

Protection from Ticks

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(8684)



(8680)



(10880)



(www.evergreenvets.co.uk)



(live.psu.edu/album/1766)



(rita314.wordpress.com/)

Ticks in New England

- 80 spp. in USA
 - 12 of public health concern
- Major Species in NE:
 - Black-Legged (Deer) Tick
 - *Ixodes scapularis* (older literature: *Ixodes dammini*)
 - (American) Dog Tick (aka “Wood Tick”)
 - *Dermacentor variabilis*
 - Lone Star Tick
 - *Amblyomma americanum*
 - Brown Dog Tick
 - *Rhipicephalus sanguineus*



How Big are Ticks?



(Wikipedia)



(Jim Occi, BugPics, Bugwood.org)

UGA1310076

Larva: ~ 1mm Nymph: ~1-3mm Adult: ~ 4-6 mm



(Stafford 2007)



(Stafford 2007)



(A. Corricelli)

Tick Bites Alone:

- Saliva secreted with “neurotoxin”:
 - “Blood thinning” antigens:
 - Blood does not **coagulate** (i.e., does not clot)
 - Host is desensitized: does **NOT** feel bite

- Effects on humans:

- Localized skin irritations & rashes (dermatitis)
- Severe allergic response (rare)
- Paralysis (on rare occasions)

if bite occurs at base of skull or along spinal column



Tick Bites Alone (*continued*):

- On pets & livestock:
 - Ticks can attach in **LARGE** numbers
 - Other than primates, most mammals lack the ability to remove ticks from all places on their bodies
 - Signs & symptoms of large infestations include:
 - Anemia
 - Weight loss
 - Death from loss of large amounts of blood

(i289.photobucket.com/albums)



(www.grassmere-animal-hospital.com)



Ticks on a Spanish Galgo



(www.hiltonpond.org)



(www.hiltonpond.org)

Ticks as Vectors of Pathogens

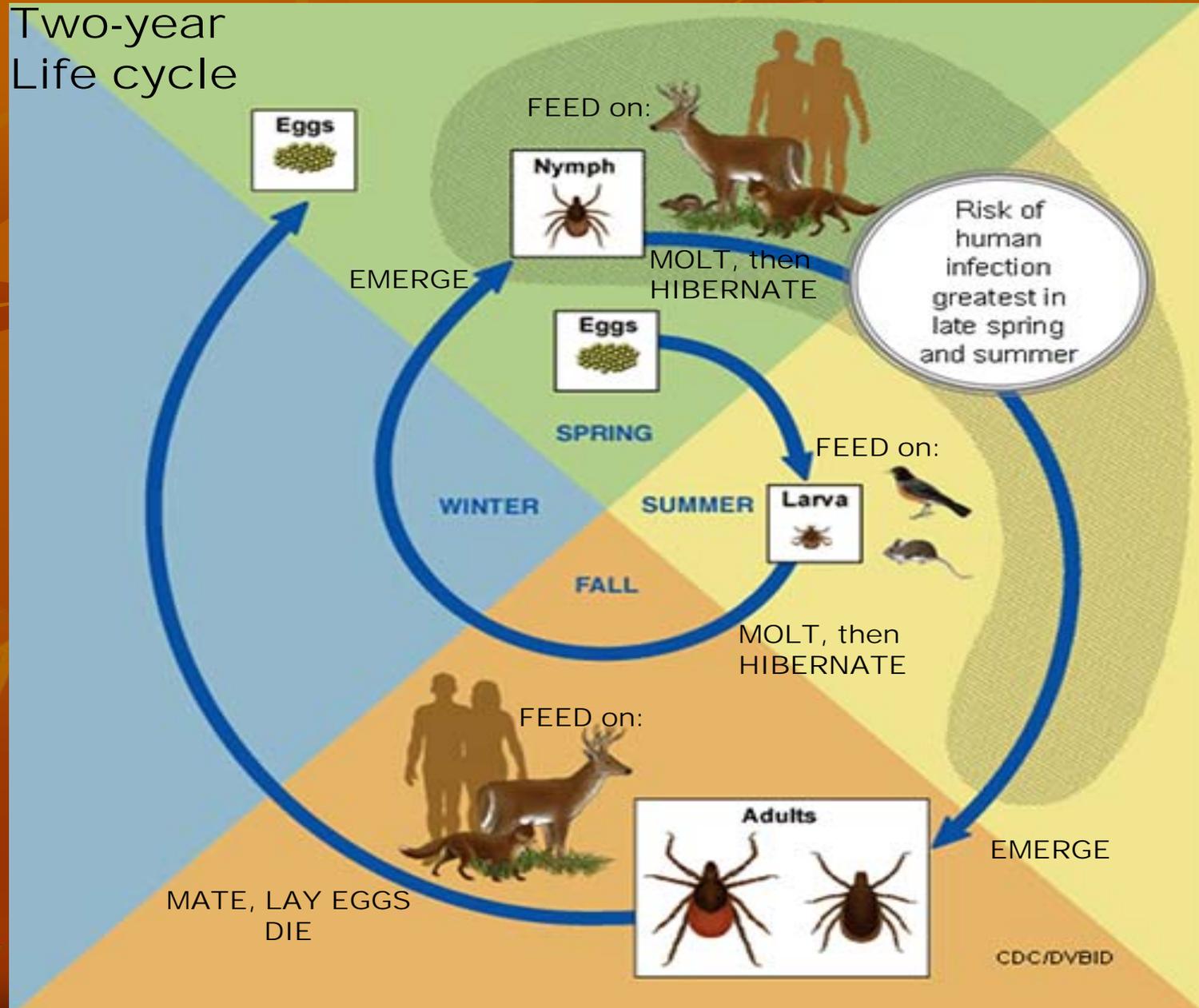
- After mosquitoes, ticks are the **greatest** vectors of human-disease pathogens in North America
 - Vectors are “carriers” of agents that cause disease
 - “pathogens” are agents that cause disease
- Diseases caused by tick-borne pathogens:
 - “Nantucket Fever” or Babesiosis
 - Rocky Mountain Spotted Fever
 - Ehrlichiosis or Anaplasmosis
 - “Rabbit Fever” or Tularemia
 - “Lyme Disease” or Lyme Borreliosis

Why are there more ticks & tick-borne diseases today?

- Today, there are more:
 - Forested areas (reforestation)
 - Herbivorous host mammals:
 - Deer & Rodents (mice, squirrels, & chipmunks)
 - Favorable weather:
 - Lack of consecutive severe cold winters
 - Tick habitats protected by snow cover
 - People living in wooded areas
 - More contacts with ticks
 - Pet contact with ticks
 - Recognition of tick-borne diseases

Life Cycle of "Deer Tick"

Two-year
Life cycle



How Ticks Attach to Hosts: Questing

- Ticks climb to edge of vegetation & wait
- Detect host by:
 - Carbon dioxide
 - Ammonia
 - Lactic acid
 - Body odors, body heat, moisture, vibrations, & visual cues (e.g., shadows)
- When animal approaches, tick becomes excited, waves the front legs in attempt to grab & attach to animal



Getting Infected with Lyme Disease

- 98% of Lyme Disease cases are associated with **nymphal ticks**:
 - Nymphs are much harder to see & detect
 - Nymphs **most active from late Spring to Mid-summer**
- 75% of cases are of infections come from **activities around the home**:
 - Playing in the yard
 - Gardening

Are ALL Deer ticks infected with *Borrelia burgdorferi*?

- 20-25% of all nymphs are infected
- 40-60% of all adults are infected

On the other hand:

- 1% of Lone Star ticks are infected with the Ehrlichiosis agent
- 0.5% of American Dog ticks are infected with the RMSF agent

“Deer Tick” vs. Dog (Wood) Tick

Distance in millimeters

**Brown “Shield”
Redder posterior**



Female deer tick

**Whiter “Shield”
Brownier posterior**



Female dog tick

Protection from Ticks & Lyme Disease

Focus on:

- Personal
- Pets
- Property

Protection from Ticks: Personal

- Reduce or avoid going outside!
- Prophylaxis?:
 - Vaccine: LYMERix (No longer available)
 - “Tick Patch” under development
 - Sensitize one to presence/bite of ticks
- When going into the forests:
 - Careful where walking:
 - Stay on paths & avoid animal trails
 - Avoid contact with low-lying & “body-high” vegetation



Personal Protection (*continued*)

- When going into the forests (cont.):
 - Wear protective clothing in forests:
 - light-colored
 - allows for easier detection of ticks
 - **never** wear shorts!
 - **Never** wear open-toed shoes & sandals!
 - **Tuck** pants into socks
 - *Yes, you are going into an alien world!*
Be prepared!!



(Stafford 2007)

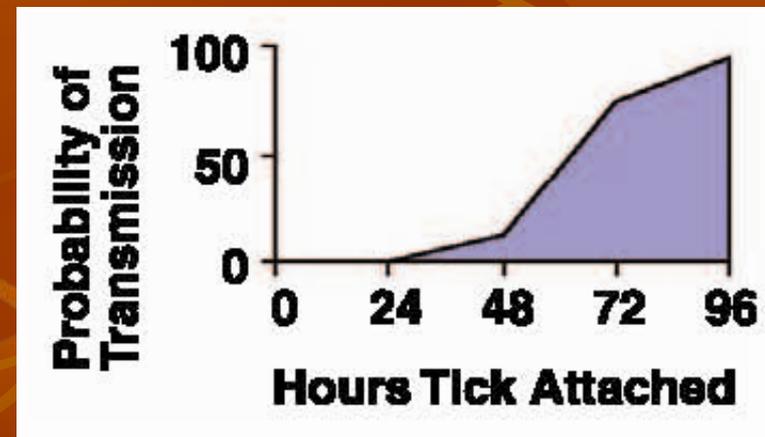
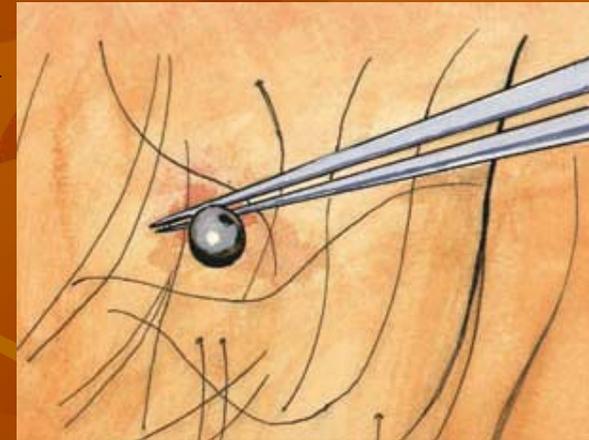
Personal Protection (*continued*)

- After you return home, put clothes into **DRYER**:
 - at least **5 minutes in high heat** to kill Deer ticks
 - 10 minutes for other species
 - Add 5 minutes to drying time if using an electric dryer
 - Afterwards, clothes can be safely washed

Personal Protection (*continued*):

Ticks Checks

- The **most effective** means to prevent infection by tick-borne pathogens
 - Remove attached ticks w' thin-tipped tweezers (forceps) as close to skin and pull straight upward.
 - Disinfect region of bite
 - The earlier ticks are removed, the less likely you can be infected w' Lyme.



Personal Protection (*continued*):

Tick Repellents

- Tick repellents can be applied to skin &/or clothing

- Most recommended:

- **“DEET”**:

- Probably the most effective broad-spectrum repellent ever discovered
- **30-40% DEET** works best against Deer ticks
- Also be applied to shoe tops, socks, & lower pants
- Effective for **at least an hour**; must be periodically reapplied
- Effectiveness depends on concentration, sweat, air temp, wind, your activity, abrasion of treated area



Tick Repellents (*continued*)

- Also recommended:

- **IR3535 & Picardin**

- Apply to skin & clothes
- Effectiveness comparable to higher concentrations of DEET



- **Permethrin-based (0.5%) repellents:**

- Best used on clothing
- Kills ticks on contact
- Permethrin-treated clothing can be purchased separately:
 - Can be washed up to 70 times & still be effective
 - do-it-your-own sprays stay effective for six washes
 - see Tickencounter.org for links to products
 - Not 100% guaranteed to be always effective



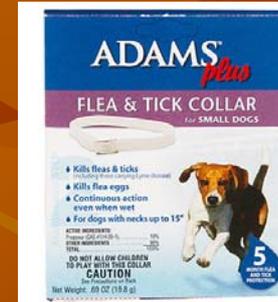
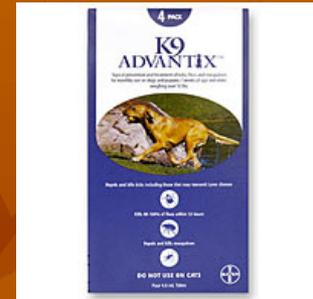
Tick Repellents (*continued*)

- Not recommended:
 - Botanical, herbal, “naturally-based” repellents
 - Almost no published data on efficacy against ticks



Protection from Ticks: Pets

- Keep pets away from tick habitats near home
- Reducing ticks on your pets:
 - Tick checks after being outside
 - Apply repellents:
 - Dips, shampoos, & powders
 - Treated collars
 - [see Tickencounter.org](http://www.tickencounter.org)
 - Use products that kill ticks (instantly or soon after contact) within 24 hours
 - Best for your pet & for your family
 - Vaccines: under debate
- Animals can carry ticks into the home:
 - Whether risk of Lyme Disease is increased is inconclusive



Protection from Ticks: Property Overview

If you live at/near wooded area, keys to reducing ticks:

- Reduce overall humidity:
 - Reduce excessive “dampness” on property
 - Increase sunlight to lower humidity
 - Why? Ticks must have high humidity to survive
- Keep “Clean”:
 - Reduce leaf litter & accumulated vegetative debris
 - Eliminate or seal stone walls
 - Why? Less opportunities for ticks (& small rodents) to hide & survive
- Reduce presence of wild mammals (especially deer)
 - Why? Reduce reproduction & sources of tick infections

Protection from Ticks: Property

- Practice Landscape Management:
 - Mow your lawns regularly
 - Reduce groundcover
 - Clear leaf-litter, mulch piles, wood debris, brush, & weeds
 - Trim tree branches & shrubs at lawn edges to allow more sunlight to the property
 - Discourage rodent activity (mice, chipmunks, etc.):
 - seal stonewalls to prevent nesting & hiding

Protection from Ticks: Property (*cont.*)

- Practice Landscape Management (cont.):
 - Reduce deer presence (see “Tick Mgmt. Handbook”):
 - Deer fencing
 - Deer-resistant plantings
 - Use hardscape & xeriscape practices:
 - brick, asphalt, or gravel paving
 - more decks
 - low-water plantings
 - Keep family area away from tick “hotspots”:
 - Keep children away from woods, dense vegetation, groundcover, unfitted stonewalls
 - Keep children swing-sets away from woodland edges

Recommended References

Review your town's Health Department Website for a copy of the slides presented today which includes references discussed and information on other products and their proper use to reduce tick populations.

Protection from Ticks: Property (*cont.*)

- Treating ticks on rodents:
 - “Damminix[®]”:
 - Carton tubes with Permethrin-impregnated cotton which mice bring back to nests.
 - Ticks in nests are exposed to treated cotton and die
 - ~\$70 per acre; two applications per year



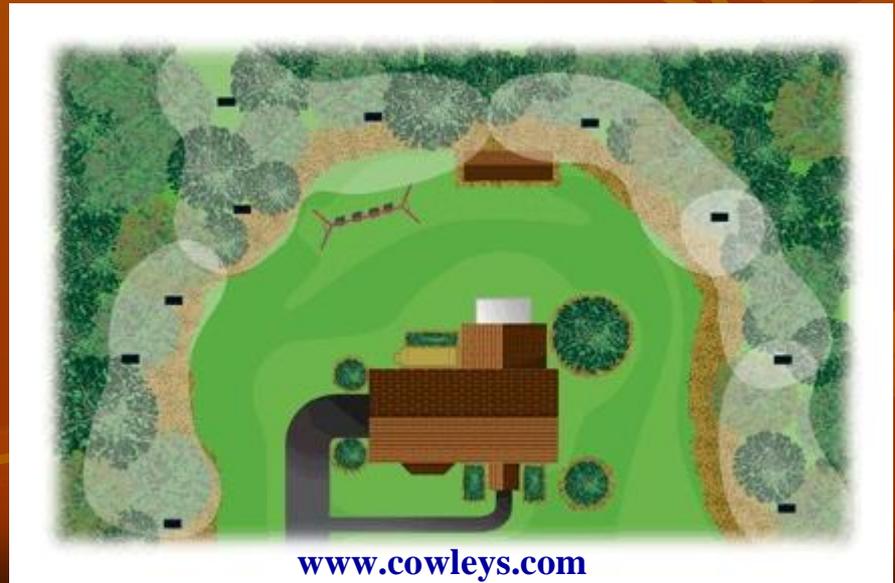
www.ablackhorse.com



www.ticktubes.com

Protection from Ticks: Property (*cont.*)

- Treating ticks on rodents (cont.):
 - “MaxForce® Tick Management System”
 - Bait stations with wicks saturated with fipronil (acaricide)
 - Feeding mice & chipmunks are coated with the fipronil & attached ticks are killed
 - Stations placed ~ 10 meters apart around perimeter of rodent habitat
 - \$300-700 per acre lot; two applications per year



Protection from Ticks: Property (*cont.*)

- Biological Controls:
 - Ticks have natural enemies but:
 - These are not effective for comprehensive tick control
 - Little commercially available
 - Recommended:
 - Poultry such as guinea-fowl & chickens may have impact on local populations



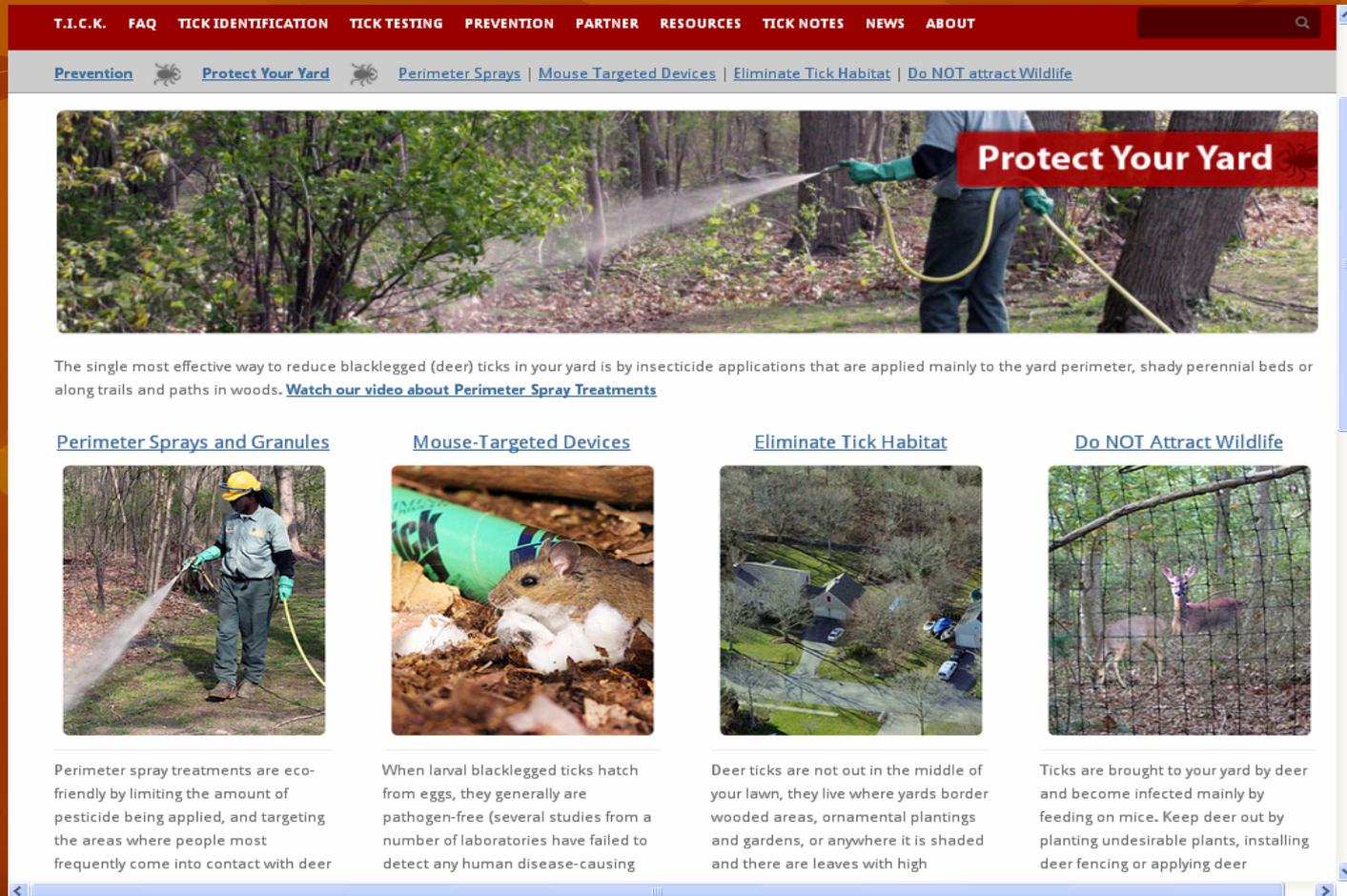
Protection from Ticks: Property (*cont.*)

- Acaricides, together with Landscape Management:
 - Provide persistent control
 - Relatively inexpensive & easy to apply:
 - Only small amounts applied when done at the right time
 - Primary focus on control of nymphs:
 - One application when they are most active: May – July
 - Target:
 - Lawn & woodland edges
 - Boundaries adjacent to areas most used:
 - play areas, outside storage, walkways & paths
 - Applications by informed homeowner or commercial applicators

Protection from Ticks: Property (cont.)

■ What to apply:

- Tickencounter.org → “Prevention” → “Protect Your Yard” for information & recommendations



The screenshot shows the Tickencounter.org website. The navigation bar includes links for T.I.C.K., FAQ, TICK IDENTIFICATION, TICK TESTING, PREVENTION, PARTNER, RESOURCES, TICK NOTES, NEWS, and ABOUT. The main content area is titled "Protect Your Yard" and features a large image of a person spraying a yard. Below this image is a paragraph of text and four sub-sections: "Perimeter Sprays and Granules", "Mouse-Targeted Devices", "Eliminate Tick Habitat", and "Do NOT Attract Wildlife".

T.I.C.K. FAQ TICK IDENTIFICATION TICK TESTING PREVENTION PARTNER RESOURCES TICK NOTES NEWS ABOUT

Prevention  Protect Your Yard  Perimeter Sprays | Mouse Targeted Devices | Eliminate Tick Habitat | Do NOT attract Wildlife

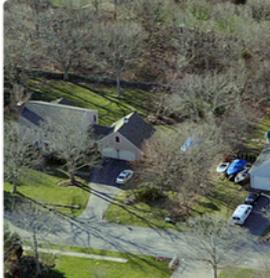
Protect Your Yard

The single most effective way to reduce blacklegged (deer) ticks in your yard is by insecticide applications that are applied mainly to the yard perimeter, shady perennial beds or along trails and paths in woods. [Watch our video about Perimeter Spray Treatments](#)

[Perimeter Sprays and Granules](#) [Mouse-Targeted Devices](#) [Eliminate Tick Habitat](#) [Do NOT Attract Wildlife](#)


Perimeter spray treatments are eco-friendly by limiting the amount of pesticide being applied, and targeting the areas where people most frequently come into contact with deer


When larval blacklegged ticks hatch from eggs, they generally are pathogen-free (several studies from a number of laboratories have failed to detect any human disease-causing


Deer ticks are not out in the middle of your lawn, they live where yards border wooded areas, ornamental plantings and gardens, or anywhere it is shaded and there are leaves with high


Ticks are brought to your yard by deer and become infected mainly by feeding on mice. Keep deer out by planting undesirable plants, installing deer fencing or applying deer

Protection from Ticks: Property (*cont.*)

■ Application(s):

■ “Barrier” or “Perimeter” application

- Done in Spring to repel nymphs:
 - Mid-May through July works best
- Additional application may be done in late summer or fall to reduce adult presence after their emergence

■ Don't trust professionals if they insist:

- that entire lawn be sprayed (not necessary)
- taking on contract for repeated/weekly applications
 - waste of product & your money
 - environmentally inappropriate



Protection from Ticks: Property (*cont.*)

- **What to apply (cont.):**
 - **Information & Purchases at:**
 - Garden Nurseries
 - Commercial applicators:
 - offered by Pest Control Operators
 - some lawn-care, landscape, tree-care companies
 - **Leave for last:** Home Improvement & Hardware stores
 - **DO NOT order through the internet!**
 - Acaricides may not be registered for use in MA
 - Products may be “dated” (effectiveness expired)
 - May not be what you ordered!

Recommended References: www.tickencounter.org

University of Rhode Island TickEncounter Resource Center

THE UNIVERSITY OF RHODE ISLAND

University of Rhode Island

TickEncounter Resource Center

HOME ABOUT TICKSMART F.A.Q. TICK IDENTIFICATION PREVENTION TICKSPOTTERS BLOG PARTNER **RESOURCES** NEWS

Did you know you can turn your own favorite clothes into [tick repellent clothes?](#)

TickSpotters

**FIND,
SAVE,
TAKE-A-PIC,
IDENTIFY**

Picture submitted from a December TickSpotter.
Brown Dog tick nymphs in Florida.

Found a tick? [Report your tick to TickSpotters](#). Your submissions will help TickEncounter collect data for our Current Tick Activity application.

start The Boston Symphon... University of Rhode I... PEABODY PUBLIC AC... Microsoft PowerPoint ... 2:25 PM



Hidden in the Leaves

What do you see in your backyard? Beyond the green lawn...flowers and shrubs...children playing...Look harder! Still, you don't see them. They're there...in the tens, hundreds, maybe even thousands. But it only takes one. One infected tick can change your life. They're there, hidden in the leaves, waiting to latch on.

Hidden in the Leaves, directed by award-winning filmmaker Mary Healey Jamiel, is the story of University of Rhode Island entomologist Thomas Mather and his team's efforts to help people see the risks for serious tick-transmitted disease lurking in an increasing number of rural, suburban and even semi-urban landscapes in the eastern United States.

This 24 minute long documentary exposes the hidden dangers that ticks represent and spotlights strategies to avoid ticks and their diseases.

Purchase *Hidden in the Leaves* on DVD!

Each DVD costs \$15 + \$3 shipping. We accept checks made out to the University of Rhode Island.



Hidden in the Leaves

Produced, Directed, and Narrated by: Mary Healey Jamiel;
Executive Producer Thomas N. Mather;
Edited by: Jeff Hellyer.

Part 1:



Also Recommended:

Tick Management Handbook
Kirby Stafford III
Revised 2007 Edition
CT Ag Experiment Station

www.ct.gov/caes

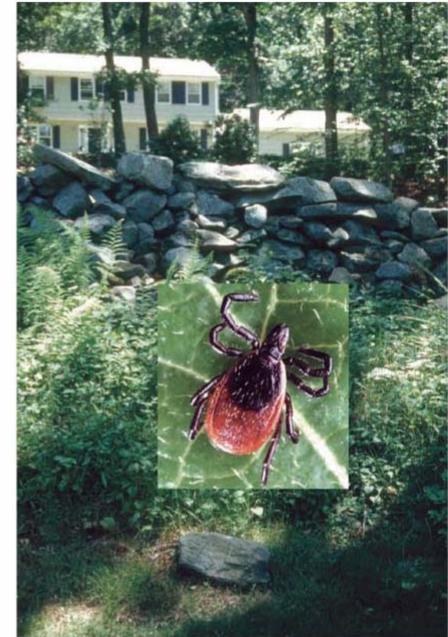
Tick Management Handbook

An integrated guide for homeowners, pest control operators, and public health officials for the prevention of tick-associated disease

Revised Edition

Prepared by:

Kirby C. Stafford III, Ph.D.
Vice Director, Chief Entomologist
Connecticut Agricultural
Experiment Station, New Haven



Support for printing this revised edition provided by
The Connecticut Agricultural Experiment Station
The Connecticut General Assembly

Also recommended:

www.cdc.gov/lyme/

Lyme Disease

Lyme disease is caused by the bacterium *Borrelia burgdorferi* and is transmitted to humans through the bite of infected blacklegged ticks. Typical symptoms include fever, headache, fatigue, and a characteristic skin rash called erythema migrans. If left untreated, infection can spread to joints, the heart, and the nervous system. Lyme disease is diagnosed based on symptoms, physical findings (e.g., rash), and the possibility of exposure to infected ticks; laboratory testing is helpful if used correctly and performed with validated methods. Most cases of Lyme disease can be treated successfully with a few weeks of antibiotics. Steps to prevent Lyme disease include using insect repellent, removing ticks promptly, applying pesticides, and reducing tick habitat. The ticks that transmit Lyme disease can occasionally transmit other tickborne diseases as well.

Treatment [Learn more...](#)

Prevention

Signs/Symptoms

Treatment >>

Replay GO

- Email page link
- Print page
- Updates

Contact Us:

Centers for Disease Control and Prevention
Bacterial Diseases Branch
Foothills Campus
Fort Collins, CO 80521

800-CDC-INFO (800-232-4636)
TTY: (888) 232-6348
[Contact CDC-INFO](#)

Patient Information



Transmission
How ticks spread Lyme disease...



Signs and Symptoms
Signs and symptoms of illness...



Diagnosis and Testing

General Lyme Topics



Prevention
Avoid getting infected...



Tick Removal
How to remove a tick...



Communications Tool

Lyme Disease FAQs



Frequently Asked Questions and Hot Topics
All about Lyme disease...

Healthcare Professionals



Clinicians, public health officials, and veterinarians...
In-depth information and links...

Prevent Lyme disease!

Wear repellent

Check for ticks daily

Shower soon after being outdoors

Call your doctor if you get a

Also recommended:

<http://www.mass.gov/eohhs/docs/dph/cdc/lyme/prevent-disease.pdf>

For more information on diseases spread by ticks:

Massachusetts Department of Public Health
Division of Epidemiology and Immunization
(617) 983-6800 or toll-free at 1-888-658-2850
www.mass.gov/dph/cdc/epii/lyme/lymehp.htm

For more information on repellents and pesticides:

Massachusetts Department of Public Health
Bureau of Environmental Health
(617) 624-5757

Massachusetts Department of Public Health Website
Fact Sheet on Tick Repellents
<http://mass.gov/dph/cdc/factsheets/factsheets.htm>

National Pesticide Information Center
1-800-858-7378
www.npic.orst.edu

Massachusetts Department of Agricultural Resources, Pesticide Bureau
(617) 626-1700

Actual sizes of adult American dog ticks:



Actual sizes of deer ticks:



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New England Journal of Medicine. 327 (8); 542.

Page 3: Centers for Disease Control and Prevention (CDC).

Page 4: Massachusetts Department of Public Health.

Page 5: Weston Westport Health District (Connecticut).

Back Cover: Cape Cod Cooperative Extension.

This brochure was developed with funding support from
the Centers for Disease Control and Prevention (CDC).

Preventing Disease Spread By Ticks



Adult female dog tick (shown on top) and adult female deer tick

Massachusetts Department of Public Health
Division of Epidemiology and Immunization

July 2007

Additional Questions

Although the Northeast MA Mosquito Control District does not do tick control, we can answer questions & provide information:

- 978-463-6630
- *William Mehaffey,
District Supervisor*
- *Can leave message,
we DO return all calls*

