recreating on their property in their spare time because of ticks.



Ticks are Parasitic Mites (Arachnids)

Hard Ticks: Have a hard shield/scutum



Soft Ticks: Are leathery, no shield/scutum



~. 900 species worldwide..



~ 90 species in the USA.



> 25 species in PA



15 species in VT

Ticks are responsible for transmitting almost 95% of vector-borne diseases in the US.

[Ntl. Park Service via picryl](#)



[Hilton Pond Center](#)



[Wikimedia Commons](#)



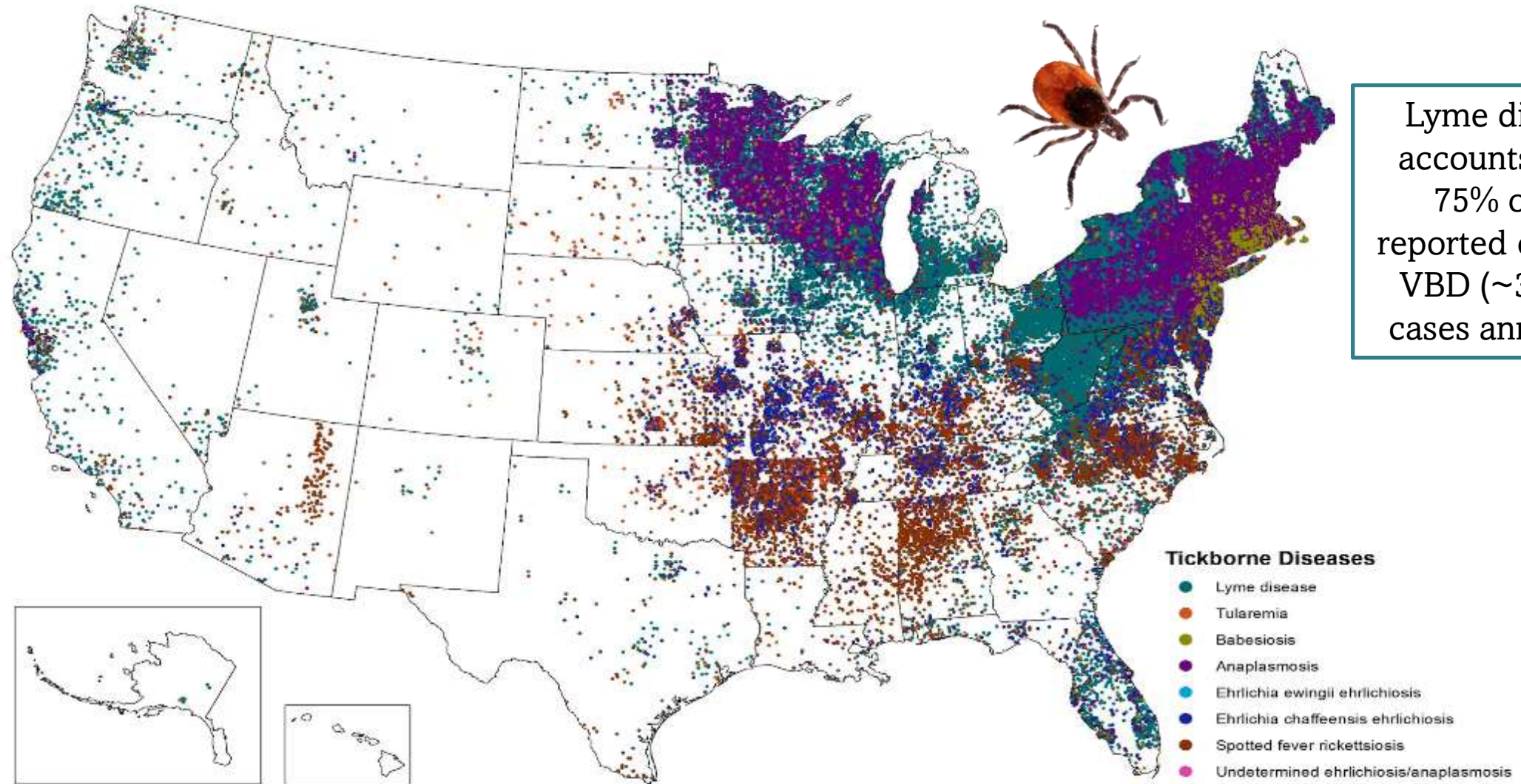
**~10% of ticks affect
the health of domestic
animals & humans,
most only associated
with wildlife.**

[Wikimedia Commons](#)



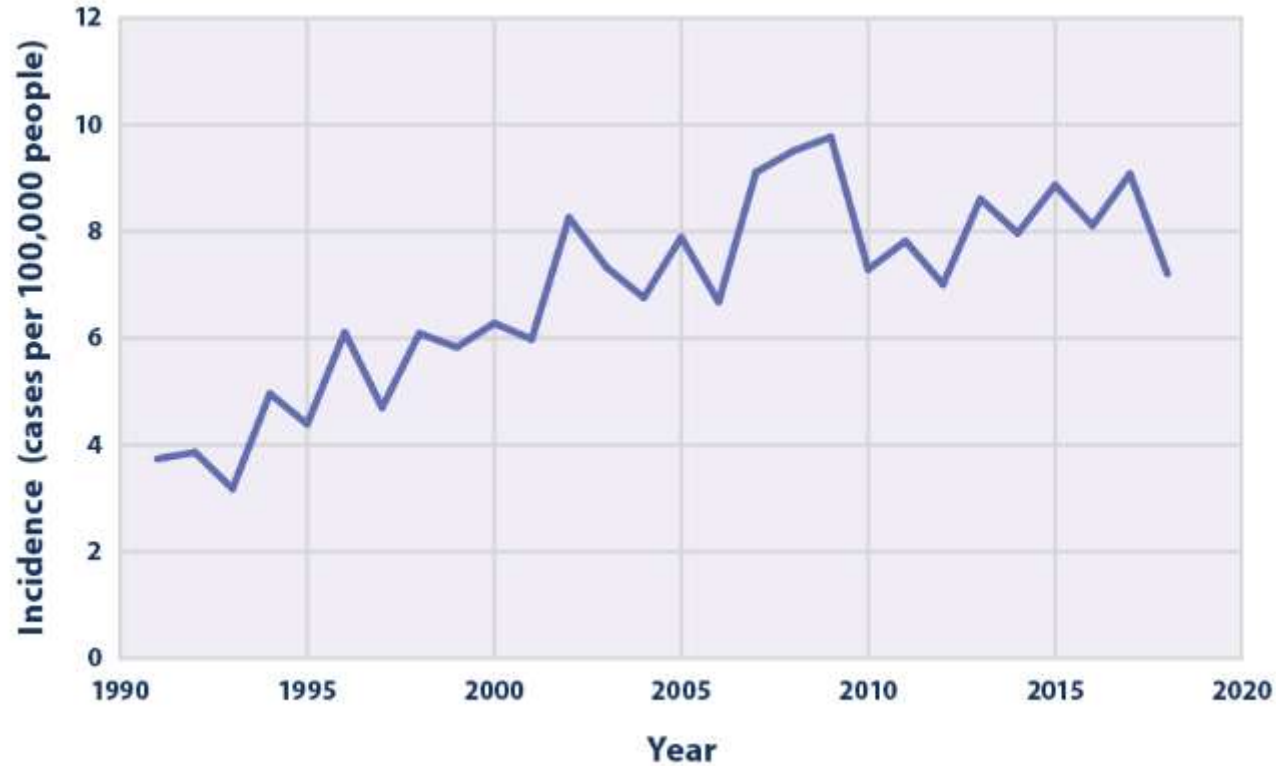
[Filipe Dantas-Torres](#)

Reported Cases of TBD (USA) 2019 - 2022



Note: Powassan data not represented on the map. Babesiosis data incomplete for years shown.

Lyme Disease on the Rise



Annual incidence of LD (the number of new cases per 100,000 people)

[Lyme Disease Surveillance and Data \(CDC\)](#)
[Climate Change Indicators: Lyme Disease \(EPA\)](#)

2001



2022



Common Tick-Borne Illnesses

Primary focus of surveillance efforts:

- Lyme disease (bacteria - *Borrelia burgdorferi* or *mayonii*) **#1**
- Anaplasmosis (bacteria - *Anaplasma phagocytophilum*) **#2**
- Babesiosis (protozoan parasite - *Babesia microti*) **#3**
- Hard Tick Relapsing Fever (bacteria - *Borrelia miyamotoi*)
- Powassan/Deer Tick Virus
- Tularemia (bacteria - *Francisella tularensis*)
- Ehrlichiosis (bacteria - *Ehrlichia chaffensis* / *E. ewingii*)
- Rocky Mountain Spotted Fever (bacteria - *Rickettsia rickettsii*)
- Southern Tick–Associated Rash Illness ‘STARI’ (unidentified agent) [southern states]
- Alpha-gal syndrome ‘red meat allergy’ (sugar molecule)

General symptoms:

- Flu-like - Fever, headache, joint pain & swelling, muscle aches, fatigue, loss of appetite.
- May take up to 30 days to appear (or not at all).
- Lyme disease ‘erythema migrans’/bulls-eye rash **(not always!)**

TBD are preventable and most are treatable if detected early.

**Majority from
blacklegged tick bites.**

**Not all ticks carry
disease-causing
pathogens**



Bullseye rash

**Only in ~
70% of cases**



Blacklegged (deer) tick

The Rising-Tide of Tick-Borne Diseases

- Climate change impacts on ticks, hosts & pathogens.
- Land use changes (reforestation, fragmentation, urbanization into forested areas)
- Thriving host (deer & rodent populations).
- Lack of research & control measures.
- Increased surveillance efforts led to discoveries of new TBD-causing pathogens & improved distribution maps.
- Greater public awareness of TBD leads to increased medical attention.



Climate Change Effects



Higher temperatures & increased precipitation provide suitable conditions that promote tick survival (ticks thrive in humid environments).



Allows for range expansion into new areas & higher elevations that were previously inhospitable.



Increases tick reproduction & accelerates life cycles.



Prolongs tick activity periods (i.e., snow free times of the year) which increases risk for bites, acquiring disease-causing pathogens & their transmission.



Ticks active year-round if temperatures are above freezing & snow is sparse.



**Just because its winter it
doesn't mean you aren't
at risk for tick bites.**

Get To Know Your Ticks

Blacklegged

(*Ixodes scapularis*: Eastern
Ixodes pacificus: Western)



Asian Longhorned

(*Haemaphysalis longicornis*)



American Dog/Wood

(*Dermacentor variabilis*)



Lone Star

(*Amblyomma americanum*)



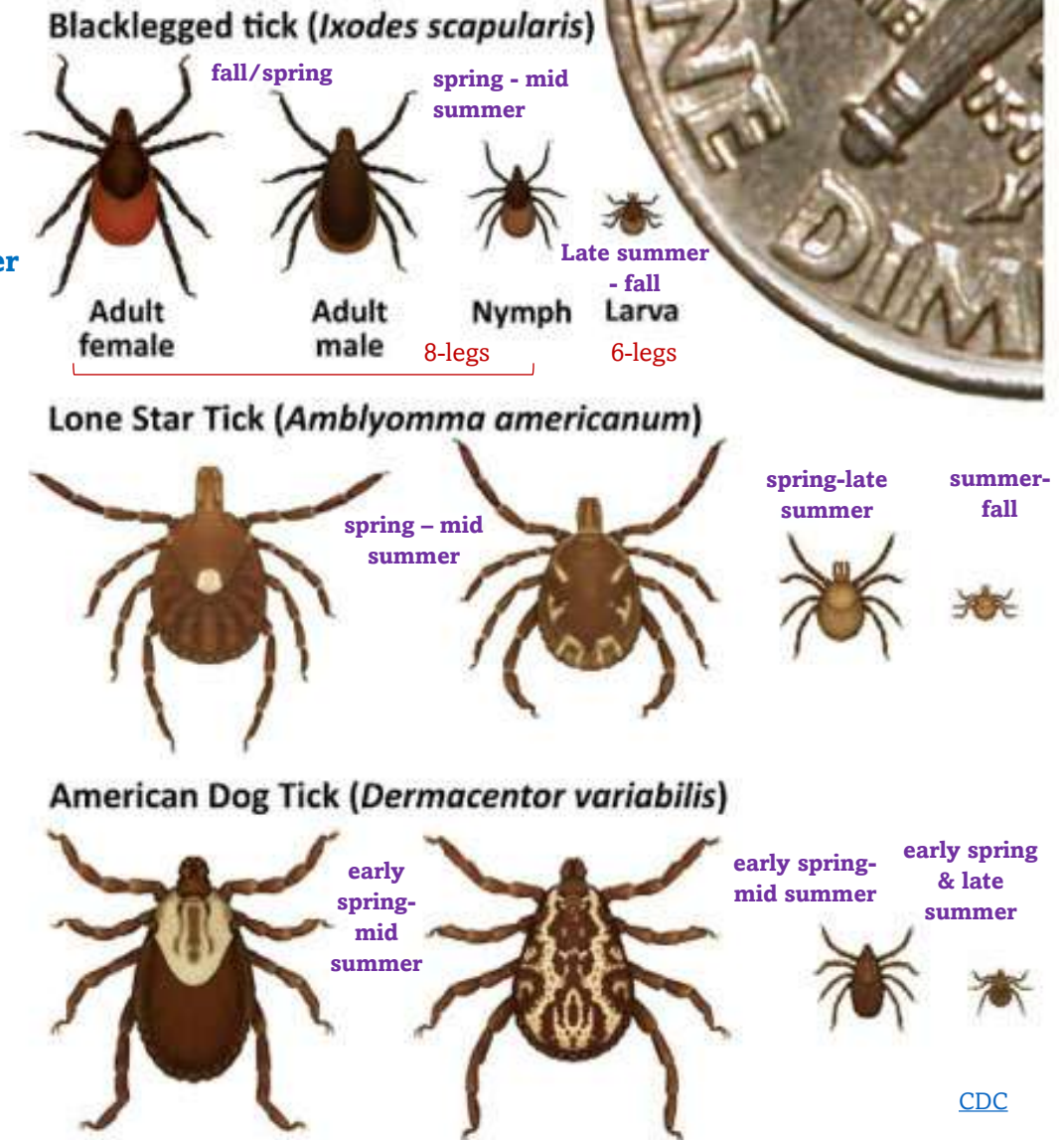
The transmitter
of the most
diseases.

Engorged (blood-
filled) adult deer tick.



... and others

Tick Life Stages



Check out [Tick Encounter](#) for Detailed Tick Descriptions.

(These are all adult females)

Blacklegged (Deer) Tick (*Ixodes scapularis*)

Jim Occi, BugPics, Bugwood.org

- ❖ **Habitat:** Within forests & forest edges, particularly where brushy/shrubby.
- ❖ Adults **quest (seek hosts)** at knee-high on the tips of vegetation/nymphs/larvae closer to the ground esp. on leaf litter/debris.



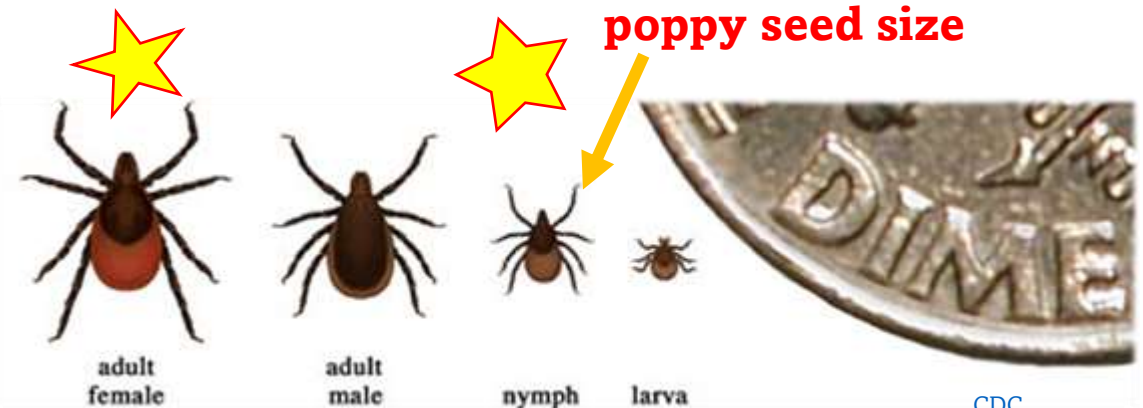
Erik Karits, pexels.com

Questing adult

**Orange-red body
surrounding the black
scutum/shield.**



Scott Bauer, USDA ARS, Bugwood.org



CDC

**STARTS
HERE**

Larval Activity (August-Sept)

Most Common Reservoir Host (infection source)

Spring Year 1
Blood fed female lays eggs

Summer Year 1
Larvae emerge (6 legs)

Summer Year 1
Larvae feed on host 1

Fall Year 1
Larvae molt to
nymphs (8 legs)

Winter
Year 2
Adults
overwinter

Blacklegged Tick Life Cycle 3-Host | 2-Years

Winter
Year 1
Nymphs
are
inactive

Adult Activity
(October – May)

Most
Common
Reproductive
Host

Late Summer/Fall Year 2
Adults feed on host 3

Summer/Fall Year 2
Nymphs molt to adults

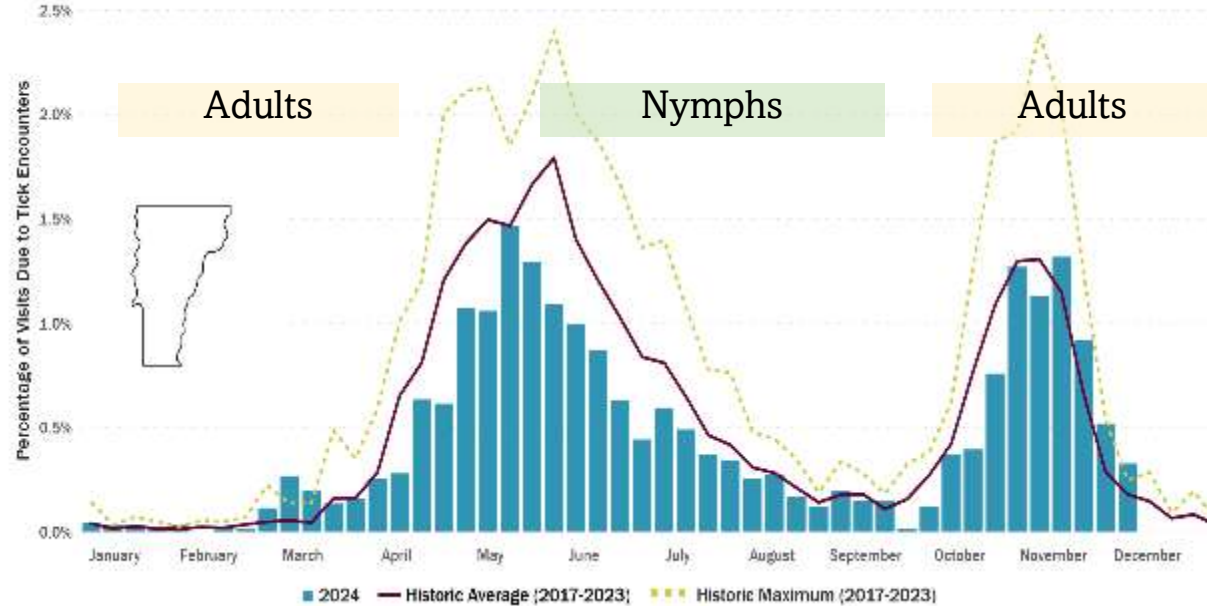
Spring/Summer Year 2
Nymphs feed on host 2

Nymph Activity
(May-July)

50-90% of white-footed
mice are infected with
Lyme- disease-causing
bacteria in the Northeast

Vermont Emergency Room & Urgent Care Visits for Human Tick Encounters

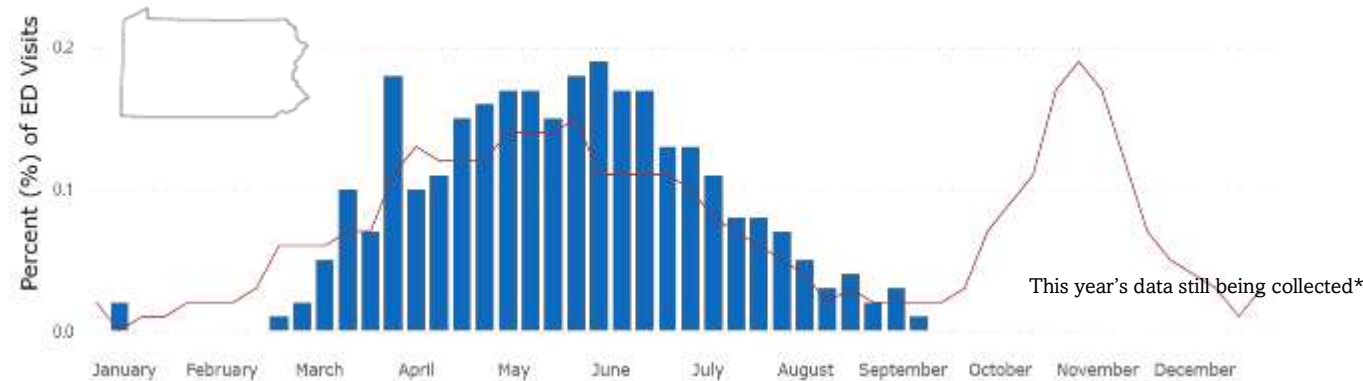
Tick encounter = any visit due to tick-related issues such as a recent tick bite or a request for tick removal



[VT Dept. of Health](#)

Tick Bite Related Emergency Department Visits

2025 2022-2024



This year's data still being collected*



Medical treatment coincides with peak nymph & adult activity because that's when you are most at risk for tick encounters.

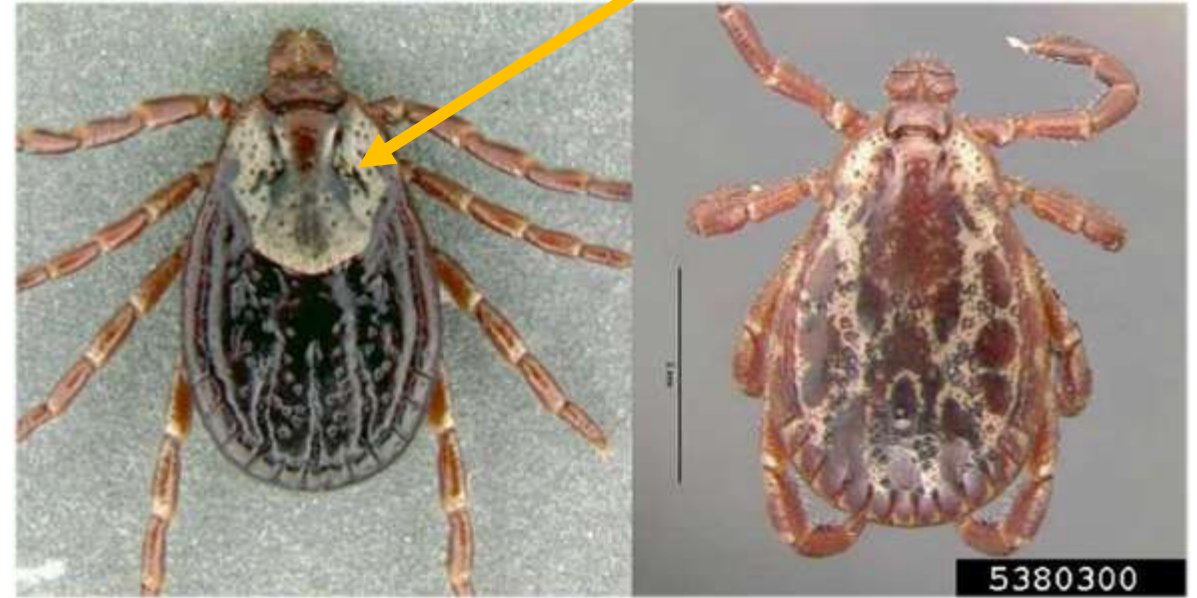
[PA Dept. of Health](#)

American Dog Tick

(*Dermacentor variabilis*)

- ❖ **Hosts:** Small rodents & medium-sized mammals, domestic cats, dogs, livestock & humans.
- ❖ Adults commonly attack humans & pets
Nymphs & larvae to a lesser extent because they prefer smaller mammals (rodents).
- ❖ **Habitat:** Forest edges, areas with little or no tree cover (i.e., grassy fields, scrubland) & along trails.
- ❖ **Activity:** Larvae (spring & fall); nymphs & adults (summer)
- ❖ **Diseases/Disorders: (Rare in VT)**
 - ❖ Rocky Mountain Spotted Fever (bacteria)
 - ❖ Tularemia (bacteria)

Brown-red bodies and ornate scutum/shield



Gary Alpert, Harvard University, Bugwood.org



Adult female



Adult male



Nymph



Larva

Lone Star Tick

(*Amblyomma americanum*)



- ❖ **Hosts:** Squirrels, raccoons, deer, cattle, some bird species, cats, dogs, humans.
- ❖ **Habitat:** Found in woodlands with dense undergrowth & near animal resting areas.
- ❖ **Activity:** Spring-Fall
- ❖ Aggressive biters (tend to hunt down prey rather than sit & wait to ambush them)
- ❖ **Diseases/Disorders:**
 - Ehrlichiosis (bacteria)
 - Rocky Mountain Spotted Fever (bacteria)
 - Tularemia (bacteria)
 - Southern Tick–Associated Rash Illness ‘STARI’ (unidentified agent) [southern states]
 - Alpha-gal syndrome ‘red meat allergy’ (sugar molecule)



Adult females Brown-red body with a single white dot on scutum/shield



Adult female



Adult male



Nymph



Larva



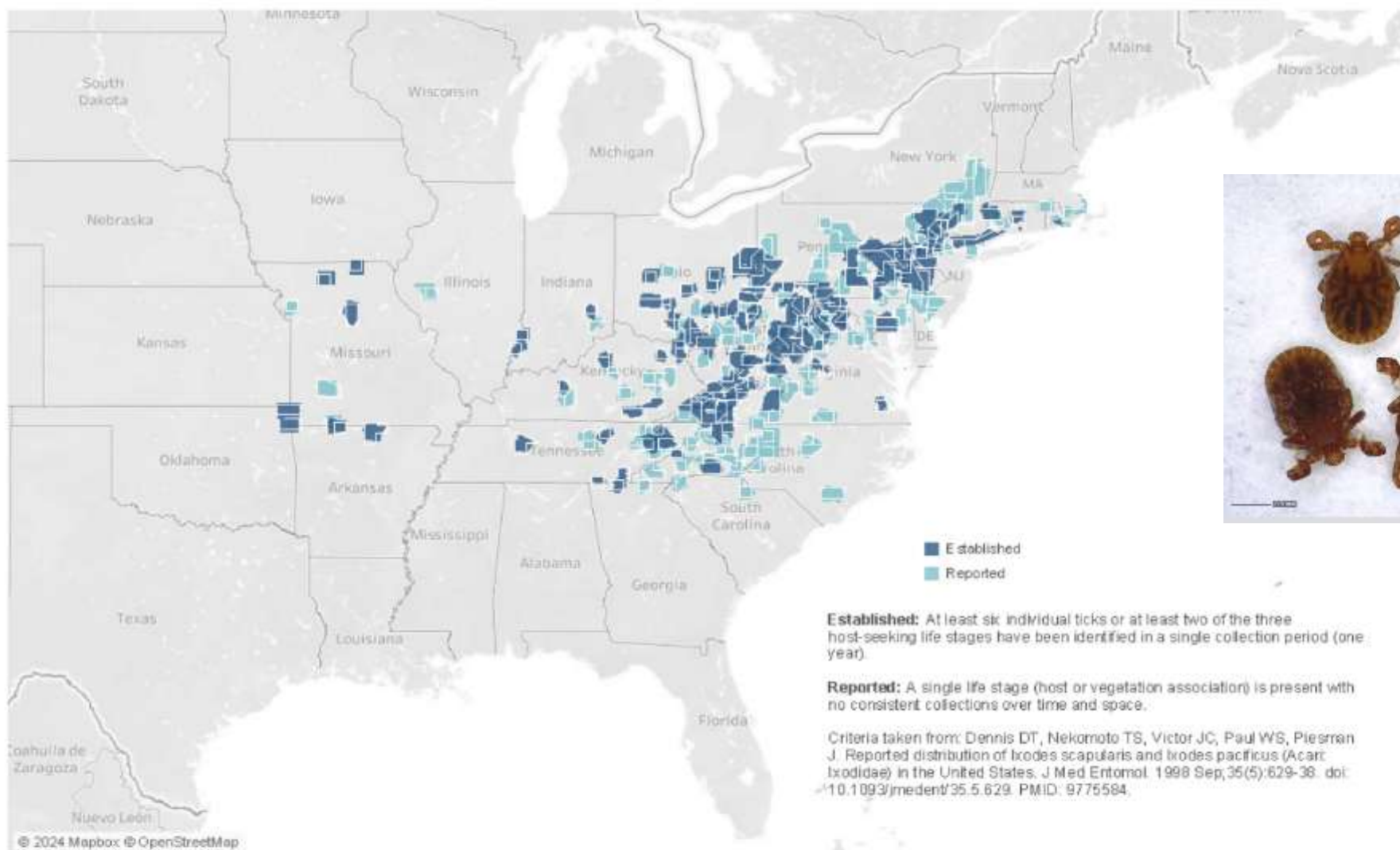
Body & scutum varying shades of reddish-brown.

Asian Longhorned Tick

(Haemaphysalis longicornis)

- ❖ **INVASIVE SPECIES ALERT!** Identified in 2017 on sheep in NJ (native to Asia).
- ❖ **Hosts:** Wide range of domestic animals & wildlife (sometimes humans)
- ❖ **Habitat:** Pastures & meadows
- ❖ Parthenogenic/aesexual (can produce thousands of offspring without a male) – rapidly spreading across the US (NOT in VT, yet).
- ❖ Very large infestations occur. Tend to quest for hosts in groups on tops of vegetation (Larvae can be picked by the hundreds).
- ❖ **Diseases/Disorders:** Several in its native range in humans, potential uncertain here in US, possibly Ehrlichiosis, - Causes Bovine theileriosis [*Theileria orientalis* Ikeda]

Counties with established Asian longhorned tick populations



Ansel Oommen, [Bugwood.org](https://bugwood.org)

Winter Tick

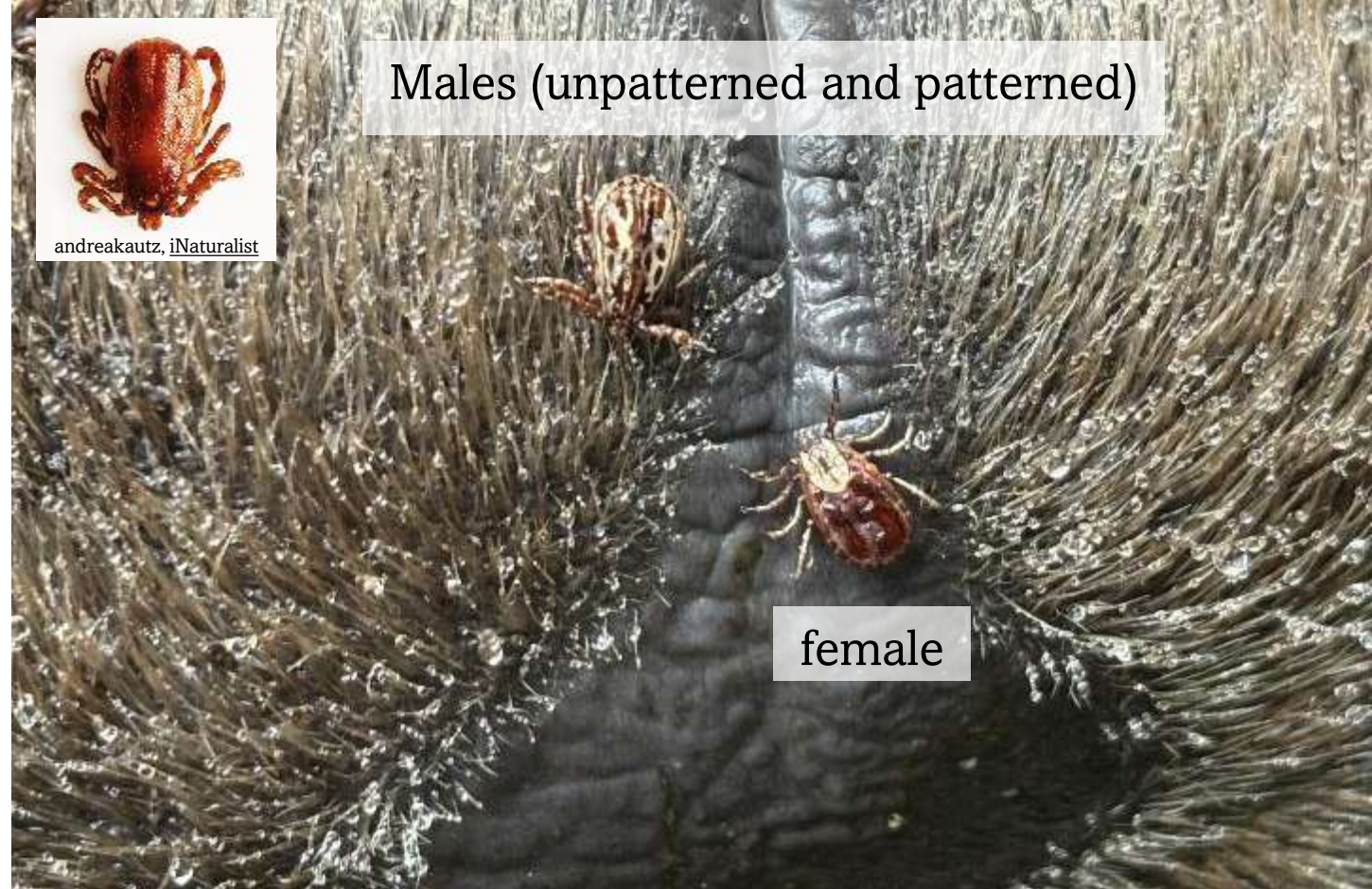
(*Dermacentor albipictus*)

aka Moose Tick

- Infests large ungulates (moose, elk, deer, caribou, cattle, horses etc.)
- Moose calf mortality (>50% annually) over past 20 years. In VT, 91% calf mortality, 25% adults, due to weight loss (atrophy of fat), hair loss & reduced cow productivity.
- Average >47,000, density 2.9 ticks/cm² on moose.
- Climate change increases tick survival & recruitment during snow-free times of their off-host period (spring – fall)



Males (unpatterned and patterned)



female



Ghost Moose

female (fed)




1 to 3 mL
blood!










A pair of white, pleated trousers is shown from the knees down, heavily infested with numerous small, dark brown ticks. The person is wearing tan hiking boots with red laces. The background is a rocky, grassy field.

Total ticks on
self = ~ 15,000

A white rectangular flag is laid flat on the ground, completely covered with a dense layer of small, dark brown ticks. A red arrow points from the bottom right towards the center of the flag.

Total ticks on sampling
flag = ~ 20,000

Different Ticks Pose Different Risks

Blacklegged (*Ixodes* sp.)



Lyme, Anaplasmosis,
Babesiosis, Powassan,
Ehrlichiosis, Relapsing Fever



Lyme,
Anaplasmosis



Lyme,
Anaplasmosis



Lyme,
Anaplasmosis

American Dog/Wood (*Dermacentor* sp.)



Rocky Mtn. Spotted
Fever, Tularemia



Anaplasmosis

Rocky Mtn.
Spotted Fever,
Babesiosis

Cytauxzoonosis
(bobcat fever),
Tularemia

Lone Star (*Amblyomma* sp.)



Southern tick-associated rash
illness (STARI), Ehrlichiosis,
Alpha-gal, Tularemia



Ehrlichiosis,
Rocky Mtn.
Spotted Fever

Cytauxzoonosis
(bobcat fever),
Tularemia

Asian Longhorned (*Haemaphysalis* sp.)



Ehrlichiosis?



Bovine theileriosis
[*Theileria orientalis* Ikeda]





Cattle

Bovine Anaplasmosis [*Anaplasma marginale*]

- Bacterial parasite from *Dermacentor* sp. ticks.
- Causes acute anemia; infected animals become carriers.
- Difficult to diagnose (lethargy most common initial sign, fever, jaundice, weakness, weight loss, decreased milk production, constipation, abortion).
- Treated with antibiotics.

Bovine Theileriosis [*Theileria orientalis* Ikeda]

- Blood-borne protozoan parasite (protozoan).
- Transmitted by invasive Asian longhorned tick.
- Infected cattle remain carriers, causes severe anemia leading to death.
- No approved treatment in US.



Horses

Lyme Disease & Equine Granulocytic Anaplasmosis

- Caused by *Borrelia burgdorferi* & *Anaplasma phagocytophilum*
- Transmitted by blacklegged ticks
- Signs include lameness, fever, joint pain, stiffness, weight loss, behavioral changes, neurological issues.
- Treated with antibiotics

Equine Piroplasmosis

- **Foreign disease**
- Caused by *Theileria equi* or *Babesia caballi*.
- Blood-borne protozoan parasite (protozoan) .
- Mortality rates can reach 50%.



Franz26, Pixabay



Openclipart-Vectors, Pixabay

What To Do About The Ticks?



Dandelion_tea, Pixabay

Tick Management Is Complicated

- Ticks are long-lived spending ~ 90% of their time off-host, free-living in the environment.
- Tick-host-habitat-ecology complexities causes patchy tick distribution challenging targeted landscape treatments.
- Takes years of research to demonstrate acceptable tick & disease reductions from targeted landscape treatments (i.e., reduced encounters & disease).



Integrated Tick Management (ITM)



Tick Checks-Monitoring

- Check for ticks daily after working in the field, forest or with animals. Check animals too.
- Use a mirror to check hard-to-see places.
- Remove ticks immediately.
- Contribute to passive tick id surveillance programs (citizen science).
- Consider sending ticks in for pathogen screening.



Personal Protection

- Wear protective clothing (light-colored long pants, long-sleeve shirt, permethrin-treated) and tuck pants into socks.
- Use EPA-approved tick repellents (i.e., Deet, Picardin). Read the label!
- Use lint roller on clothes in field after working in or near tick-infested areas.
- Shower daily in peak tick periods
- Put clothes in dryer (10 min) on high heat.
- Develop a Tick Protection Plan.
- Avoid tick habitat during peak tick activity.
- Educate others (family members, employees).



Host Management

- Treat livestock & companion animals to prevent ticks (i.e., vaccines, pills/chews, repellent sprays/wipe, ear tags, collars, pour on/spot, dusts, backrubbers) – Read labels to ensure can be used on ticks on target animal. - Consult veterinarian.
- Treat hosts (i.e., tick tubes/tick box for mice, 4 poster device for deer).
- Deter hosts & hiding places. (i.e., deer fencing for exclusion, keep compost & brush piles away from production areas, cleanup waste grain & store in rodent proof containers, hunt/trap to reduce population).



Environmental Treatments



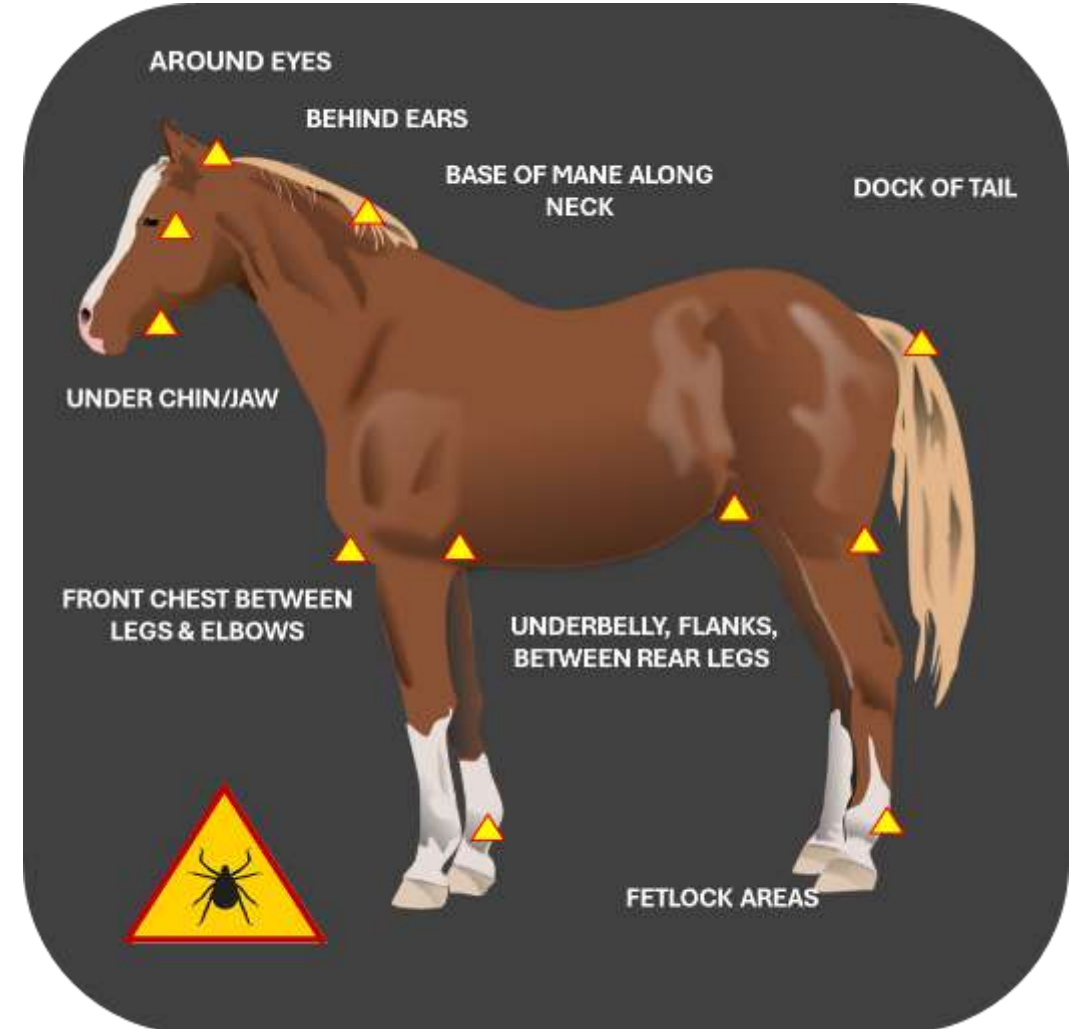
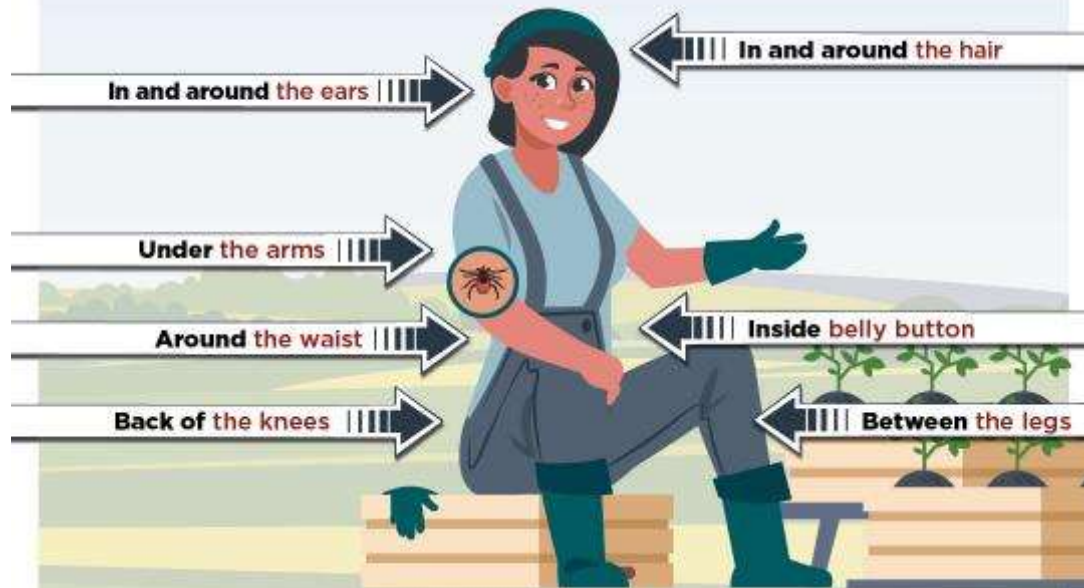
- Mow lawn & pastures (reduces humidity tick like)
- Provide buffer strips (3ft) between forest-lawn; (10-20 ft) between forest-fence & maintain it (trim tree branches, shrubs & mow).
- Pesticide sprays along fence-forest edges (last resort if all else fails).



Check for Ticks Every Day



Check these areas of your body for ticks after being outdoors in grassy, brushy, or wooded areas.





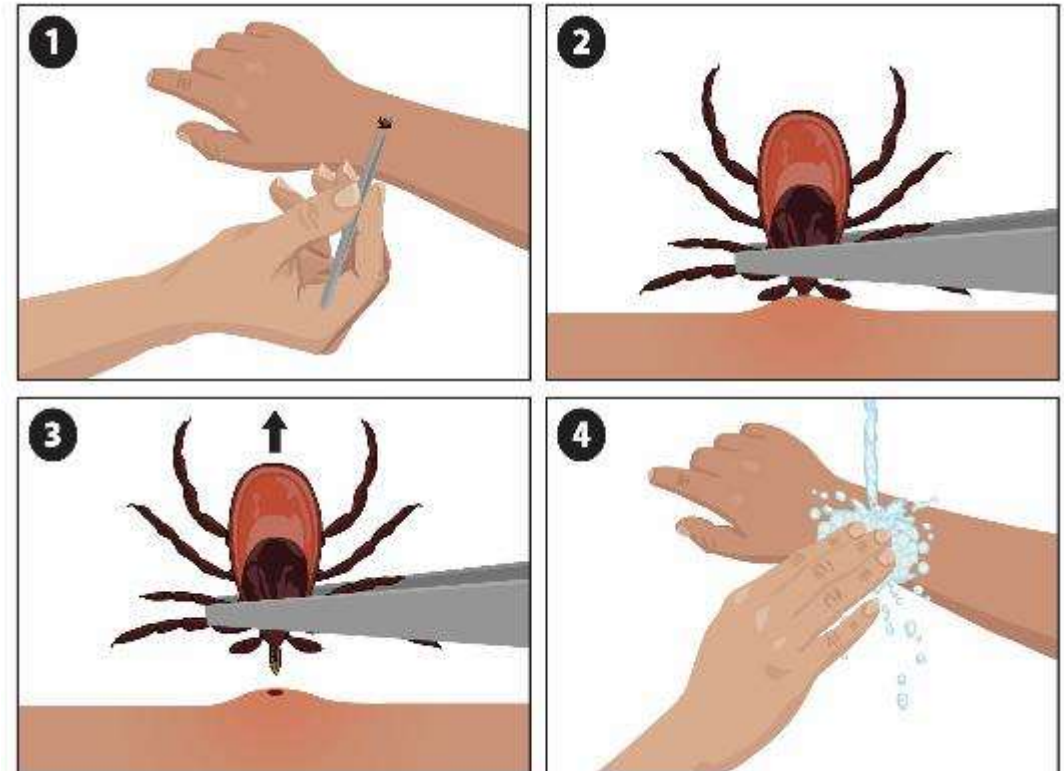
I Found a Tick on Me! Now What?

Remove the Tick:

- Use fine tip tweezers.
- Grab tick by the head, close to skin
- Pull upward with steady, even pressure – do not twist, do not crush between fingers.
- Clean area with soap & water or alcohol.
- Watch for flu-like symptoms or consult physician.

What to Do with the Tick (options)

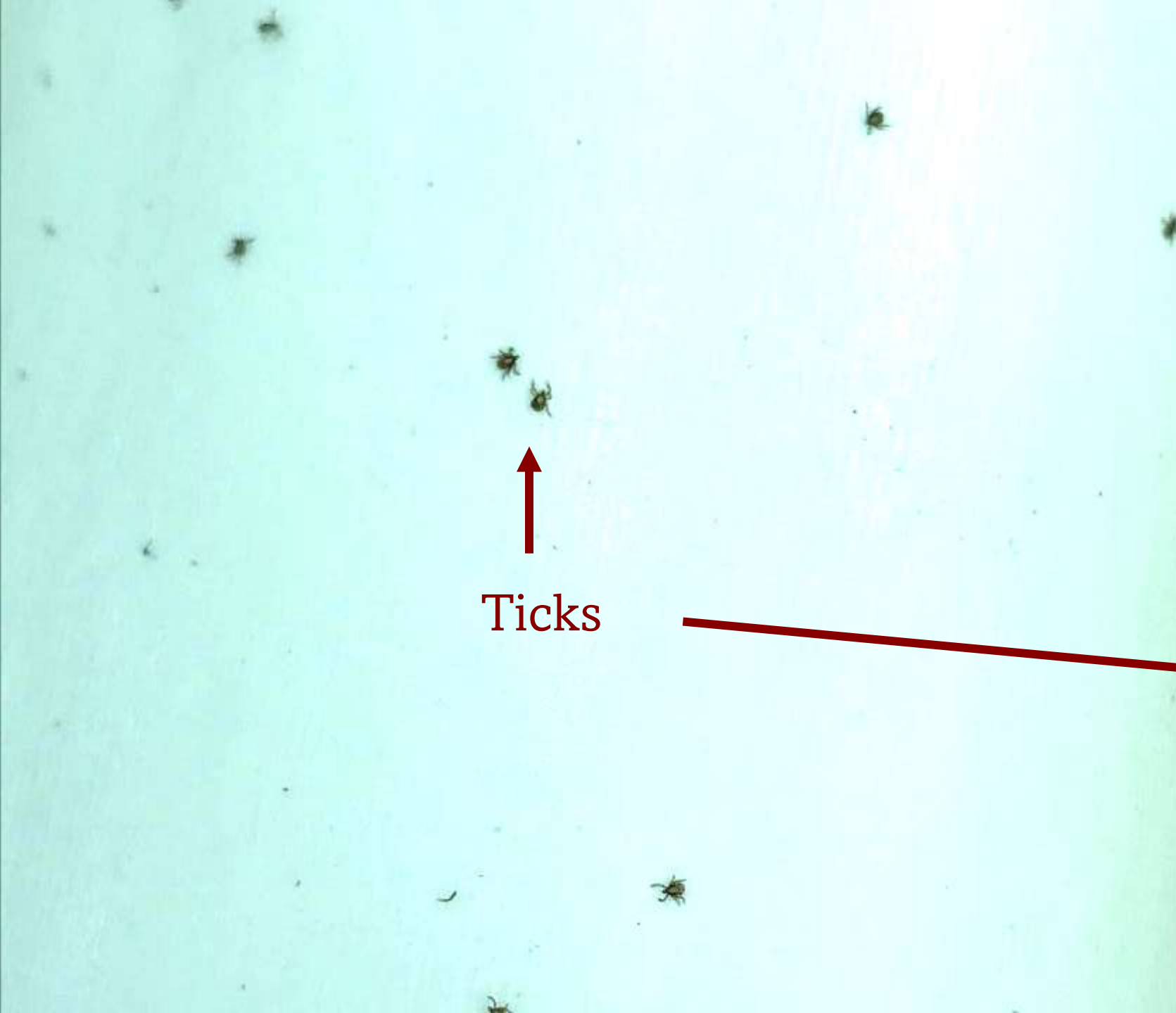
- Get an ID (picture or save in alcohol) & send to
- Dispose of tick (flush it down toilet, place between tape)
- Send it for Pathogen Testing (also includes ID) testing (note: positive results don't necessarily mean you have been infected).



Personal Protection: The 1st Line of Defense Against Tick Bites

- Wear protective clothing (light-colored long pants, long-sleeve shirt, permethrin-treated) and tuck pants into socks.
- Use EPA-approved tick repellents (i.e., Deet, Picardin). **Read the label!**
- Use lint roller on clothes in field after working in or near tick-infested areas.
- Shower daily in peak tick periods
- Put clothes in dryer (10 min) on high heat.
- Develop a Tick Protection Plan.
- Avoid tick habitat during peak tick activity.
- Educate others (family members, employees).







**Don't forget to check
where pets sleep...**

Ticks ARE an Occupational Hazard



Tick bites occurring in the work environment are work-related injuries: must be recorded in accordance with OSHA [recordkeeping requirements](#),

General recommendations:

- Train workers about the hazards of ticks and tickborne diseases in the region (provided in in their preferred language)
- Supply tick removal/prevention supplies (i.e., insect repellent, tweezers/tick removal kit, mirror, first aid kit).



Resources in Other Languages



[CDC Resources in Languages Other than English](#): Enter “lyme” into search box



[Health Information in Many Languages](#) (VT Dept. of Health): Enter “tick” into search box



PA Dept. of Health: [Tick and Lyme Educational Materials](#)



NIOSH Fast Facts: [Protecting Yourself from Ticks and Mosquitoes](#) (Spanish)



Ticks: What you need to know: [Vermont Language Justice Project YouTube Channel](#) (Videos)



Create Unfriendly Habitats For Tick Hosts

- ❖ Remove old furniture, mattresses, & other hiding places.
- ❖ Stack wood in a well-maintained/open & dry areas away from dwellings & consider sealed stone walls.
- ❖ Keep trash, bird feeders & compost away from structures.
- ❖ Store animal feed in rodent proof containers.
- ❖ Select deer resistant plant varieties in gardens.
- ❖ Remove invasive species in woodlots (i.e, honeysuckle, barberry, multiflora rose)
- ❖ Consider adequately fencing backyard or crop production areas.



Reduce Habitats That Favor Tick Survival

- ❖ Maintain yards & pastures to increase sun exposure to reduce humidity
- ❖ Mow lawn & pastures frequently.
- ❖ Provide buffer strips (3ft) between forest-lawn; (10-20 ft) between forest-fence & maintain it (trim tree branches, shrubs & mow).
- ❖ Establish wood chip/gravel barrier between lawns & wooded areas, around patios & play equipment.
- ❖ Keep playground equipment, pergolas, gazebos & patios away from yard edges.
- ❖ Remove leaf litter.
- ❖ Applying pesticides







Pesticides (Acaricides) to Repel or Kill Ticks



Biopesticides: Derived primarily from plants, microbes (fungi & bacteria), some minerals. [i.e., Mycoacaricides (fungus-based); Pyrethrins]



Mark Stebnicki, [Pexels](#)



EPA Approved Synthetic Chemicals:

bifenthrin, permethrin, cyfluthrin, deltamethrin; fipronil, ivermectin, DEET, picaridin, etc.)

Natural product-based chemicals & products exempt from EPA registration:

Essential oils - Rosemary, Peppermint Oil, Cedarwood oil, Garlic Oil, etc. (variable efficacy)

Call a pest control operator or consult veterinarian

Where Do I Find Local Tick Info?



**PennState
Extension**



[LINK](#)



[LINK](#)

**Dept. of
Environmental
Protection**



[LINK](#)



**Commonwealth
of Pennsylvania**



Dept. of Health

[LINK](#)



[LINK](#)



**Tick Research Lab
of Pennsylvania**

Also Check Out Our Resources Pages For More Information!



[VT-TIC](#) (UVM Tick Info Center)



Thank YOU!

Questions?

Please provide feedback at this
[LINK](#) by scanning code below:

Cheryl Frank Sullivan

University of Vermont
Entomology Research Laboratory
661 Spear Street
Burlington, VT 05405
Ph. 802-656-5434
Email: cfrank@uvm.edu
[Faculty webpage](#)



College of Agriculture and Life Sciences
Department of Agriculture, Landscape,
and Environment



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CDPH via Flickr

