

Aug 28th, 8:30 AM - 8:45 AM

Overview of Tobacco streak virus and Blueberry shock virus in cranberry

Lindsay Wells-Hansen

Ocean Spray Cranberries, Inc., lwellshansen@oceanspray.com

Sara Thomas-Sharma

University of Wisconsin - Madison, thomassharma@wisc.edu

Patricia McManus

University of Wisconsin - Madison, pmcmanus@wisc.edu

Follow this and additional works at: <https://scholarworks.umass.edu/nacrew>

 Part of the [Agriculture Commons](#)

Recommended Citation

Wells-Hansen, Lindsay; Thomas-Sharma, Sara; and McManus, Patricia, "Overview of Tobacco streak virus and Blueberry shock virus in cranberry" (2017). *North American Cranberry Researcher and Extension Workers Conference. 2.*
<https://scholarworks.umass.edu/nacrew/2017/papers/2>

This Event is brought to you for free and open access by the Cranberry Station at ScholarWorks@UMass Amherst. It has been accepted for inclusion in North American Cranberry Researcher and Extension Workers Conference by an authorized administrator of ScholarWorks@UMass Amherst. For more information, please contact scholarworks@library.umass.edu.

Tobacco streak virus and Blueberry shock virus in cranberry

**Lindsay Wells-Hansen
Sara Thomas-Sharma
Patty McManus**

NACREW 2017



THE UNIVERSITY
of
WISCONSIN
MADISON



Acknowledgements

McManus lab members

Sara Thomas-Sharma
Victoria Kartanos
Anna Cramer
Rae Page
Madeleine Hughan

Growers/crop consultants

WI crop consultants
Cranberry Grower Cooperators

Funding sources

USDA-HATCH
Wisconsin Cranberry Board, Inc.
Ocean Spray Cranberries, Inc.
The Cranberry Institute
Senator Robert Caldwell Graduate Fellowship

Collaborators

Murray Clayton
Tom German
Ranjit Dasgupta
Benham Lockhart
Robert Martin
Nicholi Vorsa
James Polashock
Erika Saalau-Rojas

Plant Disease Diagnostic Clinic at UW-Madison

Brian Hudelson
Ann Joy
Sean Toporek

Seed Potato Lab

Andy Witherell
Brooke Weber

Berry scarring associated with BShV and TSV is identical

TSV-positive
BShV-negative



BShV-positive
TSV-negative

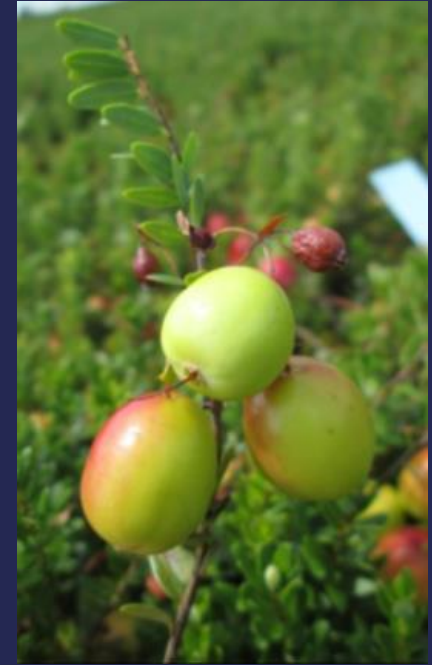


Recovery of uprights

Year 1



Year 2



- All plant parts test positive for TSV or BlShV in the year(s) following scarring
- Mechanism currently unknown

Distribution of TSV within cranberry uprights with scarred fruit

Plant part tested	% TSV-positive samples from symptomatic uprights		
	early fruit set	late fruit set	harvest
previous-season leaves	83	99	98
current-season leaves	21	83	99
symptomatic berries	99	33	4
asymptomatic berries	67	7	6
roots	79	65	60
stems	94	100	95
terminal buds	--	70	96

Distribution of TSV within cranberry uprights with non-scarred fruit

Plant part tested	% TSV-positive samples from recovered uprights			
	pre-fruit set	early fruit set	late fruit set	harvest
previous-season leaves	97	94	100	98
current-season leaves	94	93	97	95
asymptomatic berries	--	42	18	4
roots	93	84	71	63
stems	100	91	88	85
terminal buds	100	--	100	85

Detection of TSV & BShV in pollen

TSV

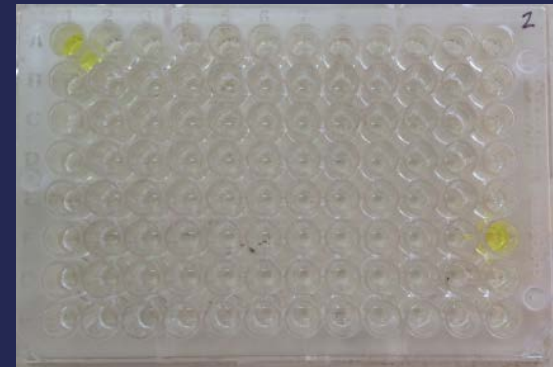
- 56% of pollen washes TSV-positive
- 100% of pollen extracts TSV-positive
- Transmitted by thrips in other crops

BShV

- NO pollen washes were BShV-positive
- 66% of pollen extracts BShV-positive
- Transmitted by pollinators in blueberry



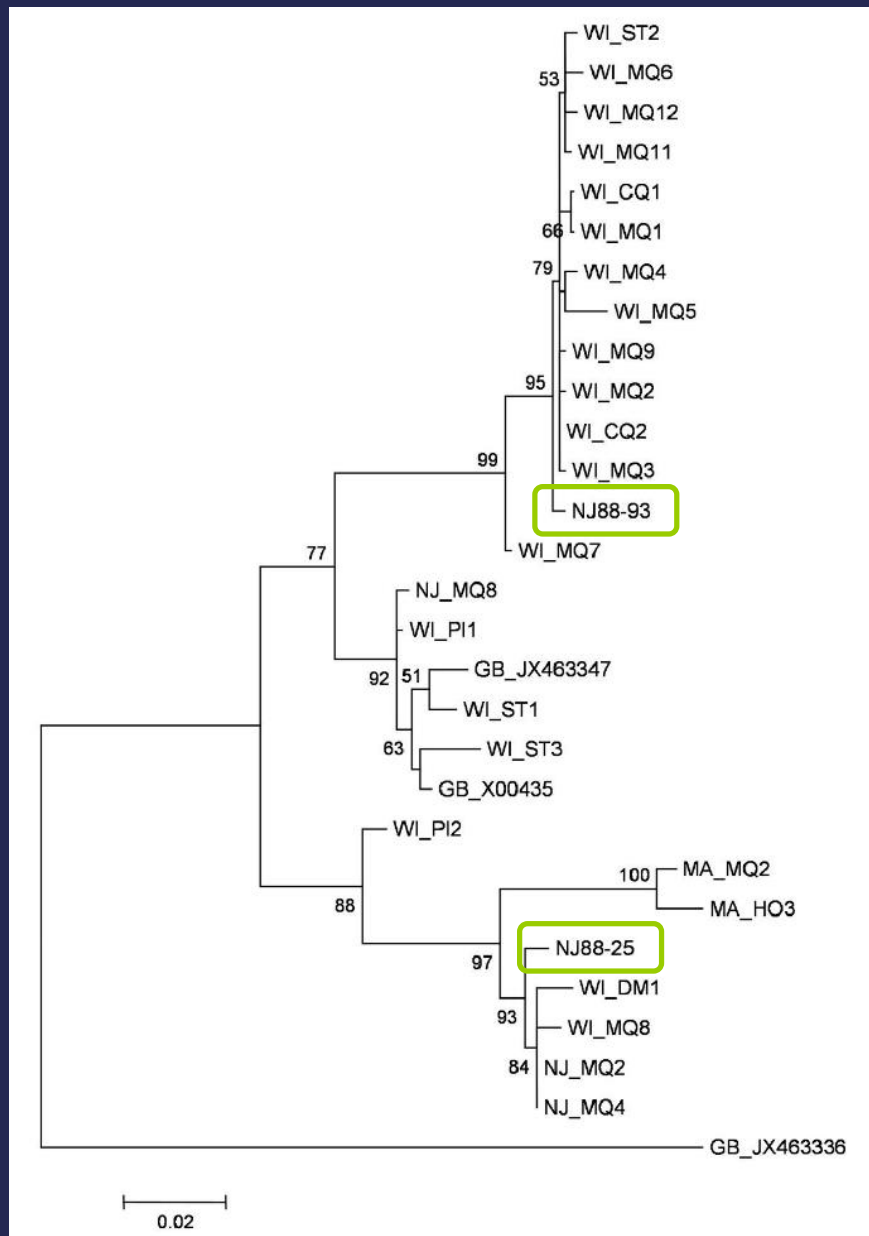
Are TSV and B1ShV seed transmitted in cranberries?



Is B1ShV seed transmitted in cranberries?

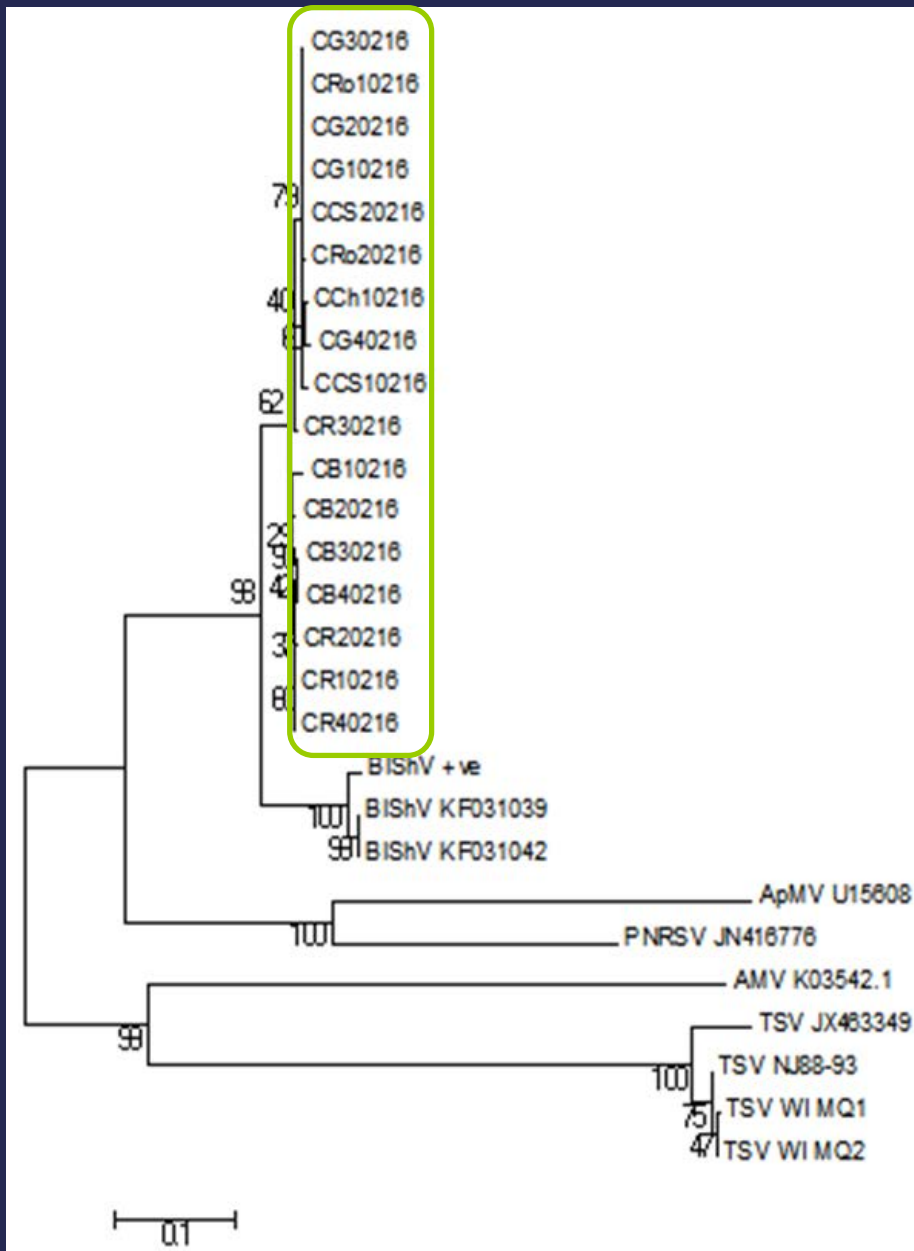
Plant material tested	Farm number	Incidence (%) of seeds or seedlings from different upright categories testing positive for B1ShV		
		Healthy	Recovered	Symptomatic
Seeds	1	1	75	12
	2	4	26	29
	3	4	67	11
Seedlings	1	46	54	56
	2	64	79	86
	3	72	85	91

Phylogenetic analysis of TSV CP coding region



- Variation among strains in cranberry
 - No grouping by state or cultivar
- Divergence of cranberry sequences from sequences in GenBank

Phylogenetic analysis of BISHV CP coding region



- Variation among strains in cranberry
 - No grouping by state or cultivar
- Shared 90% CP identity with blueberry accessions in GenBank

Summary

- TSV & BlShV symptoms are indistinguishable and variable
- BlShV, but not TSV, can be detected in seedlings
- BlShV is detected only internally in pollen
 - If TSV or BlShV is transmitted via pollen, management is complicated
- Neither TSV nor BlShV isolates group geographically

Summary

- Recovery and lack of impact on yield components help alleviate grower concerns
 - Long term effects?
 - Synergistic interactions?
- No safe time to take cuttings, but by knowing where TSV and BShV are throughout the year, we have developed sampling protocols