

# **OVERVIEW OF UF, IFAS CITRUS GREENING RESEARCH PROGRAM TOPICS**

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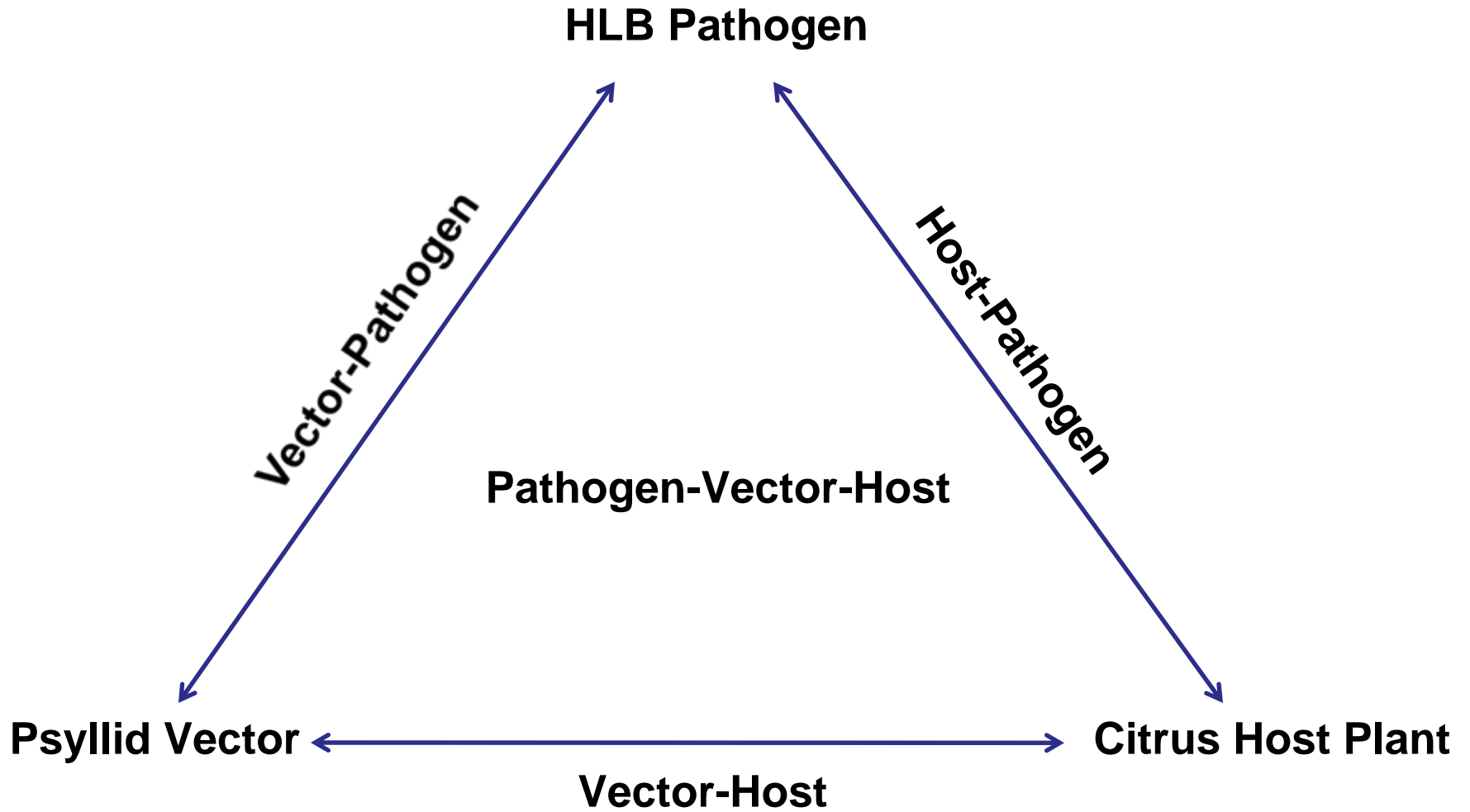
Presented to the Florida Citrus  
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# Approaches to Managing HLB

- **Cultural methods**
  - **Control psyllids**
  - **Remove inoculum sources**
  - **Change growth cycle**
  - **Change production methods to improve economics**
- **Develop resistant or tolerant trees**
- **Control the pathogen**

# Tools Needed

- Better detection methods
- Sequence of the bacterial genome
- Culturing of the bacterium
- Basic understanding of the bacterium to find a weak link
- Basic understanding of the plant response to the pathogen
- Citrus genome sequence to facilitate above



# Vectored Disease Triangle

# HLB Pathogen

**Culturing**  
**Sequencing**  
**Detection**

Vector-Pathogen

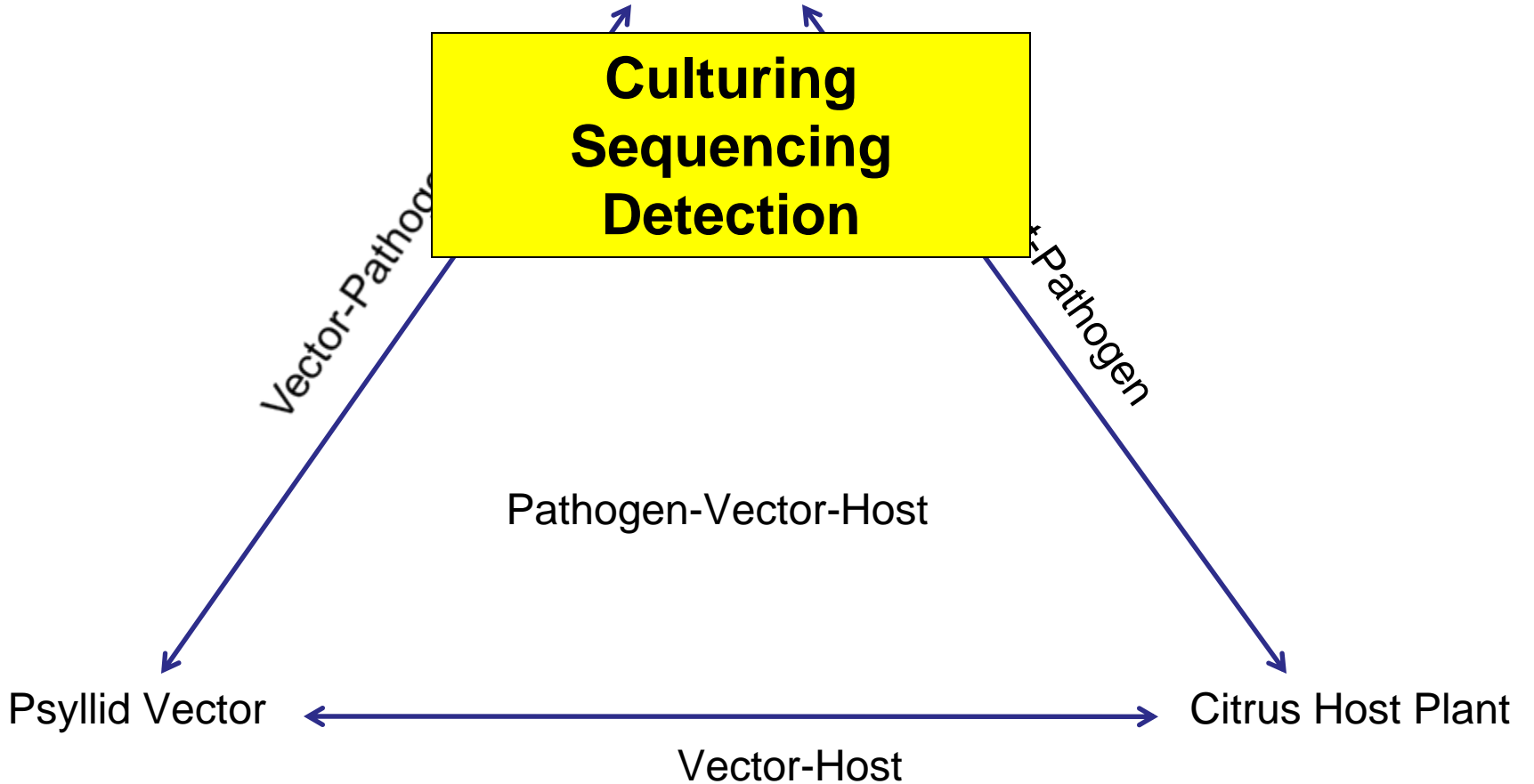
Pathogen

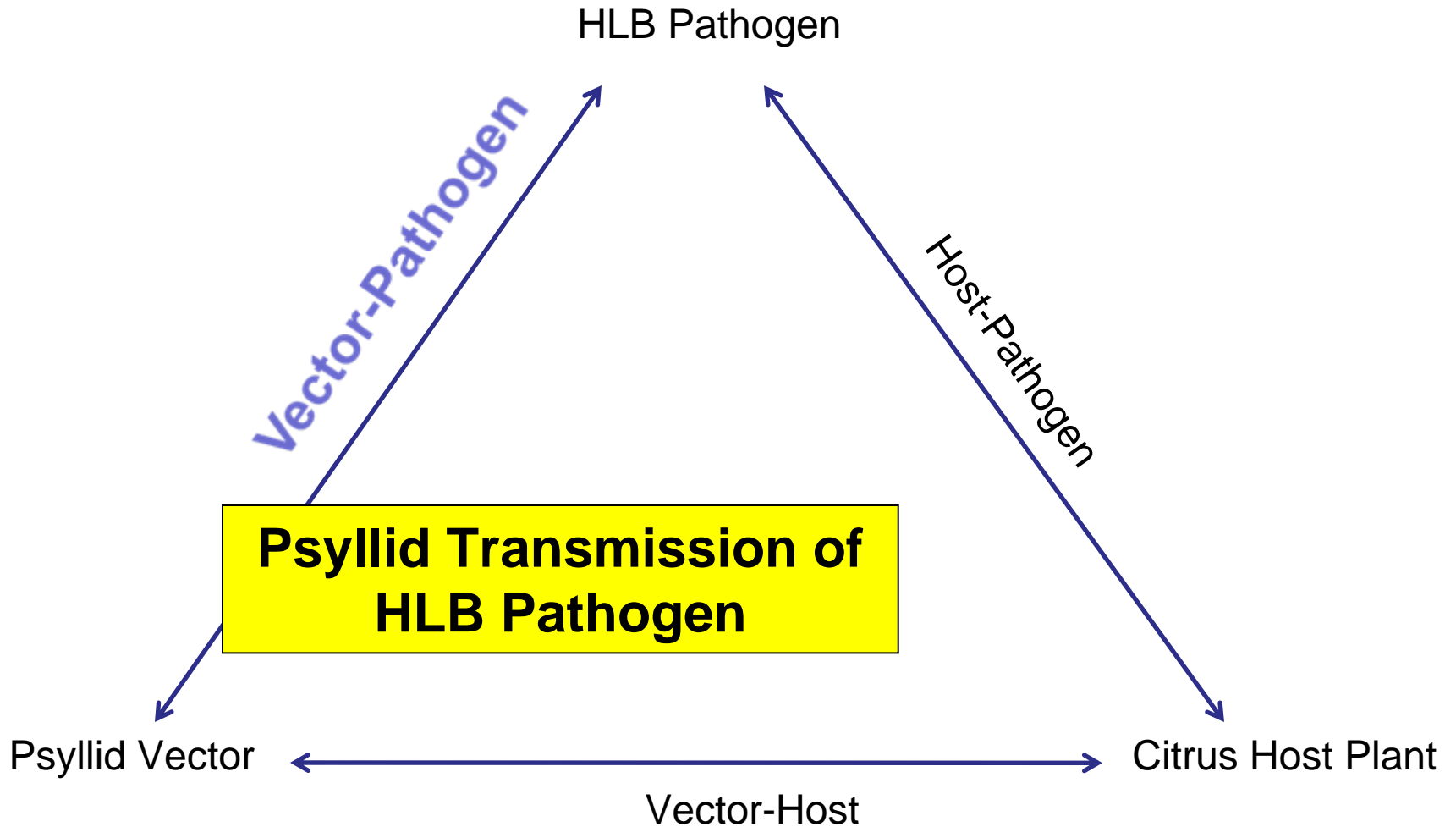
Pathogen-Vector-Host

Psyllid Vector

Citrus Host Plant

Vector-Host





HLB Pathogen

Vector-Pathogen

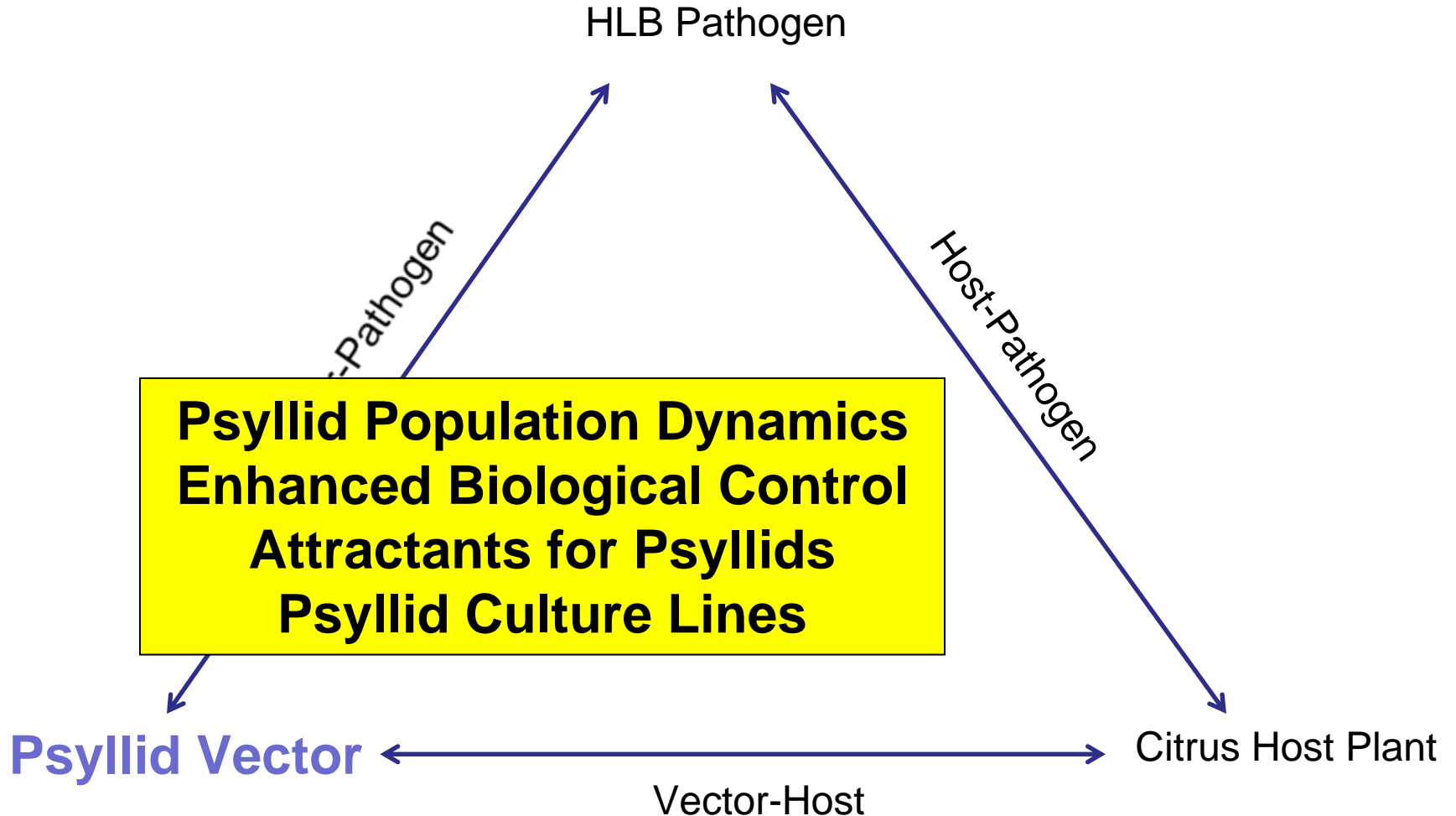
Host-Pathogen

**Psyllid Population Dynamics**  
**Enhanced Biological Control**  
**Attractants for Psyllids**  
**Psyllid Culture Lines**

**Psyllid Vector**

Citrus Host Plant

Vector-Host



HLB Pathogen



**Movement Patterns of Psyllids in/between Groves**  
**Evaluation of Insecticides for Psyllid Control**  
**Spot Treatment of Young Flushes**  
**Optimize Spray Patterns**  
**Baseline Psyllid Toxicology**  
**Effects of Insecticides on Transmission**  
**Development & Evaluation of Psyllid Management**



Psyllid Vector



Citrus Host Plant



**Vector-Host**

HLB Pathogen

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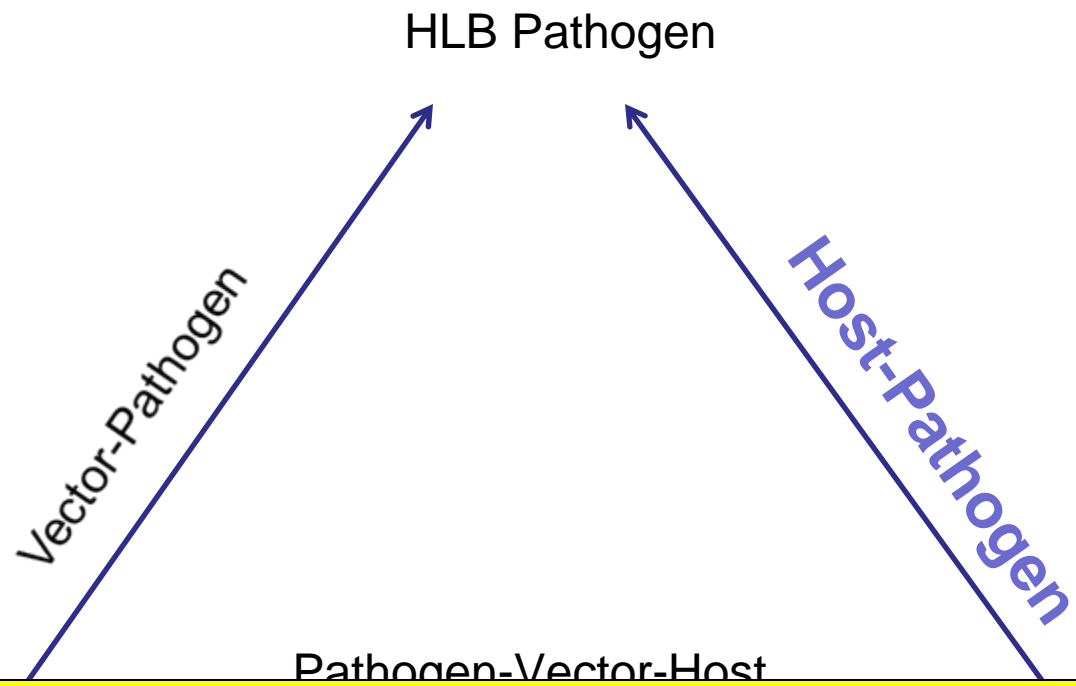
Host

**Host Plants and Disease  
Transformation of Citrus and Other Plants  
Selective Promoters  
Micro-Element Management and HLB Detection  
Citrus Genome Project**

Psyllid Vector

**Citrus Host Plant**

Vector-Host



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**Improved HLB Diagnostics**  
**Alternate Hosts of HLB**  
**Evaluate HLB Survivors**  
**HLB Multiplication, Movement and Disease in Citrus**  
**Materials to Suppress HLB**  
**Developing Resistant Trees**

HLB Pathogen

Vector-Pathogen

Host-Pathogen

**Screening methods to test HLB controls**  
**Evaluating Induced Systemic Resistance**  
**Gene Expression & Metabolites of HLB Infection**  
**Movement of HLB in Citrus**  
**Rootstock/Scion Responses to HLB Infection**  
**Juice Off-Flavors Associated with HLB**

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# Pathogen/Vector/Host Interactions



HLB Pathogen

**Timing of Hedging to Affect Psyllid and HLB**  
**Integrated Management of HLB**  
**Economic Assessment of HLB/other Disease**  
**HLB Extension Program**  
**National & International Collaborations**

Vector

Pathogen

**Pathogen-Vector-Host**

Psyllid Vector

Citrus Host Plant

Vector-Host