2ND ARIZONA STATEWIDE TRIBAL, IHS, AZDHS, CDC RMSF MEETING

ENVIRONMENTAL TICK CONTROL AND SURVEILLANCE COMMITTEE

Development of programs for tick surveillance, risk assessment, and best practices on tick control

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RMSF RISK ASSESSMENT, MANAGEMENT & CONTROL PROCESS

Environmental Tick Control and Surveillance

Risk Assessment
- Conduct home assessment
- Tool: Assessment Form

Risk Management
- Make RMSF and tick control decisions based on assessment
- Tool: Decision Flowchart

Risk Control
- Implement an effective RMSF and tick control plan
- Tool: Control Guidance
RISK ASSESSMENT
Environmental Tick Control and Surveillance

• Tick control committee developed a comprehensive form that incorporates questions in three main areas:
  • Human (e.g. knowledge and awareness of RMSF)
  • Dog (e.g. observe dogs for ticks, free roaming?)
  • Living Environment (e.g. assess the home and surroundings for tick harborage)
RISK MANAGEMENT: DECISION MAKING

Environmental Tick Control and Surveillance

Low Risk = Response may be focused on one specific finding from the risk assessment

Moderate Risk = Response may include several interventions

High Risk = Response should be broad and comprehensive

LOW RISK
- No reported human RMSF cases
- No evidence or report of tick presence in community or home
- No stray dogs in the area
- Yard is free of tick harborage
- Home owner is knowledgeable and aware of RMSF and tick control measures
- No seroprevalence in dogs

MODERATE RISK
- Report of ticks in the yard
- Children at residence
- Tick harborage areas present in yard
- Free roaming dogs at the home
- Home owner is aware of RMSF & tick control measures
- Positive seroprevalence in 15-50% of dogs

HIGH RISK
- Confirmed, probable, or suspect human RMSF cases in the community
- Observed tick presence in yards, homes and on dogs
- Free roaming dogs in the community
- Positive seroprevalence in >50% of dogs
RISK MANAGEMENT: DECISION MAKING
Environmental Tick Control and Surveillance

BEGIN

Community
- Human RMSF cases in community or
- Tick observed on dogs and in the environment
- Free roaming dogs in the community
- Positive seroprevalence in >50% of dogs

YES

Consider implementing comprehensive tick control plan that may include:
- Yard and dog treatment
- Modifications to environment
- RMSF Education
- Animal Control

High Risk Recommendation

NO

NO

Home
- Homeowner reports ticks in yard or home or
- Positive seroprevalence in 15-50% of dogs
- Children at residence

YES

Consider proactive yard and dog tick treatment and emphasize importance of eliminating tick harborage areas and need for animal care and control

Moderate Risk Recommendation

NO

Lack of homeowner awareness of RMSF and control measures
- No yard fence to keep out free roaming dogs

YES

Educate homeowner on RMSF and tick control measures along with encouraging continuous monitoring for ticks

Low Risk Recommendation

NO

END

Closeout with homeowner and provide recommendations

Framework for interpreting assessment results and making recommendations for appropriate controls
SURVEILLANCE STRATEGIES
Environmental Tick Control and Surveillance

- Canine Tick Load
- Environmental Tick Load
- Canine Seroprevalence
- Tick Rickettsial Prevalence
- Climate Considerations
CANINE TICK LOAD
Environmental Tick Control and Surveillance

CONSIDERATIONS
- Possible Indicator of community-wide tick problem
- Possible indicator of a tick problem on a specific property
- Provides a baseline to measure interventions
- Can be used in combination with other factors to determine risk

METHODS & RESOURCES
- Observational method
- Consider representative sample of communities
- Determine proper sample size
- Consider seasonal differences
- Consider gathering additional information (e.g. presence of tick collar)

LIMITATIONS
- Treated /protected dogs may affect results of survey
- Temperature and seasonal differences
ENVIRONMENTAL TICK LOAD
Environmental Tick Control and Surveillance

CONSIDERATIONS
• Carbon Dioxide Tick Trap
• Drags and flagging (do not work well for the Brown Dog Tick)
• Environmental Assessment/Inspection

METHODS & RESOURCES
• Dry ice emits carbon dioxide and attracts ticks
• Ticks are gathered on flannel cloth
• Provides estimates of tick load
• Observation of ticks in the environment - Environmental Assessment Forms

LIMITATIONS
• Limited laboratory capacity for counts and species identification
• Results variable depending on weather conditions (wind, rain) and seasonal differences
• Availability of dry ice
CANINE SEROPREVALENCE
Environmental Tick Control and Surveillance

CONSIDERATIONS
• Baseline, Investigative, Evaluative Measures
• Conducted by Veterinarians and Veterinarian Technicians
• No rapid clinical test available
• Laboratory analysis required

METHODS & RESOURCES
• Consider age of dog when developing strategy
• Frequency of sampling depends on use of data
• Veterinarian/Vet Tech

LIMITATIONS
• Laboratory capacity
• Limited funding
• Requires specific expertise (Veterinarian/Vet Tech)
TICK RICKETTSIAL PREVALENCE
Environmental Tick Control and Surveillance

CONSIDERATIONS
• Testing ticks to determine infectivity
• Typically used in specific outbreak or case investigations

METHODS & RESOURCES
• Collected from dogs and or tick traps
• Requires laboratory analysis
• Canine seroprevalence is more commonly used to determine RMSF activity

LIMITATIONS
• Funding
• Laboratory capacity
• May require a large number of tick samples
CLIMATE CONSIDERATIONS
Environmental Tick Control and Surveillance

CONSIDERATIONS

- Monitoring climate trends to understand changes in tick populations
- Monitoring weather conditions to predict tick activity

METHODS & RESOURCES

- Requires monitoring of trends in climate over long periods of time
- Local weather data
- Can be used in combination with field observation and or complaints
- Can help determine most effective times of control activities

LIMITATIONS

- May require local weather station
- Dedicated staff and expertise
CONTROL MEASURES
Environmental Tick Control and Surveillance

- Integrated Pest Management
- Product Selection and Cost
- Estimated Labor Costs
1) Ideally, individuals take responsibility for tick control on their dogs and homes

2) Out of necessity, Gov. programs providing tick treatment
INTEGRATED PEST MANAGEMENT
Environmental Tick Control And Surveillance

A) Dogs need year round protection from ticks
Ticks feed and breed on dogs. That’s when we can get ‘em!

B) Reduce Tick Habitat

Outdoors: Remove vegetation and solid waste. Routinely inspect dog housing. Indoors: general sanitation, clutter removal, routine dog bed laundering

C) Pesticide application
PRODUCT SELECTION AND COST
Environmental Tick Control And Surveillance

Product and Cost variables

a. Application equipment cost
e. Travel Time
b. Pesticide Cost
f. Manpower
c. Application rate
g. Training
d. Residual
h. Efficacy

Product cost (excluding staff & capital) = [product cost per dog] x [number of dogs to be treated] x [number of treatments needed per year]

Tick Collar Examples:

(A) Propoxur collar $3.50 each x 2,600 dogs x 4 treatments per year = $36,400. Providing collars door-to-door would require visiting 1,105 homes four times per year. Estimate 1 FTE with vehicle visiting 40 homes per day for 110 work days, or nearly 6 months

(B) Switch to $40 collar lasting 8 months = $156,000 and 1 FTE visiting 40 homes/day for 41 days
Pesticide Examples:

(A) 25 lb bag Permethrin granules ($18 each / 6 homes treated per bag) x 2,400 homes x 12 treatments per year = $86,400

(B) 10% liquid Permethrin concentrate diluted and applied by pickup mounted 50-gal gas powered high volume sprayer

$10.66 per homesite treated x 2,400 homes x 12 treatments per year = $307,008
### Pesticide application method vs. Estimated number homes treated per team per day

<table>
<thead>
<tr>
<th>Pesticide application method</th>
<th>Estimated number homes treated per team per day</th>
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</thead>
<tbody>
<tr>
<td>Granules – seed spreader</td>
<td>45</td>
</tr>
<tr>
<td>Liquid – RTS hose attachment</td>
<td>18</td>
</tr>
<tr>
<td>Liquid – hand pump sprayer</td>
<td>30</td>
</tr>
<tr>
<td>ATV mounted sprayer</td>
<td>55</td>
</tr>
<tr>
<td>Pickup mounted sprayer</td>
<td>35</td>
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TAKE HOME MESSAGES
Environmental Tick Control And Surveillance

Risk Assessment

• Assessing RMSF risk is essential to determining and implementing appropriate and effective tick control measures.

Surveillance Strategies

• Surveillance can provide measurement and direction for prevention efforts.

Control Measures

• By following IPM principles, tick control measures are most effective when custom tailored to your specific environmental conditions.
Q & A

THANK YOU