Leprosis and stem-pitting: exotic viral diseases we want to keep out of Florida

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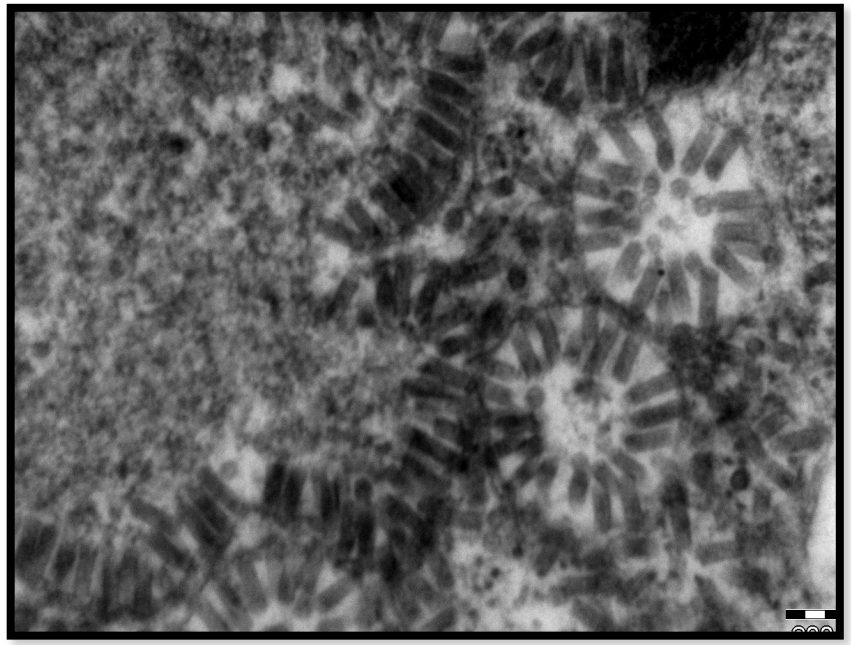
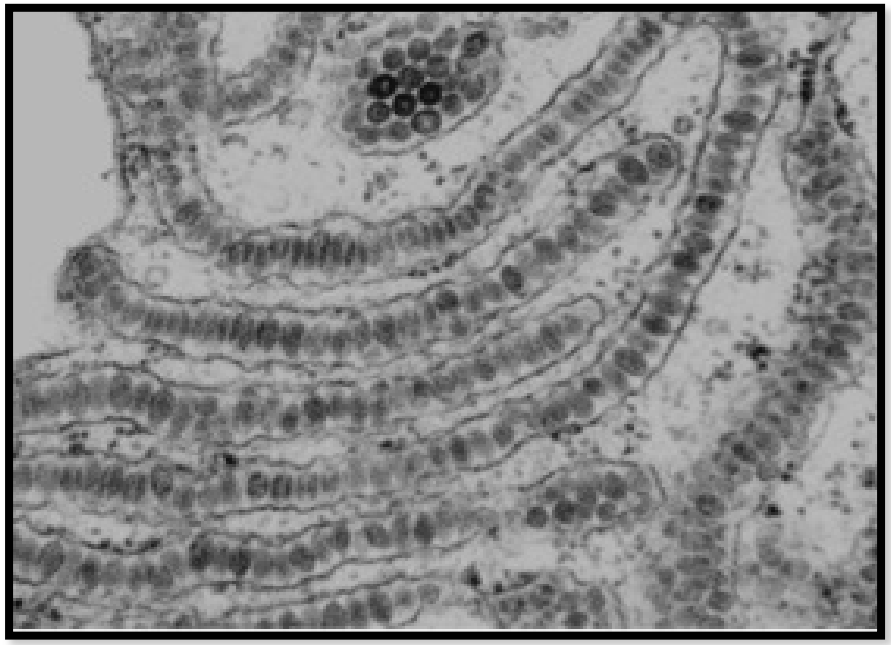
What are exotic diseases?

- An exotic citrus disease is a disease that does not occur in Florida, but can be found in other major citrus growing regions around the world.
- Citrus leprosis and Stem-pitting are exotic viral diseases with high potential to develop in Florida
- Early detection is essential to protecting Florida citrus. So its important to know about these diseases before they spread

Citrus Leprosis Virus





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Leprosis is spread through south and central America

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Citrus Leprosis virus – Nuclear Rhabdoviridae –Bullet shaped viruses

- **CiLV-N thought to be what was present in Florida from 1860s through 1960s.**
- **It is a minor isolate in Brazil.**

- *Orchid fleck virus* *OFV*
- *Citrus leprosis virus N* *CiLV-N*
- *Citrus Chlorotic spot virus* *CiCSV*

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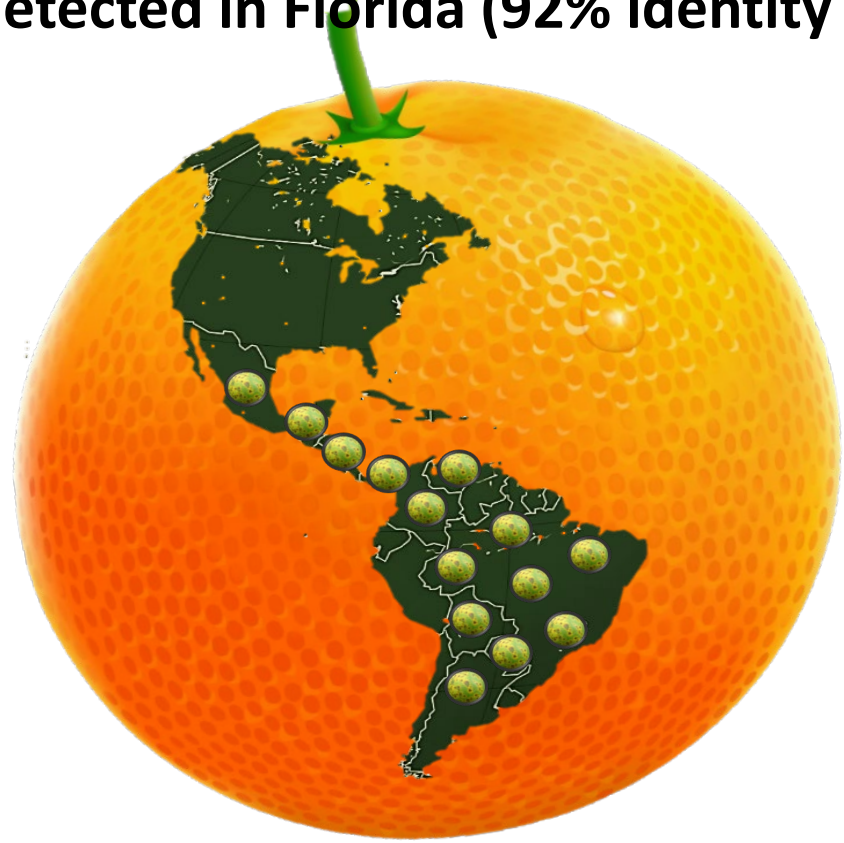
Citrus Leprosis virus – Cytoplasmic

- **CiLV-C has caused economic losses in Brazil, Argentina, Paraguay, Uruguay, Venezuela, Costa Rica, Mexico, Panamá and Honduras**
- **Hibiscus-infecting cilevirus (HiCV) was detected in Florida (92% identity to CiLV-C2)**

- *Cilevirus*
  - Citrus leprosis virus – C CiLV-C
  - Citrus leprosis virus – C2 CiLV-C2
- *Higrevirus*
  - Hibiscus green spot virus 2 HGSV-2



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Virus transmitted by false spider mites = Flat Mites

- **False spider mites are present in Florida**

- The *Brevipalpus yothersi* flat mite transmits citrus leprosis disease (cytoplasmic virus).
- *B. californicus* thought to transmit leprosis in Florida in the 1860s – 1960s
- *B. phoenicis*
- *B. papayensis*
- *B. obovatus*
- **Specific *leprosis diseases associated with specific vectors.***

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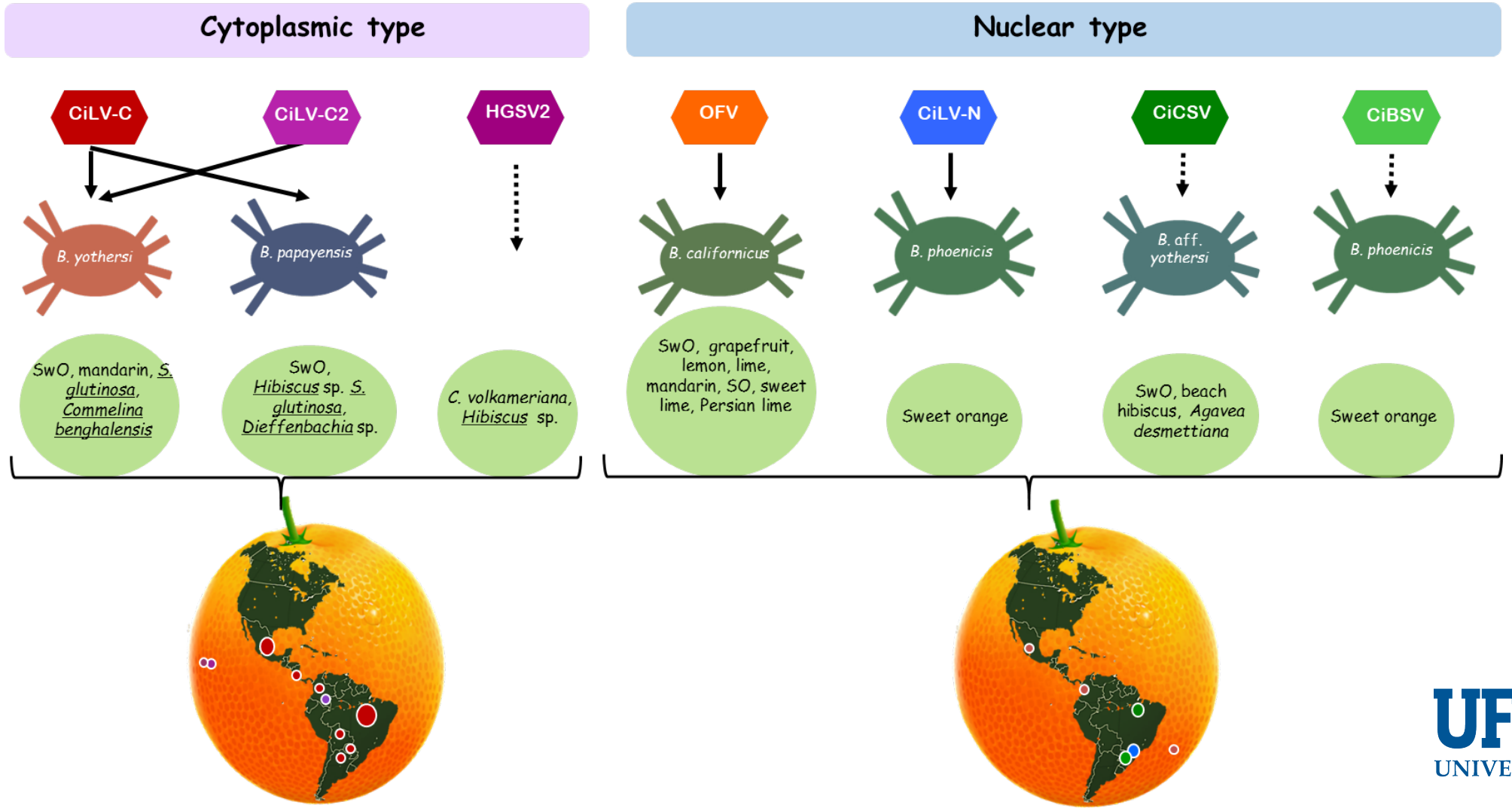
Range/Distribution of Citrus Leprosis Viruses



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Fruit Symptoms

Early chlorotic lesions on fruit.

Older lesions showing signs of gumming and cracking, with a distinct yellow halo.

Twig and Branch Symptoms

Early stage, shallow lesions on stem.

Older lesions, corky and scaly bark.

Leaf Symptoms

Early chlorotic leaf lesions (CiLV C-type).

Leaf lesions on the upper side of leaf (CiLV C-type).

Corresponding leaf lesion on the underside of the leaf, less pronounced (CiLV C-type).

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Can be Confused with Citrus Canker

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Diagnosis

- Visual symptoms on leaves
- Inoculation into common bean as a herbaceous indicator
- Transmission Electron Microscopy of lesions to lD virus particles
- Specific Polymerase chain reaction test, but need to know which of the Leprosis complex you are looking for.
  - New tests are developed as new strains are identified

Our goal- keep leprosis out of Florida; detect as soon as possible if it arrives

If you Suspect you see symptoms of Leprosis:

Contact us

Or Florida Division of Plant Industry 1-800-282-5153

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Citrus Tristeza Virus Stem Pitting

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Citrus Tristeza Virus (CTV) – Stem Pitting

Stem pitting results in pits in the wood under depressed areas of bark and are often associated with severe stunting and considerably reduced fruit production.

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Citrus Tristeza Virus (CTV) – Stem Pitting

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Citrus Tristeza Virus (CTV) – Stem Pitting

- **Moderate severe stem pitting isolates of CTV known to be in Florida (no severe). VT most dominant.**

•Host Range and Symptoms

Stem pitting does not kill trees
Reduces vigor, reduces growth, reduces yield and fruit size
Stem pitting is specific to virus isolate and host
some isolates cause stem pitting in grapefruit
some isolates cause stem pitting in sweet orange
some isolates cause stem pitting in both
In Florida, mandarins are more tolerant

•Control

Keep stem pitting isolates out
Mild strain cross protection
Control Aphids

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CTV-VT is transmitted by aphids

- The brown citrus aphid is the most efficient vector of CTV VT- cause stem pitting
- It is sometimes assumed the brown citrus aphid was eradicated by the psyllid spray programs
- All aphids are capable of periodic outbreaks when conditions are right

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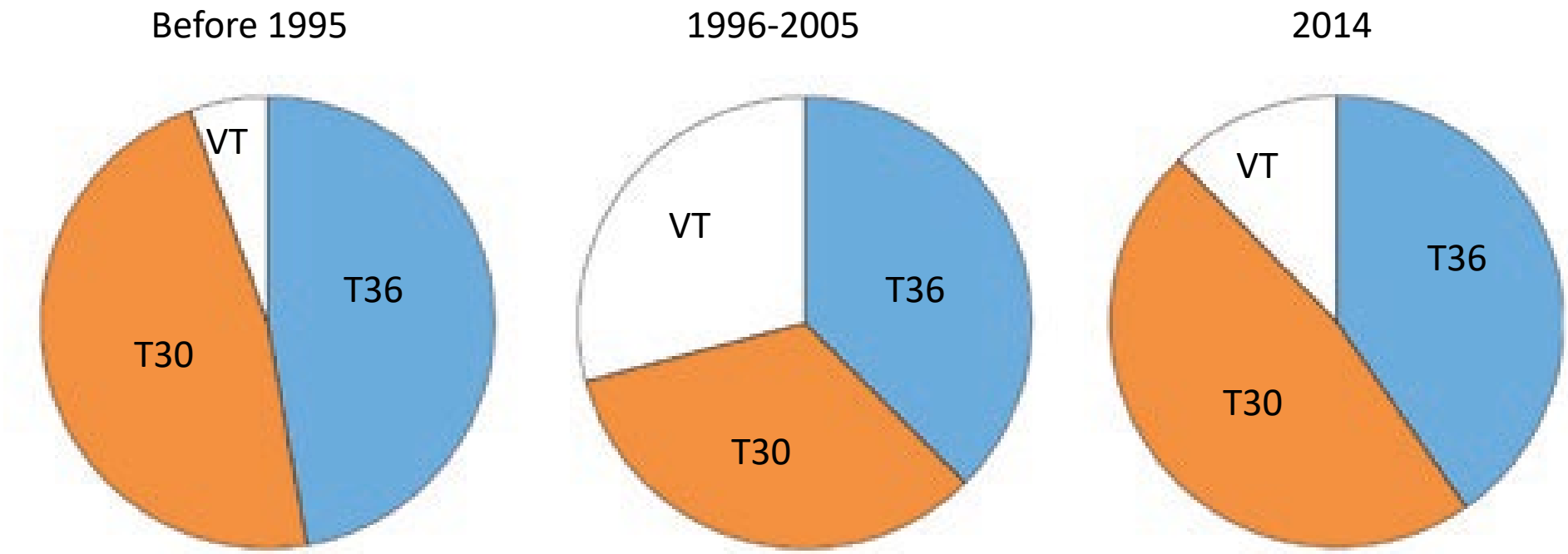
CTV-VT levels went down 2005-2014



S.J. Harper, S.J. Cowell, S.E. Halbert, R.H. Brlansky and W.O. Dawson, citrus industry, 2015

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VT still present in groves in Florida (2020)

Site	County	Main Var/RS	Sample Dates and tissue type	CTV Genotypes Detected
1	Polk	Sweet orange/variety of rootstocks	Fall 2018 Budsticks	VT detected;
1	Polk	Sweet orange/variety of rootstocks	Feb 2020 Roots	VT detected
1	Polk	Sweet Orange/variety of rootstocks	June 2020 budsticks	VT detected
6	Polk	Glen navel/trifoliate hybrid	Apr 2020	VT only detected

Overall, we found VT isolate in 25% of our sampling sites

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VT still present in groves in Florida (2020)

PSYLLID qPCR RESULTS				
Test#	Sample	County	Coll Date	CTV
E-505	Psyllid adults	**Glades County**	10/27/2017	T-36, **VT**
E-506	Psyllid nymphs	**Collier County**	11/1/2017	T-36, **VT**
E-510	Psyllid adults	**Orange County**	11/20/2020	T-36, **VT**
E-514	Psyllid adults	**Orange County**	3/9/2018	T-36, **VT**
E-515	Psyllid adults	**Collier County**	3/13/2020	T-30, T-36, **VT**

VT isolate was present in about a third of the psyllid sampling sites

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CTV-stem pitting isolate is present in Florida

If you suspect stem pitting:

- Contact us
- Or Florida Division of Plant Industry 1-800-282-5153

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Thanks to:
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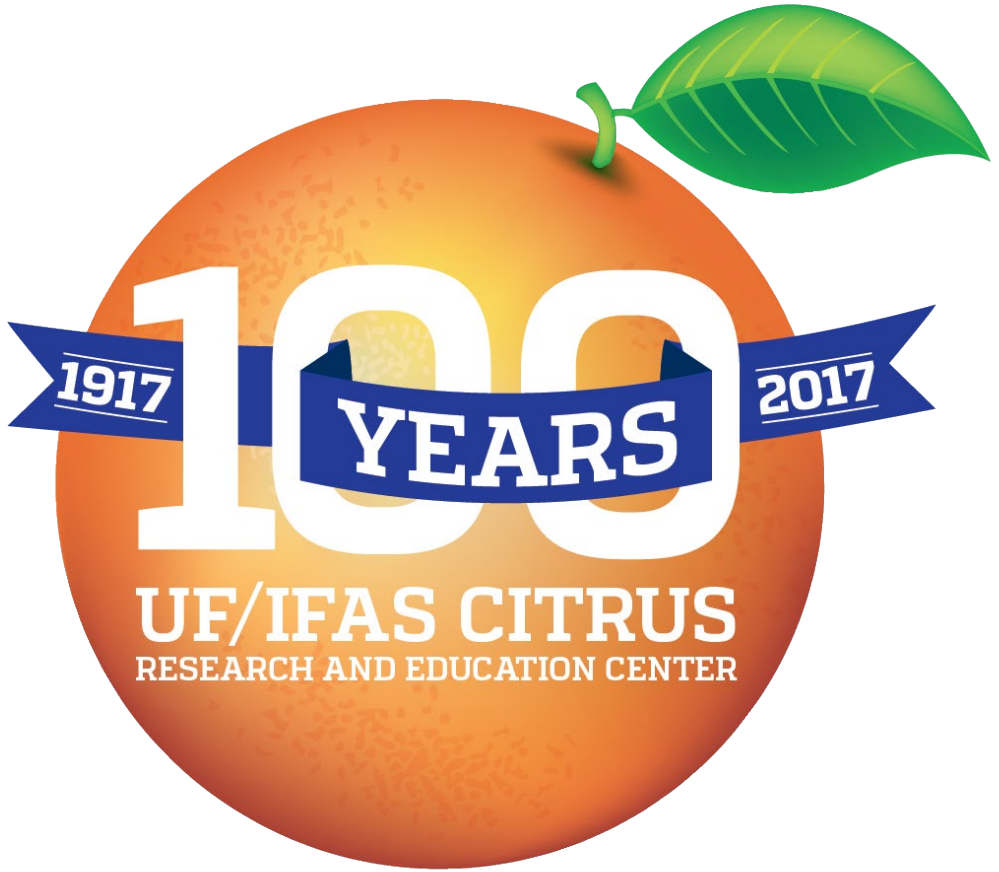

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