

# Oscar Ospina

## *Biological Science*

Persona non-grata: Preventing the re-emergence of the citrus leprosis

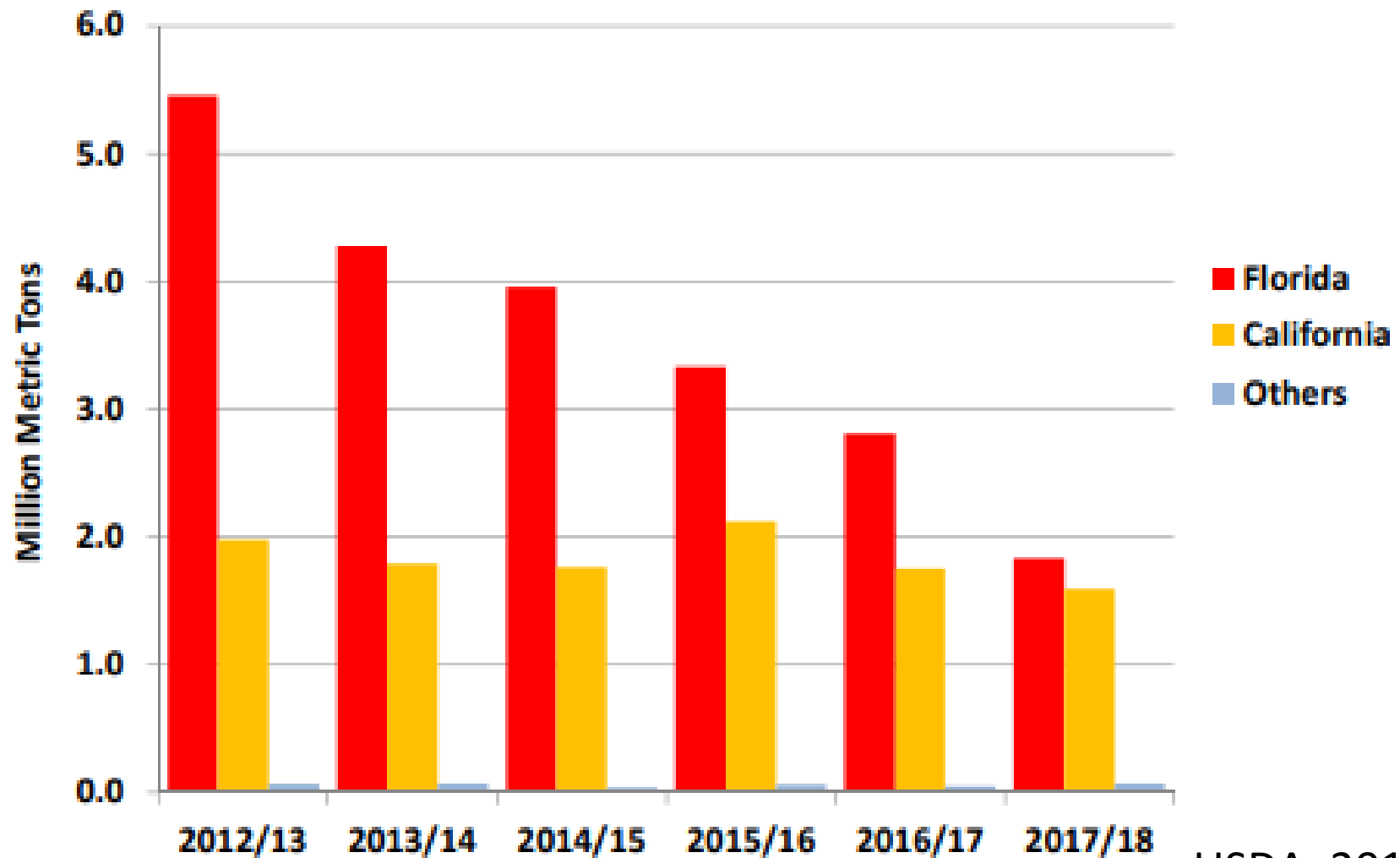
The Office of Postdoctoral Affairs

The Graduate School | Florida State University





# U.S. Orange Production Plummets in Florida

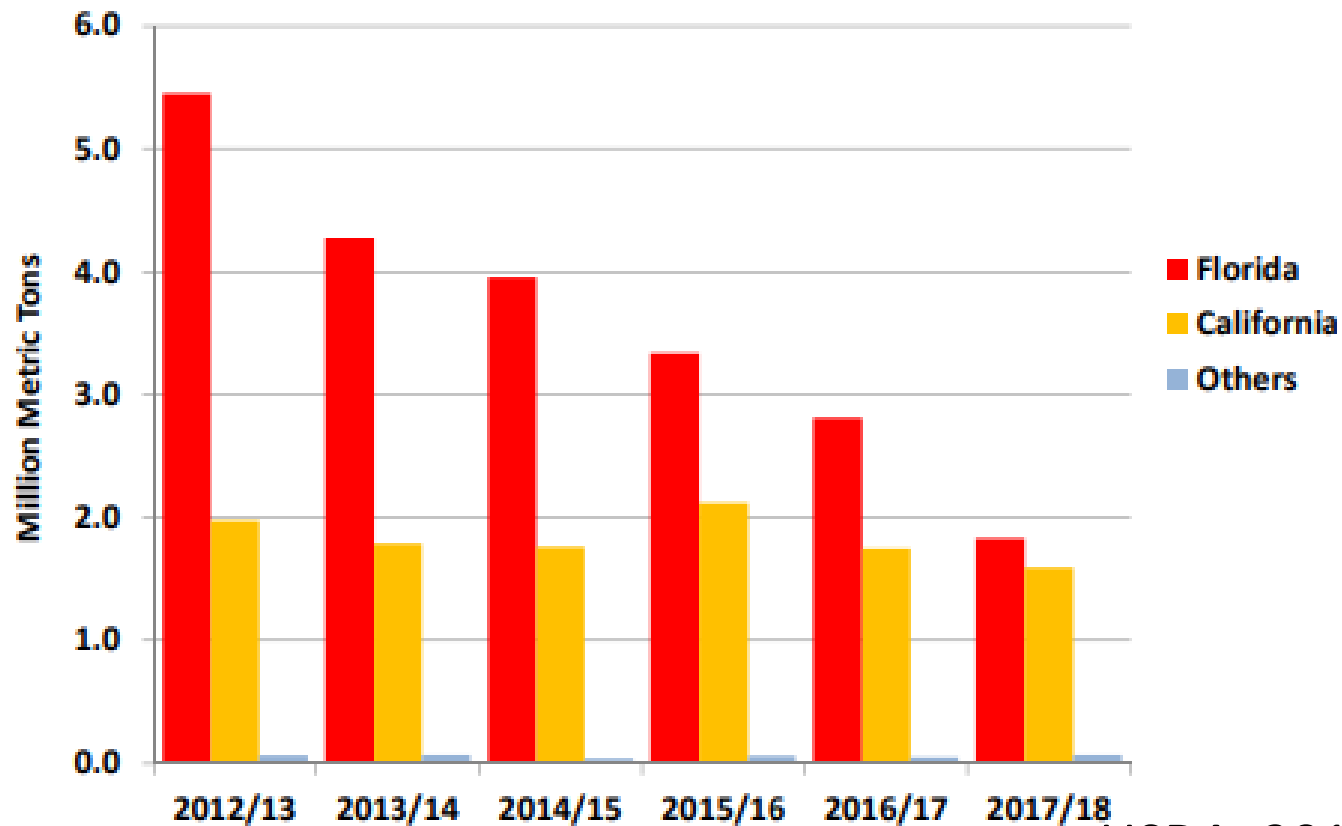


USDA, 2018

# Florida's Orange Industry, Symbol of a State, Is Dying

Julie Wernau 9/27/2017

Florida is synonymous with oranges. They're on the state license plate. At the product's heyday in 1977, the state boasted 53 orange juice processing plants. Today, beset by bacteria, hurricanes and international competition, there are seven.



USDA, 2018

# Diseases Attacking Citrus



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## Citrus greening

Current, major disease

# Diseases Attacking Citrus



**Citrus greening**

Current, major disease



**Citrus leprosis**

Formerly present in US  
(**spreading northwards?**)



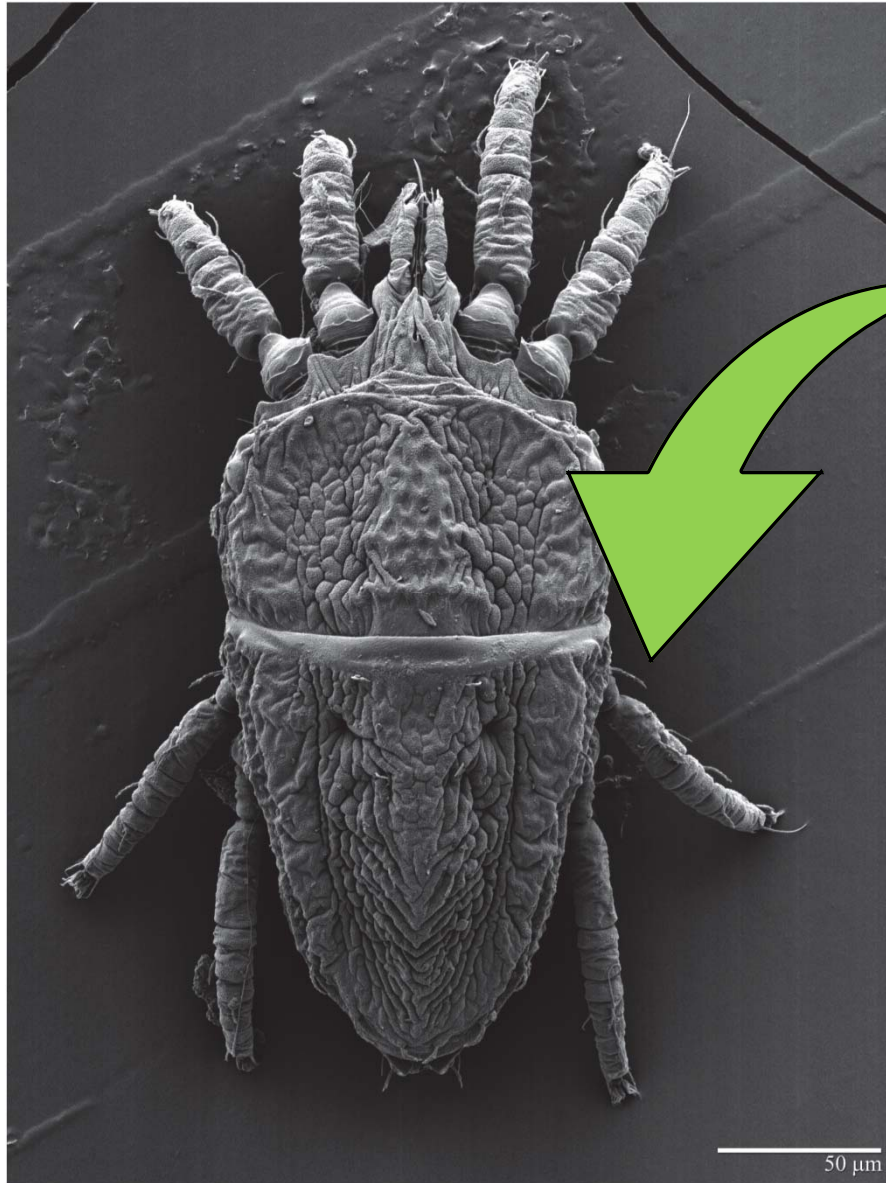




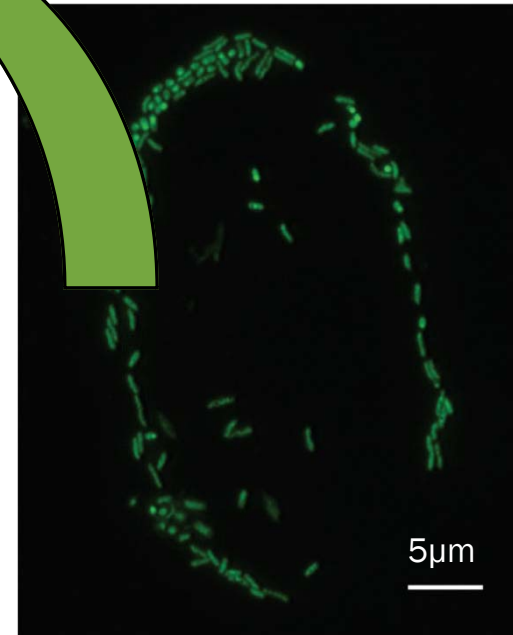
# Flat Mites



# Flat Mites



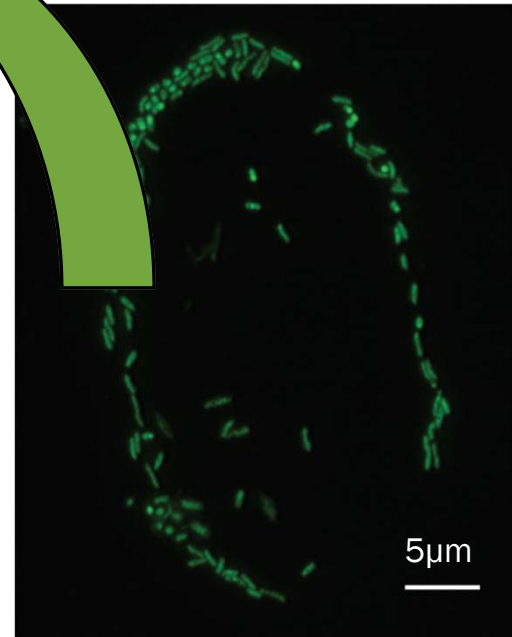
Bacteria  
*Cardinium*

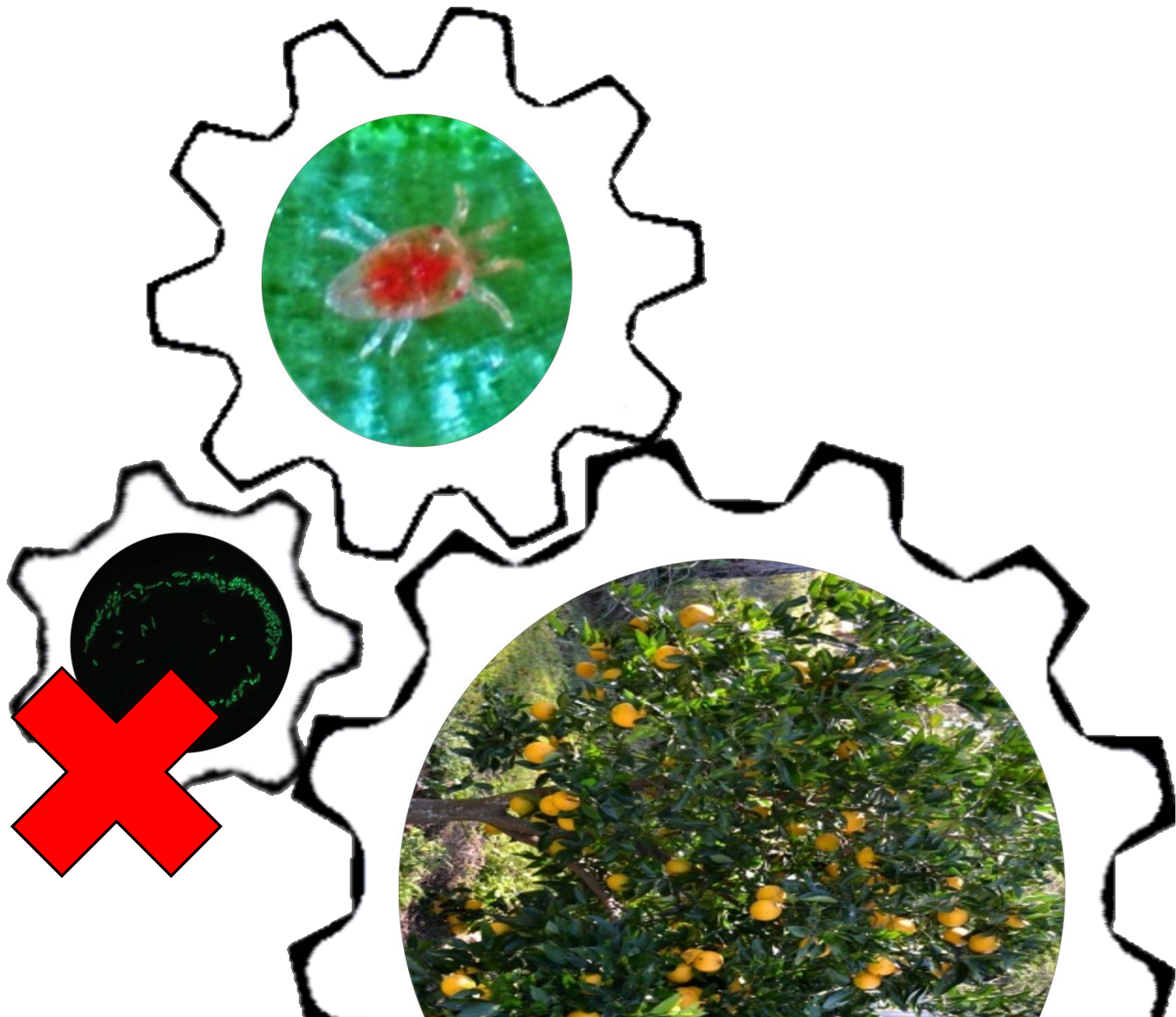


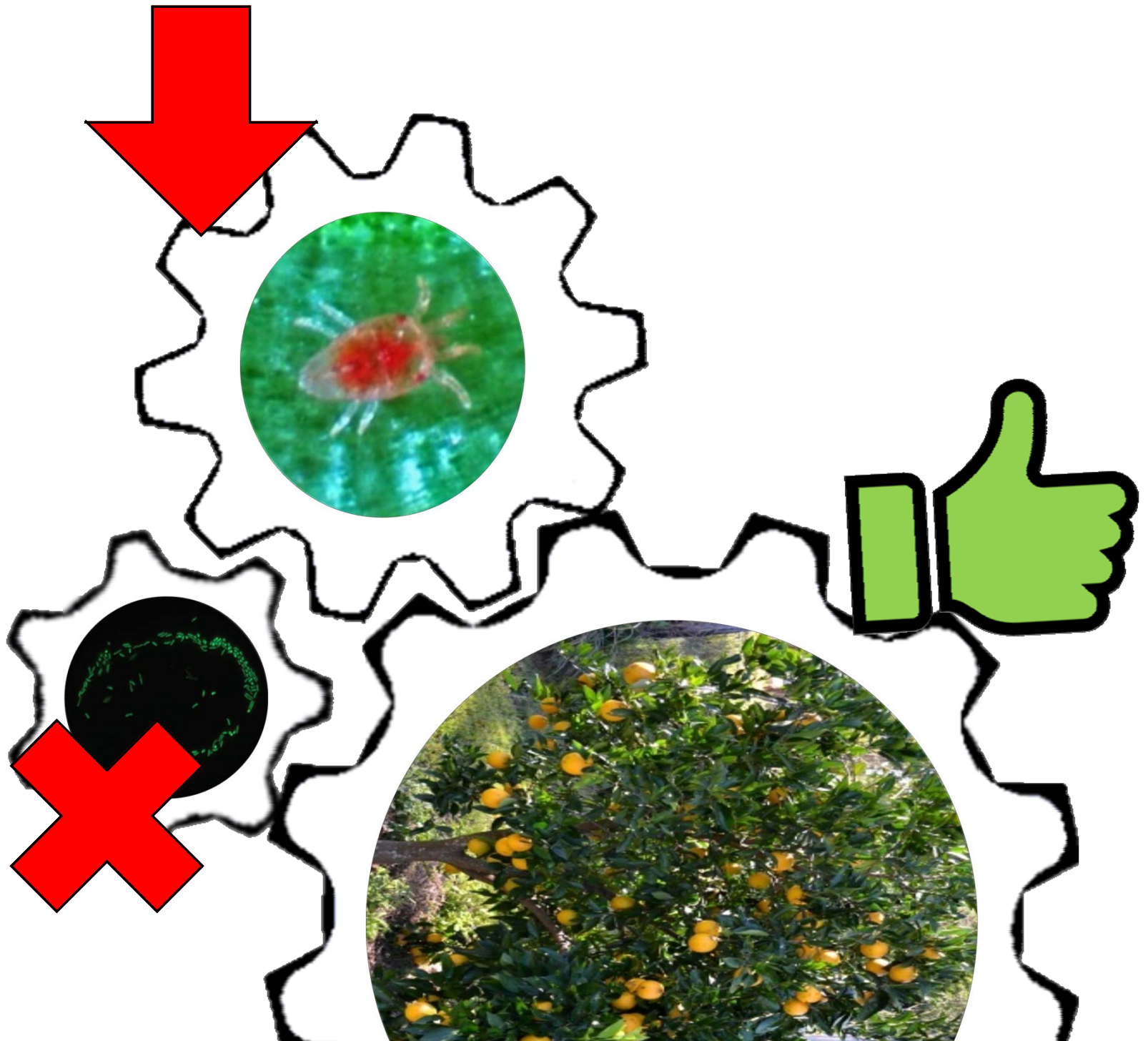
# Flat Mites



Bacteria  
*Cardinium*



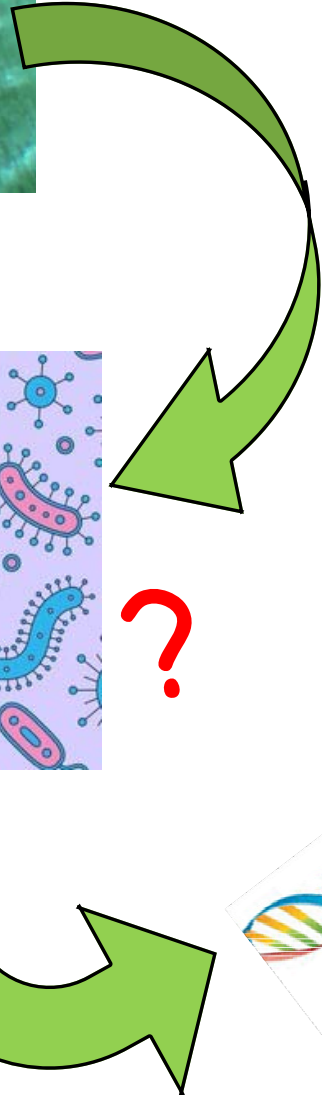
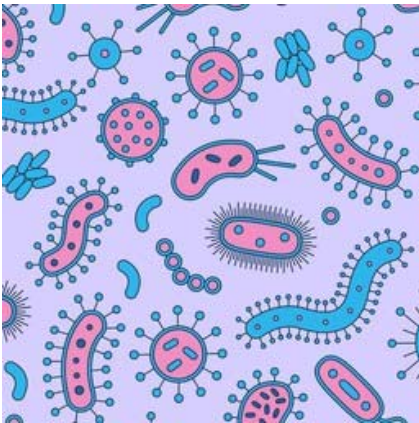




# Females



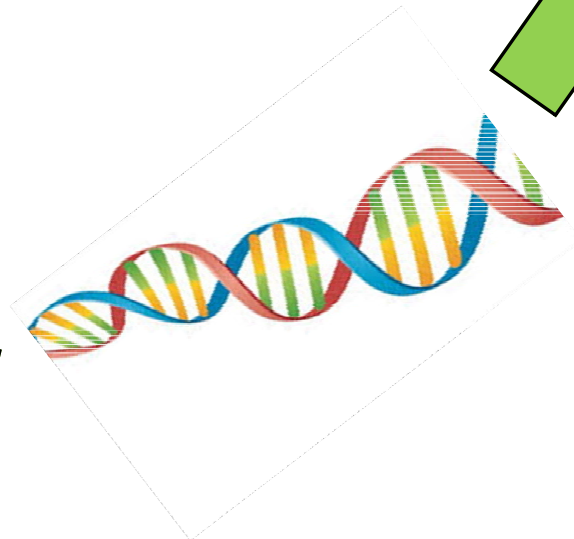
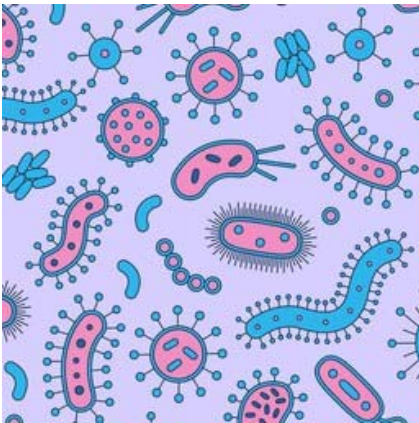
# Bacteria



Females



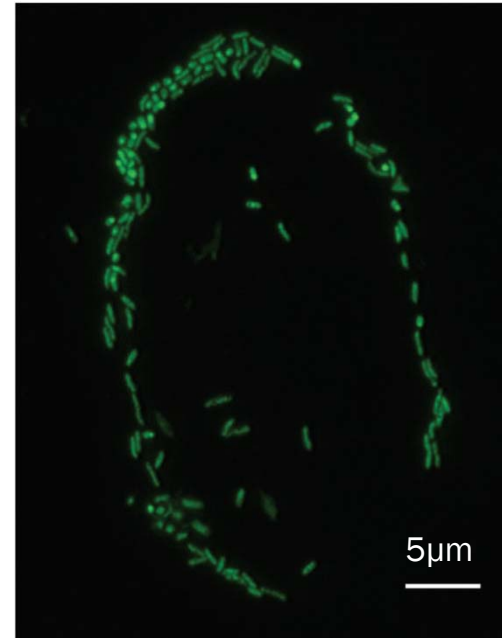
Bacteria



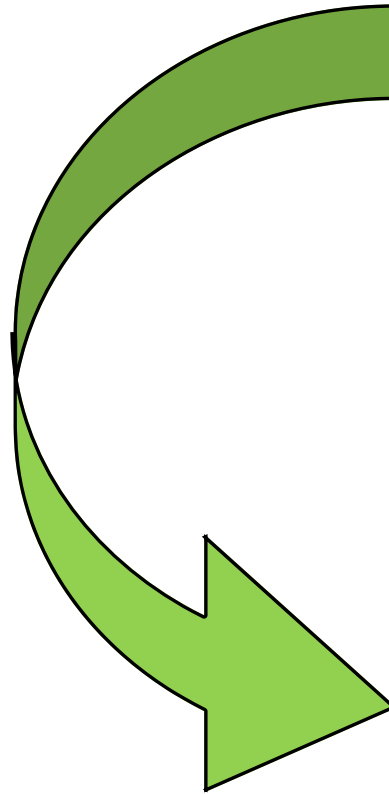
**IDENTIFICATION  
OF BACTERIA**



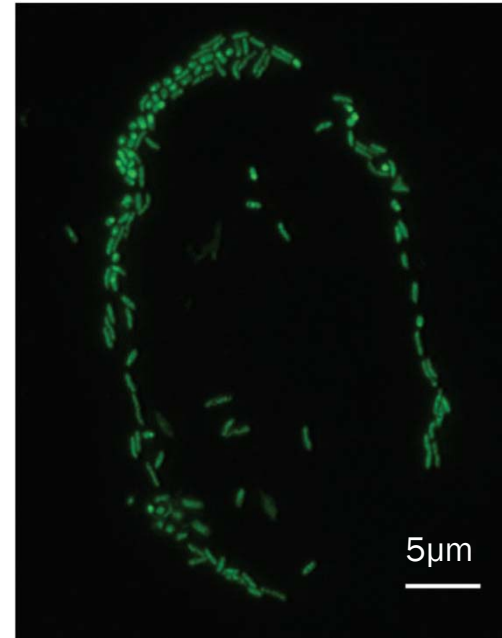
Bacteria  
*Cardinium*



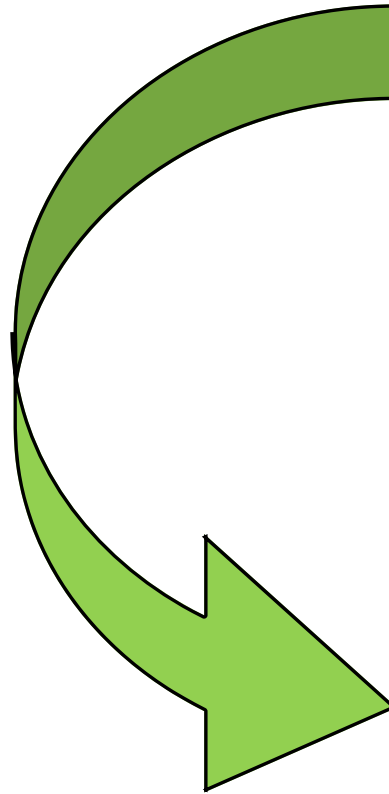
25%  
to  
75%



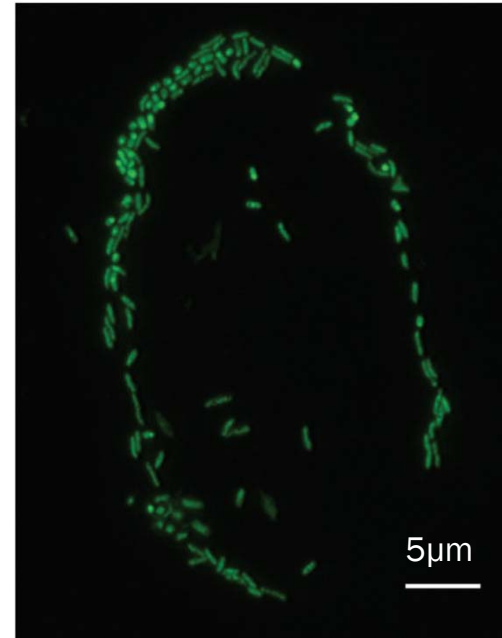
Bacteria  
*Cardinium*



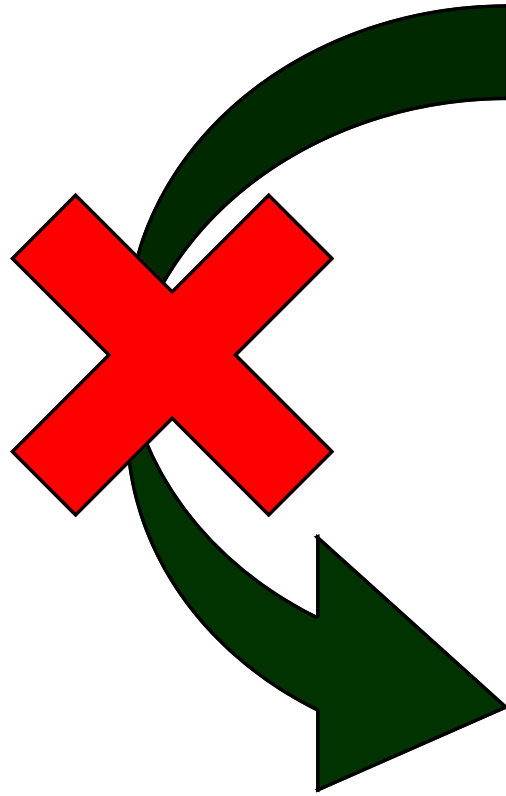
Metabolism of  
Vitamins  
&  
Amino acids



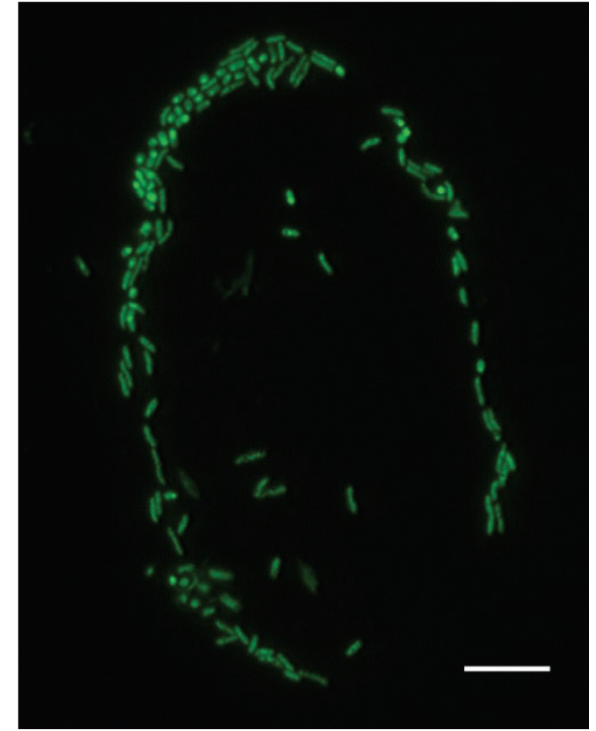
Bacteria  
*Cardinium*



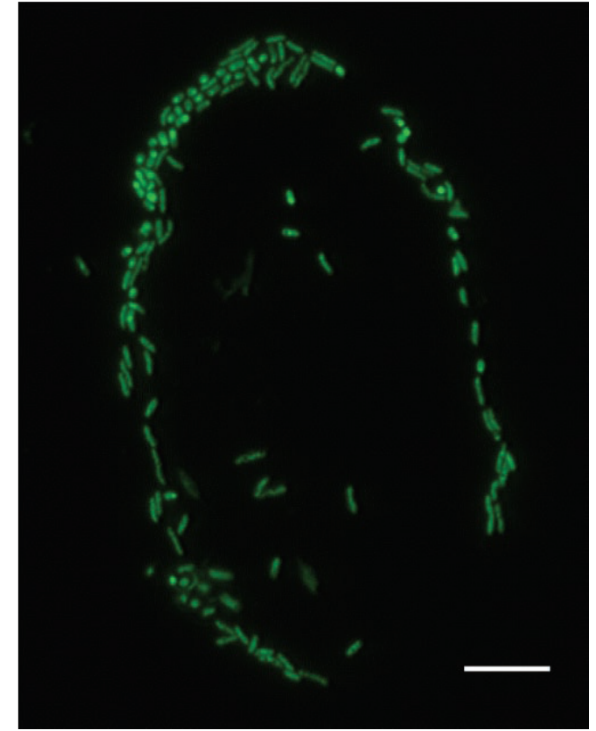
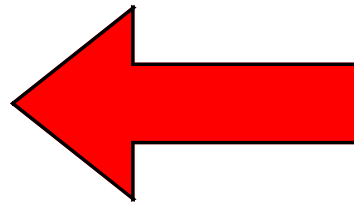
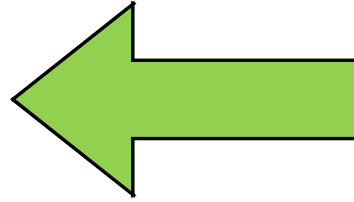
Degradation  
of pesticides



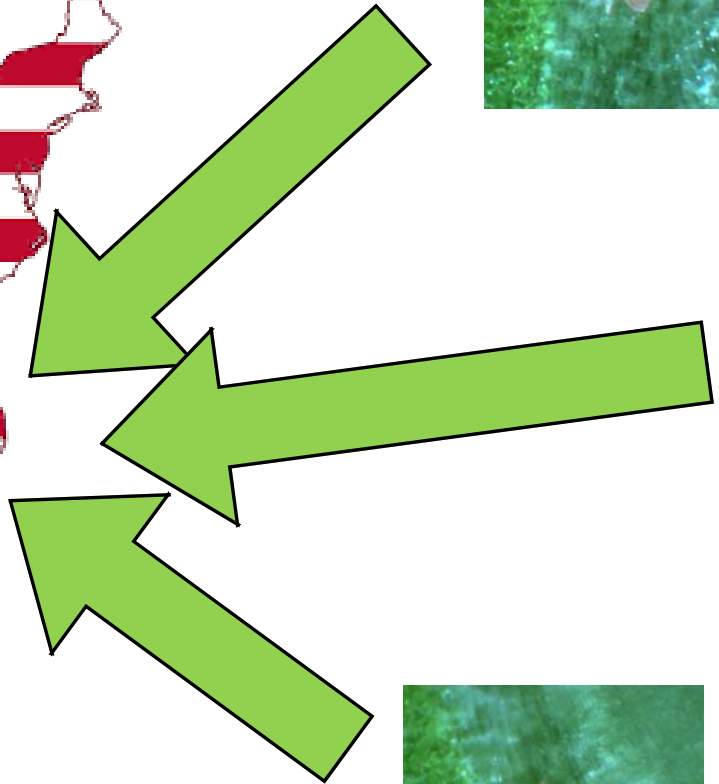
# Highlights



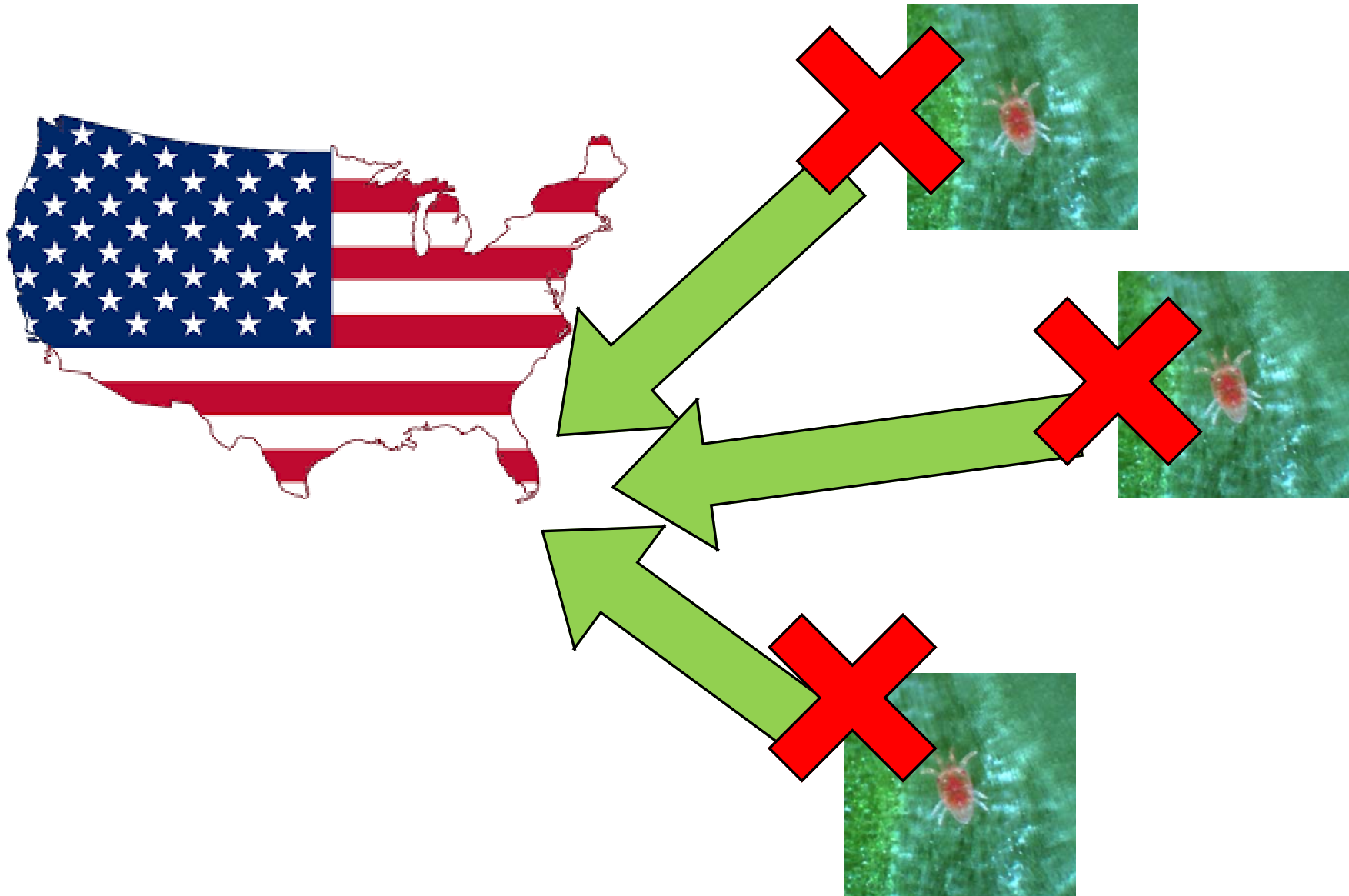
# Highlights



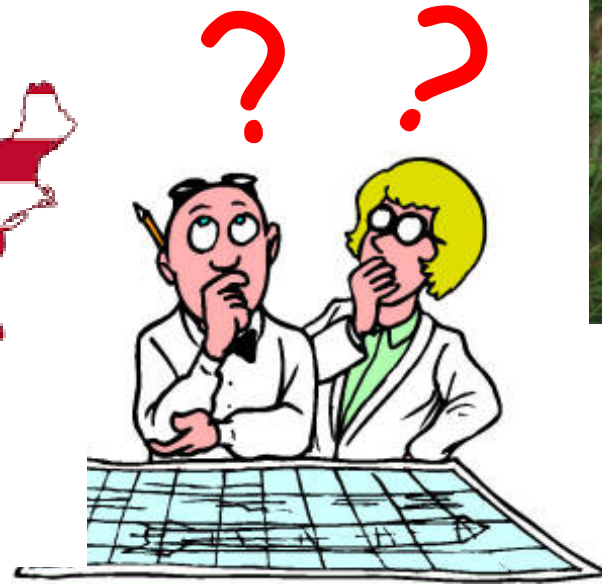
# Implications



# Implications



# Implications







Thank you!

