Prevention and Control of Tick-Borne Diseases

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Major Ticks of Concern Northeastern U.S.

Blacklegged Tick

American Dog Tick

Lone Star Tick

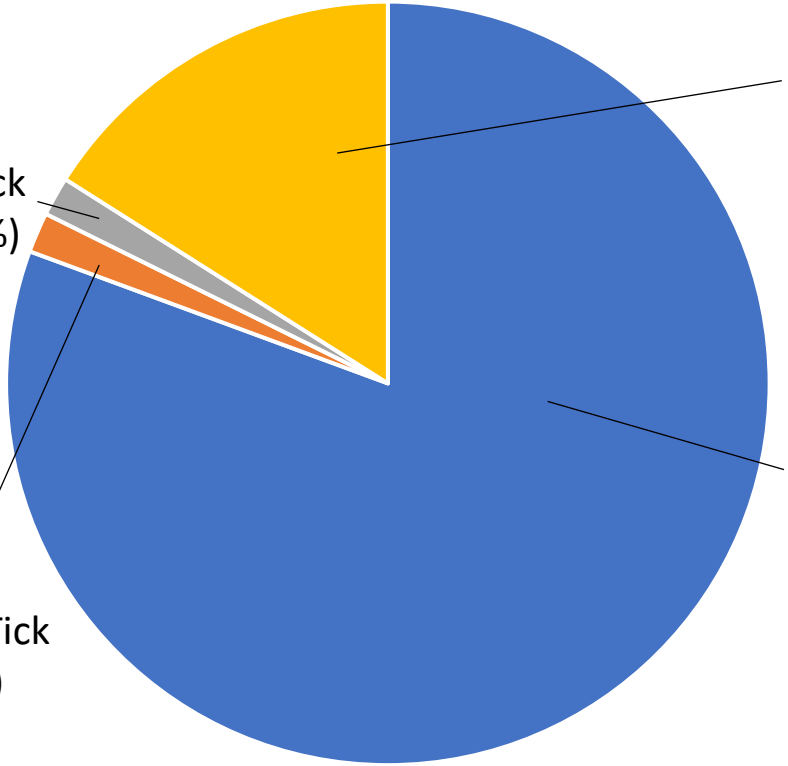
Gulf Coast Tick

CDC/James Gathany

Longhorned Tick

CDC/James Gathany

CAES Active Tick Surveillance Program in 2024



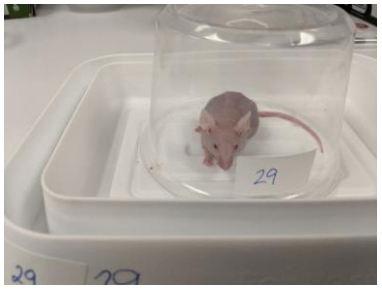
Total ticks collected
N =4,345

Integrated Tick Management (ITM)

- "Integrated management pursues the optimized use of compatible methods to manage pests in a way that is safe, economically viable, and environmentally sustainable."

Individual Methods for ITM

- Education and behavior changes
- Personal protective measures
- Landscape modifications
- Chemical control
- Biological control
- Host reduction and/or exclusion
- Host-targeted acaricides and vaccines



Integrated Tick Management

Short Term and Small Scale

Immediate need

Homeowners

Peridomestic

Within season

Smaller hosts and habitat

Long Term and Large Scale

Landscape approach

Across years

Cumulative impact

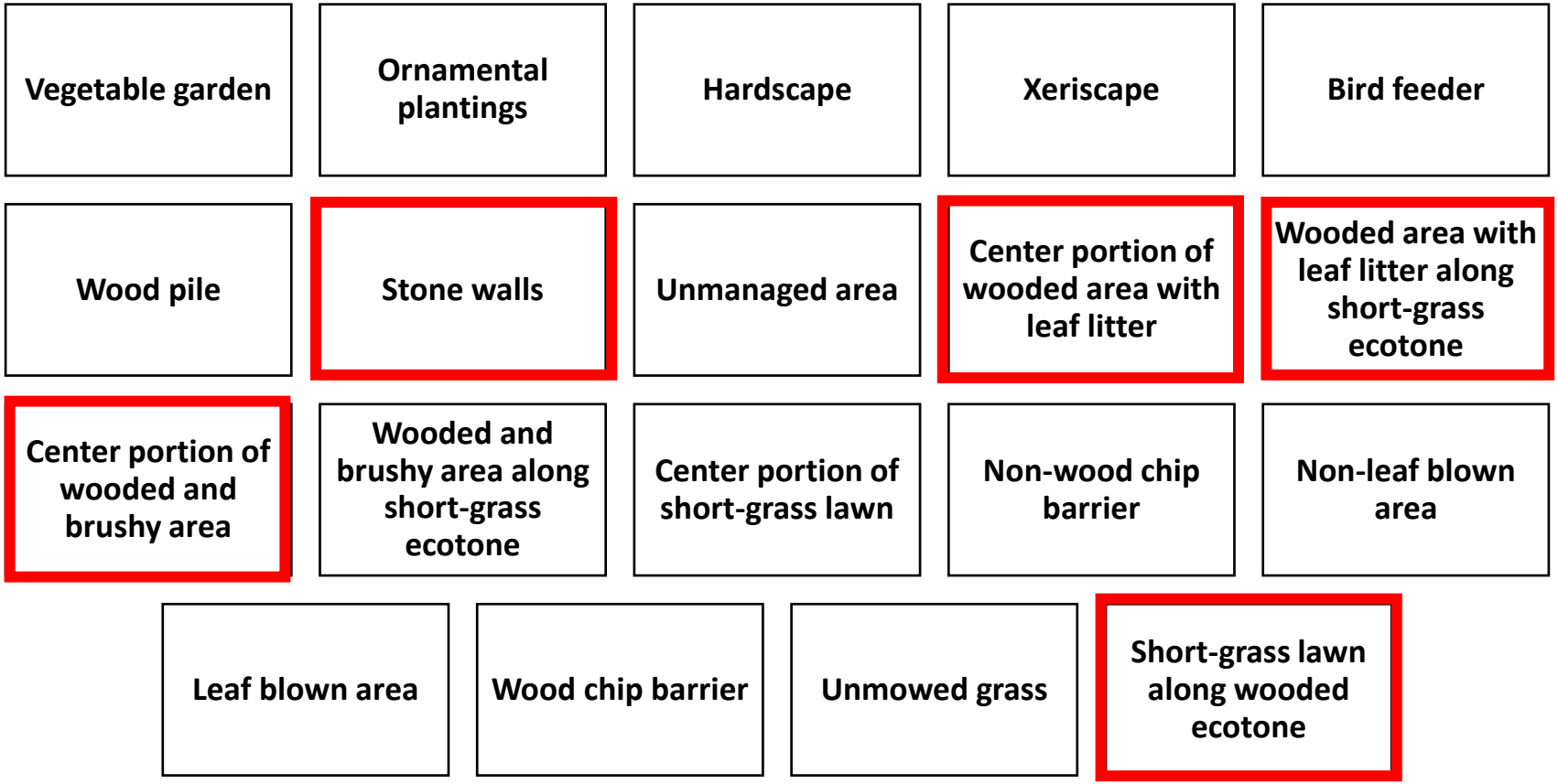
Larger hosts and habitat

Distribution of Blacklegged Ticks in Residential Backyards

Vegetable garden	Ornamental plantings	Hardscape	Xeriscape	Bird feeder
Wood pile	Stone walls	Unmanaged area	Center portion of wooded area with leaf litter	Wooded area with leaf litter along short-grass ecotone
Center portion of wooded and brushy area	Wooded and brushy area along short-grass ecotone	Center portion of short-grass lawn	Non-wood chip barrier	Non-leaf blown area

Leaf blown area	Wood chip barrier	Unmowed grass	Short-grass lawn along wooded ecotone

Evaluation of landscaping and vegetation management



Evaluation of landscaping and vegetation management

Findings and Implications

- Not all habitat is significant
- Not all manipulations make an impact
- Host-habitat dynamics
  - Intersection of host and tick preferred habitats
- Increase homeowner awareness
- Acaricide applications
  - More targeted and responsible application of acaricides
  - Advancing the field of pesticide application

Evaluation of Fall and Spring Pesticide Applications

Treatments

- Demand CS (lambda-cyhalothrin)
  - High pressure spray rig
  - Powered backpack blower

Findings and Implications

- High pressure spray and backpack spray have multi-season impact when sprayed in the Fall
- High pressure spray is more effective at reaching leaf litter layers
  - Breaches hospitable habitat for ticks utilized during questing seasons and overwintering

Continuation of Study

Two years

- Looking at cumulative impacts

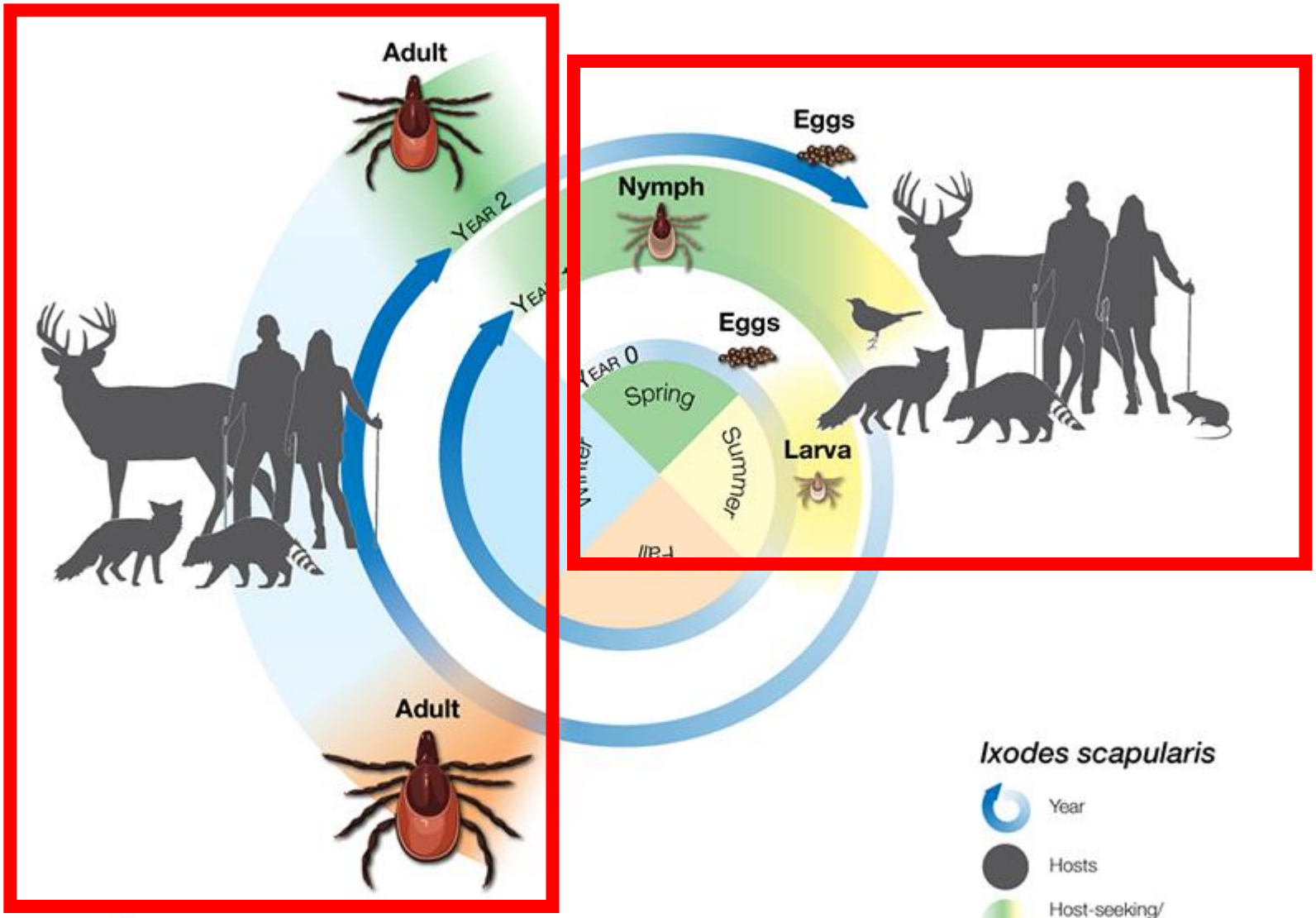
Non-target surveys

- Blue vane traps

Soil and leaf litter testing

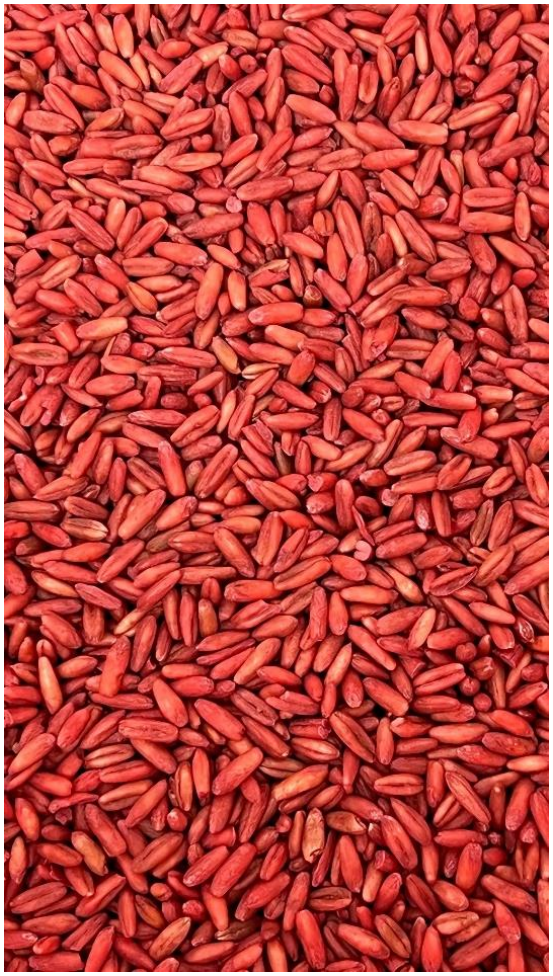
- Active ingredient breakdown over winter

Three-host Tick Life-cycle



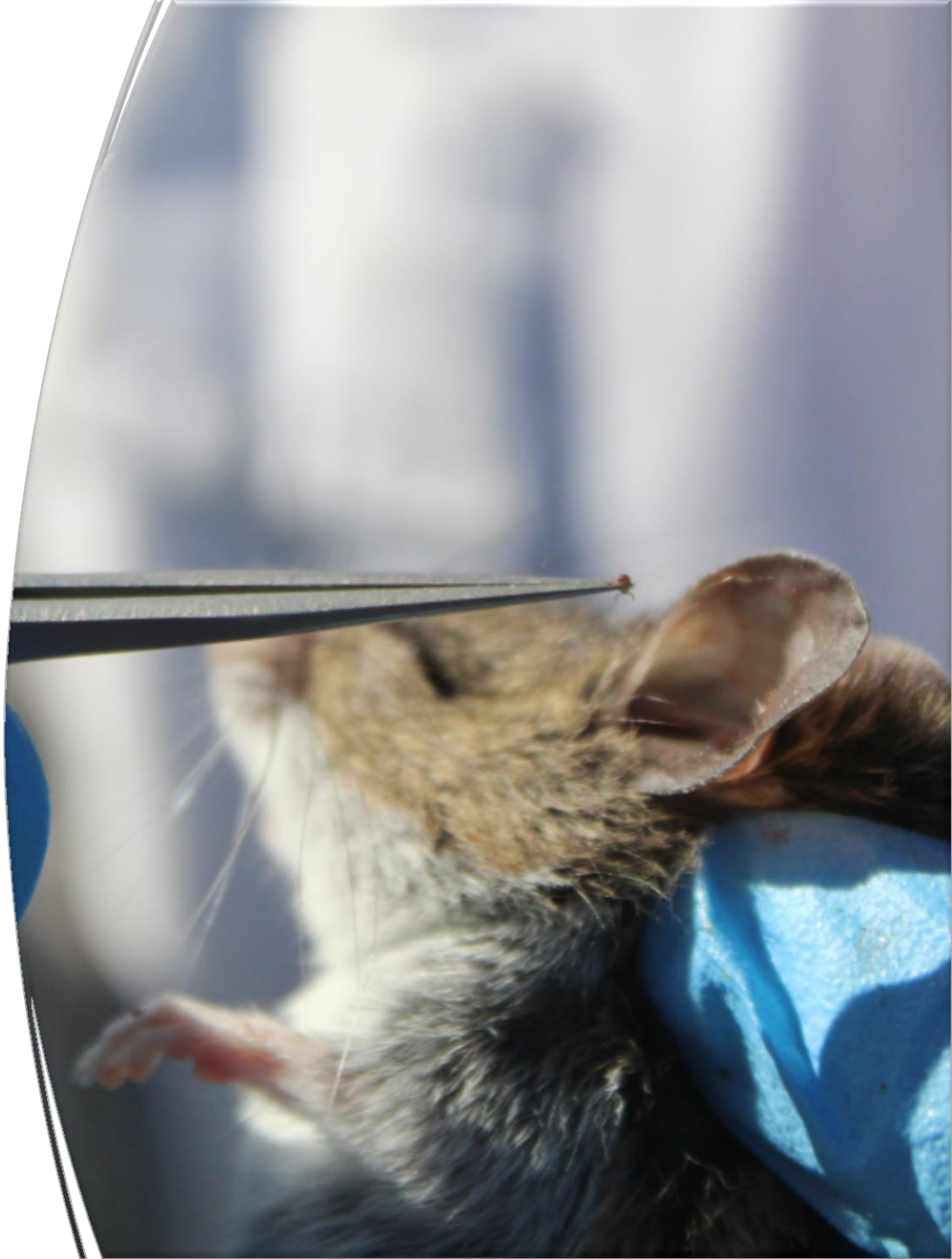
Systemic Treatment of White-Footed Mice


RESTRICTED USE PESTICID
e to Need for Highly Specialized Applicator T
ale to and use only by Certified Applicators or persons under their d
and only for those uses covered by the Certified Applicator's certifica
Kaput®
FLEA CONTROL BAI
WITH FIPRONIL
KILLS OROPSYLLA SPP. FLEAS, NOT THE PRAIRIE DOG
NET WT. 25 LBS. (11.3 kg)
EPA Est. 72500-CO-1
Keep Out of Reach of Chil
CAUTION
See back panel for First Aid and Precautions



Findings and Implications

- Oral delivery of systemic acaricide (fipronil) to white-footed mice to reduce juvenile *Ixodes scapularis* tick burdens.
  - Traditionally, fipronil is applied topically to rodents, but oral delivery is a newer approach.
  - Bait box sites saw rapid tick reduction
    - Tick reductions (80% in 2021, 94% in 2022)



Systemic Treatment of White-Tailed Deer

Findings and Implications

- 83% of captured deer were above minimum lethal level
  - 5-8 ppb
- Proved they will consume the bait and in the necessary quantity for it to be effective
- Trials with fipronil-based bait currently being tested

Evolving, Adapting, and Evaluating Treatment Strategies

- Optimizing individual treatments
  - Efficient and sustainable acaricide application
  - Systemic treatment interrupting the tick life cycle and pathogen transmission cycle
- Identifying significant combinations
  - Short term and long term

Acknowledgements

- Dr. Kirby Stafford III
- Dr. Scott Williams
- Dr. Goudarz Molaei
- Dr. Douglas Brackney
- Ms. Jamie Cantoni
- Ms. Heidi Stuber
- Mr. Michael Short
- Mr. Duncan Cozens
- Dr. Jessica Brown
- Ms. Natalie Bailey

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