



Delivering Disease Prevention



Making New York a Healthier and Safer Place to Live

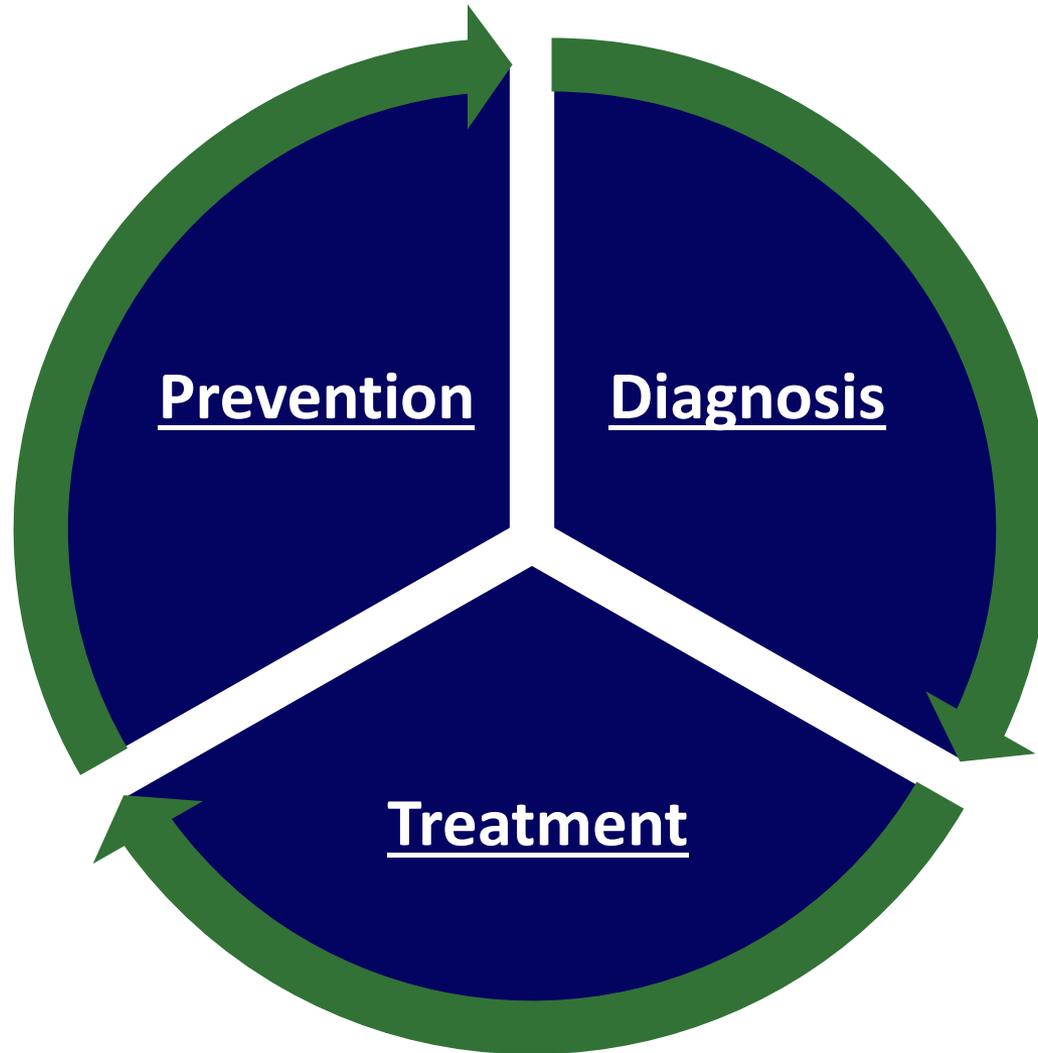
Public / Private Integrated Tick Management

May 10, 2017

Disease Prevention Partnerships



Integrated Disease Control



Zoonotic Disease



“Scientists estimate that more than **6 out of every 10** infectious diseases in humans are spread from animals.”

[CDC](#)



“**3 out of every 4** new or emerging infectious diseases in people are spread from animals.” [CDC](#)

Integrated Pest Management



Reservoir
Targeted Vaccine
(RTV)



Vector Control



Education



Behavioral

Integrated Pest Management

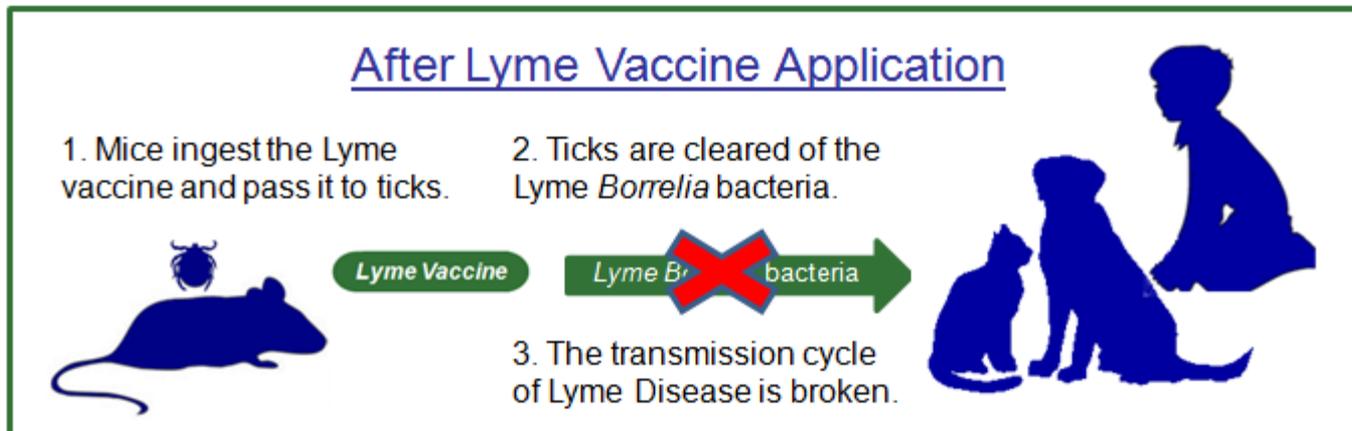
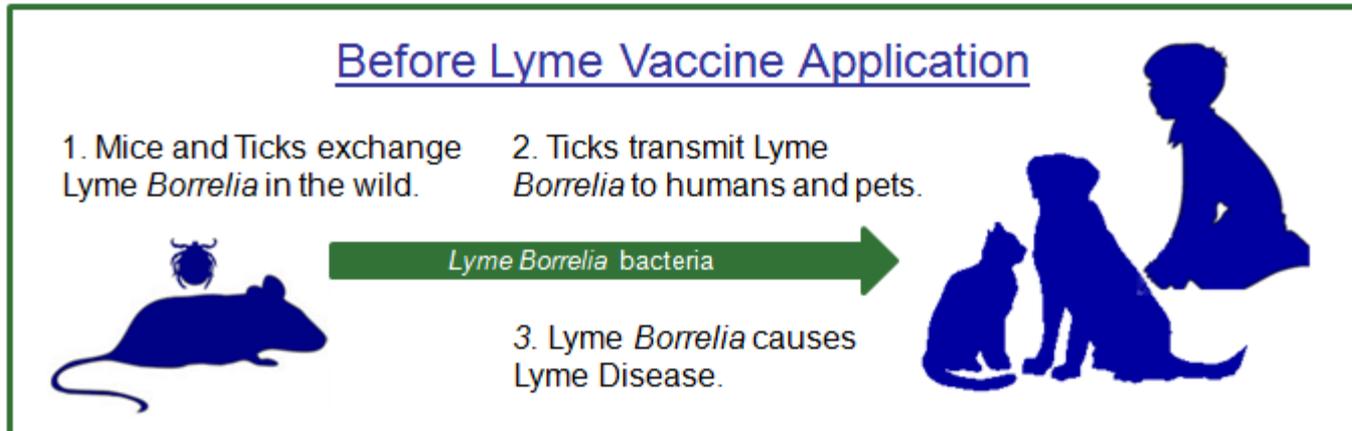


Mating Host
Control



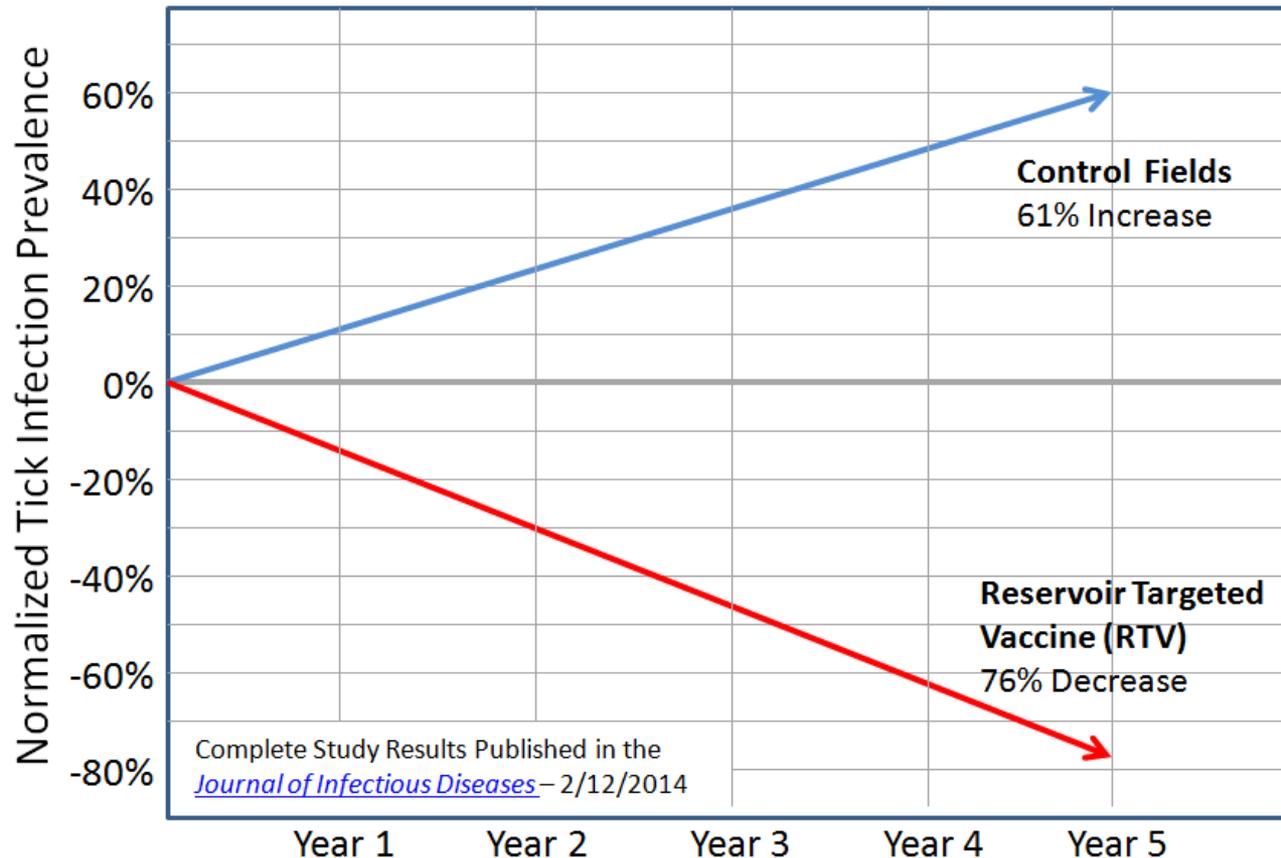
Landscaping

The Lyme Vaccine Solution



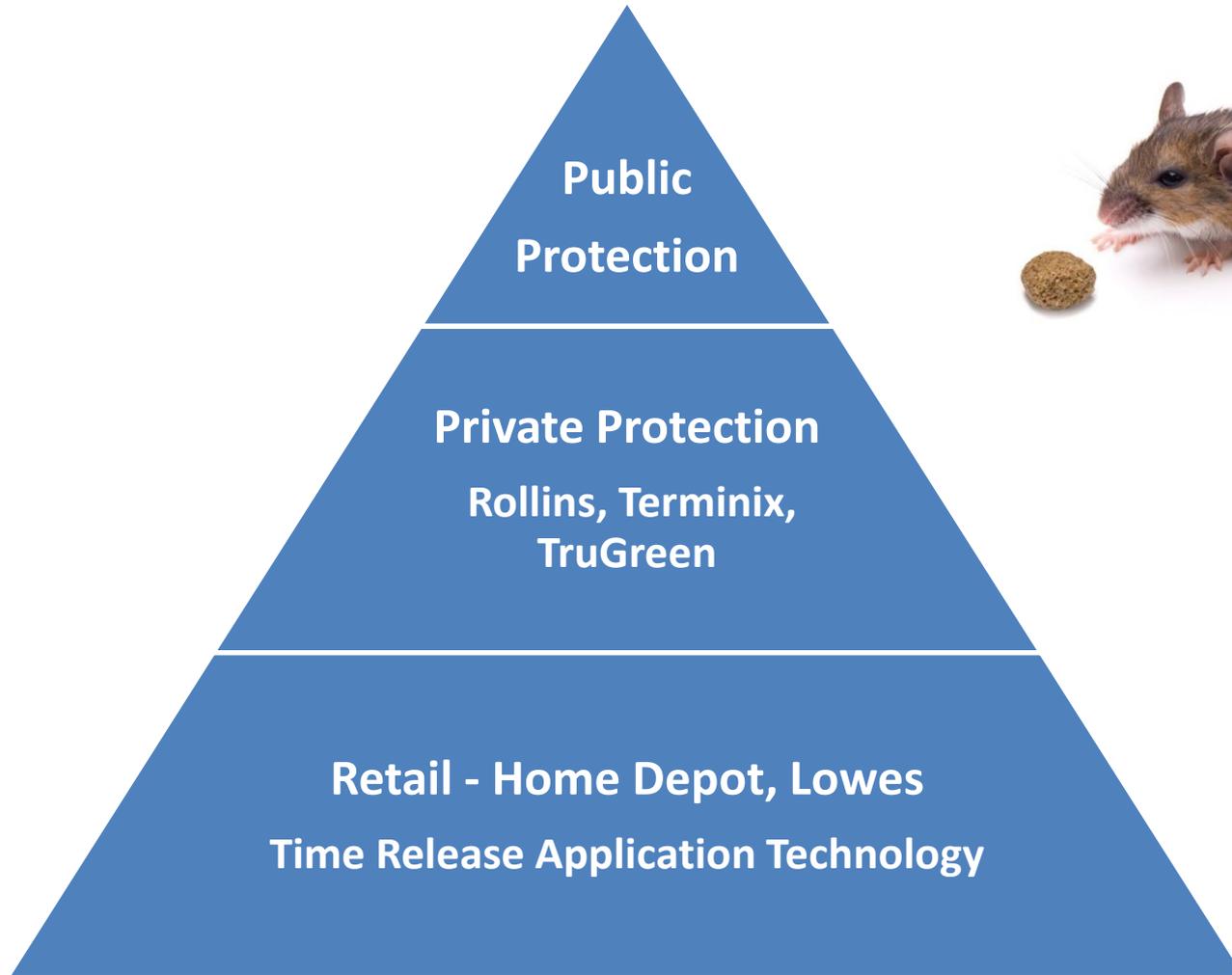
A disease prevention platform that can address multiple diseases.

New York RTV Tick Infection Reduction



Recent studies in partnership with the state of **Connecticut** have reported equally compelling reductions in tick infection.

LymeShield Application Partners



Public / Private Application



Recreational Areas

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



Trails

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

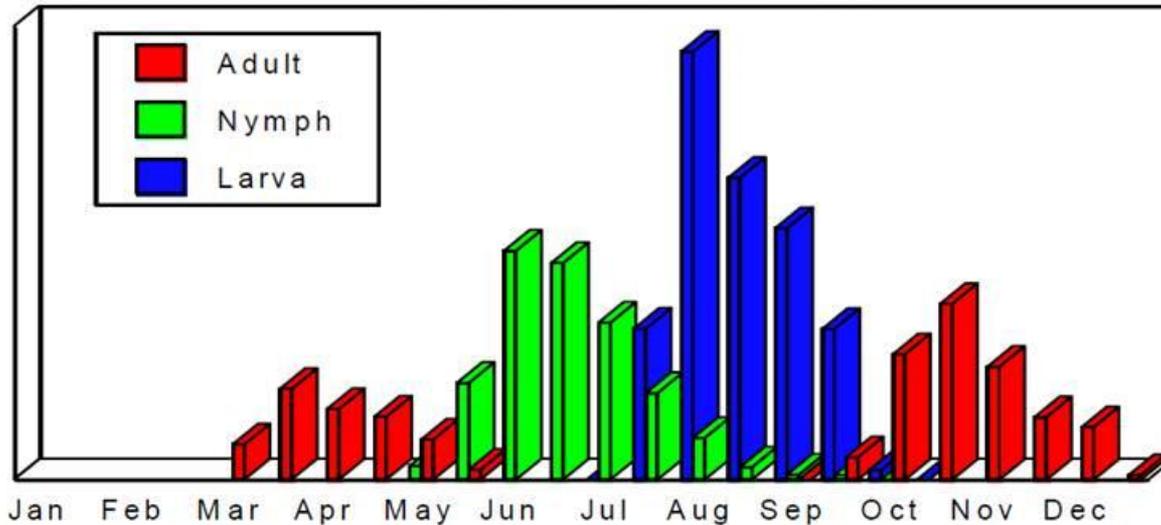


Private Application

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

Application Matched to Tick Cycle

Seasonal activity of *I. scapularis* adults, nymphs, and larvae.



W	S	M	T	W	T	F	S
18		1	2	3	4	5	6
19	7	8	9	10	11	12	13
20	14	15	16	17	18	19	20
21	21	22	23	24	25	26	27
22	28	29	30	31			

W	S	M	T	W	T	F	S
22					1	2	3
23	4	5	6	7	8	9	10
24	11	12	13	14	15	16	17
25	18	19	20	21	22	23	24
26	25	26	27	28	29	30	

W	S	M	T	W	T	F	S
26							1
27	2	3	4	5	6	7	8
28	9	10	11	12	13	14	15
29	16	17	18	19	20	21	22
30	23	24	25	26	27	28	29
31	30	31					

W	S	M	T	W	T	F	S
31			1	2	3	4	5
32	6	7	8	9	10	11	12
33	13	14	15	16	17	18	19
34	20	21	22	23	24	25	26
35	27	28	29	30	31		

Targeted distributions to “hot zone” areas during the months of May through August will cover multiple generations of mice and provide year-long protection.

Sample Public Protection Model



William R. Steinhaus Dutchess Rail Trail

County Disease Prevalence:	.14% (427 cases / 296,916 population)
Annual Trail Visitors:	~100,000 (and growing)
Lyme Risk:	140 visitors / year (.14% X 100,000)
Risk Cost:	\$1,507,660 (140 X \$10,769 / avg. cost)
Trail Size:	14 miles (280 acres)
Protection Cost:	\$42,000 (280 acres X \$150 / acre)
Cost of Protection / Visitor:	\$.42 / visitor

Notes: Estimated coverage acreage is variable per location.
Numbers do not include the CDC's 10X under-reporting factor.

Residential Protection



LymeShield System Functionality

- Complements current tick-prevention methods
- Season-Long Integrated Tick Management
- Oral and contact prevention options
- Simple 5 minute installation
- Automated time-release application
- No seasonal maintenance
- Multi-year system durability
- Aesthetically non-intrusive and designed to fit under existing shrubbery & foliage, the natural habitat for outdoor mice.

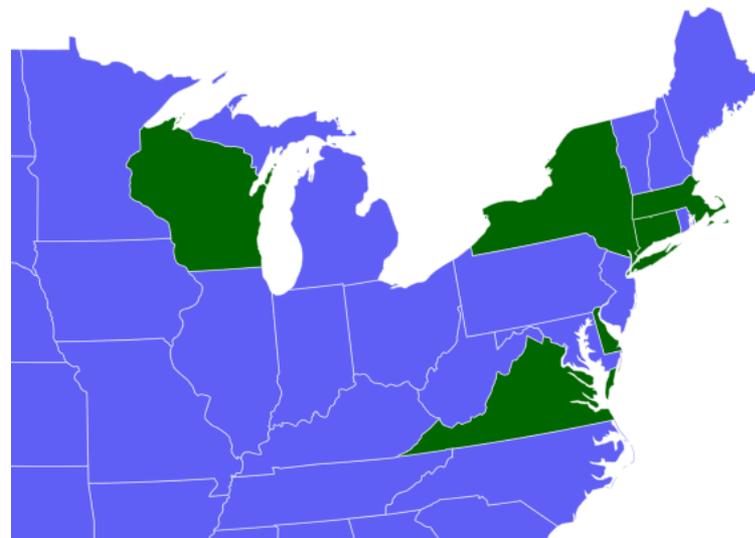


LYMESHIELD



2017 Application Plans and Partners

- In 2017, LymeShield Systems are being distributed in five states (CT, MA, NY, VA, WI).
- A select team of public/private leaders has been selected to participate. These include:
 - 5 Leading Pest Mgmt. Companies
 - The Dept. of Defense - Fort Drum
 - Nantucket Dept. of Public Health



2017 Implementation is focused on three strategic U.S. regions.

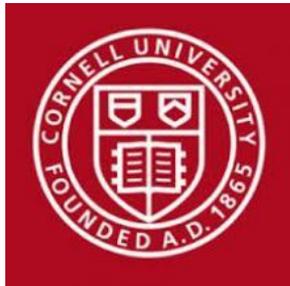
CDC Centers of Excellence Leadership



- Leveraged and shared assets and expertise



- Co-sponsored implementation



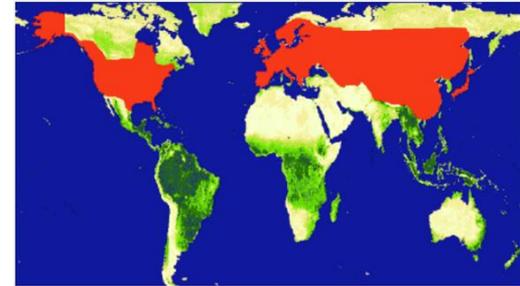
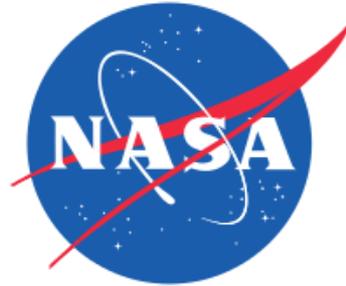
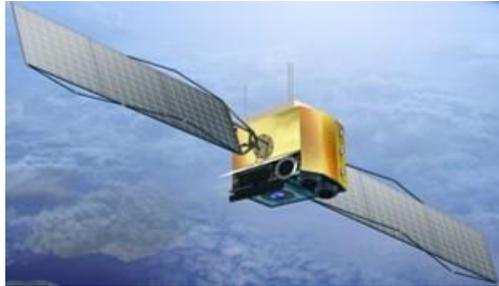
- Multi-institution, multi-site observation and application programs

Lyme Vaccine Summary

- 329,000+ U.S. Lyme Disease cases/year.
- Proven orally delivered Lyme vaccine targeting disease reservoir, the white-footed mouse.
- Novel time-release application system.
- **5-state planned market entry in 2017.** Partners include Rollins/Orkin, world's largest pest-management organization.
- **Environmentally-conscious.**



Tools in Development: BioLogistics



“With the help of Earth-watching satellites, scientists can identify high-risk "hot spots" for deadly diseases before outbreaks strike.”

NASA

In partnership with NASA, *US BIOLOGIC* is developing disease identification and prevention programs with acre-level precision.

Solutions in Development

- **Canine Lyme vaccines** can be delivered as a simple treat to replace traditional shots.
- **Expanded Disease Control** – Anaplasmosis, Babesiosis, etc.
- **Tick Feed Inhibitor** technology could address all tick-borne disease by preventing ticks from feeding on pets and humans.
- **Global RTV** tick strain refinement and delivery starting with Canada and Europe.



Delivering Disease Prevention



Thank You!

For additional information please contact:

Mason Kauffman (901) 755-6868

mason.kauffman@usbiologic.com