Education

The Core of any IPM Model

Presentation by:

Bob Maurais
Mainely Ticks, Inc.

www.mainelyticks.com

Tick Management through Education & Science
A World of Difference
Our Mission

To protect **people, pets, and properties** from ticks and tick-borne illnesses with a personal, professional, and effective tick management program centered around education and awareness.
Ticks feeding on deer

Visit [www.mainelyticks.com](http://www.mainelyticks.com) to read complete article from *Northern Woodlands Magazine*.

Above
Photo by Susan C. Morse
*Northern Woodlands Magazine*
“Tale of the Tick. How Lyme Disease is Expanding Northward”
The prevalence of Lyme disease is due to a number of factors including:

- Increased tick population
- Overabundant deer population
- Increased recognition of the disease
- Establishment of more residences in wooded areas
- Changes in worldwide climate

**Tick Fact:**

75% of all Lyme disease cases are contracted within 100 feet of the home.

Source: Connecticut Department of Agriculture

Without an effective intervention strategy, an increase in tick-borne diseases is likely to continue.
Lyme disease is the leading arthropod associated disease in the United States with nearly 40,000 human confirmed and probable cases reported to the Centers for Disease Control (CDC) in 2015.
Distribution by county of recorded presence of I. scapularis and I. pacificus in the continental United States (a) 1907–1996 (from Dennis et al. 1998), (b) 1907–2015.

Red or Green: For a given tick species, at least six ticks or two life stages recorded within a single year.
Blue or Yellow: Counties with fewer ticks of a single life cycle for the tick species.
White: Counties with no records.
Maine Lyme Disease Cases by County

2001

Number of Lyme Disease Cases by County, Maine 2001

- York: 68 cases
- Cumberland: 14 cases
- Penobscot: 5 cases
- Aroostook: 1 case
- Piscataquis: 1 case
- Somerset: 1 case
- Washington: 1 case
- Oxford: 2 cases
- Kennebec: 1 case
- Waldo: 7 cases
- Hancock: 1 case

108 Cases

2014

Number of Lyme Disease Cases by County, Maine 2014

- York: 268 cases
- Cumberland: 330 cases
- Penobscot: 50 cases
- Aroostook: 6 cases
- Piscataquis: 2 cases
- Somerset: 17 cases
- Washington: 14 cases
- Oxford: 42 cases
- Kennebec: 136 cases
- Waldo: 49 cases
- Hancock: 120 cases

1,401 Cases

Mainely Ticks
Cases of nationally notifiable vector-borne diseases reported in the U.S., 2014. N=48,519 cases. Adapted from CDC’s Public Health Grand Round Presentation: Emerging Tickborne Diseases (Presenter: Dr. Rebecca Eisen, Research Biologist)
CDC provides estimate of Americans diagnosed with Lyme disease each year

CDC releases 2013 press releases/0819-lyme-disease.html

For Immediate Release: Monday, August 19, 2013
Contact: Media Relations
(404) 639-3286

Cdc Provides Estimate Of Americans Diagnosed With Lyme Disease Each Year

Preliminary estimates released by the Centers for Disease Control and Prevention indicate that the number of Americans diagnosed with Lyme disease each year is around 300,000. The preliminary estimates were presented Sunday night in Boston at the 2013 International Conference on Lyme Borreliosis and Other Tick-Borne Diseases.

This early estimate is based on findings from three ongoing CDC studies that use different methods, but all aim to define the approximate number of people diagnosed with Lyme disease each year. The first project analyzes medical claims information for approximately 22 million insured people annually for six years, the second project is based on a survey of clinical laboratories and the third project analyzes self-reported Lyme disease cases from a survey of the general public.

Each year, more than 30,000 cases of Lyme disease are reported to CDC, making it the most commonly reported tick-borne illness in the United States. The new estimate suggests that the total number of people diagnosed with Lyme disease is roughly 10 times higher than the yearly reported number. This new estimate supports studies published in the 1990s indicating that the true number of cases is between 3- and 12-fold higher than the number of reported cases.

“We know that routine surveillance only gives us part of the picture, and that the true number of illnesses is much greater,” said Paul Mead, M.D., M.P.H., chief of epidemiology and surveillance for CDC’s Lyme disease program. “This new preliminary estimate confirms that Lyme disease is a tremendous public health problem in the United States, and clearly highlights the urgent need for prevention.”

CDC continues to analyze the data in the three studies to refine the estimates and better understand the overall burden of Lyme disease in the United States and will publish finalized estimates when the studies are complete. Efforts are also underway at CDC and by other researchers to identify novel methods to kill ticks and prevent illness in people.
Tick Biology

Lone Star Tick
(Amblyomma americanum)

American Dog Tick (*Dermacentor variabilis*)

Deer Tick
(Ixodes scapularis)

The Deer Tick is responsible for transmitting the Lyme bacteria
TickEncounter.org

TickSpotters

Tracking tick activity trends in America

Ticks change their appearance as they feed...
And it can make identification challenging.

Female adult stage blacklegged ticks

Female adult stage American dog ticks
Two year life cycle of the deer tick

Eggs hatch in early August into 6-legged Larvae

Larvae remain dormant until the spring

Larvae molt into 8-legged Nymphs

Nymphs molt into Adults

First Blood Feeding

Second Blood Feeding

Third Blood Feeding

Special thanks to The Maine Medical Center Research Institute Vector-borne Disease Lab for their technical assistance in presenting this information.
Seasonal Activity

Courtesy MMCRI

Seasonality of Maine Deer Tick (Ixodes scapularis) Submissions 1989-2002

- Larvae
- Nymphs
- Adults

YEAR (by week)
Lyme disease cases by month
2001-2015 Courtesy CDC

N=272,500

Month of disease onset
Lyme Disease...Who’s at risk?

- Hikers
- Hunters
- Gardeners
- Landscape workers
- Children playing in the yard
- Pets

Any man, woman, child or pet who spends time outdoors in proximity to deer tick habitat.
Children ages 5-14 are most at risk from tick bites and Lyme disease. Playing outdoors in proximity to woodland edges or mixed grassy areas & brush areas is considered high-risk.

Pets can bring home deer ticks, resulting in a tick bite without a person being outdoors. Consult your veterinarian for preventative measures.
Our Response...

Education & Awareness
Education & Awareness

32 million impacted

Winter Weather Alerts

Storm brings messy mix of snow & ice

32 million people from Mississippi to Maine in path

TODAY's Top Story

Mainely Ticks
Distribution of Key Tickborne Diseases, United States, 2015

Mainly Ticks
Researchers concerned by virus that killed well-known Maine artist

They believe the Powassan virus, which is spread through tick bites, has developed into a new strain that threatens more humans.

BY EDWARD D. MURPHY STAFF WRITER
emurphy@pressherald.com | 207-791-6465

Researchers are worried that a rare virus which killed a South Thomaston woman last week may have developed into a new strain that is more likely to be passed to humans.

Marilyn Ruth Snow, a well-known watercolor artist, died last week of Powassan
Maine sees increase in non-Lyme tick-bite illnesses

Cases of anaplasmosis and babesiosis, which can seriously affect health if undetected, are at or nearing record levels in the state. An interactive map shows state rankings by number of cases.

BY ERIC RUSSELL  STAFF WRITER
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anaplasmosis, a tick-borne disease, has hit a record level in Maine. Maine, which has one of the highest states in the nation for the incidence of cases transmitted by tick bites. To see state rankings and case numbers, click a category on the right and mouse over the map. Figures are based on Aug. 8 data from the Morbidity and Mortality weekly report by the U.S. Centers for Disease Control, which differs from Maine data released by the Maine Department of Health and Human Services because of reporting delays.

Anaplasmosis cases break record in Maine
With more Lyme disease, public health experts call for more awareness, research

Once diagnosed in just 100 Mainers annually, the disease is an increasing concern, with 1,376 cases last year.

BY JOE LAWLOR STAFF WRITER
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INTERACTIVE
Lyme disease cases by county, 1992 -2011
Emu in Cumberland County has EEE, Maine officials confirm

The CDC has also found the virus in three mosquito pools in York County.

Three mosquito pools in York County and an emu in Cumberland County have tested positive for Eastern Equine Encephalitis, according to the Maine Center for Disease Control and Prevention.

Emus are large, flightless birds that are sometimes raised as livestock.

The CDC last week announced a mosquito pool in York tested positive for EEE. State health officials say people should protect themselves from mosquito bites, though it is rare for humans to be infected with EEE.
WATCH OUT: Ticks Are Already a Big Problem and It's Not Even Spring

Vets have seen tons of parasites on dogs, and it's only the beginning of March.

Yet another nor'easter will slam the country this week, but some of nature's most annoying pests aren't paying any attention to the weather reports. Disease-carrying ticks have already woken up for the season – or never went dormant at all – posing a risk to any potential host they find.

Multiple veterinary hospitals in Michigan have reported seeing the parasites on dogs since February, with their numbers only increasing, according to WWMT. Vets in Virginia have
Lyme cases in Maine spiked again in 2017 to another record

Data from the Maine CDC shows another tick-borne illness, anaplasmosis, also hit a record high, and both diseases can have long-term health impacts.

Lymane disease and anaplasmosis soared to record highs in Maine last year, with experts saying the relatively warm fall probably contributed to the increase in tick-borne illnesses.

Except for a slight downturn in 2015, reported cases of Lyme disease have now broken records in Maine every year since 2011.

There were 1,787 positive tests for Lyme in 2017, a 22 percent increase over the 1,464 Lyme cases in 2016, according to statistics compiled by the Maine Center for...
Integrated Pest Management

IPM is the selection and use of a variety of methods and tactics to reduce, rather than eliminate a pest population by:

- Reducing host animal habitat
- Altering landscape
- Behavior modification
- Applying least toxic pesticides
- Creating a “Tick Safer” zone around your home that encompasses the portions of the yard that your family uses the most
Area wide spray program

An area wide spray program is immediate and the most effective way to manage the tick population on your property.

- Consistent control.
- Easy to apply.
- Relatively inexpensive. Coordinated spray program is timed to the peak outbreak of each stage.
- Chemistry is EPA and State of Maine approved.
How to Choose A Residential Pesticide Applicator

Mainely Ticks
Tick Safer Zone

WHAT IS A “TICK SAFE ZONE?”
Wells Reserve
November 16, 2015
Temperature 56 degrees
125 Ticks in 68 minutes
Wells Reserve
Most at risk?
Children!
Don’t forget about companion animals...

April is “Prevent Lyme Disease in Dogs” Month

As the weather gets warmer and our canine friends spend more time in beachy and wooded areas, we wanted to answer a few frequently asked questions about Lyme disease. For more information, please contact your veterinarian.

What is Lyme disease? Lyme disease is a bacterial disease spread by ticks. It is most prevalent in the Northeast, but it has been discovered in almost all parts of the United States. Lyme disease affects dogs and humans and is rare in other domestic animals.

Source: AnimalGeneral.com
Poor location for children’s play center
Ideal location for children’s play center
Typical Properties

How many applications?
Effectiveness of Residential Acaricides to Prevent Lyme and Other Tick-borne Diseases in Humans

Alison Hinckley et al

The Journal of Infectious Diseases

Major Article

Background. In the northeastern United States, tick-borne diseases are a major public health concern. In controlled studies, a single springtime application of acaricide has been shown to kill 68%-100% of ticks. Although public health authorities recommend use of acaricides to control tick populations in yards, the effectiveness of these products to prevent tick bites or human tick-borne disease is unknown.

Methods. We conducted a 2-year, randomized, double-blinded, placebo-controlled trial among 2,727 households in 3 northeastern states. Households received a single springtime barrier application of bifenthrin or water according to recommended practices. Tick drops were conducted 3-4 weeks after treatment on 10% of properties. Information on human-tick encounters and tick-borne disease was collected through monthly surveys; reports of illness were validated by medical record review.

Results. Although the abundance of questing ticks was significantly lower (63%) on acaricide-treated properties, there was no difference between treatment groups in human-tick encounters, self-reported tick-borne diseases, or medical-record validated tick-borne diseases.

Conclusions. Used as recommended, acaricide barrier sprays do not significantly reduce the household risk of tick exposure or incidence of tick-borne disease. Measures for preventing tick-borne diseases should be evaluated against human outcomes to confirm effectiveness.

Keywords. Lyme disease; tick-borne diseases; ticks; prevention; pest control; acaricide; humans.

Lyme disease is the most common tick-borne disease in the United States, resulting from an estimated 300,000 infections in 2008 [1]. The etiologic agent, Borrelia burgdorferi, is transmitted in the northeastern United States through the bite of infected black-legged ticks (Ixodes scapularis Say). Less common but potentially more-serious diseases associated with the bite of these same ticks include anaplasmosis, babesiosis, and disease due to a Powassan virus variant. In the northeastern United States, exposure to I. scapularis ticks is considered highest around the home (ie, peridomestically), owing to land use factors and population density [2-5].

Prevention of tick-borne disease generally relies on the action of individuals or households. Personal protection strategies (eg, tick checks and repellent use) are single measures that can reduce the incidence of tick bite but require daily vigilance [6]. Household-level measures require less frequent practice and can include landscaping and use of acaricides to control tick populations. In small studies, a single, springtime application of acaricide on residential properties has been shown to kill 68%-100% of host-seeking I. scapularis nymphs [5,7-9]. Some public health authorities recommend the use of residential acaricides to help control ticks and prevent tick-borne diseases [10-13], and in a survey of 2,830 Connecticut households, 25% of homeowners reported having their property sprayed to control ticks [14].

While acaricides have been shown to reduce tick populations, their usefulness for protecting humans from Lyme or other tick-borne diseases has not been demonstrated. We conducted a double-blinded, randomized, placebo-controlled trial to evaluate the effectiveness of a single, residential, barrier acaricide application to prevent tick encounters and tick-borne diseases. This study was undertaken through TickNET [15], a collaboration between the Centers for Disease Control and Prevention (CDC) and emerging infectious diseases programs in Connecticut, Maryland, and New York.

METHODS
This study was conducted in 8 counties with a high incidence of reported Lyme disease: Fairfield, Litchfield, and New Haven, connecticut; New York city, New York; and the counties of Berkley, Essex, and Union, New Jersey. The estimated annual incidence of Lyme disease in the study area during 2004-2008 was 31 cases per 100,000 people, which is significantly higher than that reported in the United States as a whole (1.5 cases per 100,000 people) [16].

The study area was divided into 5 districts: Fairfield, Litchfield, New Haven, and 2 districts in New Jersey. The floor number of each household was randomly assigned to receive either a springtime barrier application of timbustar (4% chlordimeform) with a 2% alpha-cypermethrin adjuvant or a placebo (2% alpha-cypermethrin) sprayer. The sprayer was positioned 3 meters from the house and 1 meter above the ground, and the acaricide was applied as a mist to cover the 20-meter perimeter from the house with a 25-meter radius. Households were instructed to keep pets indoors and to avoid using household pesticides before and after the application. The sprayer was applied in the central portion of the yard, with additional applications made to areas where I. scapularis had been found previously. The sprayer was applied in early spring (March) and late spring (May) in the southern states and late spring (May) in the northeastern states. The sprayer was applied in late spring (May) in the southern states and late spring (May) in the northeastern states. The sprayer was applied in late spring (May) in the southern states and late spring (May) in the northeastern states. The sprayer was applied in late spring (May) in the southern states and late spring (May) in the northeastern states. The sprayer was applied in late spring (May) in the southern states and late spring (May) in the northeastern states.
Background

In the northeast United States, tick-borne diseases are a major public health concern. In controlled studies, a single springtime application of acaricide has been shown to kill 68%-100% of ticks. Although public health authorities recommend use of acaracides to control tick populations in yards, the effectiveness of these pesticides to prevent tick bites or human tick-borne diseases is unknown.

- a single springtime application - applied too late in the season. Ignored overwintering adults, and the most important factor, perimeter foliage density. Also, application methods; backpack misters vs. high pressure, high volume agitation.

-Acaracide and placebo treatments applied from May 9 through June 29.
April
October
Methods

We conducted a 2-year, randomized, double-blinded, placebo-controlled trial among 2727 households in 3 northeastern states. Households received a single springtime barrier application of bifenthrin or water according to recommended practices. Tick drags were conducted 3-4 weeks after treatment on 10% of properties. Information on human-tick encounters and tick-borne diseases was collected through monthly surveys; reports of illness were validated by medical record review.

- We may want to better define recommended practices
Results

Although the abundance of questing ticks was significantly lower (63%) on acaricide-treated properties, there was no difference between treatment groups in human-tick encounters, self-reported tick-borne diseases, or medical-record-validated tick-borne diseases.

-Perimeter only applications do not fully address areas of the property in which ticks harbor
Conclusion

Used as recommended, acaricide barrier sprays do not significantly reduce the household risk of tick exposure or incidence of tick-borne disease. Measures for preventing tick-borne diseases should be evaluated against human outcomes to confirm effectiveness.

Mainely Ticks - Thorough and regularly timed applications of acaricides to all areas of a property that potentially harbor questing ticks does significantly reduce the tick population.
Community-Based Control of the Brown Dog Tick in a Region with High Rates of Rocky Mountain Spotted Fever 2012-2013

Abstract

Rocky Mountain spotted fever (RMSF) transmitted by the brown dog tick (Rhipicephalus sanguineus s.Usu) has emerged as a significant public health risk on American Indian reservations in eastern Arizona. During 2003-2012, more than 250 RMSF cases and 19 deaths were documented among Arizona’s American Indian population. The high case fatality rate makes community-level interventions aimed at rapid and sustained reduction of ticks urgent. Beginning in 2012, a two-year pilot integrated tick prevention campaign called the RMSF Rodeo was launched in a ~600-home tribal community with high rates of RMSF. During year one, long-acting tick collars were placed on all dogs in the community, environmental control activities were applied to yards monthly, and animal care practices such as spaying and neutering and proper petting procedures were encouraged. Tick levels, indicated by visible inspection of dogs, tick traps and homeowner reports were used to monitor tick presence and evaluate the efficacy of interventions throughout the project. By the end of year one, <1% of dogs in the RMSF Rodeo community had visible tick infestations five months after the project was started.
THE RMSF RODEO PROJECT: 2012

- Project divided in six primary rotating phases:
  - Dog population count
  - Collar and register all dogs in study area
  - Spray each home 4 times
  - Tick counts in environment
  - Spay/neuter clinic
  - Knowledge, attitudes and practices survey
- Provide data for tribe to expand reservation-wide

An Integrated Approach
Slides courtesy of Dr. Tom Mather
Tick Collars for Dogs

- Seresto®, new pre-market tick collar provided by Bayer
  - 4.5% Flumethrin, 10% imidacloprid
  - Visible marker of treatment
  - Utility in harsh environment unknown
  - Expected to last complete season (8 months)

- Applied with tribal/owner consent
Properly Timed Pesticide Treatments

Once a Summer

May

June

July

August
Homeowner reports of tick activity
Tick Counts on Dogs at RMSF Rodeo Home sites

Expected level of ticks without intervention

Phase I
Phase II
Mainely Ticks Area Treatments 2017

1,135 Customers

3,650 treatments

Average customer = 3.2 sprays

9 callbacks for the entire season
Mainely Ticks - 2014 Customer Survey
738 mailed on 10-1-14 / 362 received as of 11-06-14 (49%)

Type of Service:
- Ticks
- Mosquitoes
- Ticks & Mosquitoes
- Party Spray
- Other

Majority of survey: returned were from tick customers, followed by tick & mosquito, followed by mosquito.

How would you rate:

...the employees of Mainely Ticks?

<table>
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<tr>
<th>Excellent</th>
<th>Good</th>
<th>Fair</th>
<th>Poor</th>
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<tr>
<td>335 (93%)</td>
<td>27 (7%)</td>
<td>—</td>
<td>—</td>
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...our educational information, including the www.MainelyTicks.com website?

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<th>Excellent</th>
<th>Good</th>
<th>Fair</th>
<th>Poor</th>
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<tr>
<td>312 (86%)</td>
<td>50 (14%)</td>
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Number of customers indicated no computers.

...the overall value of services provided to you and your family by Mainely Ticks?

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<th>Excellent</th>
<th>Good</th>
<th>Fair</th>
<th>Poor</th>
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<td>324 (90%)</td>
<td>38 (10%)</td>
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How likely is it that you would recommend the services of Mainely Ticks to a friend, family member or colleague?

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<th>Extremely Likely</th>
<th>Somewhat Likely</th>
<th>Not Likely</th>
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<tr>
<td>356 (98%)</td>
<td>6 (2%)</td>
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Name: ____________________________________________ (Required for FREE spray drawing)

Would you and/or family members, friends or colleagues attend an educational seminar conducted by Mainely Ticks if one were scheduled in your community? Yes Maybe No Majority responded Maybe

Would you like to receive updates on upcoming community events via email? Yes No

Email address: ____________________________________ (Your email address will not be shared)

Among the guiding principles of our company are:
- We honor our commitments. Strongly Agree Agree Disagree Strongly Disagree
  - 325 (90%) 37 (10%) —
- We maintain integrity in all we do. Strongly Agree Agree Disagree Strongly Disagree
  - 319 (88%) 43 (12%) —
- We exceed the expectations of our customers. Strongly Agree Agree Disagree Strongly Disagree
  - 304 (84%) 58 (16%) —

Please share a comment or write a brief testimonial for Mainely Ticks.

180 customers shared a comment (compiled separately)

Thank you for your continued patronage and for sharing your thoughts with us. (Use back of survey if necessary)

Ed Maurais, Bob Maurais & George Bennett
Cary Institute
The Tick Project

The Tick Project is testing whether environmental interventions can prevent tick-borne diseases in our communities. The need for prevention is stronger than ever, with expanding tick populations and more than 300,000 Americans diagnosed with Lyme disease each year.

The Tick Project is a five-year study to determine whether neighborhood-based prevention can reduce human cases of Lyme and other tick-borne diseases. The methods we are testing are simple and safe for people, pets, and the environment.
Mice & Chipmunks

- The white footed mouse is the most abundant & efficient animal reservoir for the Lyme disease bacteria. In many areas, over 90% of the white footed mice will be infected with B. burgdorferi, and up to half have been found to also be a reservoir for ehrlichiosis & babesiosis.

- Chipmunks also harbor and infect ticks.
Ideal Rodent & Tick Habitat
Tick Tubes
How do we prevent Lyme disease?

LEARN MORE

US BIOLOGIC uses a One Health approach guided by biologists to focus on the point of disease transmission, which are the interactions between mice and ticks.

To do so, we implement programs to apply a safe Lyme vaccine pellet eaten by a mouse. In response to the vaccine, the mouse's body creates antibodies, which in turn are passed to feeding ticks, breaking the transmission of Lyme disease.

Mainely Ticks
Introducing TICK BOX™ TICK CONTROL SYSTEM

Take back your yard from ticks and tick-borne diseases.
Not just mice, chipmunks too!

Anatomy of a bait box

1. Bait boxes are placed around the perimeter of a house to attract the white-footed mouse that carries the bacterium responsible for Lyme disease and forest lympho. Ticks that feed on the mice become infected with the bacterium and transmit it to humans.

2. The smell of food entices a mouse to enter the bait box.

3. In order to collect bait, the mouse or other small rodent must rub against a wick that activates an acaricide known as permethrin.

4. The mouse exits the bait box, and the acaricide on its body kills any ticks that the mouse is carrying. This agent continues to kill ticks for many weeks after the initial application.

Our product treats both chipmunks and mice (host animals) which are the reservoirs of the bacteria that cause Lyme Disease.

The Tick Box Tick Control System achieves 97% control and interrupts the transmission cycle of Lyme disease, no other product can make that claim.

© 2018 Tick Box Technology Corporation, Norwalk, CT

Mainely Ticks
TCS Boxes
A Typical System Installation
Education - the core of any IPM program
Tick Alert!

Ticks that cause Lyme disease and other tick-borne illness may be in this area.

For your protection:

- As much as possible, avoid tick habitat including tall grass, wooded edges, dense vegetation and leaf litter.
- Walk on the center of the trails.
- Wear light colored clothing.
- Utilize appropriate repellents.
- Perform a thorough tick check daily, and immediately after outdoor activities.
- Promptly remove attached ticks.

Education & Awareness are key in avoiding tick-borne illnesses.

Preventive Partners
Ticks & Mosquitoes
Vector-borne Solutions

For more information visit www.mainelyticks.com - 1-877-332-3842

Mainely Ticks
Tick Management Through Education & Science

- Personal Protection Strategies
  - Avoidance—deer ticks require a damp, humid environment to survive and are most often found in wooded areas and forest edges, especially in leaf litter and low ground cover.
  - Repellents—Apply a skin-based repellent and insect clothing with Permethrin—Save 20% using code below.
  - Daily tick check is the single most important step in reducing your chances of contracting a tick-borne disease.
  - Tick removal—Use a pair of fine pointed tweezers to promptly remove attached ticks.

Mainely Ticks is dedicated to providing education and information about ticks and tick-borne diseases. We are committed to helping prevent tick bites and the diseases they can cause.
National Pest Alert

Ticks and Tick-Borne Diseases

Ticks and tick-borne diseases (TBD) pose a major public health concern nationally. Eleven of the seventeen tick-borne diseases in the U.S. are known to infect humans. Lyme disease accounts for over 90% of all reported human vector-borne disease, with an estimated 300,000 cases annually. TBDs are most often spread by the bite of ticks.

Tick Life Cycle

Most tick life cycles include four stages: egg, six-legged larva, eight-legged nymph, and adult. Each life stage varies in size and color for each species. Ticks need a blood meal at every life stage after hatching in nature or eggs. Ticks can feed on mammals, birds, reptiles, and amphibians. Most ticks prefer a different host animal at each life stage. Ticks are most active in the spring, summer, and fall; however, the adults of some species are active in the winter.

The Spread of Disease

Most ticks wait passively on vegetation for host animals to move by. If a host passes by close enough, the tick will latch on. Ticks spread germs that cause disease through the process of feeding:

- Once the tick finds a feeding spot, it grasps the skin and cuts into the surface.
- The tick inserts its feeding tube to suck blood slowly for several days. If the host animal has a TBD, the tick will ingest the germs with the blood.
- Large amounts of saliva from the tick enter the skin of the host animal during the feeding process. If the tick is carrying germs that will cause a TBD, the germs may be passed on to the host animal in the tick's saliva.
- Usually, ticks have to be feeding for several hours before any infections are spread to the host. This timeline varies by tick species and the type of germ. An infectious dose of the Lyme disease germ can be passed on usually after 24 hours whereas the Rocky Mountain spotted fever germ can be passed on as soon as 4-6 hours, and Powassan encephalitis virus can be passed on in as little as 2 hours after tick attachment.
- After feeding, most ticks will drop off and prepare for the next life stage. As its next feeding, a tick that picked up germs in a blood meal can then spread disease to a new host.

Tick-borne Disease Symptoms

Many TBDs share symptoms. The most common symptoms of tick-borne diseases are:
- Fever/chills
- Severe headache
- Muscle and joint pain
- Nausea
- Cognitive defects
- Sleep disturbances
- Rash

Tick-borne Disease Prevention

Ticks dry out in heat and thrive in damp, humid environments. Yard-care practices including removing leaf litter and mowing the lawn can help reduce tick habitat. Keeping children’s play areas away from wooded edges, and mowing to areas with short grass and sunshine reduces the chances of a tick encounter.

Personal protective strategies to reduce the chances of coming in contact with ticks include:
- tick-dense areas, wearing permethrin-treated clothing, and applying tick repellent.
- Insect repellents containing DEET or picaridin can be sprayed on skin, but wearing tick repellent clothing is most effective. A dryer set on high heat can kill lingering ticks on clothing in 5-15 minutes.

The best strategy to reduce the number of people who get TBDs is to perform daily tick checks and remove a tick before it has the chance to spread disease-causing germs.

Tick Removal

Presto tape is best for removing ticks by grabbing the tick as close to the skin as possible and pulling upwards with a slow, steady motion. Other resources like TickRemoval.com are available for tick identification and risk assessment. TickRemoval.com can be used for tick testing to determine if the tick is infected.

Species, Location, and Related Disease

Lyme Disease

Location: Pacific Coast of the U.S., Appalachians, and Lyme disease

AMERICKAN ENGLISH TIG

Location: Northeastern and Midwestern U.S.

Rocky Mountain Wood Tick

Location: Midwestern and upper Midwest U.S.

Rocky Mountain Spotted Fever

Location: North central and southcentral Canada

Cocky Mountain Spotted Fever

Location: Rocky Mountain spotted fever, Colorado Tick Fever in Michigan

For more information on ticks, TBDs, tick control recommendations and state resources visit our website: www.ippm.org/ticks/ticks/10056000.

October 2016

Mainly Ticks

Mainly Ticks

Mainly Ticks
FREE Educational Brochure

Tick Identification

- Deer, Dog, & Lone Star Ticks
  - Female: 2.5 to 3.7 mm
  - Male: 1.9 to 3.1 mm

- Dog Tick
  - Female: 1.4 to 1.7 mm
  - Male: 0.7 to 0.8 mm

- Lone Star Tick
  - Female: 2.4 mm
  - Male: 1.5 mm

- Blacklegged Tick
  - Female: 4.4 mm
  - Male: 1.8 mm

- Rocky Mountain Wood Tick

Tick Removal

Using a pair of fine pointed tweezers, grasp the tick as close to the skin as possible, and pull straight up with a steady motion. It may take several minutes for the tick to release. Do not use vaseline or a lit match, and avoid twisting or squeezing the tick with your fingers as this may inject the contents of the tick’s gut into your bloodstream.

After removal...clean and disinfect the area. Mark the date on a calendar.

Contact your physician or veterinarian if symptoms develop.

Education & Awareness are key!

Tick Submission

Record of tick removal
- Date: __/__/____
- Time:
- Tick was removed:
- Tick was attached to:
  - Person
  - Animal
  - Not Attached
- Age of person: Male Female
- Body part attached to:
- Visible rash: Yes No
- Symptoms:
- If found on animal: Dog Cat Other:
- Town where tick acquired: State:

Sample Preparation
- Place the tick to be identified in a small crush proof container along with a small piece of wet cotton. Insert the container inside a small zip-lock bag and mail with the appropriate tick submission form to your state agency or diagnostic laboratory.

Services provided by various state agencies and/or diagnostic laboratories vary from simple tick identification to complete pathogen analysis. A partial list of testing labs, services and associated fees is available at www.mainelyticks.com

ProTickMe™

Mainely Ticks is a family owned and operated pest control business located in Southern Maine. Since 2004, they have distributed over 50,000 tick identification guides and education brochures to residents of Southern Maine and surrounding areas. Visit their website for information on:
- Personal Protection Strategies
- Landscape Modifications
- The Life Cycle of the Deer Tick
- Tick-borne Diseases
- Symptoms
- Tick Submission Information
- Links & Downloads

Products available online for individuals, retailers, healthcare professionals and support groups include:
- Fine Pointed Magnified Tweezers
- Tick Identification Guides, Bookmarks & Posters
- ProTickMe Tick Identification, Removal and Submission Kits

www.mainelyticks.com
1-877-332-3842

Lyne disease is the most frequently reported vector-borne illness in the United States. In some endemic areas, as many as 40-70% of blacklegged ticks are infected with the Borrelia burgdorferi bacteria. While Lyme is endemic in the Northeast and Upper Midwest, other tick-borne diseases are also prevalent in these and other parts of the United States.

By utilizing a combination of education and awareness, landscape modifications, personal protection strategies and the proper and timely removal of attached ticks, you can significantly reduce your chances of contracting tick-borne diseases.

The single most important step in reducing your chances of contracting tick-borne illnesses is the daily tick check. Be sure to check yourself, your children and pets after spending time outdoors in tick endemic areas. Use the sensitivity of your fingertips to feel for small bumps, starting with a thorough inspection of the scalp, in and around the ears, hairline and neck, arms, armpits, back (full length mirror or partner to assist), torso, belly button, entire groin area front and back, between all skin folds, legs, behind the knees and between your toes.

A thorough tick check should take at least 30-45 seconds. Don’t just look...feel...this is the actual size of the tick.
**Tick Identification Guide**

**Deer Ticks**
- **Female**: 3 to 3.7 mm
- **Male**: 2 to 2.7 mm
- **Nymph**: 1.3 to 1.7 mm
- **Larvae**: 0.7 to 0.8 mm

**Dog Ticks**
- **Female**: 5-6 mm
- **Male**: 3-4 mm

**Lone Star Ticks**
- **Male**: 3-4 mm
- **Female**: 5-6 mm

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**Daily tick checks reduce your risk of contracting tick-borne illnesses.**

The longer a tick is attached, the greater your chances of contracting Lyme disease and/or other co-infections. Check yourself, your pets, and especially small children **DAILY** after outdoor activity year round, particularly in the months of May, June and July. When showering or bathing, do a full body inspection for a rash or attached ticks. Use the sensitivity of your fingertips to **feel** while checking favorite tick spots including the scalp, behind the ears, armpits, back, belly button, groin, behind the knees and between the toes.

**Tick Removal**: Using a pair of fine pointed tweezers, grasp the tick as close to the skin as possible, and pull straight up with a steady motion.

**After Removal**: Disinfect the area, mark the date on a calendar, see your physician or veterinarian if symptoms develop.

Visit our website for more information.

[www.mainelyticks.com](http://www.mainelyticks.com) - **1-877-332-3842**

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![Mainely Ticks logo](image)
Magnified Fine Pointed Tweezers

Magnified Fine Pointed Tick Removal Tweezers

- Suitable for people and pets -

- Ideal for removing ticks, splinters & thorns -

The Centers for Disease Control (CDC) recommends fine pointed tweezers to properly remove an attached tick.

Are your family members and pets protected?

Distributed by:

Mainly Ticks

Preventative Partners
Ticks & Mosquitoes
Vector-borne Solutions

1-877-332-3842

www.mainelyticks.com
You can significantly increase your level of protection against ticks and mosquitoes by pre-treating clothing with 5% permethrin spray. When applied to clothing, the permethrin binds to fabric, eliminating the risk of over exposure to the skin. Spray pump, aerosol, or soaking applications can last up to six weeks and through several washing cycles.

You can also purchase clothing pre-treated with permethrin. Insect Shield is an excellent source, and they can also treat your personal clothing. Just like other Insect Shield apparel, garment repellency is invisible, odorless, EPA registered, and lasts for 70 launderings. Click here to begin the process…select the “Singles” option to begin the ordering process. Watch this short video on how well Insect Shield works.

Apply a repellent of choice to exposed skin (note the availability of DEET free products as well). The Centers for Disease Control (CDC) and American Academy of Pediatrics (AAP) both recommend using DEET based repellents to help prevent mosquito and tick bites. The CDC states that DEET-based repellents are safe when used according to the directions and the AAP suggests that products containing up to 30 percent DEET can be used on children over the age of two months. For more information on the safe and proper application of DEET products, visit www.deetonline.org.

Picaridin is an emerging repellent that warrants your attention…check out this recent article from Consumer Reports.

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**Insect Shield Your Own Clothing**

Enter promo code **MAINELYTICKS1** at checkout

Wearing tick repellent clothing is the best--and easiest--way for people to prevent tick bites when they venture outdoors. Did you know you can turn your own favorite clothes into tick repellent clothes? Your comfortable gardening pants, lucky golf shorts, hiking socks, children’s play clothes...all professionally treated with an invisible, odorless, EPA registered, tick repellent (permethrin) that remains effective through 70 washes! Insect Shield provides a service that does just that.

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**Insect Shield Your Own Clothing**

Enter promo code **MAINELYTICKS2** at checkout

Insect Shield® Repellent Apparel and Insect Shield® Repellent Gear are revolutionary products designed to provide long-lasting, effective and convenient personal insect protection. Insect Shield apparel and gear, such as mosquito repellent clothing, work wear clothing, bug repellent blanket and more, combine the Insect Shield process with a proprietary formulation of the insect repellent permethrin—resulting in effective, odorless insect protection that lasts the expected lifetime of the product, repelling mosquitoes, ticks, flies and fleas.

Apparel for the whole family...protection as easy as getting dressed!

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www.insectshield.com
Companion Animals

- Golfers
- Children playing in the yard
- Pets
- Homeowners maintaining their property

What about my pets?
Insect Shield apparel and gear is now available for your companion animals. Outdoor enthusiasts will love that Insect Shield repels ticks, mosquitoes, fleas on camping trips, hikes, runs, and picnics. Stay-at-home pet parents will appreciate the all-around protection Insect Shield offers both their pets and their homes. Available in blankets, hoodies, vests, bandanas, car seat covers and beds.

Check out Maine Based Dog Not Gone at www.dognotgone.com/
www.insectshieldforpets.com

The data in this map was provided by IDEXX Laboratories and ANTECH Diagnostics. It is statistically significant and it serves as a strong representation of the parasite activity for each area.
Our most precious resource

Camps, Day Care, Schools, Scouts

Lyme disease is the most frequently reported vector-borne illness in the United States and is on the rise. In some areas of the United States, as many as 40-70% of blacklegged ticks are infected with the Borrelia burgdorferi bacteria. While Lyme disease is endemic in the Northeast and Upper Midwest states, other tick borne diseases, including Babesia, Ehrlichiosis, Rocky Mountain Spotted Fever and Anaplasmosis are also prevalent in these and other parts of the United States.

- Children ages 5-14 have the highest incidence of Lyme disease in the United States (Source: CDC) and most cases are acquired in the summer months.
- Tick-borne illnesses are not as prevalent in the spring and fall. Be aware that adult deer ticks may be active during the winter months whenever temperatures are above freezing.
- The actual number of confirmed and probable cases of Lyme disease may be significantly higher than those currently reported by the national CDC. According to the May 7, 2004 edition of the Morbidity and Mortality Weekly Report (MMWR), “Surveillance for LD is subject to several limitations. Studies from the early 1990s suggested that LD cases were underreported by six to 12-fold in some areas where LD is endemic...” In 2013, the CDC acknowledged the actual number is closer to 300,000 cases per year.
- Check the latest state numbers and incidence rates of Lyme disease for your state.

What does this mean for the safety and well being of children in your care?

Summer Camps/Scout Providers/Schools:
- Perform multiple tick checks throughout the day. Consider a tick check after each
Health Fairs
"...I rise in support of this Resolution as a cosponsor...Since friends of mine who are in the Gallary today, Bob and Barb Maurais got involved, they have educated me on Lyme Disease..." — Representative Gary Plummer
A New and Different Call to Action Against Ticks & Disease

So many ticks! More ticks in more places, too. These days, ticks are much more than a nuisance. These days, some tick species, like the notorious blacklegged (deer) ticks, are LOADED with pathogens that can make you sick. Really sick! Lyme disease affects more than 300,000 Americans every year. Some other tick-borne perils, like the agent of human babesiosis, or Powassan virus and Heartland virus cause infections that can be fatal. These days, ticks are causing an unmet public health crisis... in towns all across America.

“Ticks are being found in neighborhoods, exclusive up-scale suburbs, rural areas, and sometimes even in urban settings,” said Dr. Tom Mather, the TickGuy and director of the University of Rhode Island’s TickEncounter Resource Center. “And with multiple types of ticks active in 3 different life-stages, each having their own seasons of activity and level of disease riskiness, it can be a bit overwhelming,” he added.

So, maybe there are ticks in your favorite park, your neighborhood, your own yard! Maybe there are neighbors who have gotten sick. Maybe you’ve even found a tick crawling on you, or worse ... biting you! What kind was it? How risky? Do you really know what’s best to do next?

Wouldn’t it be nice if there was a tick expert always on hand...readily accessible...to coach, guide, and remind you to take the most effective actions to prevent a tick encounter? “While people like to be free to make their own choices,” Mather explained, “most people also appreciate getting a little guidance from experts, whether the topic is their retirement, their fitness, their fun, or even about ticks.”

That’s where TickEncounter’s newest initiative comes in—TickSmart™ Towns America—a new civic program for engaging, educating, and empowering citizens to learn and know more about the dangers from ticks and how best to protect themselves. Using seasonally relevant messages delivered across various forms of media, a variety of learning events, supportive programs, and your town’s own TickSmart™ Ambassador to help make it all happen, citizens will increasingly start making TickSmart choices and use TickSmart best practices, whether they’re doing yardwork, taking a hike or just walking the dog.

In a TickSmart™ Town, widely promoted web links provide every citizen with anytime access to expert TickSmart advice and personalized answers. As the TickGuy explains, “people don’t want to think about ticks often or at all, but when they find a tick they usually have questions and concerns, and they usually want their answers in real time from an expert.”

With more ticks in more places now, people CAN feel safer living in a place where their civic leaders care enough, and neighbors know enough to provide a little nudge...a constant reminder of the best way to avoid potentially life-altering tick encounters, and what to do next if they do find a tick.

Ask your civic leaders to make your town a TickSmart™ Town. Click this hyperlink or go to www.TickEncounter.org to find out more.

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Our Happy Customers Say

Over the past two years, Mainely Ticks has surveyed more than 1,000 customers with a nearly 50% return rate! 98.5% of respondents indicated that they would be "Extremely Likely" to recommend the services of Mainely Ticks to a friend, family member or colleague.

We love to hear from our clients. Write us a review below.

Write a Review

Integrity & honesty come to mind when I think of your work ethic.

Leslie W.
Yarmouth
Education - The Core of any IPM Model

Questions?

Thank you for helping raise the level of education and awareness!