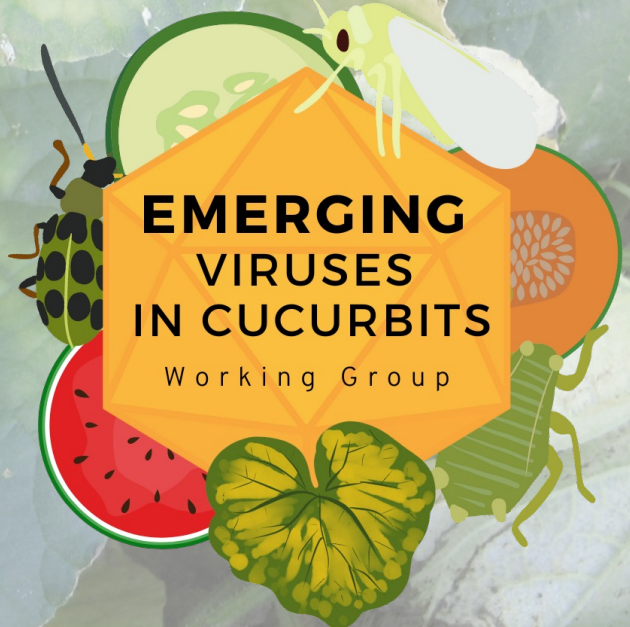


The Emerging Viruses in Cucurbits Working Group (EVCWG): a new working group to reduce virus spread in cucurbit crops

[event name]
[location] • [date]

[Presenter]



What is the problem?

- Cucurbit-infecting viruses are being introduced into or emerging in the United States at an alarming rate.
- Yield and quality of fruit are affected, reducing marketability and profits.
- These viruses are both seed-borne and insect-transmitted.
- Additional viruses affecting cucurbits exist internationally and could potentially be introduced into the United States.
- There is insufficient industry-wide communication and knowledge of these viruses and their management within the cucurbit industry.

What are some of the virus threats facing cucurbit production?

- Existing U.S. virus concerns
 - Cucumber green mottle mosaic virus (CGMMV) and related tobamoviruses
 - Cucurbit yellow stunting disorder virus (CYSDV), cucurbit chlorotic yellows virus (CCYV), and related criniviruses
 - Squash vein yellowing virus (SqVYV, ipomovirus)
 - Mosaic viruses (cucumber mosaic virus (CMV, cucumovirus) and potyviruses)
- International concerns
 - Tomato leaf curl New Delhi virus (ToLCNDV, begomovirus)
 - Watermelon chlorotic leaf curl virus (MCLCuV, begomovirus)
 - Cucumber vein yellowing virus (CVYV, ipomovirus)

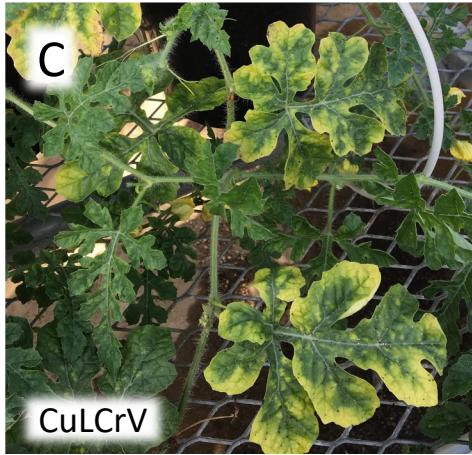
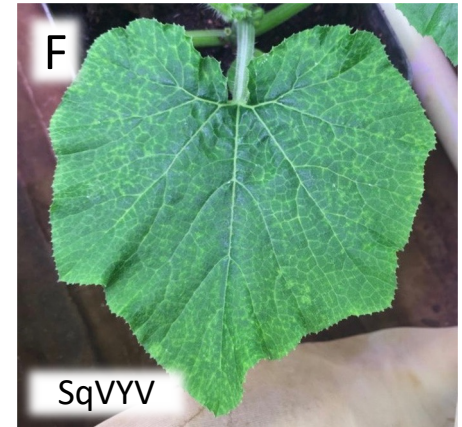
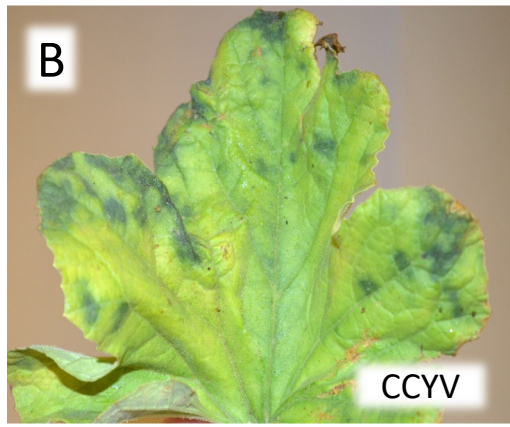
Cucumber green mottle mosaic virus (CGMMV) is currently a major production concern.



Cucumber green mottle mosaic virus (CGMMV, *Tobamovirus*) on cucumber.
Photo: Tongyan Tian, CDFA.

- *Tobamovirus*
- Identified in Canada and California, 2013
- Extremely stable
- Infects all cucurbits
- Leaf mottle/mosaic, fruit distortion, pulp deterioration, reduced sugars
- Seed-borne

Whitefly-transmitted viruses cause disease on U.S. cucurbit crops



Whitefly-covered leaf and whitefly storm

Photos: A, B, D, and F – W. M. Wintermantel, USDA-ARS; C – M. Rojas, Univ. California-Davis; E – A. Simmons, USDA-ARS; G, H - E. Natwick, Univ. California Extension.

Symptoms of many viruses can be difficult if not impossible to differentiate.



Cucurbit yellow stunting disorder virus (CYSDV; *Crinivirus*) infecting melon in the San Joaquin Valley of California where the virus was recently identified. Photo: W. M. Wintermantel, USDA-ARS.

Cucurbit yellow stunting disorder virus (CYSDV, *Crinivirus*) symptoms are identical or very similar to those of:

- Cucurbit chlorotic yellows virus (CCYV; *Crinivirus*)
- Beet pseudoyellows virus (BPYV; *Crinivirus*)
- Cucurbit aphid-borne yellows virus (CABYV; *Polerovirus*)
- *Tomato leaf curl New Delhi virus (ToLCNDV; *Begomovirus*)
- *Melon chlorotic leaf curl virus (MCLCuV; *Begomovirus*)

* Virus not officially reported in U.S.

Symptoms of many viruses can be difficult if not impossible to differentiate.



Watermelon mosaic virus (WMV; *Potyvirus*) in pumpkin in Mississippi. Photo: R. A. Melanson, Mississippi State University Extension.

Watermelon mosaic virus (WMV, *Potyvirus*) symptoms are identical or very similar to those of:

- Papaya ringspot virus (PRSV; *Potyvirus*)
- Zucchini yellow mosaic virus (ZYMV; *Potyvirus*)
- Squash mosaic virus (SqMV; *Comovirus*)
- Cucumber mosaic virus (CMV; *Cucumovirus*)
- Cucumber green mottle mosaic virus (CGMMV; *Tobamovirus*)

Timeline of Whitefly-transmitted Cucurbit Virus Emergence in the United States

California

SLCV 1977
LIYV 1981
CuLCrV 1998
CYSDV 2006
SqVYV 2014
CCYV 2014

Arizona

SLCV 1978
LIYV 1981
CuLCrV 1998
CYSDV 2006
SqVYV 2019
CCYV 2019

Texas

SLCV 1993
CuLCrV 1998
CYSDV 1999
CCYV 2020

Alabama

CYSDV 2020
CCYV 2020

South Carolina

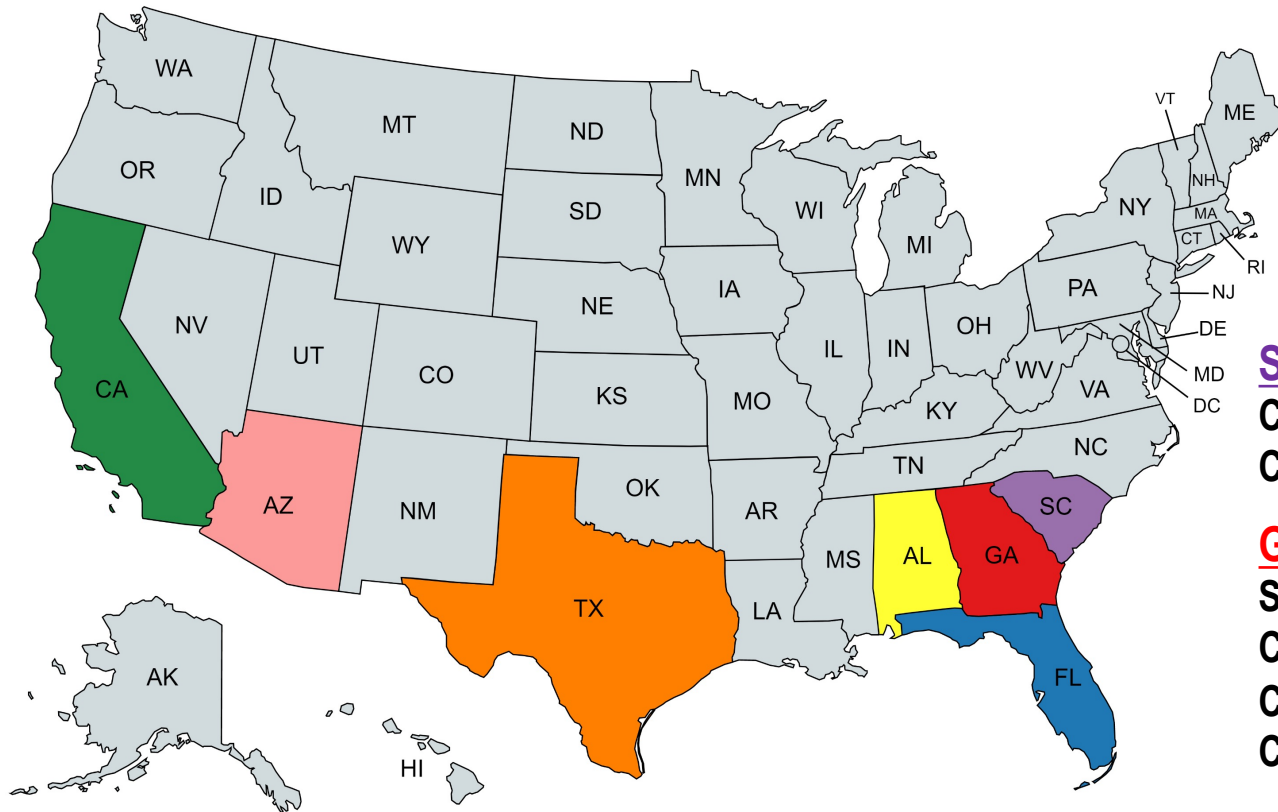
CuLCrV 2018
CYSDV 2019

Georgia

SqVYV 2011
CYSDV 2016
CuLCrV 2019
CCYV 2020

Florida

SqVYV 2003
CYSDV 2007
CuLCrV 2008

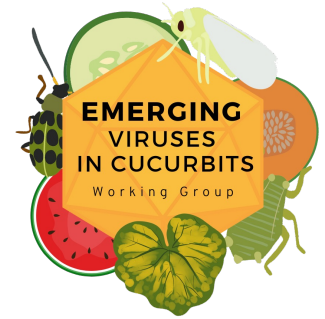


How did the EVCWG evolve?

- Idea Café discussion at Plant Health 2021 (APS virtual meeting), August 2021, led by Wintermantel and Melanson
- Follow-up discussion with cucurbit industry, October 2021
 - Identified needs:
 - Increased knowledge across the industry with regard to current and potential virus threats
 - Improved educational resources on virus threats for industry stakeholders (growers, extension, seed industry, greenhouse, nursery, research)
- Funded by Southern Region IPM Center, Southern IPM Grants 2022 program to support development of the EVCWG and activities.

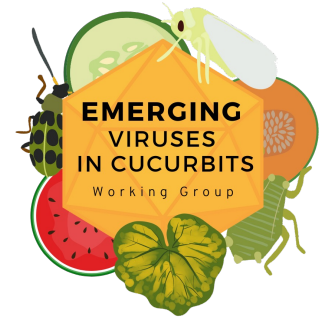


Who is the EVCWG?



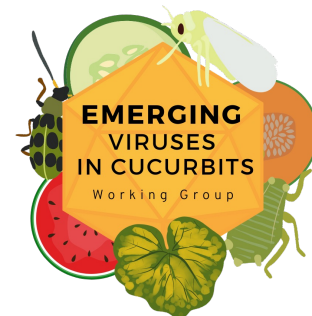
- A collaborative group of **25** members representing various crops, disciplines, and sectors of the cucurbit industry:
 - Co-Chairs: Bill Wintermantel, USDA-ARS, Salinas, CA, and Rebecca Melanson, Mississippi State University Extension
 - Steering committee: includes 8 members representing seed companies (2), government research (2), and university research (4)
 - General membership: includes 11 members representing USDA-APHIS-PPQ, USDA-ARS, university extension, and university research from various regions of the U.S.
 - International membership: includes 4 members representing interests from other cucurbit producing regions of the world

Who is the EVCWG?



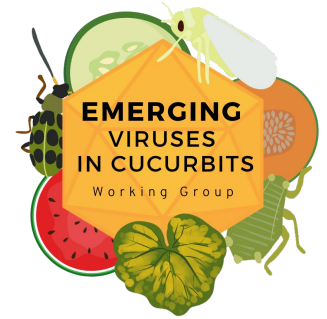
- **Co-chairs:**
 - Rebecca Melanson (MS)
 - Bill Wintermantel (CA)
- **Steering committee:**
 - Scott Adkins (FL)
 - Olufemi Alabi (TX)
 - Sudeep Bag (GA)
 - Kishor Bhattarai (CA)
 - Phyllis Himmel (CA)
 - Shaker Kousik (SC)
 - Kerry Mauck (AZ)
 - Samantha Thomas (MO)
- **U.S. Members:** Bright Adindotan (MD), Apurba Barman (CA), Ric Dunkle (VA), Bob Gilberton (CA), Tony Keinath (SC), Kai-Shu Ling (SC), Cecelia McGregor (GA), John Palumbo (AZ), Babu Srinivasan (GA), Tom Turini (CA), Gary Vallad (FL)
- **International Members:** Aviv Dombrovsky (Israel), Cherie Gambley (Australia), Marisa Gómez-Guillamón (Spain), Frédéric Péréfarres (Spain)

What is the mission of the EVCWG?



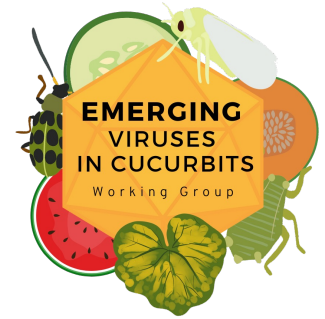
- Improve communication and knowledge of viruses and their spread across the industry
- Promote strategies to successfully identify and mitigate virus threats to cucurbit production
- Educate stakeholders on emerging viruses of cucurbits and the mission and initiatives of the EVCWG both in the U.S. and internationally

How will the EVCWG achieve its mission?



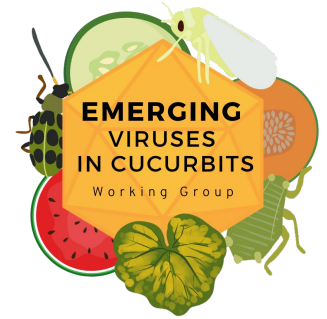
- Hold quarterly EVCWG meetings
- Develop an EVCWG website (***Coming soon!***) to share and communicate EVCWG initiatives, activities, and educational resources
- Develop educational webcasts/videos/recorded presentations and fact sheets on virus threats to cucurbit production
- Deliver educational presentations to stakeholders on emerging viruses and their management

Why should I visit the EVCWG website? **COMING SOON!** www.eCucurbitviruses.org



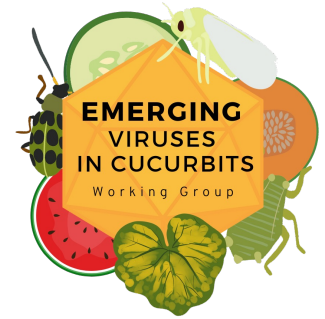
- Learn about EVCWG activities!
 - Access reports about EVCWG member meetings
- Learn how to identify and manage viruses in cucurbits!
 - Access cucurbit virus and vector images
 - Access educational resources on cucurbit viruses (fact sheets and videos)
- Access contact information for state diagnostic laboratories and EVCWG members
- Access other useful resources for cucurbit production!

What questions are currently being addressed by the EVCWG?



- What are the potential risk factors for viruses affecting cucurbits?
- What regional/local threats exist and how do risks vary by type of production or region?
- What approaches can we take to mitigate threats?
- What can industry and academia do to coordinate efforts to reduce threats?

Visit with an EVCWG member to learn more.



- **Bill Wintermantel**
EVCWG Co-chair
USDA-ARS, Salinas, CA
bill.wintermantel@usda.gov



- **Rebecca A. Melanson**
EVCWG Co-chair
MS State University Extension
rebecca.melanson@msstate.edu

