Citrus Under Protective Screening (CUPS)

Used for fresh fruit production
- Needed because of higher costs

Expensive: $1 per ft^2
- Replace screens every 7-10 yrs
- More if hurricanes/tropical storms

550 known acres in 2022
- However, no centralized database, so probably more

Not fool proof: found lizards inside
However, effective if well maintained
- CREC CUPS: 6 years with only 1 psyllid, 1 HLB tree

Citrus Under Protective Screening (CUPS)

Used for fresh fruit production
- Needed because of higher costs

Expensive: $1 per ft^2
- Replace screens every 7-10 yrs
- More if hurricanes/tropical storms

550 known acres in 2022
- However, no centralized database, so probably more

Not fool proof: found lizards inside

However, effective if well maintained
- CREC CUPS: 6 years with only 1 psyllid, 1 HLB tree
- If psyllids do get in, easy to wipe them out

Citrus Under Protective Screening (CUPS)

If psyllids do get in, easy to wipe them out

Breeding New Varieties

Finger lime hybrids

Breeding New Varieties

Finger lime hybrids

Breeding New Varieties

Finger lime hybrids

Resistant to HLB

Breeding New Varieties

Finger lime hybrids

Resistant to HLB

Results are promising

Breeding New Varieties

Finger lime hybrids

Resistant to HLB

Results are promising

Will take time to come to market

Breeding New Varieties

Finger lime hybrids

Resistant to HLB

Results are promising

Will take time to come to market

More time to become widespread

Summary of ACP/HLB

Summary of ACP/HLB

Drastic decline in Florida citrus

Summary of ACP/HLB

Drastic decline in Florida citrus

Leave the business, abandoned groves

Summary of ACP/HLB

Drastic decline in Florida citrus

Leave the business, abandoned groves

Nursery production indoors, insects excluded

Summary of ACP/HLB

Drastic decline in Florida citrus

Leave the business, abandoned groves

Nursery production indoors, insects excluded

Different tree management, denser plantings

Summary of ACP/HLB

Drastic decline in Florida citrus

Leave the business, abandoned groves

Nursery production indoors, insects excluded

Different tree management, denser plantings

Frequent insecticide applications

Summary of ACP/HLB

Drastic decline in Florida citrus

Leave the business, abandoned groves

Nursery production indoors, insects excluded

Different tree management, denser plantings

Frequent insecticide applications

IPCs on young trees common

Summary of ACP/HLB

Drastic decline in Florida citrus

Leave the business, abandoned groves

Nursery production indoors, insects excluded

Different tree management, denser plantings

Frequent insecticide applications

IPCs on young trees common

CUPS for fresh fruit production

Summary of ACP/HLB

Drastic decline in Florida citrus

Leave the business, abandoned groves

Nursery production indoors, insects excluded

Different tree management, denser plantings

Frequent insecticide applications

IPCs on young trees common

CUPS for fresh fruit production

Work on new varieties resistant to HLB

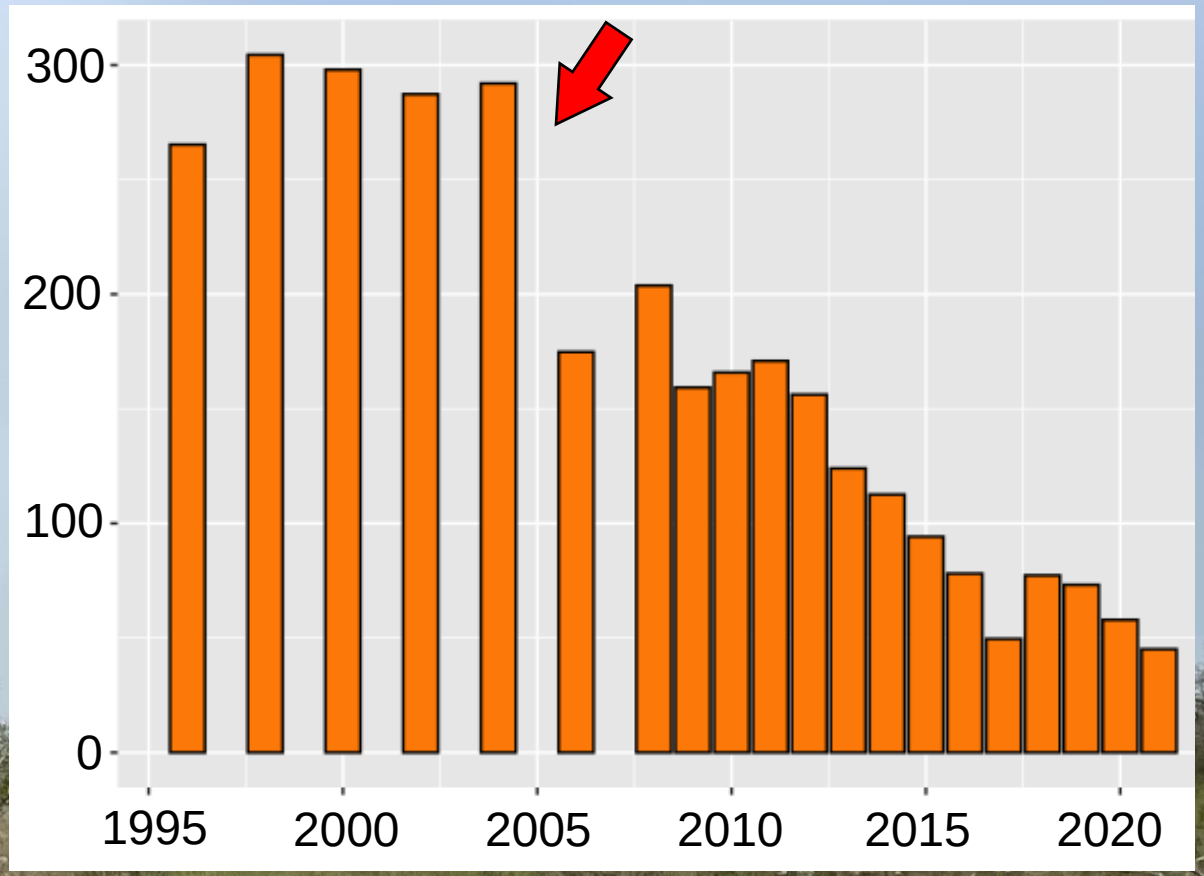
Did It Work?

Did It Work?

Yes and no

Did It Work?

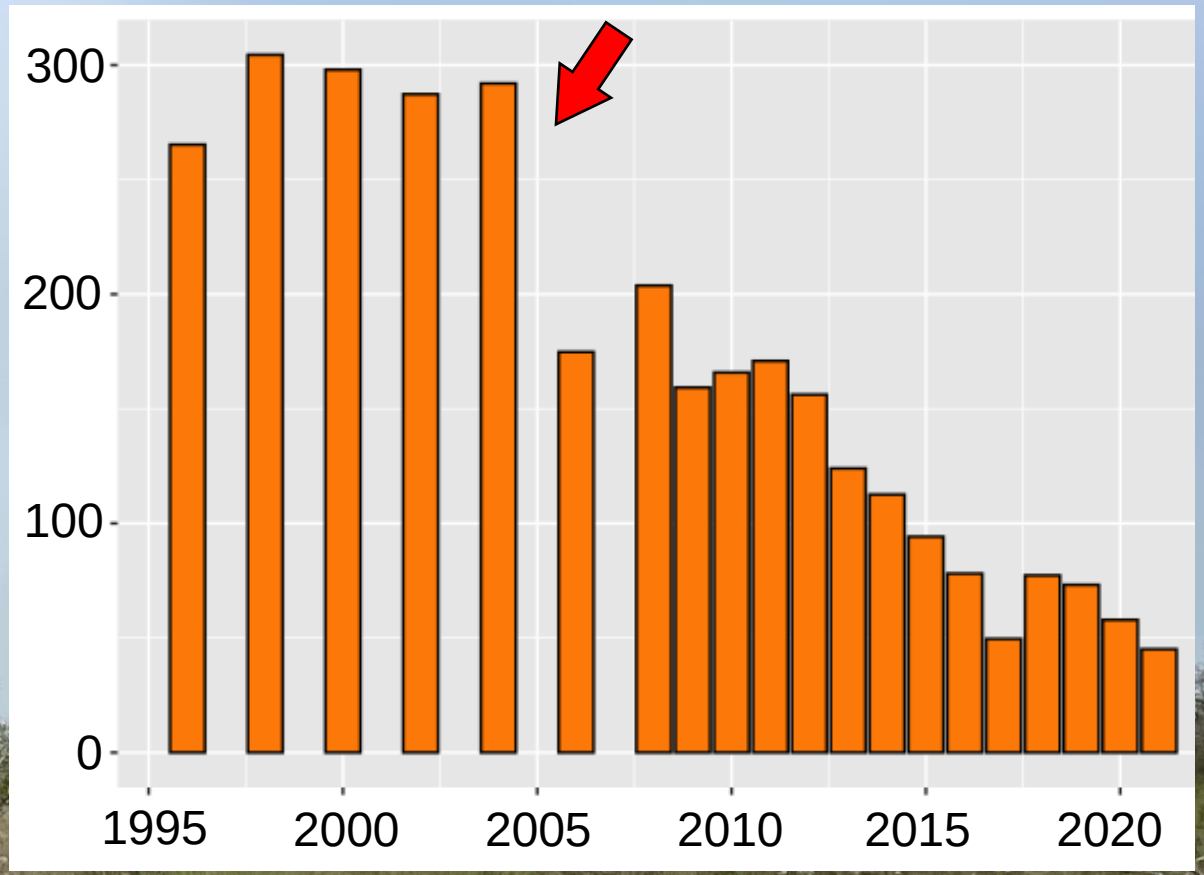
Yes and no



Did It Work?

Yes and no

Solutions are tenuous



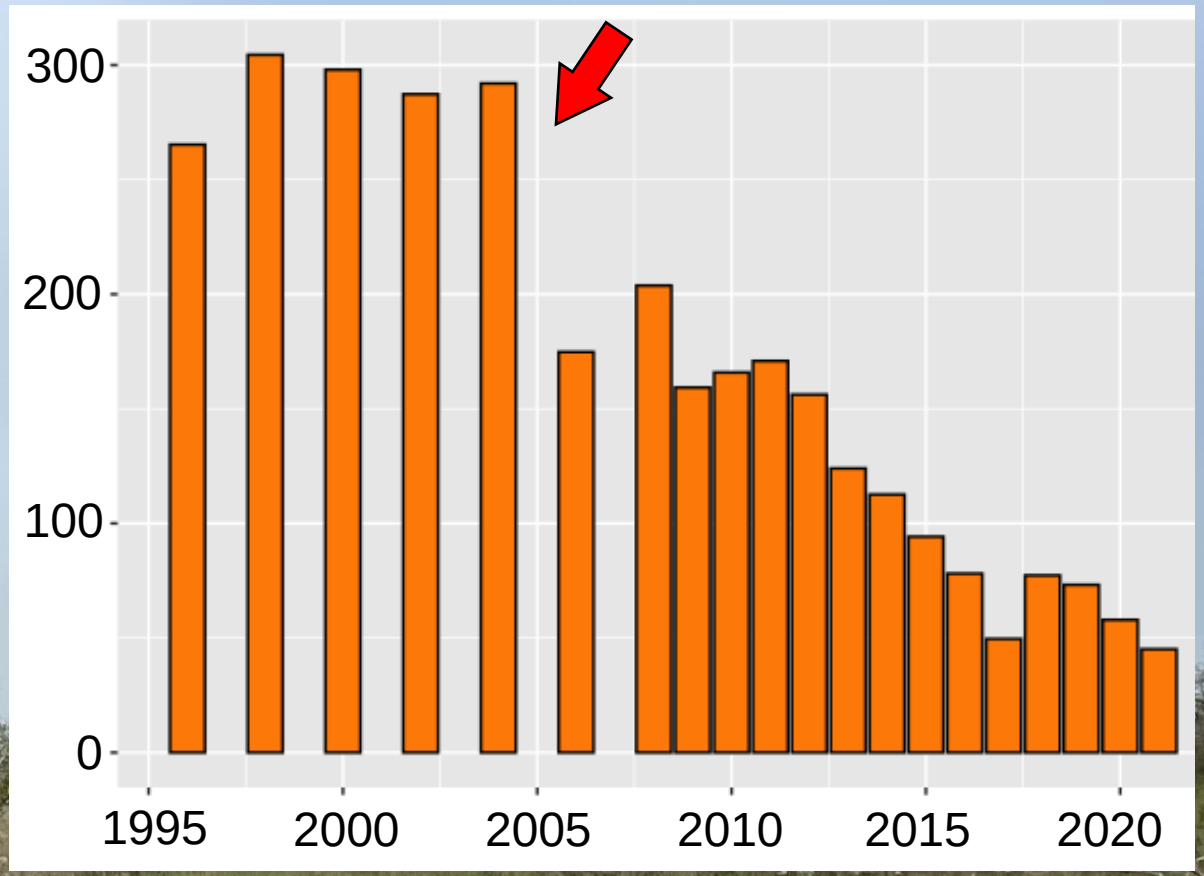
Did It Work?

Yes and no

Solutions are tenuous

Production is down and continues to drop

Management is harder, more expensive



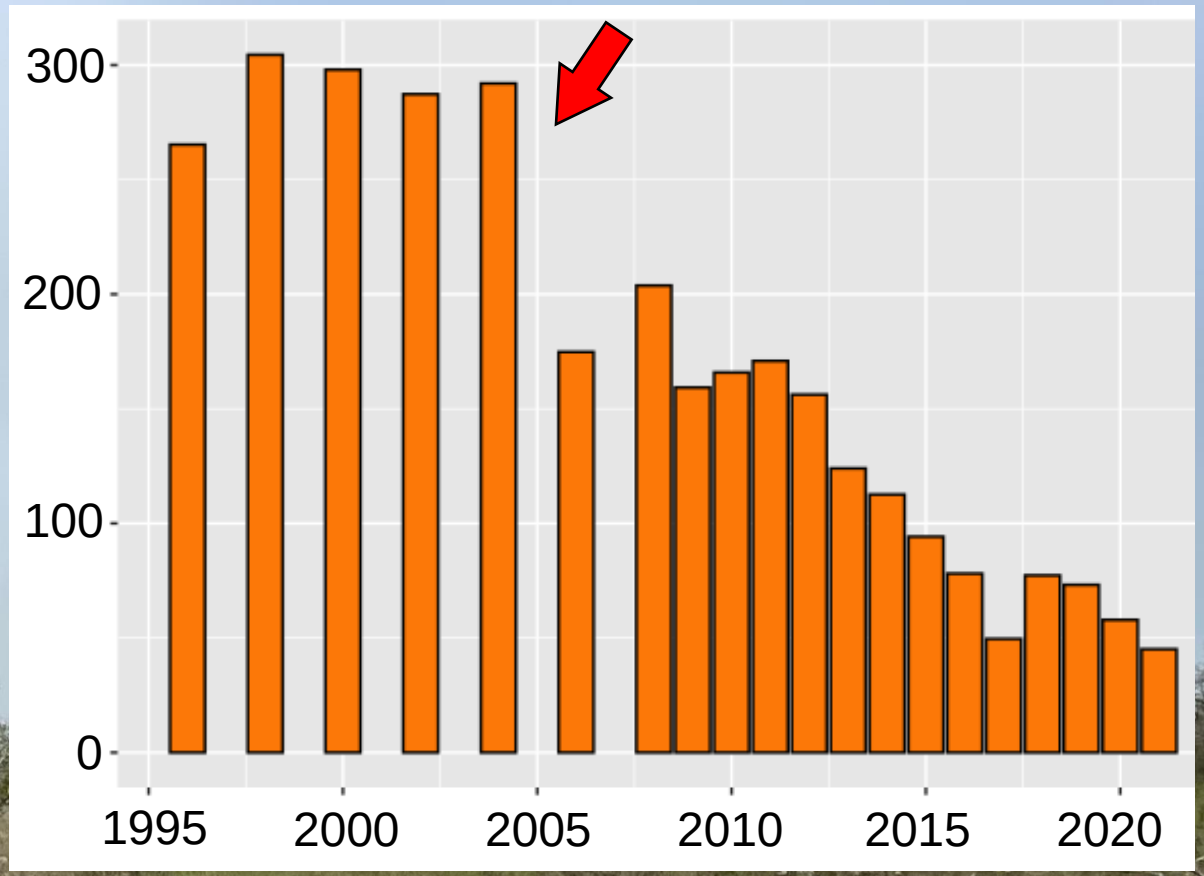
Did It Work?

Yes and no

Solutions are tenuous

Production is down and continues to drop

Management is harder, more expensive



Citrus industry still exists and is adapting

New practices being studied

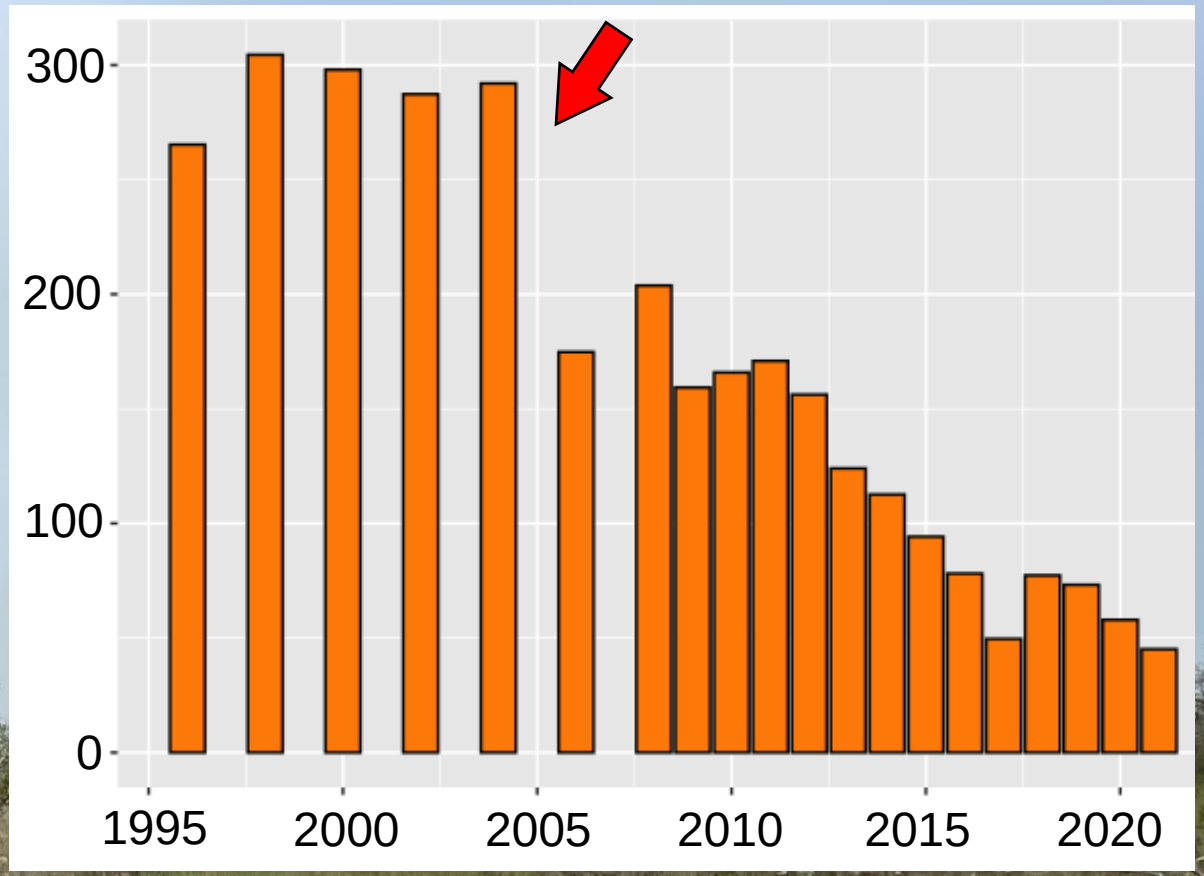
Did It Work?

Yes and no

Solutions are tenuous

Production is down and continues to drop

Management is harder, more expensive



Citrus industry still exists and is adapting

New practices being studied

The situation will continue to evolve

Downstream Effects

Downstream Effects

Management has moved away from IPM in many ways

Downstream Effects

Management has moved away from IPM in many ways

Focus is on ACP/HLB, to the exclusion of other pests

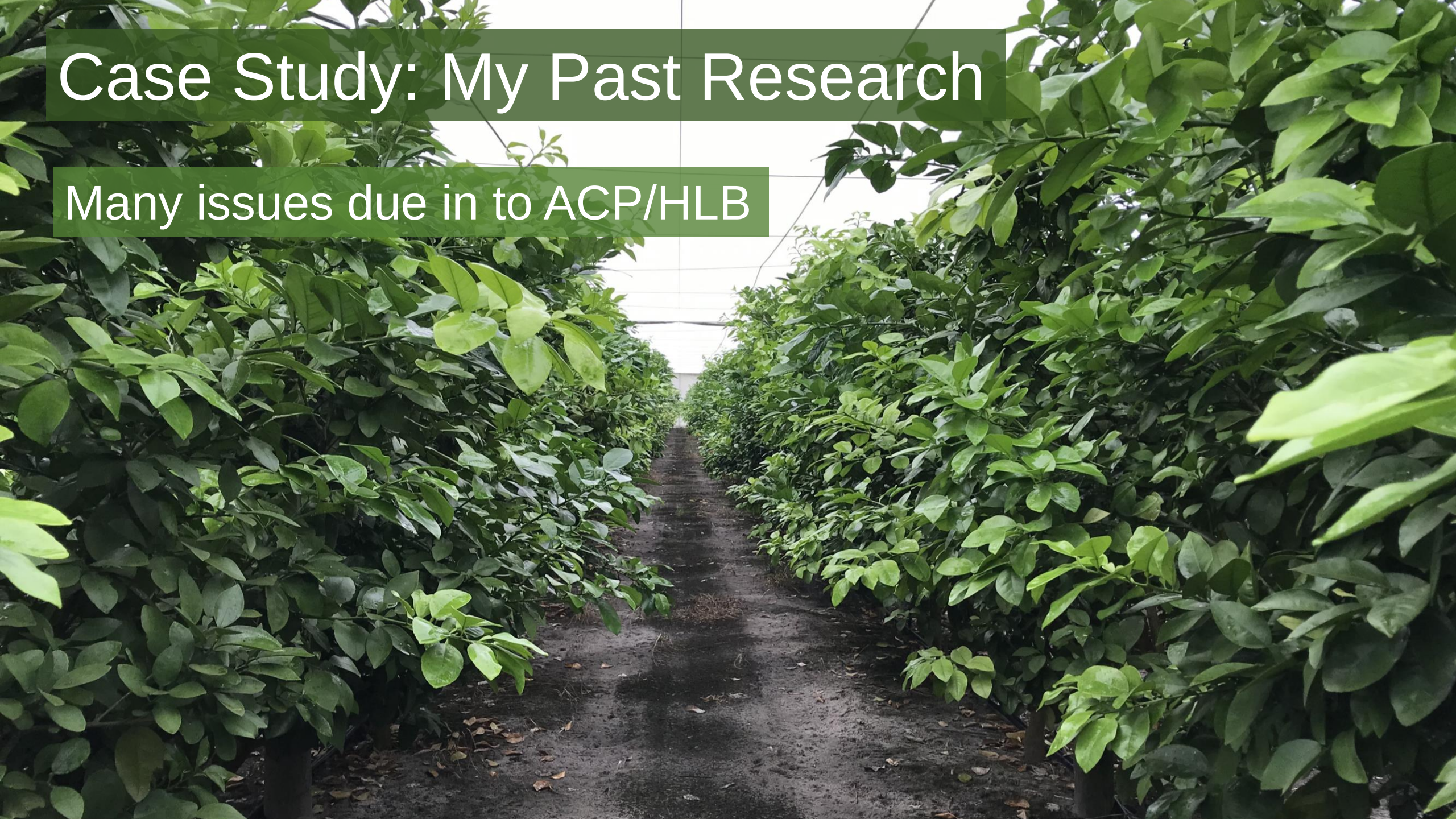
Downstream Effects

Management has moved away from IPM in many ways

Focus is on ACP/HLB, to the exclusion of other pests

Other pest species thrive in the conditions created by ACP and HLB management

Case Study: My Past Research



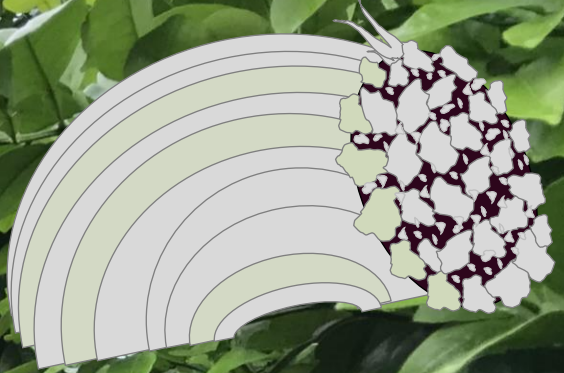
Case Study: My Past Research

Many issues due in to ACP/HLB

Case Study: My Past Research

Many issues due in to ACP/HLB

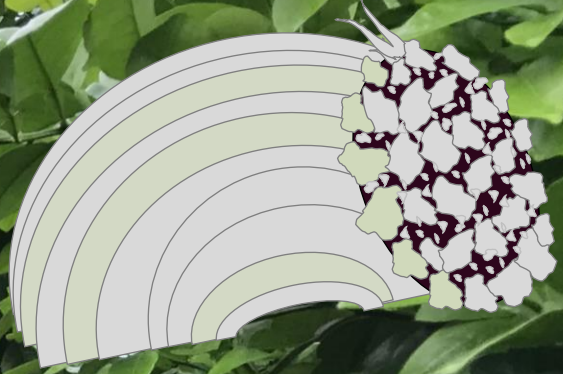
I studied a new invasive mealybug



Case Study: My Past Research

Many issues due in to ACP/HLB

I studied a new invasive mealybug



Hibiscus mealybug (*Nipaecoccus viridis*)

Found on citrus in 2019

Case Study: My Past Research

Many issues due in to ACP/HLB

I studied a new invasive mealybug

Hibiscus mealybug (*Nipaecoccus viridis*)

Found on citrus in 2019

Perfect example of unintended consequences of ACP/HLB management

Hibiscus Mealybug Biology

Hibiscus Mealybug Biology

Feed on all parts of tree

Causes branch dieback, fruit distortions

Sooty mold

Hibiscus Mealybug Biology

Feed on all parts of tree

Causes branch dieback, fruit distortions

Sooty mold

Can kill young trees if infestations bad

Hibiscus Mealybug Biology

Feed on all parts of tree

Causes branch dieback, fruit distortions

Sooty mold

Can kill young trees if infestations bad

Mealybugs normally a sporadic pest

Become an issue when natural enemies are absent

Hibiscus Mealybug Biology

Feed on all parts of tree

Causes branch dieback, fruit distortions

Sooty mold

Can kill young trees if infestations bad

Mealybugs normally a sporadic pest

Become an issue when natural enemies are absent

Hibiscus Mealybug Biology

Feed on all parts of tree

Causes branch dieback, fruit distortions

Sooty mold

Can kill young trees if infestations bad

Mealybugs normally a sporadic pest

Become an issue when natural enemies are absent

Covered in protective wax, feed in enclosed spaces

Difficult to control with insecticides

Hibiscus Mealybug Biology

Feed on all parts of tree

Causes branch dieback, fruit distortions

Sooty mold

Can kill young trees if infestations bad

Mealybugs normally a sporadic pest

Become an issue when natural enemies are absent

Covered in protective wax, feed in enclosed spaces

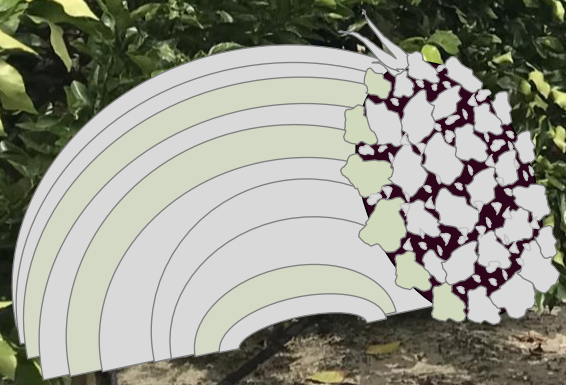
Difficult to control with insecticides

Reach high numbers under correct conditions

Hibiscus Mealybug and ACP Management

Hibiscus Mealybug and ACP Management

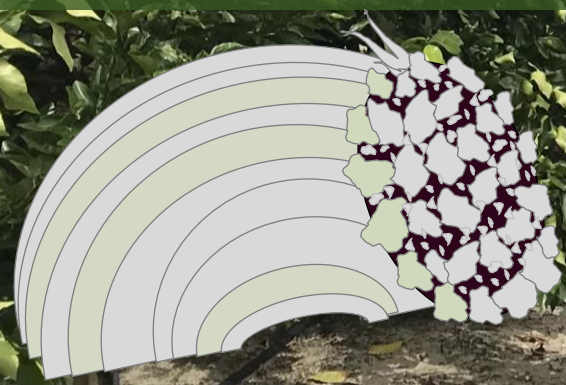
Mealybugs become an issue if…



Hibiscus Mealybug and ACP Management

Mealybugs become an issue if…

- Plants are in enclosed spaces
- Insecticides used frequently
- Natural enemies not present



Hibiscus Mealybug and ACP Management

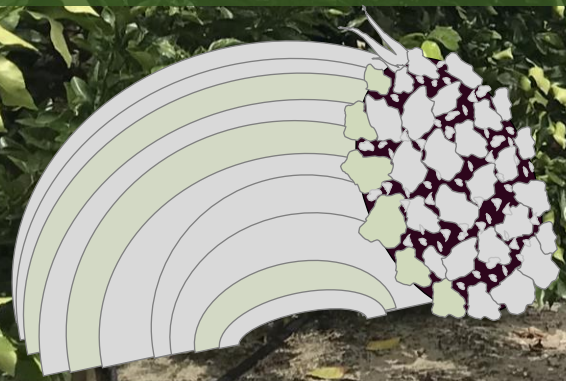
Mealybugs become an issue if…

Plants are in enclosed spaces

Insecticides used frequently

Natural enemies not present

IPCs and CUPS



Hibiscus Mealybug and ACP Management

Mealybugs become an issue if…

Plants are in enclosed spaces

Insecticides used frequently

Natural enemies not present

IPCs and CUPS

Constant use of insecticides