IMPROVING THE SANITARY STATUS OF SWEET CHERRY PLANTING MATERIALS

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Improving the sanitary status of sweet cherry planting materials

Objectives:

Objective 1: Determine the critical stages of fungal pathogen infection and contamination sources during tree production at the nursery **(year 1)**

Objective 2: Determine the efficacy of various compounds for the protection of tree wounds following budding/grafting of cherry planting material **(year 1 and year 2)**

Objective 3: Investigate the occurrence of the X-Disease Phytoplasma and Little cherry viruses in cherry propagation materials and orchards **(year 1 and year 2)**

Objective 4: Outreach and education **(year 1 and year 2)**

Fungal contaminations in planting materials

- Wood decay and canker fungi

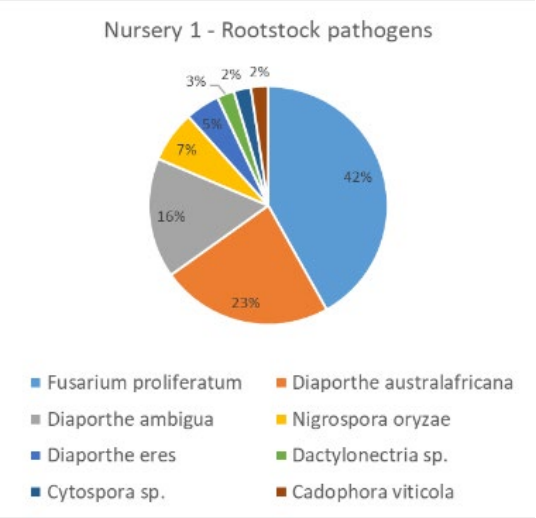


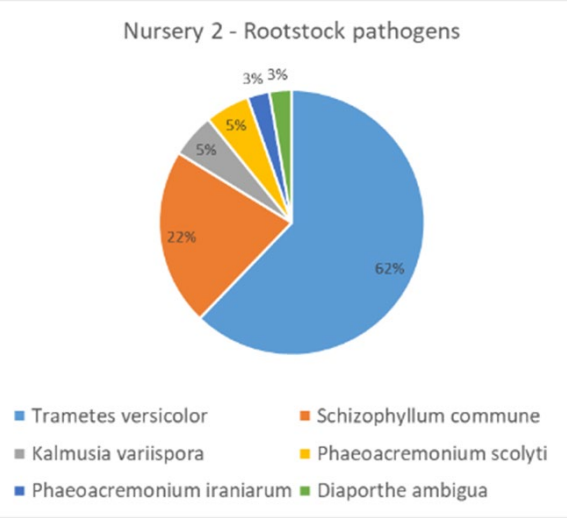

Fungal contaminations in planting materials

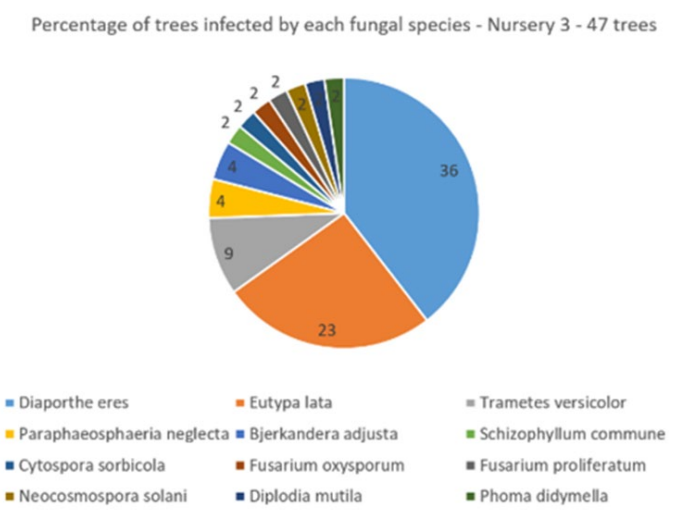
- Wood decay and canker fungi

Fungal contaminations in planting materials

- ❑ **Wood decay and canker fungi**
- ❑ **3 nursery surveyed in 2021**





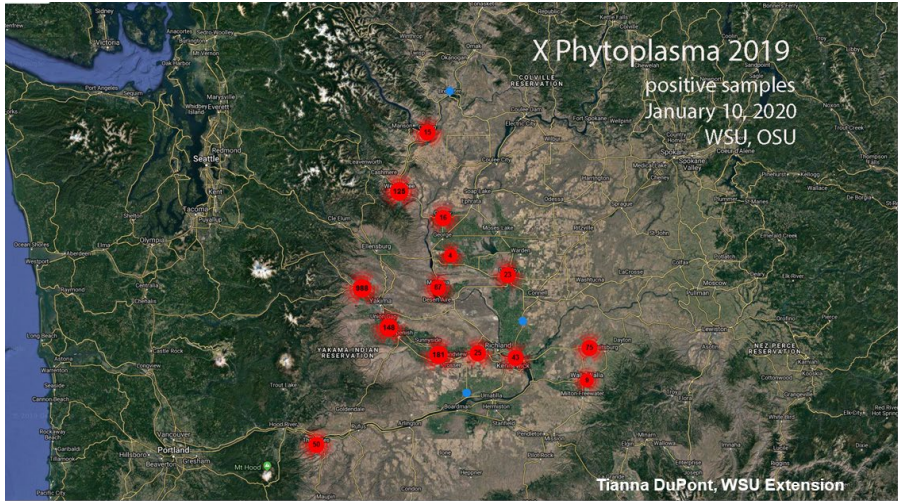


Western X-disease

- Western X-disease has reached epidemic levels in Washington cherries with 2,629 positive samples in 2019

- Disease complex: Little Cherry Disease (LCD)

✓ **The X-Disease Phytoplasmas**
✓ Little cherry virus 1 (LChV1),
✓ **Little cherry virus 2 (LChV2)**



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Assessing the quality and sanitary status of nursery planting material

- ❑ Determine possible infection pathways during tree production at the nursery (3 nurseries visited)
- ❑ Sampling planting materials at different stages during tree production (scion wood or bud wood, rootstocks)
- ❑ Sampling grafted trees a few months after topping and heading back of rootstocks and scions,
- ❑ Sampling trees before shipping

Assessing the quality and sanitary status of nursery planting material

- ❑ Identifying inoculum sources at the nursery
- ❑ Testing budwood for virus and phytoplasmas
- ❑ Protecting wounds resulting from topping rootstock following budding




Assessing the quality and sanitary status of nursery planting material

- Sampling symptomatic tissues





Testing for viruses and phytoplasmas

- ❑ No viruses or phytoplasmas were detected at the nursery
- ❑ Some viruses detected in growers' fields

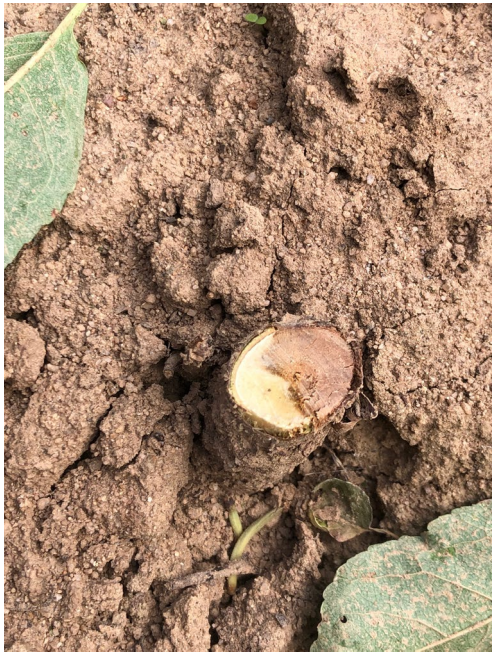
LChV1 = Little Cherry Virus 1
LChV2 = Little Cherry Virus 2
PDV = Prune Dwarf Virus
PNRSV = Prunus Necrotic Ringspot Virus
Phyto=Phytoplasmas

Foundation Plant Services

#3: Nursery 1	negative	negative	negative	negative	negative
#4: Nursery 1	negative	negative	negative	negative	negative
#5: Nursery 1	negative	negative	negative	negative	negative
#6: Nursery 1	negative	negative	negative	negative	negative
#7: Nursery 1	negative	negative	negative	negative	negative
#10: Nursery 2	negative	negative	negative	negative	negative
#11: Nursery 2	negative	negative	negative	negative	negative
#12: Nursery 2	negative	negative	negative	negative	negative
#13: Nursery 2	negative	negative	negative	negative	negative
#14: Nursery 2	negative	negative	negative	negative	negative
#15: Nursery 2	negative	negative	negative	negative	negative

Sampling of rootstocks

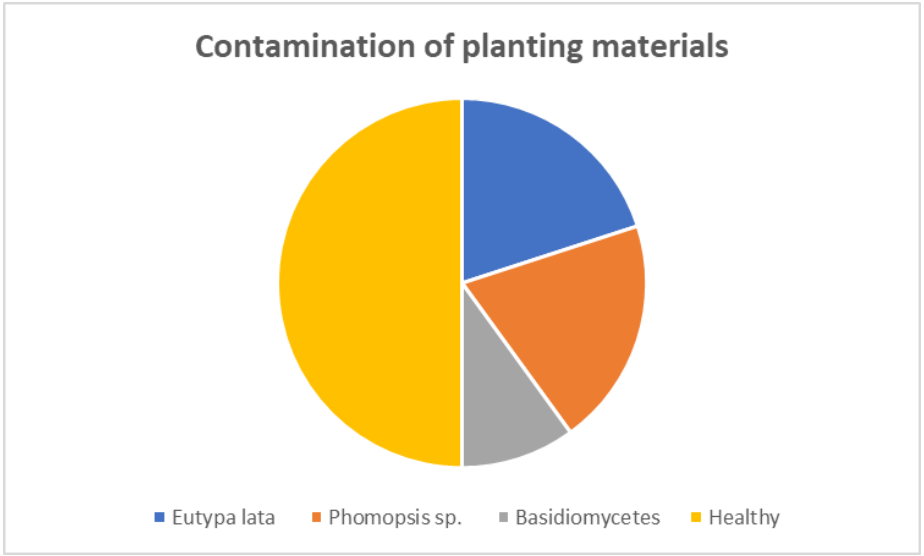
- ❑ We detected wood decay and canker diseases
- ❑ Mainly in budded trees

Sampling of rootstocks

- ❑ Nursery 1 had wood decay and canker diseases
- ❑ Nursery 2 was clean
- ❑ Nursery 3 was clean

Nursery 1



Nursery 2

Surveying nurseries

- ❑ Nursery 1 had wood decay and canker diseases
- ❑ Nursery 2 was clean

Nursery 1

Nursery 2

Identifying inoculum sources

- Sources of inoculum were identified at the nursery for wood decay and canker diseases
- *Trametes versicolor, Schyzophyllum commune, Phomopsis/Diaporthe*

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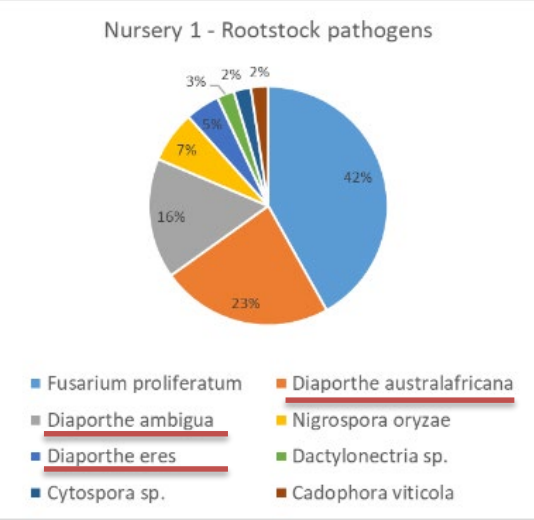
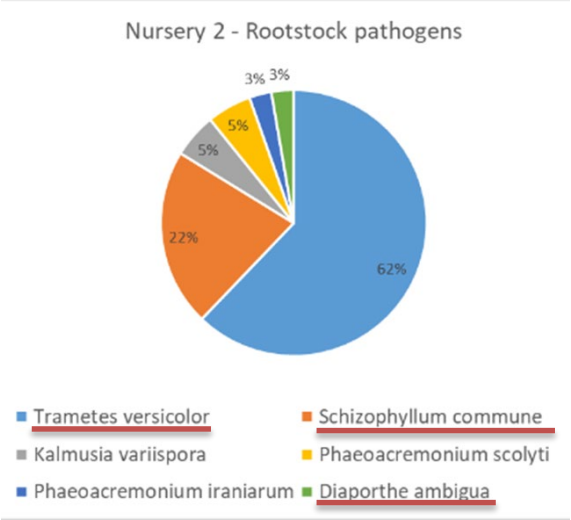
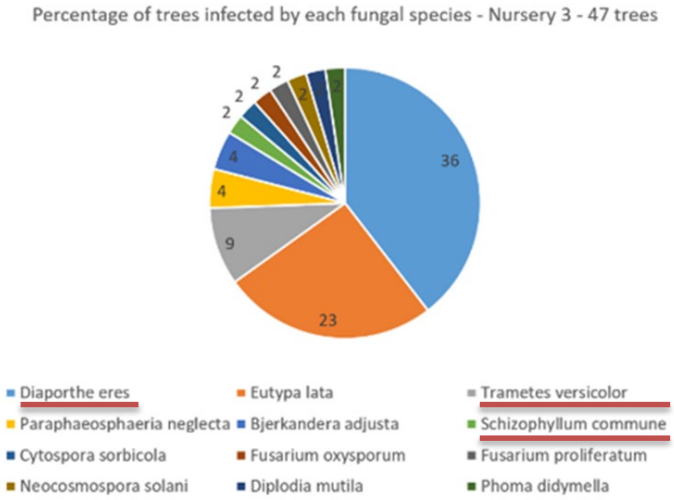
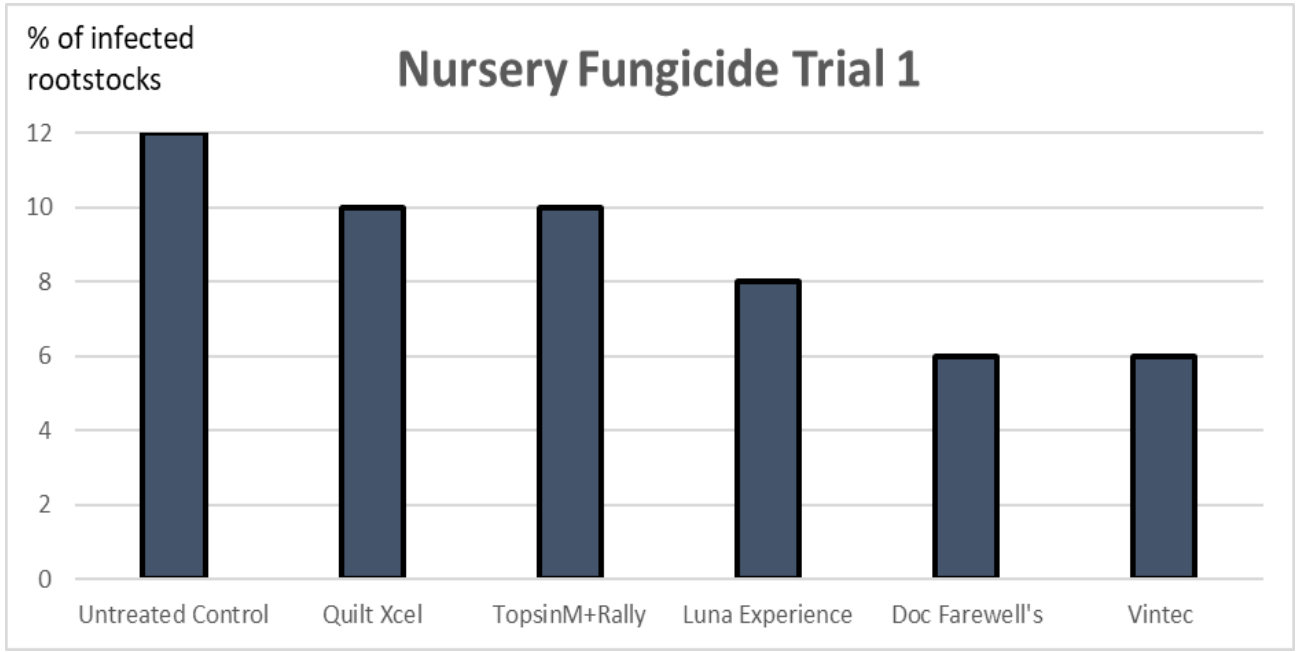






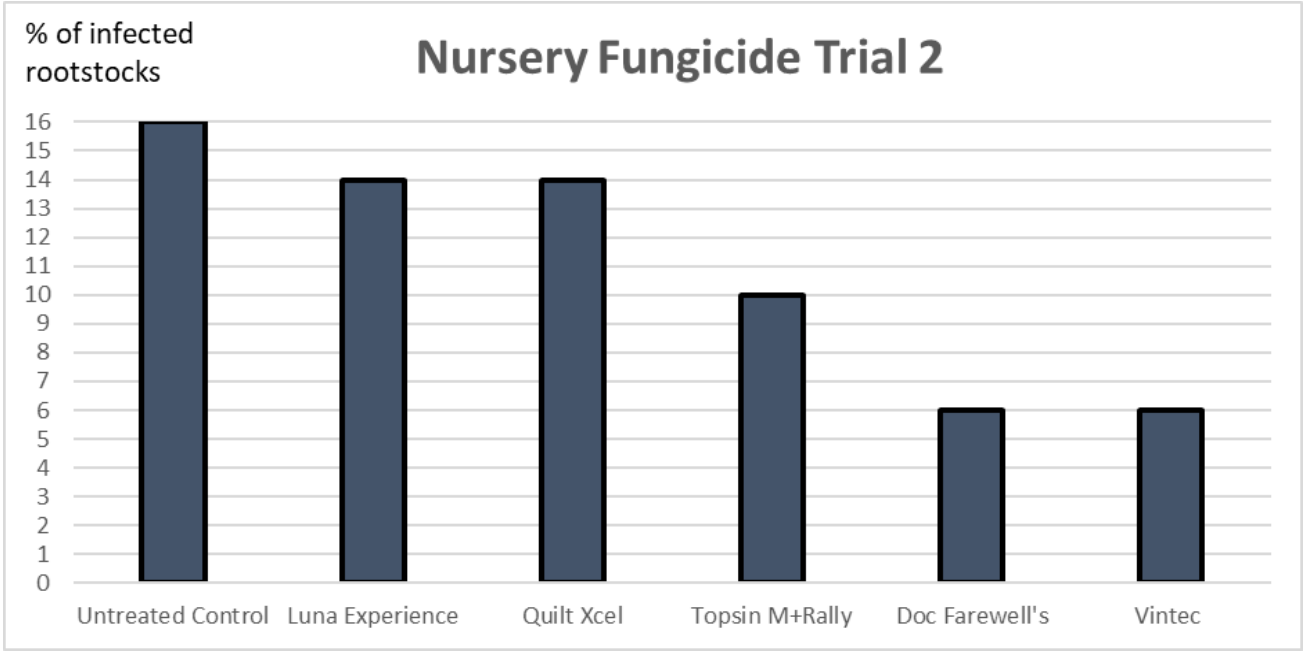
Improving the quality of planting materials

- ❑ Fungicide trials at the nursery 4/29/21 (natural inoculum)
- ❑ To protect heading cuts on rootstocks



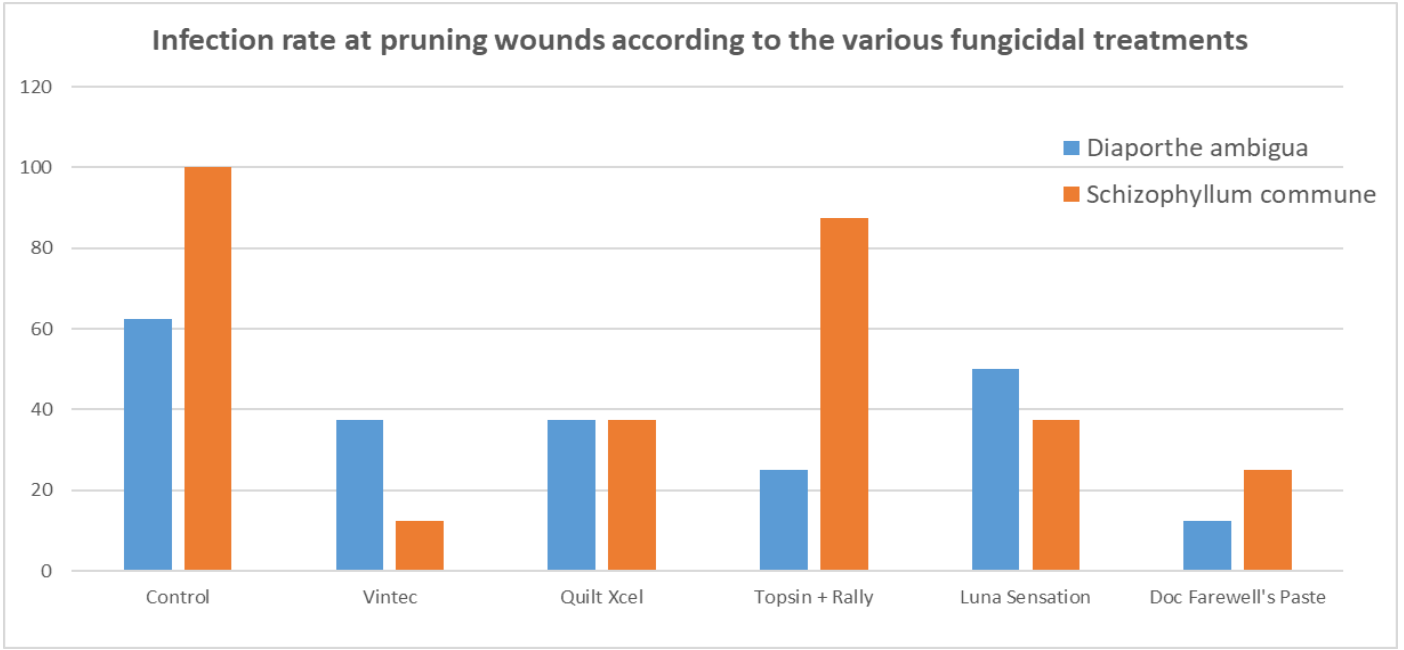
Improving the quality of planting materials

- Fungicide trial at the nursery 5/12/21 (natural inoculum)
- To protect heading cuts on rootstocks



Improving the quality of planting materials

- Fungicide trial at KARE and UC Davis (Spring 2022)
- To protect heading cuts on rootstocks



Sampling orchards for western X-disease Phytoplasma

- Mohamed Nouri (SJ County) , Mohammad Yaghmour (Kern County)
- Sampling orchards neighboring previously infected field

LChV1 = Little Cherry Virus 1
LChV2 = Little Cherry Virus 2
PDV = Prune Dwarf Virus
PNRSV = Prunus Necrotic Ringspot Virus
Phyto=Phytoplasmas

Foundation Plant Services

Sample #/Description	P-LChV1	P-LChV2	P-PDV	P-Phyto	P-PNRSV
#1: Kern Co, orchard previously tested positive for X Phytoplasma	POSITIVE	negative	POSITIVE	negative	POSITIVE
#2: Kern Co, orchard just South of **#1**	negative	negative	POSITIVE	negative	POSITIVE

Description	P-LChV1	P-LChV2	P-PDV	P-Phyto	P-PNRSV
Tree 1	negative	negative	negative	POSITIVE	negative
Tree 2	negative	negative	negative	negative	negative
Tree 3	negative	negative	negative	POSITIVE	negative
Tree 4	negative	negative	POSITIVE	negative	negative

Sampling orchards for western X-disease Phytoplasma

- ❑ Orchard # 1 (2021)
- ❑ Black Pearl and Coral varieties grafted onto Mahaleb rootstock
- ❑ No pathogen detected




Sampling orchards for western X-disease Phytoplasma

- ❑ Orchard # 2 (2022)
- ❑ Black Tartarian (pollinator) and Bing varieties grafted onto Mahaleb rootstock
- ❑ No pathogen detected




Conclusion

- Three CA nurseries were surveyed
- No viruses or phytoplasmas detected at the nurseries
- Wood decay and canker diseases in planting material at one nursery
- Source of inoculum were identified and removed
- Fungicide trial at the nursery, KARE, and UC Davis identified Doc Farewell's grafting seal and Vintec (Trichoderma) as good protectants of heading cuts made during the tree production process
- X-Disease Phytoplasma and Little cherry virus 1 detected in a few growers' orchards
- Some spread to neighboring orchards
- Another sudden decline of cherry trees was identified with zippering at the bud union
- To be continued…