



TEXAS

Health and Human Services



Texas Department of State  
Health Services

# Mosquito Surveillance in Texas

**Bethany Bolling MS, PhD**

**Arbovirus-Entomology Laboratory**

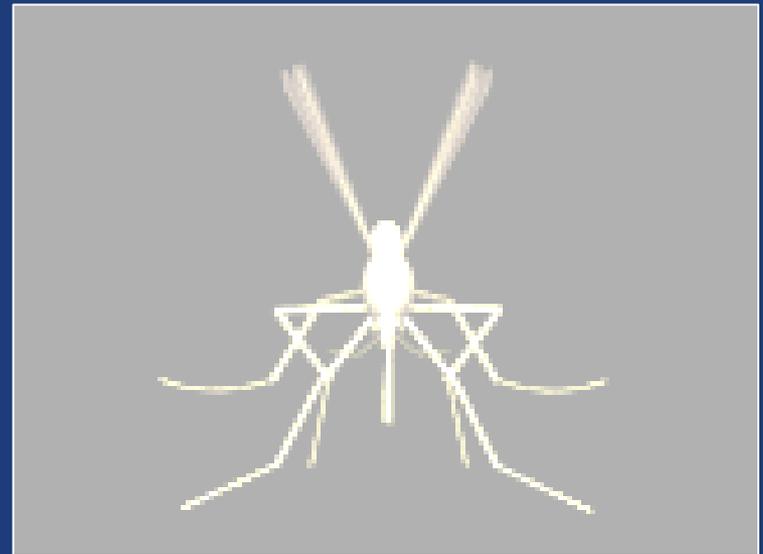
# Overview



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- Arbovirus-Entomology Laboratory
- Mosquito surveillance
- Mosquito control
- UTRGV Project



# Importance of Mosquito Surveillance



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- Emerging and re-emerging arboviral diseases
- Lack of vaccines licensed for human use
- Vector control is the primary disease prevention strategy
- Mosquito surveillance and testing data can determine areas of human risk for arboviral diseases
- This information can be used to inform the public regarding arbovirus activity and to direct vector control efforts



<http://backyardbugpatrol.com/>



# Arbovirus Laboratory



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(Arbovirus - Arthropod-borne virus)

- Services provided:
  - Mosquito species identification (year-round)
  - Mosquito testing (May-November)
  - Testing rabies-negative equines for arboviruses (year-round)
  - Insecticide resistance testing- *Aedes* species





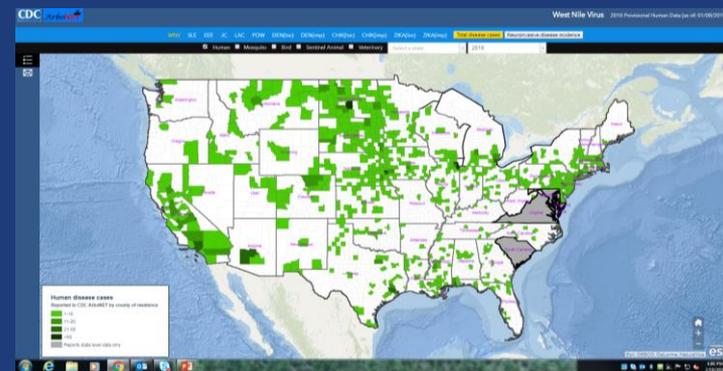


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# Result Reporting

- Turnaround time for results
  - 1-2 days for mosquito identification
  - 2-3 days for multiplex testing
  - ~2 weeks for cell culture testing
- Virus-positive mosquito pool results
  - Phone call
  - Email report
  - Notify Zoonosis Control Branch for ArboNET reporting

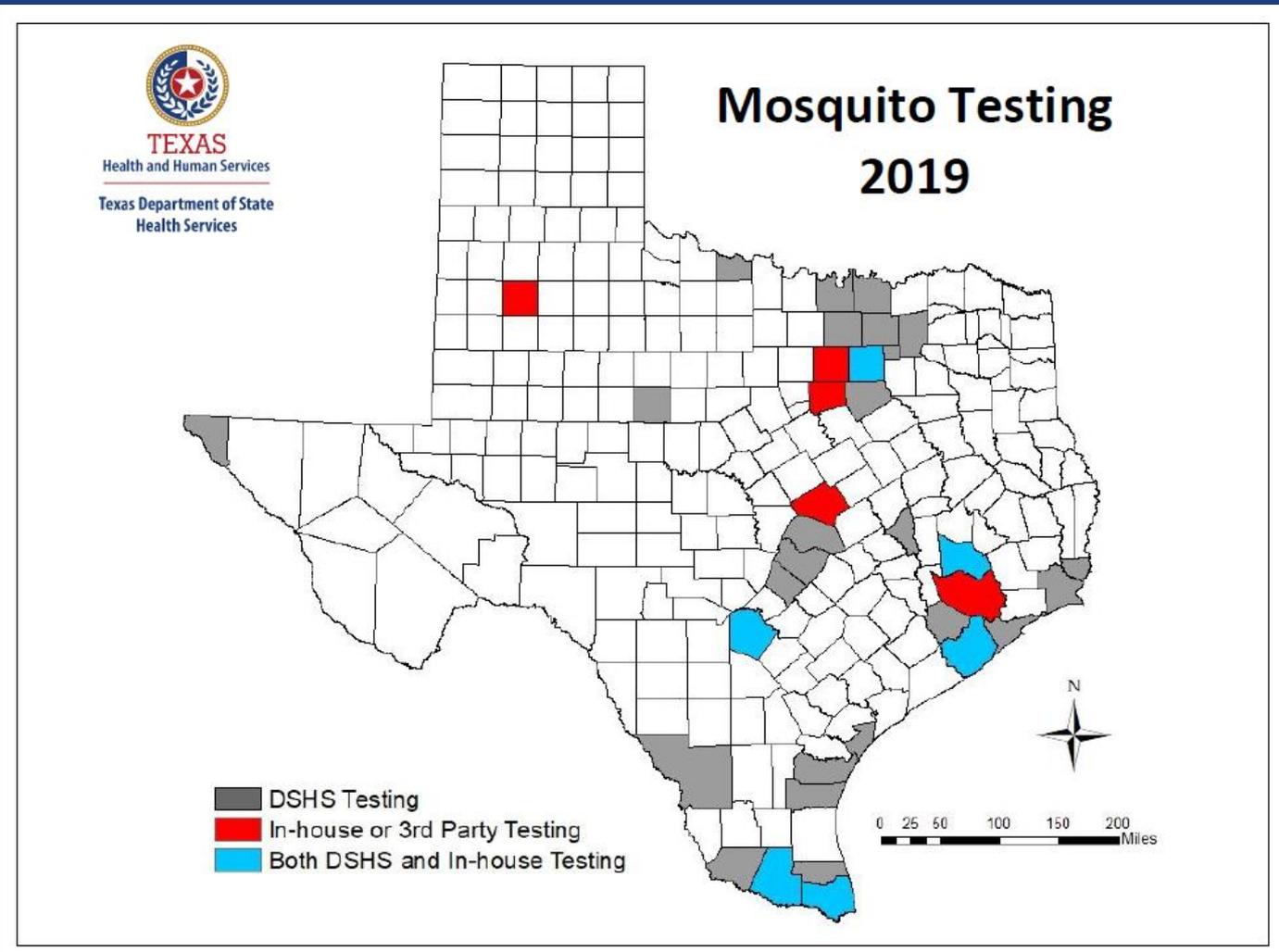


# Mosquito Surveillance



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# South Texas Border Counties

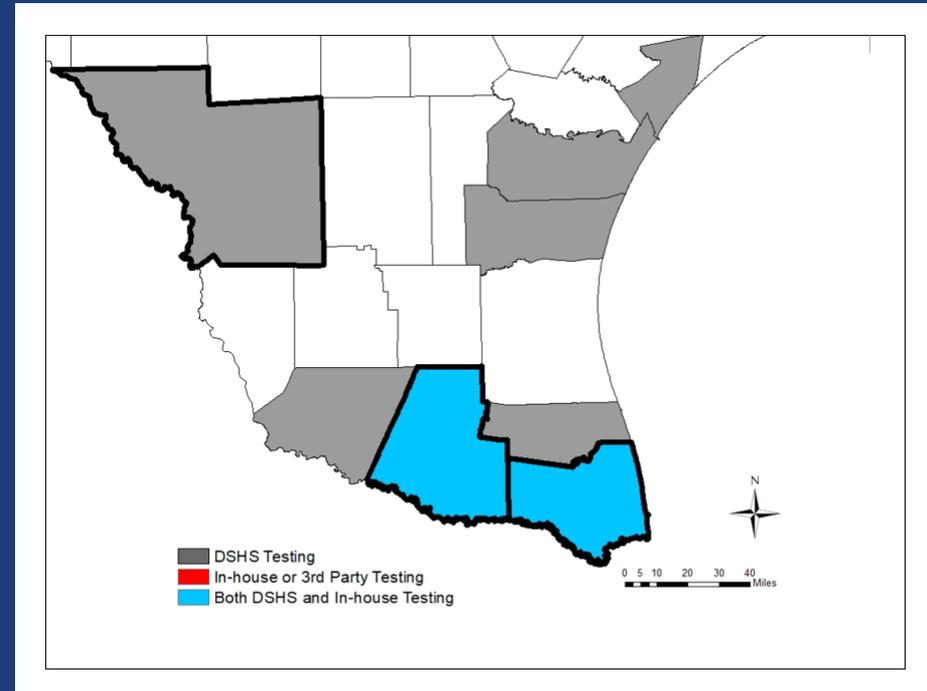


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## Weekly submitters

- Cameron
  - Cameron County HD
  - City of Brownsville PHD
- Hidalgo
  - Hidalgo County HD
- Webb
  - City of Laredo HD



# South Texas Border Counties



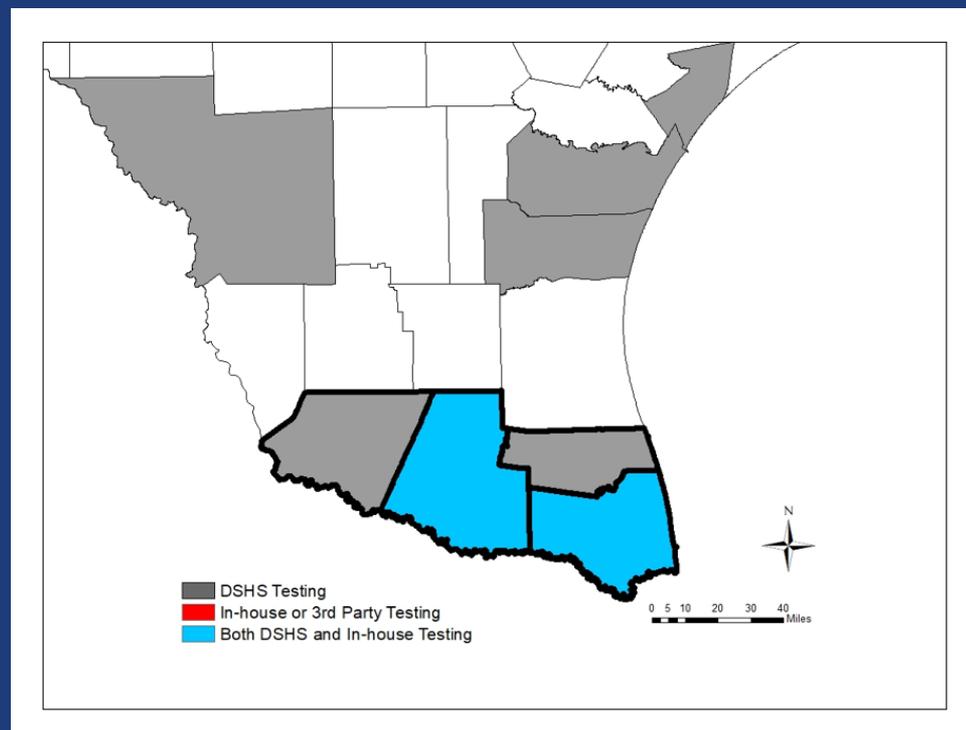
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## DSHS PHR 11

### Monthly Mosquito Roundup

- Cameron
  - Cameron County HD
  - City of Harlingen HD
  - City of Los Fresnos
  - City of Los Indios
  - City of Port Isabel
- Hidalgo
  - Hidalgo County HD
  - City of Alamo
  - City of McAllen
  - City of Mission HD
  - City of Pharr
- Starr
  - Rio Grande City Vector Control
- Willacy
  - Willacy County HD
  - City of Raymondville



# Vector Control



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- DSHS has limited role in vector control in Texas
- DSHS provides:
  - Technical consultation
  - Support via existing vector control contracts
  - Laboratory services for mosquito speciation, arbovirus testing, and insecticide resistance testing



# DSHS Insecticide Resistance Testing



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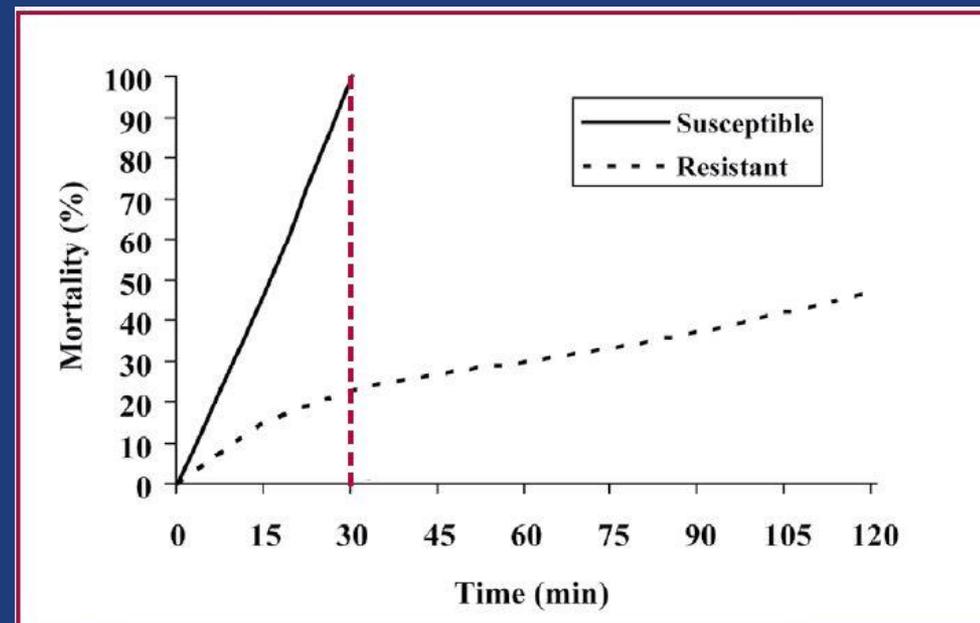
- CDC bottle bioassay
  - *Aedes aegypti*
  - *Aedes albopictus*
- Result reporting
- Interpretation of results
- Vector control recommendations



Photo by Rick Duhrkopf



Photo by Timothy Deschamps



# Mosquito Control Infrastructure

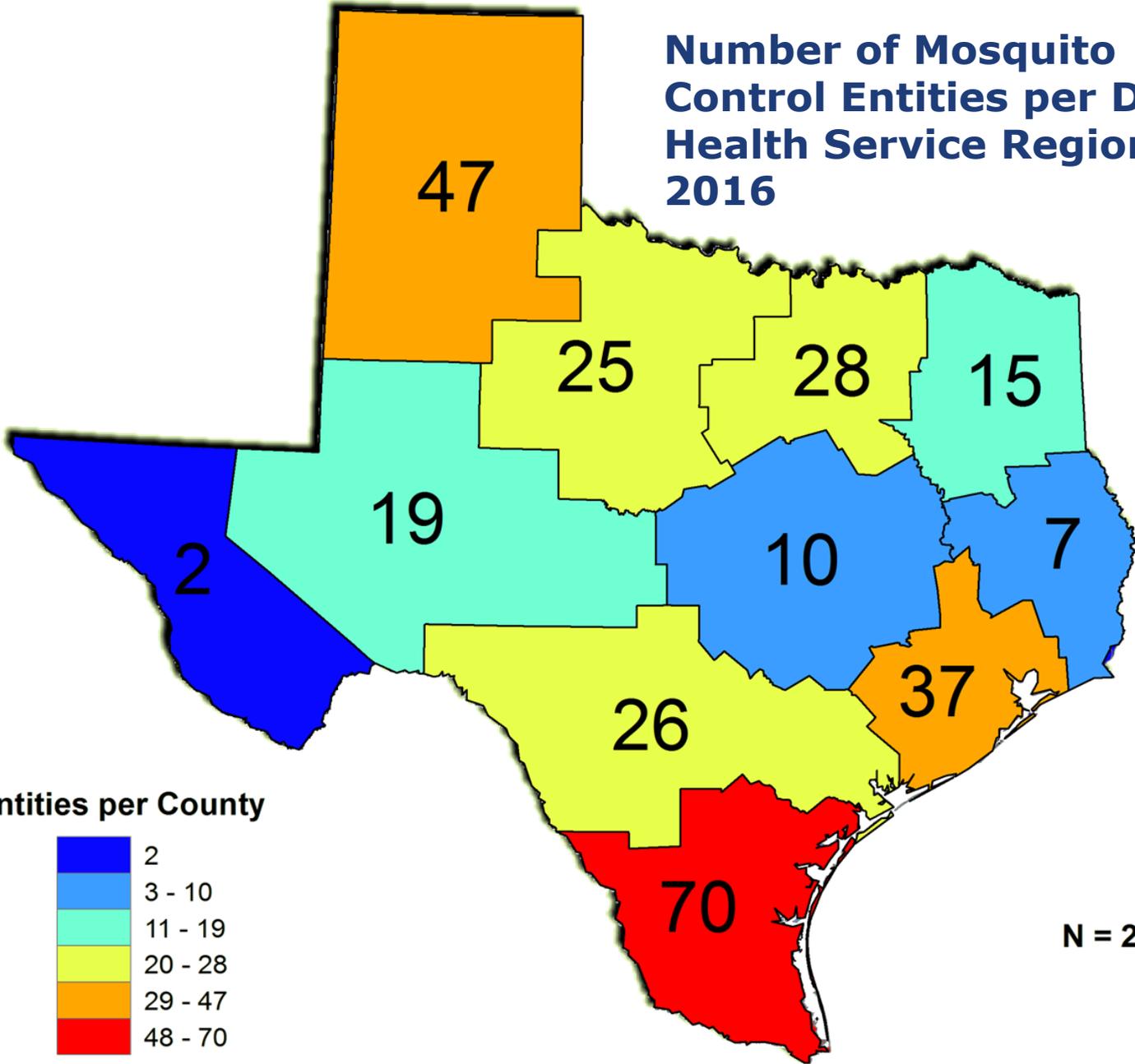


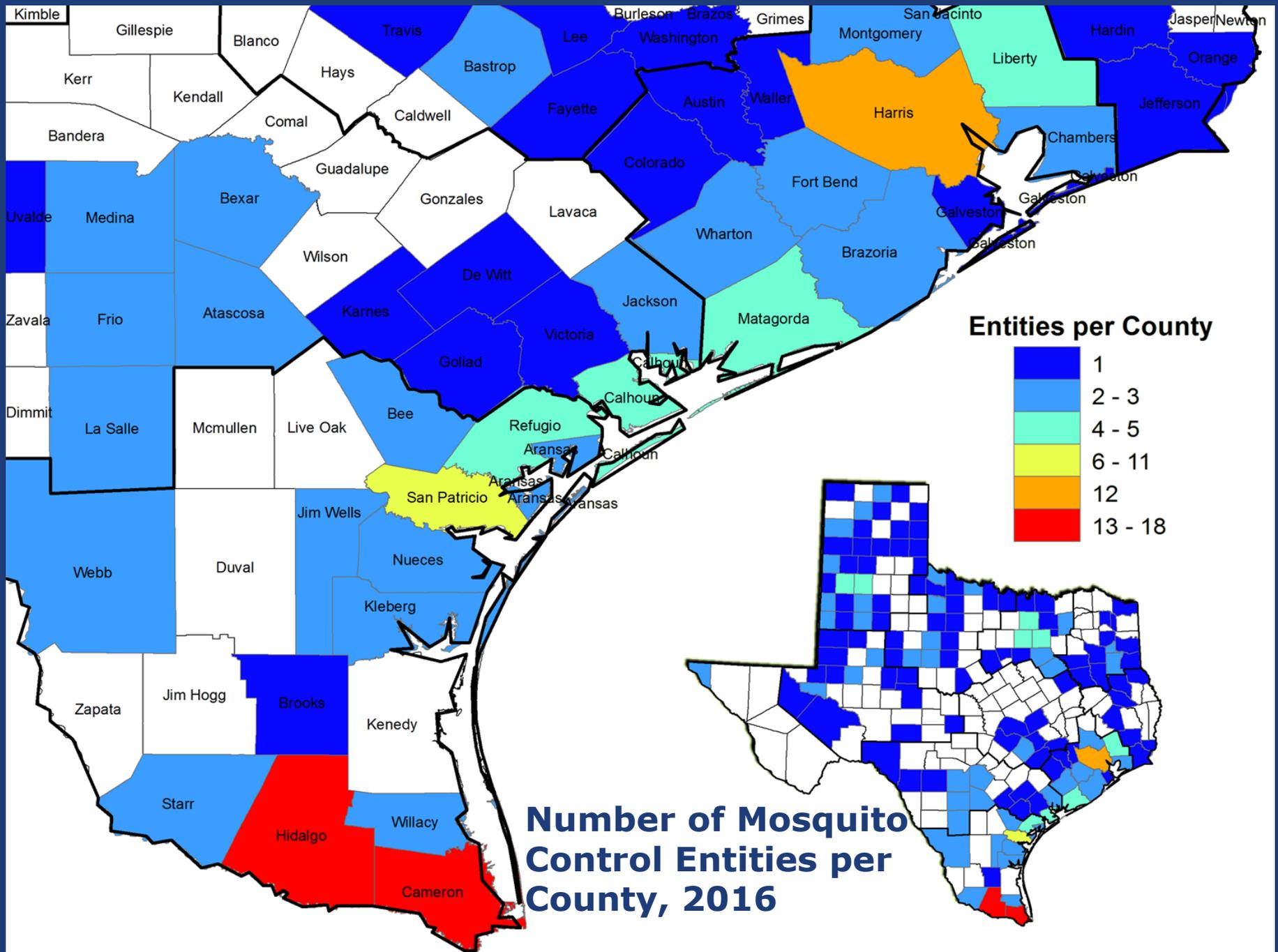
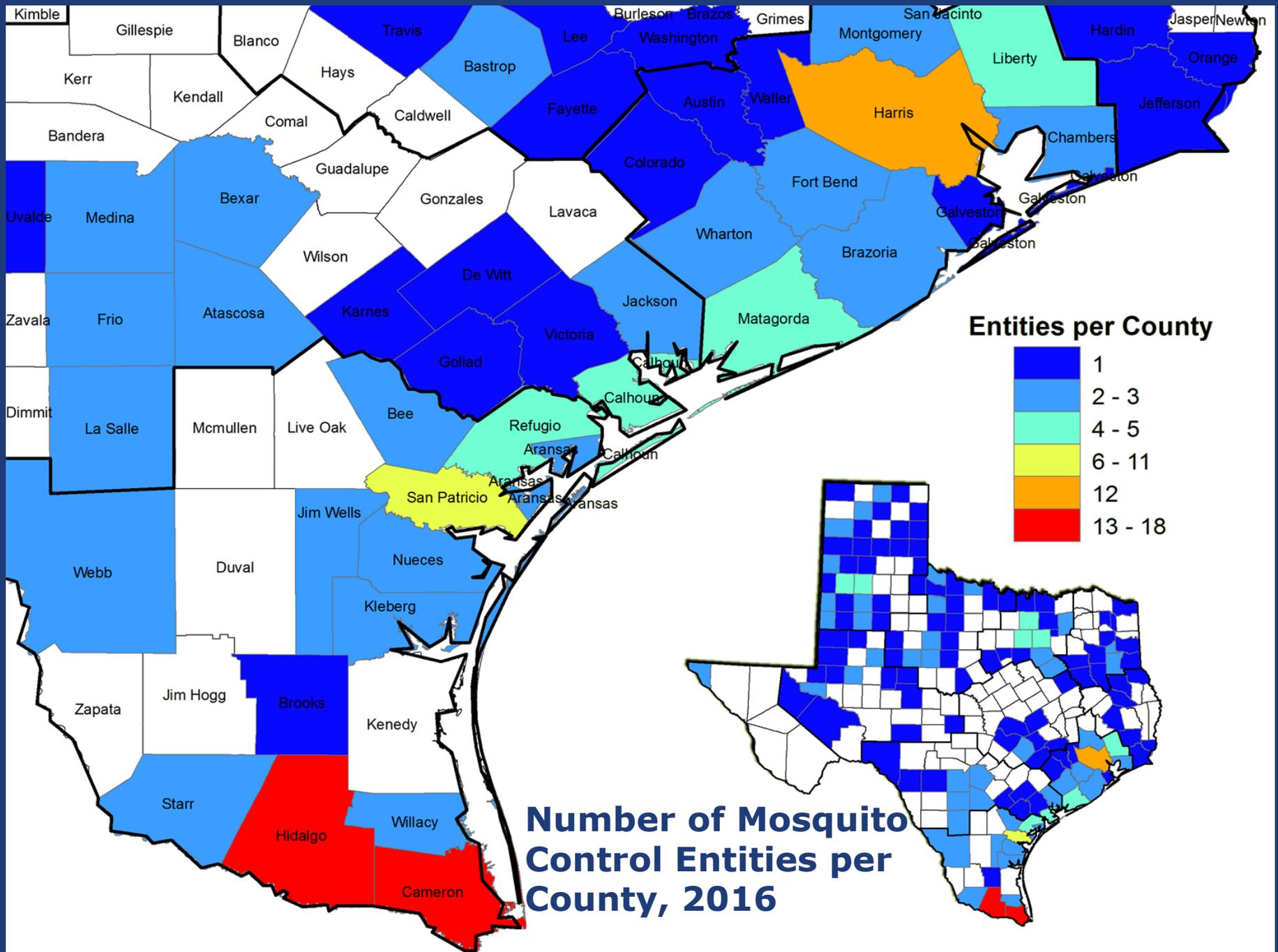
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<u>Type of Entity</u>	<u>Adulticide</u>	<u>Larvicide</u>	<u>Both</u>	<u># of programs</u>
Public Works	74	2	54	131
Street Dept.	13		30	43
County Precinct	18		14	32
Code Enforcement	2	1	12	15
Health Dept.	1	1	9	11
Environmental Health		1	10	11
Parks Dept.	5		6	11
Mosquito Control			10	10
Animal Control		1	6	7
County Road & Bridge	1		3	4
Contract Applicator	4			4
City Health Dept.	1		2	3
Golf Course			2	2
Solid Waste Division			1	1
Tribal housing Authority			1	1
Community Services			1	1
<b>Totals</b>	<b>119</b>	<b>6</b>	<b>161</b>	<b>286</b>

# Number of Mosquito Control Entities per DSHS Health Service Region in 2016





# UTRGV Insecticide Resistance Surveillance



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- Fall 2017 - Established 7 field sites along TX/MX border:
  - Del Rio
  - Eagle Pass
  - Laredo
  - Rio Grande City
  - McAllen
  - Progreso
  - Harlingen
- 2019 - Added 2 field sites:
  - San Benito
  - Brownsville
- Eggs collected weekly from oviposition cups

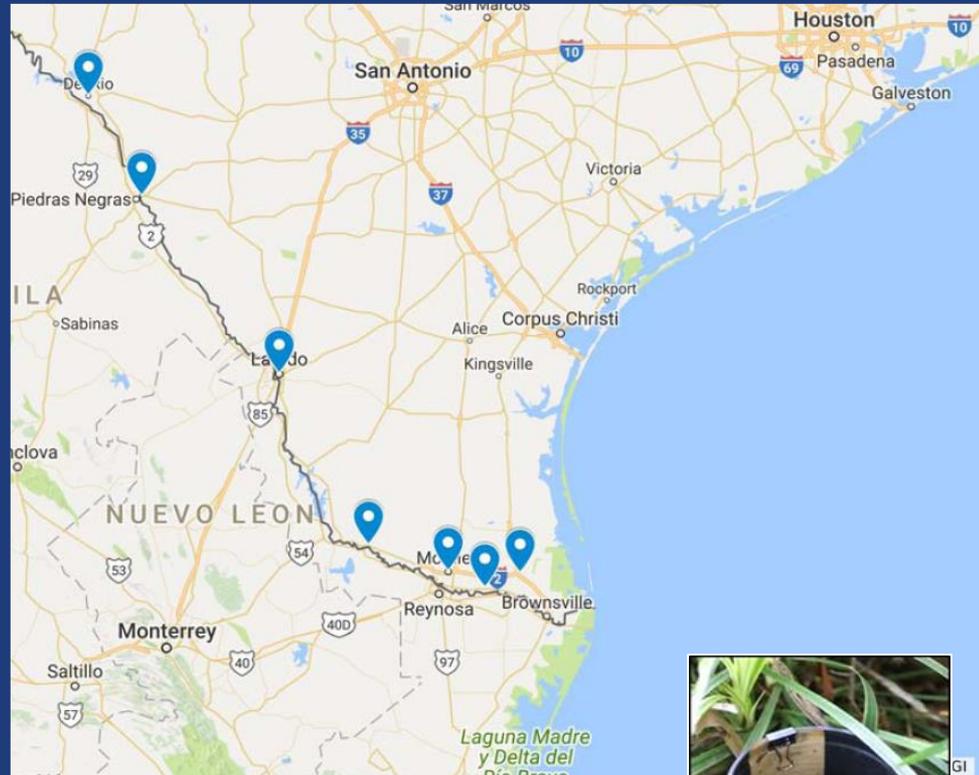


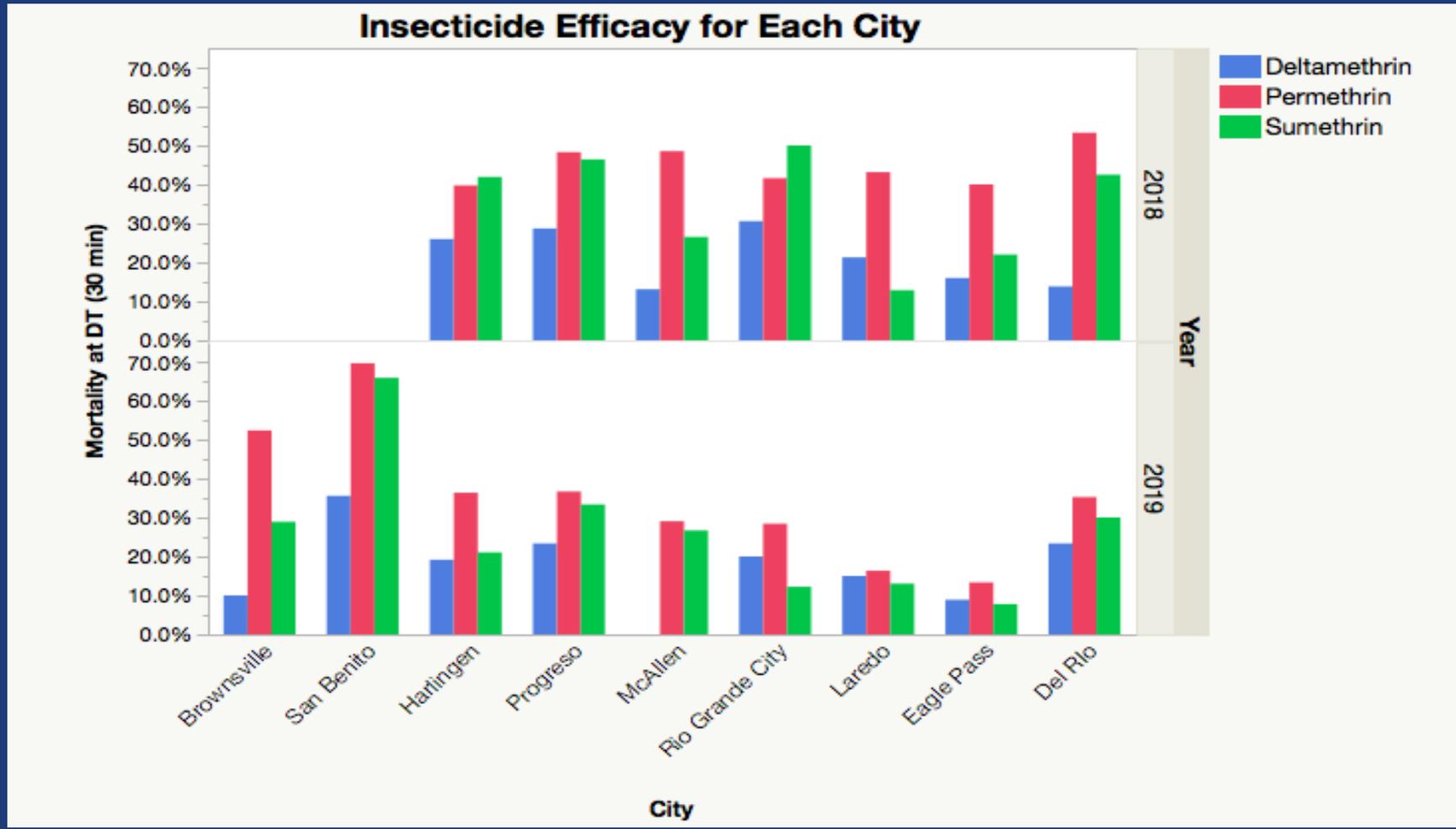
Photo by Rick Duhrkopf

# UTRGV Insecticide Resistance Surveillance



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## 2018-2019 Data



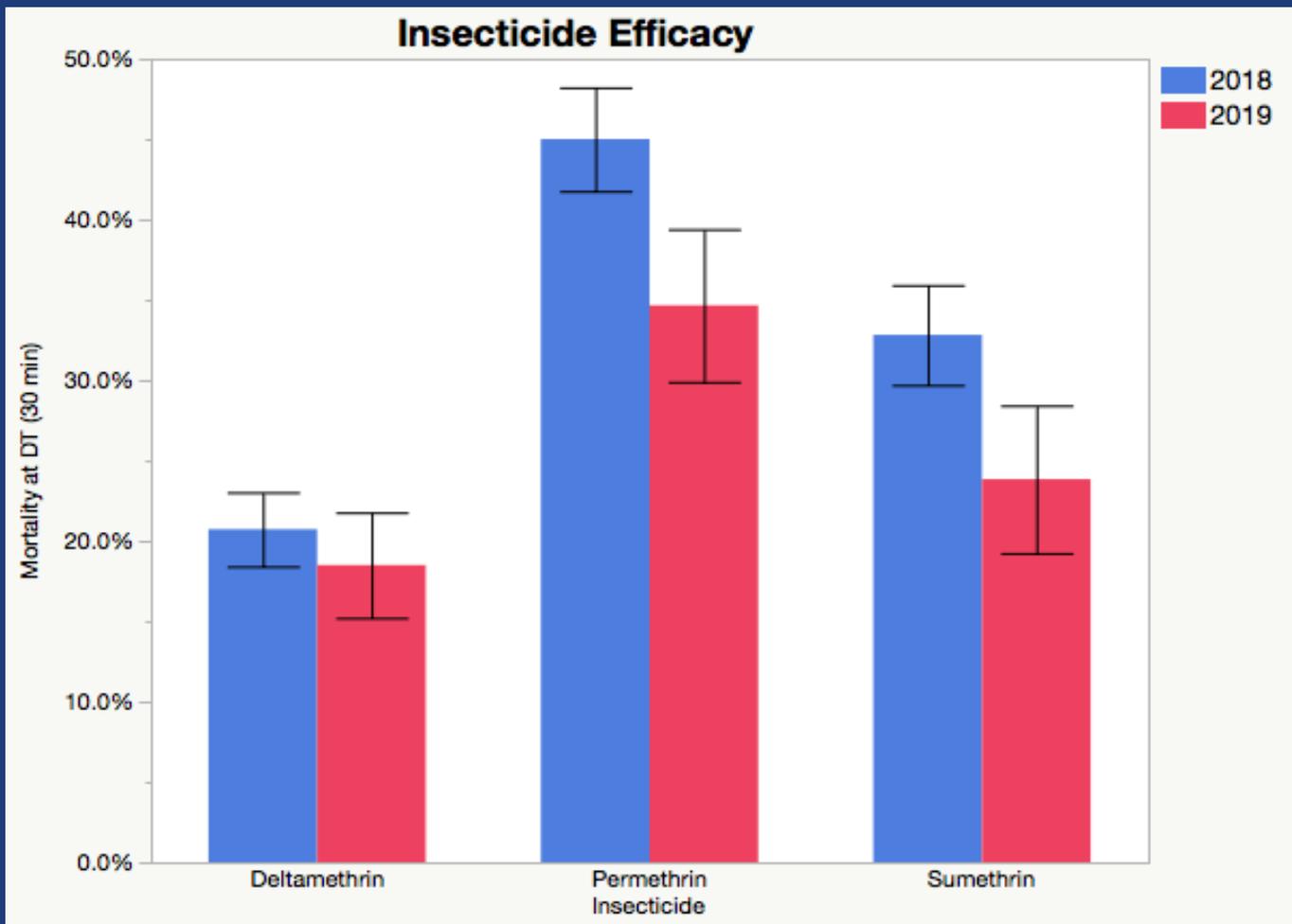
# UTRGV Insecticide Resistance Surveillance



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## 2018-2019 Data



# UTRGV Insecticide Resistance Surveillance



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## Summary

- Resistance to synthetic pyrethroids detected in all locations
- Variation in rates observed between years and locations
- UTRGV communicating with local jurisdictions regarding results and recommendations
  - IR test evaluates active ingredient, not the product formulation
  - Consider using products containing PBO (piperonyl butoxide-synergist)
  - Consider using products at mid to high label rate
  - Consider incorporation of larviciding

# Thank you



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