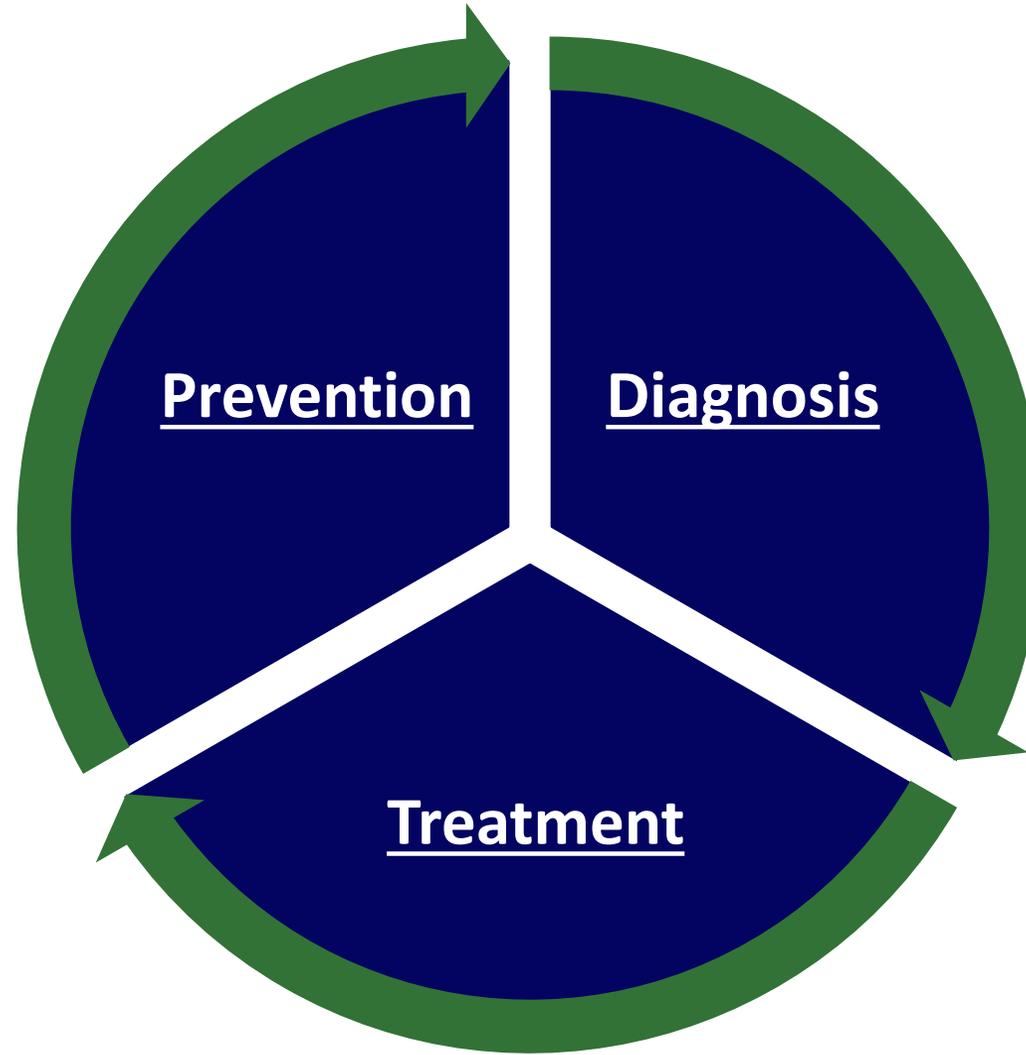


Delivering Disease Prevention[®]



Making New York a Healthier and Safer Place to Live
Public / Private Integrated Tick Management
April 26, 2018

Integrated Disease Control



Integrated Tick Management



Vector Control



US BIOLOGIC
Lyme Vaccine



Education

Integrated Tick Management



Landscaping



Behavioral

About *US BIOLOGIC*

- *US BIOLOGIC* is a social innovation, “[One Health](#)” Company focused on delivering disease prevention.
- We have developed an orally delivered wildlife Lyme vaccine targeted at the disease host to provide maximum benefit to pets and humans.
- We have also developed the “LymeShield” time-release application system providing automated year-long protection against infected ticks.
- We are in the process of building a complementary predictive analytics toolset to: 1) proactively predict disease hotspots, 2) educate/protect the public, and 3) guide disease prevention interventions.



Multi-Disciplinary Team of Leaders



Mason Kauffman
President and
Chief Executive Officer



Chris Przybyszewski
Executive Vice President



Steve Zatechka, PhD
Chief Science Officer



Maria Gomes-Solecki, DVM
Inventor & Science Advisor



Luciana Richer, DVM
Laboratory Director
& Principal Scientist



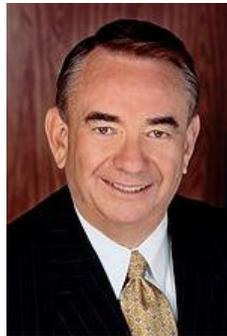
Steve Good
Senior PMP and
T&O Advisor



Tom Monath, MD
Board Member
Retired Director, CDC
Retired Chief, USAMRIID



Dave Williams
Board Member
Retired Chairman
& CEO of SANOFI



Gov. Tommy Thompson
Board Member
WI Governor for 14 years
U.S. Secretary of Health
& Human Services



Lance Waller, PhD
Rollins Professor &
Chair, Biostatistics
and Bioinformatics,
Rollins School of
Public Health

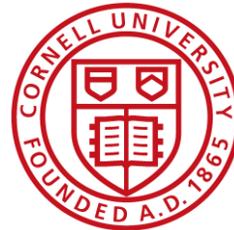
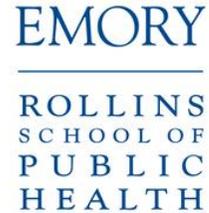


Stephen Wikel, PhD
Senior Science Advisor



Kirby Stafford, PhD
Chief Scientist / State
Entomologist, State of
Connecticut

Expanded Disease Prevention Partnerships



Lyme Prevention Community Survey

- 2017 survey conducted in 15 most Lyme-endemic states
- 600 qualified respondents (95% CI; 3% MoE)
- 71% suburban, 16% urban, 13% rural
- 100% homeowners
- 84% achieved a bachelor's degree or higher
- 52% primary decision makers; 48% co-decision makers
- 90% married or living as married
- 33% with children living at home

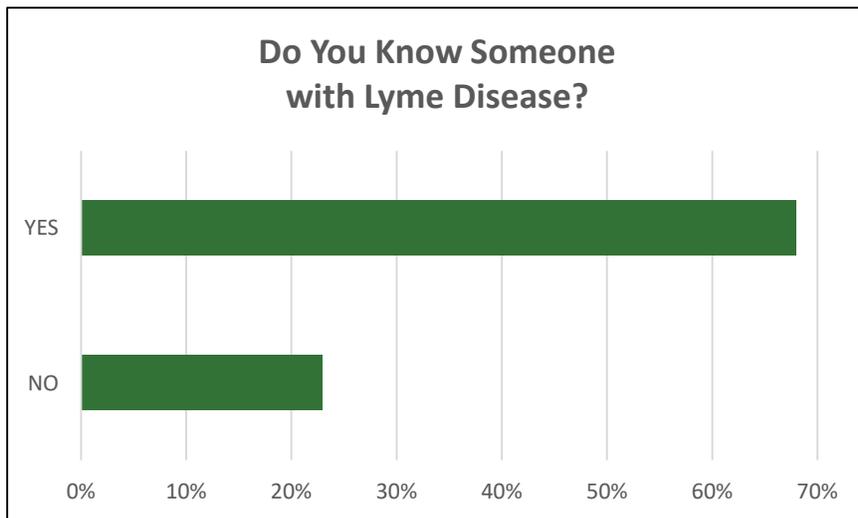
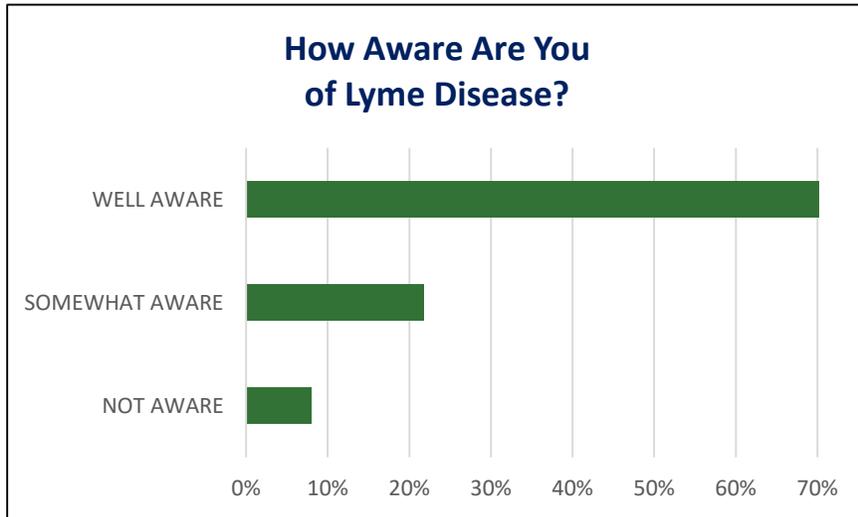
Lyme Prevention Community Survey Results

US BIOLOGIC commissioned an independent homeowner survey to assess awareness and concern of Lyme disease, as well as prevention interest.

The results:

- **84%** were concerned about **protecting their families**.
- **68%** believed Lyme-infected ticks **occupied their area**.
- **68%** either had **contracted Lyme disease** or **knew someone** who had contracted the disease.
- **85%** believed they had **no adequate way to protect their families**.

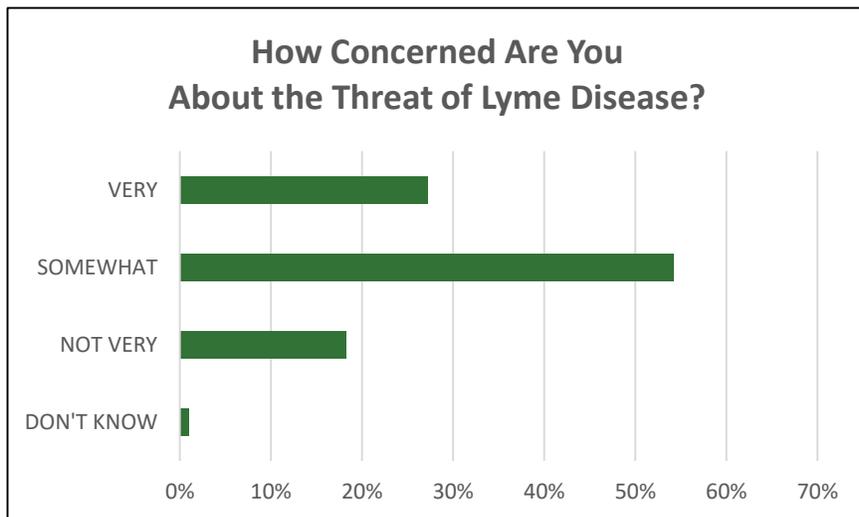
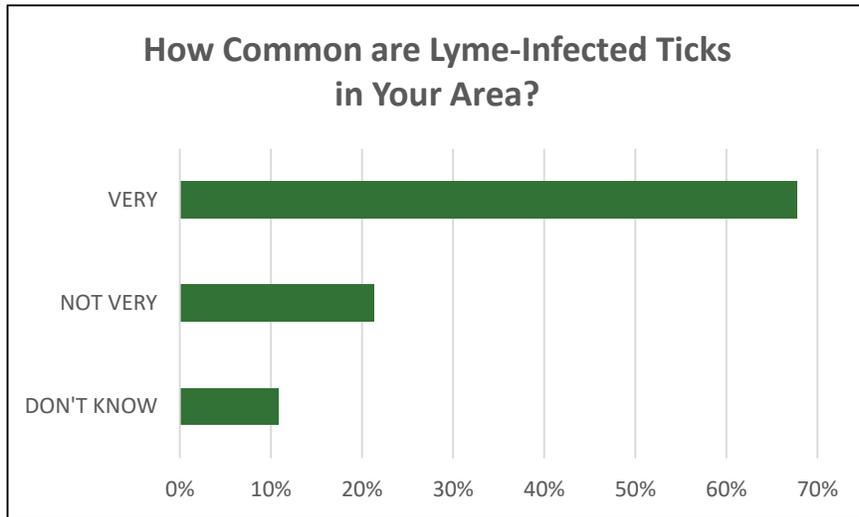
Lyme Prevention Community Survey Results



SUMMARY

- Respondents reported a high awareness that Lyme disease is very/somewhat common in surveyed states (**combined 92%**).
- Respondents reported a substantial personal experience with Lyme disease (**68%**).
- The effect is local. Those in High Incidence states were more likely (**74%**) than those in Low Incidence states (**62%**) to have a personal experience.

Lyme Prevention Community Survey Results



SUMMARY

- Nearly **70%** of respondents responded that Lyme-infected ticks occupied their area. Points to an awareness of “clear-and-present” danger.
- Incidence also played a factor. Those living in High Incidence states were more concerned about Lyme disease (**78% very/somewhat**) vs. Low Incidence states (**59% very/somewhat**).

Both Public and Private Protection is Important



Recreational Areas

- Parks, playgrounds, campgrounds, hiking trails, golf courses, sports fields, etc.



Trails

- Fields, forests, etc.
- Alongside lakes, rivers, etc.



Private Application

- Residential, universities, schools, camps, corporate campuses, country clubs, etc.

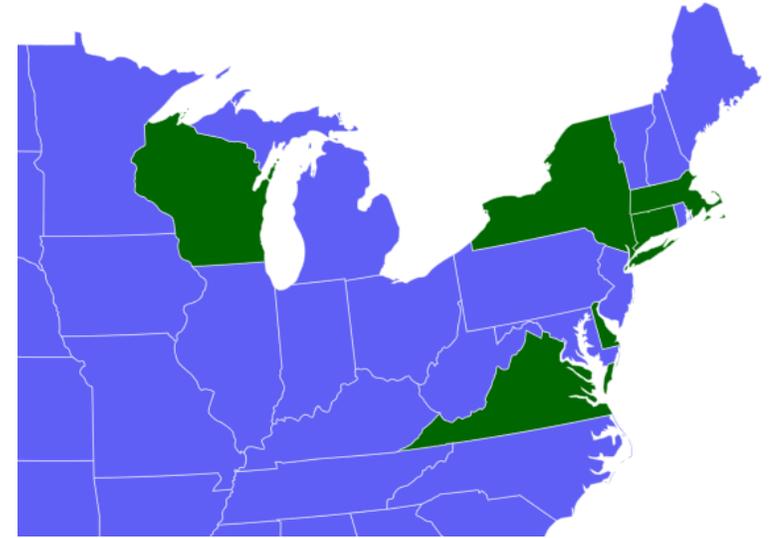
The LymeShield System

- Complements traditional treatment programs
- Promotes an eco-healthy environment
- Simple installation and automated application
- One station protects ½ acre
- Non-intrusive and designed to fit under existing shrubbery and foliage, the natural habitat for outdoor mice
- Year-long protection
- Multi-year system durability
- Designed to prevent all tick-borne disease



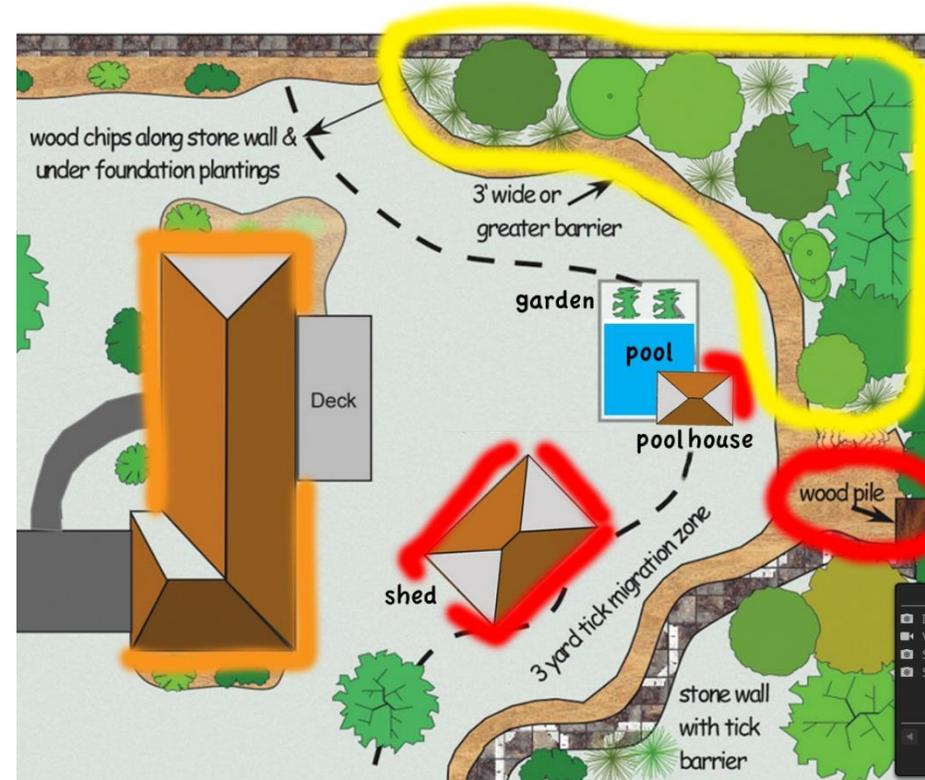
Summer 2017 Conditions of Use

- 300 stations were tested across 3 regions and five states (CT, MA, NY, VA, WI)
- High station durability – No external damage
- High station reliability of timing mechanism
- No appreciable environmental impact from rain, moisture, or insects
- No wildlife interference with use of the paver-fastening system (note images on right)
- Good pellet viability with anti-fungal coating
- Strong consumption by target species



Winter 2018 Conditions of Use

- Recognizing the foraging behavior of mice in winter, *US BIOLOGIC* and a pest-management partner repeated its summer program in during the winter of 2018.
- Stations were placed in three “zones” in a domestic setting to observe the function of the station *and* feeding behaviors of mice in the winter months.



Example Zone Map based on known “hot spots” of mouse / tick activity in winter.

Winter 2018 Conditions of Use

- 100 stations tested in nine sites in the NE
- Replicated Summer findings (e.g., reliability, low interference, no environmental issues, high durability)
- Strong battery life despite heavy snow fall and sub-freezing temperatures
- Strong consumption in all study sites
- No significant differences found in terms of which part of yard stations were placed
- Opportunity to provide year-long protection



Replicated Disease Prevention Study Results

Cary Institute of Ecosystem Studies

- 2007-2012
- Millbrook, New York
- Open field; trapped feeding; live vaccine
- Significant (75%+) reduction in infected ticks



Connecticut Agricultural Experiment Station

- 2014-2016
- Redding, Connecticut
- Residential; open feeding; inactive vaccine
- Equally significant reduction in infected ticks



Tick-Borne Disease Prevention Pipeline (under development)

- Tick Elimination Technology to help prevent all tick-borne disease
- Pet vaccines administered as treats
- ZooHub - Free mobile app to proactively identify and treat local Lyme infection hotspots (Analogous to the *Weather Channel* app)



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For More Information:
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