Public Health IPM Leadership Team

Kacey Ernst
Epidemiology & Biostatistics
Vector-borne disease transmission and control

Dawn Gouge
Entomology
Public health entomologist

Lucy Li

Paula Rivadeneira
Soil, Water & Environmental Science
Food Safety and Wildlife

Trent Teegerstrom
Agricultural & Resource Economics
Risk Management; Associate Director of Tribal Extension

Kathleen Walker
Entomology
Mosquito vectors

Peter Ellsworth
Entomology
IPM, APMC & Pesticide Coordinator
An Invasive New Tick Is Spreading in the U.S.

The Asian long-horned tick was first identified in New Jersey last November. The species now has been reported in the suburbs of New York City and as far west as Arkansas.

James Gathany/Centers for Disease Control and Prevention

- IPM Short
- Extension Publication
- Media release
- Information distribution
Human ectoparasites

MANY OTHER PESTS
Integrated Pest Management Team

Making life healthier and happier where people live, learn, and heal.

Integrated Pest Management Team

Making life healthier and happier where people live, learn, and heal.

IPM in Public Housing

- Implemented IPM strategies in five public housing sites (612 units).
- 87% reduction in German cockroaches
- 93% reduction in bed bugs
- Sanitation standards improved and clutter levels reduced

Improved satisfaction

1  2  3  4  5
Wow...... 1,500 participants in one webinar!

Integrated Pest Management—A Simple Solution to Problem Pests in Elderly and Disabled Public Housing

Welcome to Integrated Pest Management—A Simple Solution to Problem Pests in Elderly and Disabled Public Housing

Download a PDF of today’s presentation and other materials at http://stoppests.org/go/IPMsolution

Brought to you by:

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Presenters: Dawn H. Gouge, Ph.D., Shujuan (Lucy) Li, Ph.D., Shakunthala (Shaku) Nair, Ph.D. - Arizona Pest Management Center, University of Arizona–MAC, Maricopa

Date of live broadcast: November 14th 2018

Integrated Pest Management—A Simple Solution to Problem Pests in Elderly and Disabled Public Housing

Today’s Presenters:

Dawn H. Gouge, Ph.D., Shujuan (Lucy) Li, Ph.D., Shakunthala (Shaku) Nair, Ph.D. - Arizona Pest Management Center, University of Arizona–MAC, Maricopa

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Industry Partnership

B&G Lo Line Cockroach Traps

SenSci ActivVolcano
CEUs applied for: AZ, NV, NM, and CA AG and SPCB

GOLD SPONSOR

SILVER SPONSORS
2017-2020.
Evaluate field integrated vector management techniques.
Assess impacts of targeted larviciding and ultra-low volume (ULV) adulticiding on the abundance and age structure of *Aedes aegypti* in south-central Arizona.
CDC 2004-2016 U.S. vector-borne human disease cases tripled
9 pathogens discovered or introduced

Every year around 110 people in AZ are clinically ill with West Nile - 5-10 preventable deaths

2018
23 clinical
4 fatalities
Mosquito that could transmit pathogens to humans if the pathogens were introduced

DEFEND AGAINST DENGUE

YELLOW FEVER ZONE

ZIKA VIRUS

1 travel

0

7 travel

Zika risk

No Aedes aegypti over 5,500 feet elevation?
2018 Sonora Zika

Cases

2018 Sonora confirmed  2017 Sonora confirmed

2018 Dengue

Human Dengue Rates (per 100,000)

0.0  0.0-0.05  0.05-2.0

Aedes aegypti Mosquito Pools (n=7,384)

* Trace set in the same location at different times are displayed only once in the map.
AEDES AEGYPTI ABUNDANCE 2014

2016

Rainfall and high temperature strongly predict mosquito presence

Higher wealth consistently associated with higher mosquito abundance, even when adjusted for rainfall and temperature
“Field” study

2017- Are methods used to control Culex mosquitoes effective against Aedes aegypti?

- Adulticide fogged from truck
- Granular larvicide
- Surveillance methods effective for A. aegypti?
**Adulticiding efficacy**

![Bar chart showing adulticiding efficacy](chart.png)

- Before spray
- After spray

**Older mosquitoes are more likely to transmit disease causing pathogens**

![Image of a mosquito](mosquito.png)
How old are the mosquitoes?

- Parity analysis

- qPCR with SCP1

![Gene expression SCP/RP graph](chart.png)

Age of pooled mosquitoes in days post-eclosion

Gene expression SCP/RP
How old are the mosquitoes?

- NIRS

Larvae
2017 resident exit survey results

Hard copy and online exit survey
67% found the weekly reports very useful
43% called, texted or emailed questions

What did people do?

- Avoided outside
- Pest-proofed home
- Reported mosquitoes to vector
- Inspected and eliminated
- Used fish or a biocontrol agent
- Used a pesticide outside
- Did something else (called us for...)
- Used repellent

% of participants
2017 conclusions

• West Nile and/or Saint Louis encephalitis viruses in mosquitoes in 50% of surveyed blocks
• Control methods are not effective
• Monitoring methods are not effective
• Residents are concerned
  Residents do not report mosquitoes

2018 - Are improved methods more effective?

• DeltaGard & Permanone adulticide
• Larviciding Altosid® XR-Briquets 150 day
Aedes aegypti trap counts over time

Number of mosquitoes

2017  2018

July  Aug  Sep  Oct

Neighborhood retention areas

• Wettest October ever
• 4th wettest month

The calendar year total 8.72"  2.55" above normal
Neighborhood retention areas

You breed ‘em – you feed ‘em
Are fogged *Aedes aegypti* populations younger?

### Before treatment vs After treatment

![Graph showing Before and After treatment](image)

- **Before treatment:**
  - AA046
  - n = 7

- **After treatment:**
  - AA046
  - n = 13

- *Before treatment* compared to *After treatment* shows a decrease in the population size.
2018 resident exit survey results over half had participated in 2017

Hard copy survey
- 61% found the weekly reports very useful
- 46% invited us to HOA meeting
- 85% called, texted, or emailed

What did people do?

- Used repellent
- Did something else (called us for advice)
- Used a pesticide outside
- Used fish or a biocontrol agent outside
- Inspected and eliminated standing water
- Reported mosquitoes to vector control
- Pest-proofed home

2018 conclusions

- West Nile and/or Saint Louis encephalitis viruses in mosquitoes in 50% of surveyed blocks
- Control methods are not effective
- HOAs groups are concerned about health impacts - $
- Residents do not report mosquitoes
- Water management