Plant Pathology in Strawberry

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UNIVERSITY OF CALIFORNIA
Agriculture and Natural Resources

Outline

- Update on strawberry Neopestalotiopsis leaf spot and fruit rot (THANK YOU- Kelly Ivors, Driscoll's, Plant Pathology Senior Manager)
- Re-operate UCCE diagnostic service

Severe disease outbreak of Florida strawberry since 2017

wusf Public Media

Now Playing
Florida Strawberries Attacked By Aggressive Fungus | on-demand

Environment

Florida Strawberries Attacked By Aggressive Fungus

WUSF Public Media - WUSF 89.7 | By Jessica Meszaros
Published January 23, 2020 at 8:51 AM EST

LISTEN · 1:29

U.S. NEWS JAN. 24, 2020 / 3:00 AM

Fungus attacks, destroys part of Florida strawberry crop

By Paul Brinkmann

Disease caused by Neopestalotiopsis

- Leaf spots
- Fruit rots
- Root and crown infection

ONfruit
INFORMATION FOR ONTARIO FRUIT GROWERS

HOME APPLES BERRIES GRAPES TENDER FRUIT PEST MANAGEMENT FIRE BLIGHT PREDICTION MAPS PODCAST EVENTS

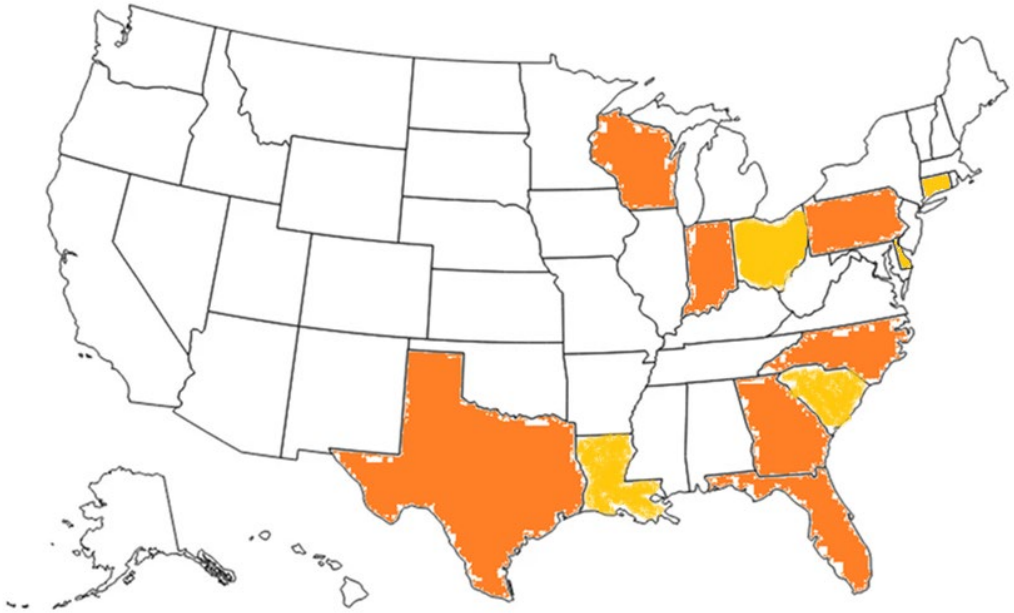
BERRIES STRAWBERRIES

Pest Alert: Neopestalotiopsis – an emerging strawberry disease in North America

BY ERICA PATE
MARCH 11, 2021

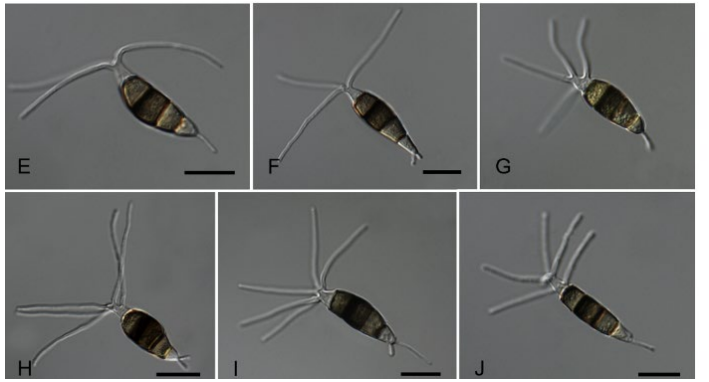
COMMENTS 0

Disease confirmed in several states of US as of 2021 (orange), 2024 (orange+yellow)



- Significant damage in Southeastern US
- Alabama, Georgia, Louisiana, North Carolina, South Carolina, Texas….

Neopestalotiopsis species



(Maharachchikumbura et al. 2014)

- Neopest
- Weak strawberry pathogens associated with stress (Howard and Albregts, 1973)

Two aggressive strains

- *Neopestalotiopsis sp*. first detected in Florida in 2017
- *Neopestalotiopsis rosae* first detected in Mexico in 2017, was introduced to US in 2022-2023
- Can cause severe damage (leaf spots, fruit rots, root and crown infection)

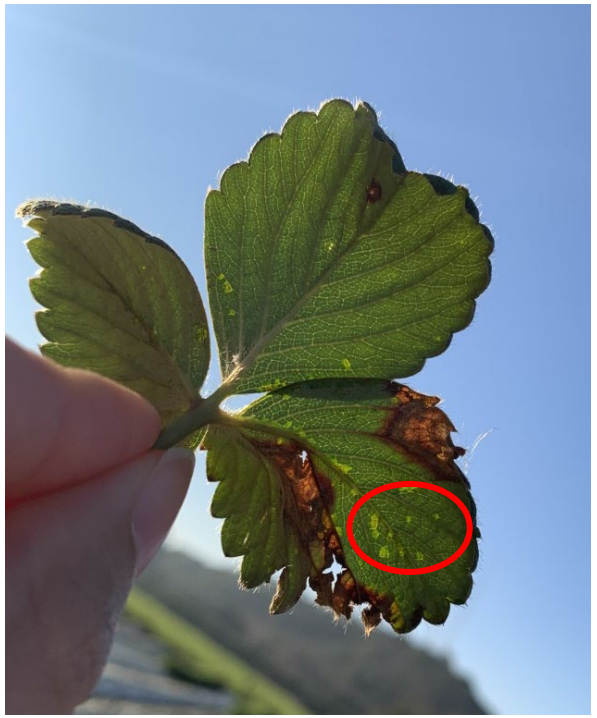
Neopestalotiopsis leaf spot

(Marcus Marin, and Strawberry Pathology Lab - UF, GCREC)

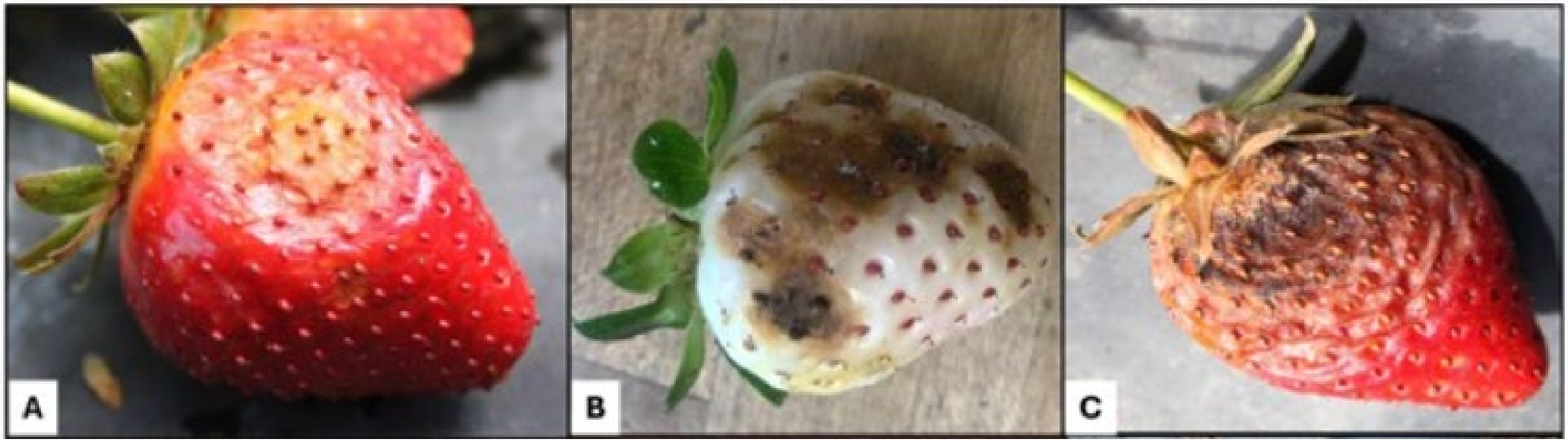
Other leaf spots that may be confused with *Neopestalotiopsis*

Zythia leaf blotch
(*Gnomonia comari/ Zythia fragariae*)

Angular leaf spot
(*Xanthomonas fragariae*)



Neopestalotiopsis fruit rot



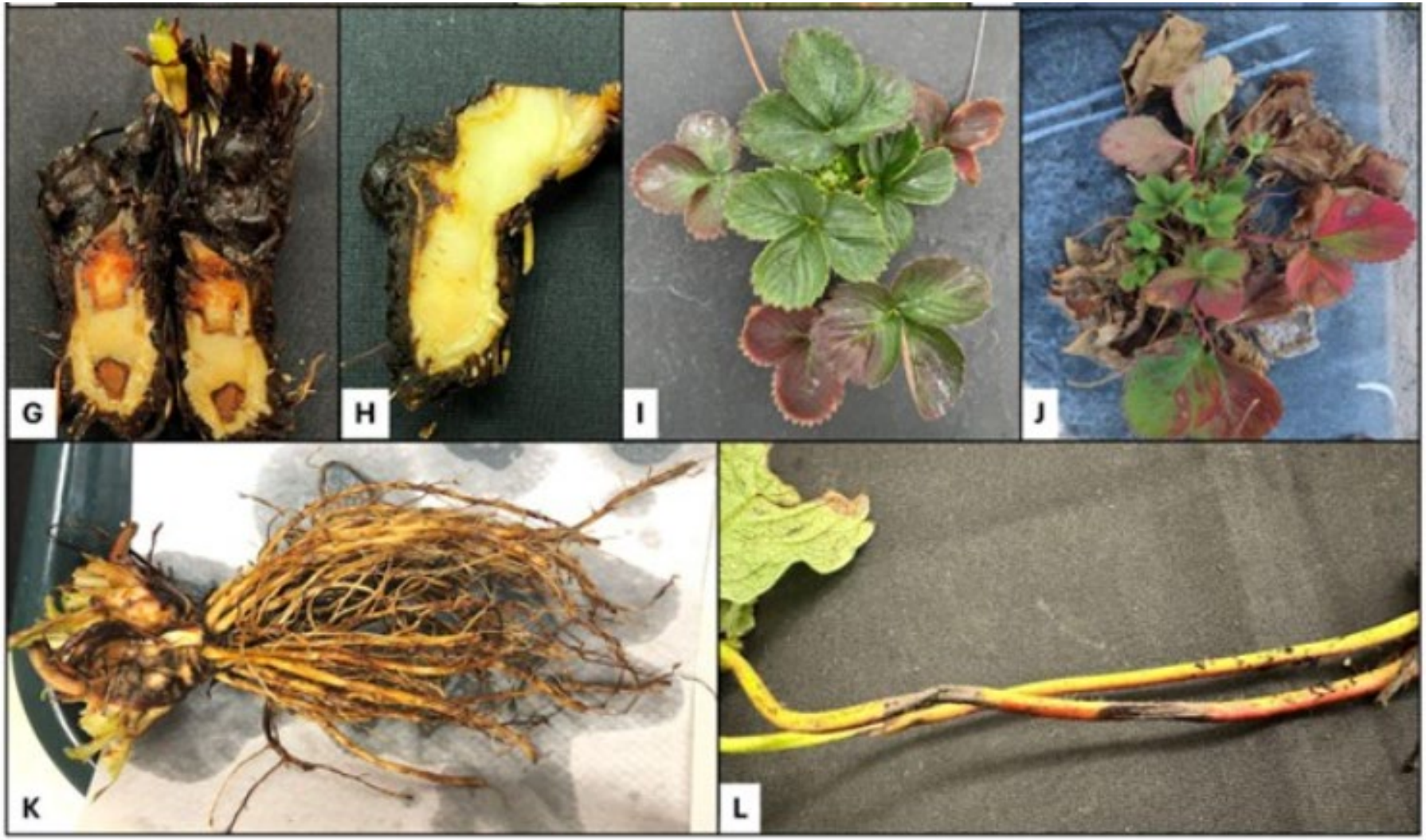
(Marcus Marin, and Strawberry Pathology Lab - UF, GCREC)

Other fruit rots that may be confused with *Neopestalotiopsis*

Anthracnose fruit rot
(*Colletotrichum acutatum*)

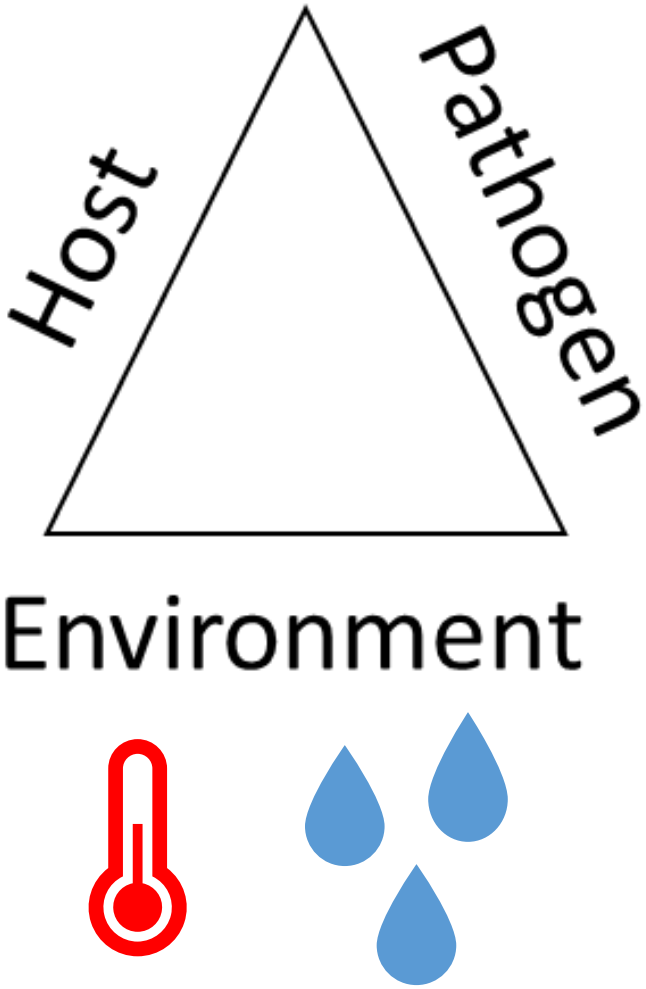
Botrytis fruit rot
(*Botrytis cinerea*)

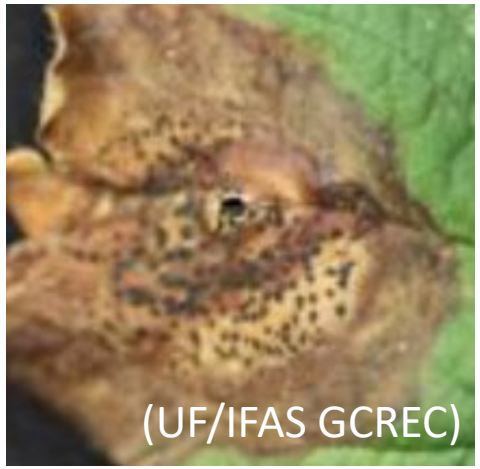
Neopestalotiopsis root and crown infection



(Marcus Marin, and Strawberry Pathology Lab - UF, GCREC)

Disease occurrence in California strawberry?



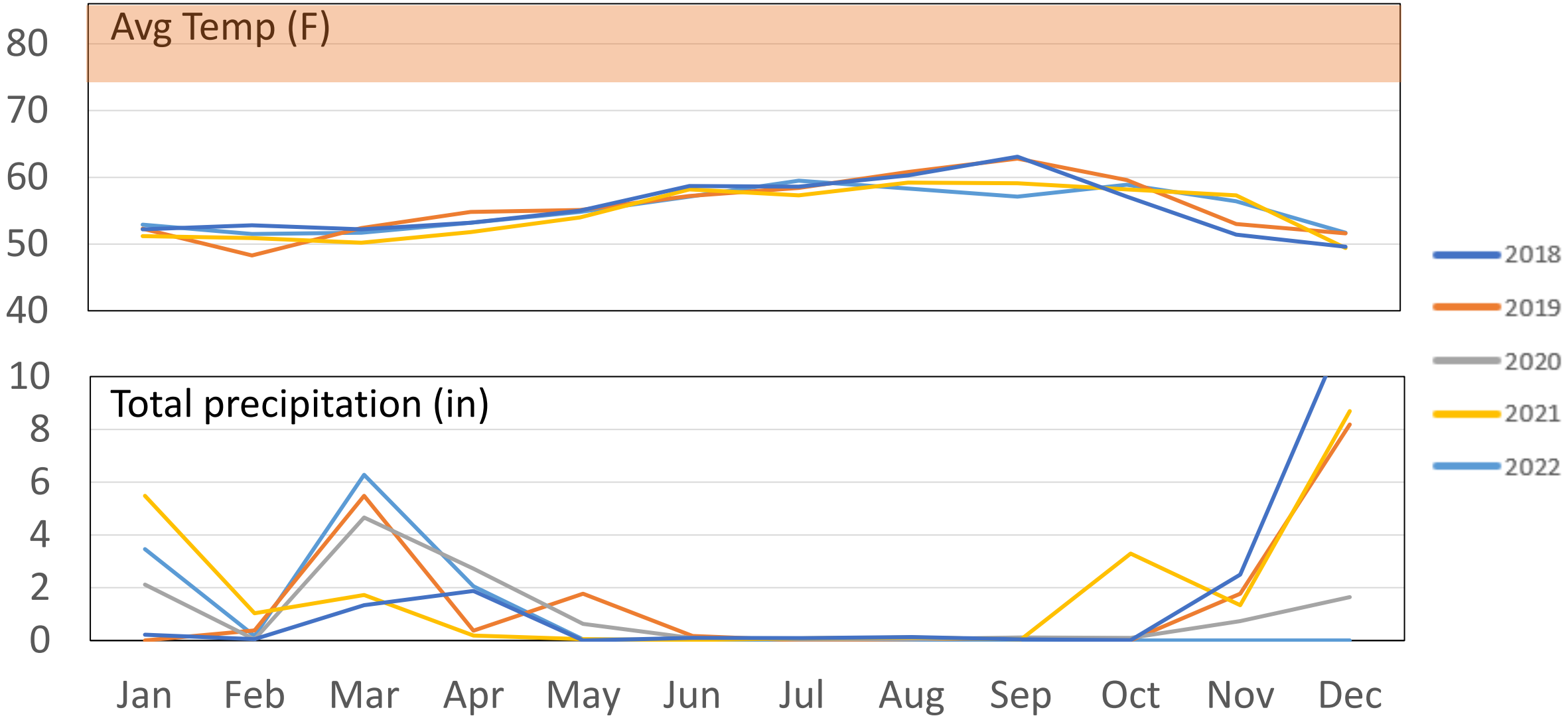


Strawberry Neopestalotiopsis leaf spot and fruit rot

- Favored by heavy rain and warm temperature
  - Consecutive and prolonged rain events (>36h)
  - Optimum temperature: 77-86°F
- Water-spread

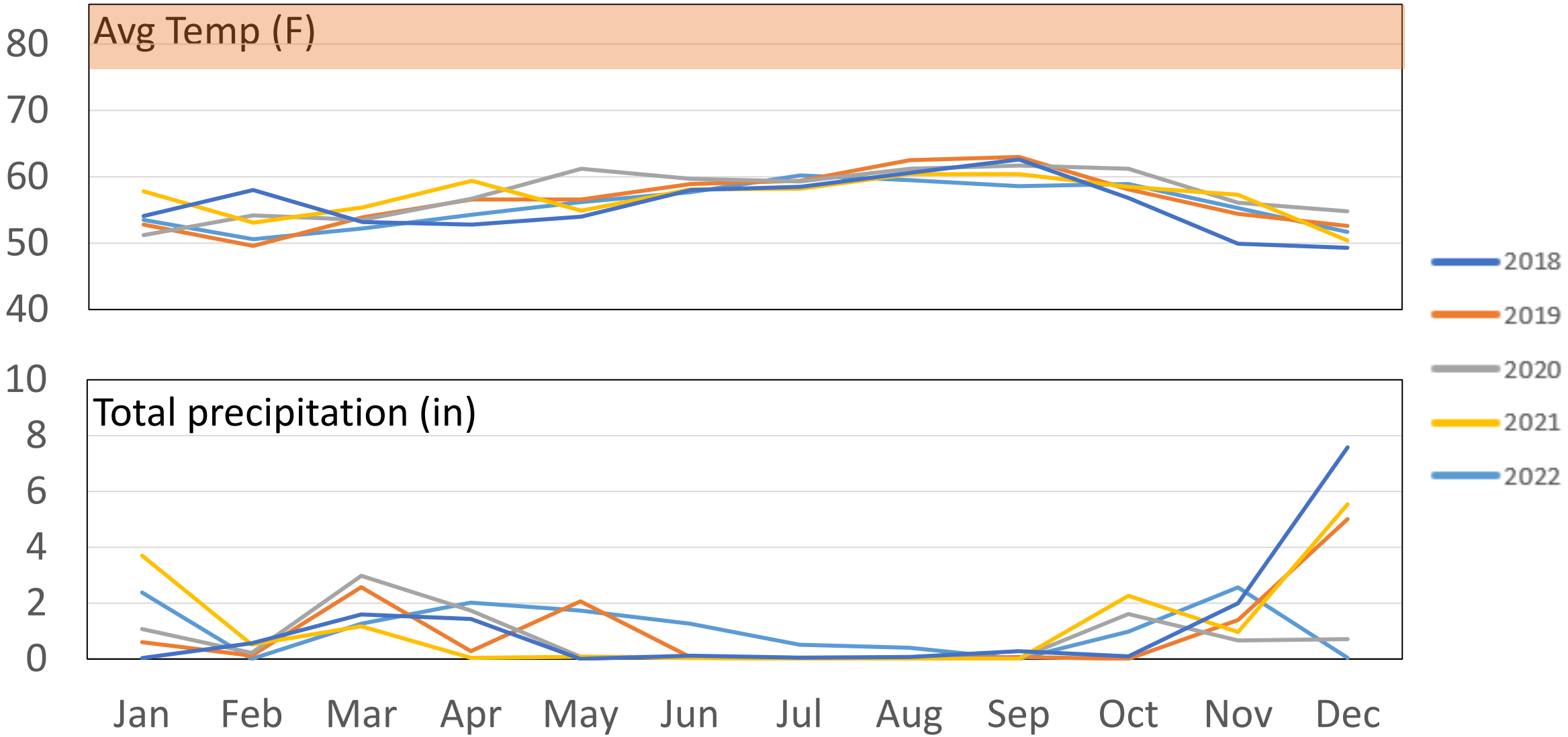
(Source: Natalia Peres)

Less conducive environment for Neopestalotiopsis



CIMIS station: Watsonville west

Less conducive environment for Neopestalotiopsis

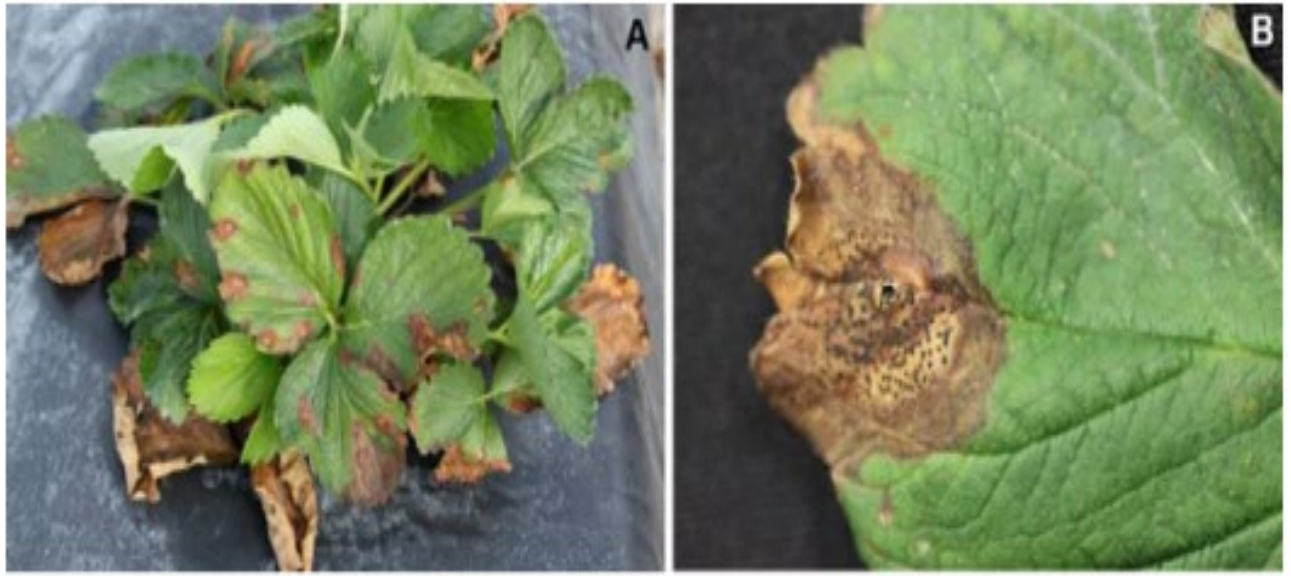


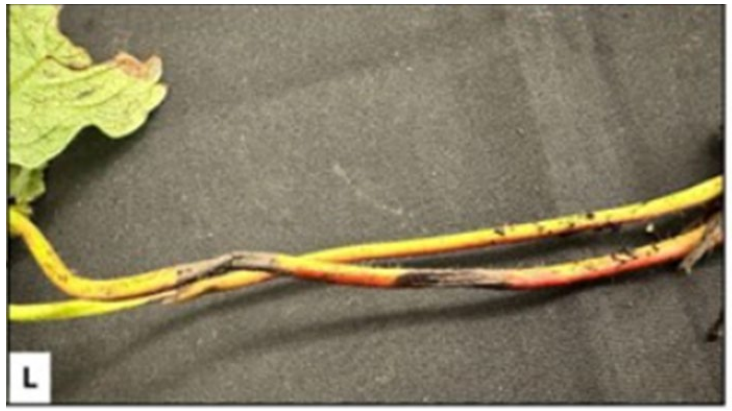
CIMIS station: Salinas North

Bottom line

- Neopestalotiopsis is currently not a dramatic disease in California since the CA environment is not favored by the disease.
- It could cause leaf spot, fruit rot, sunken lesion on petiole and runner. Black sporulation on the old leaf and fruit lesion is the key of field diagnosis.
- Getting proper diagnosis is crucial. UCCE can help.

(Photo: UF/IFAS GCREC)





When sending pictures to us for diagnosis…..

- Closeups of symptoms
- Picture of the whole plant
- Picture of the field

- FOCUSED image
- BOTH leaf surfaces- upper and lower sides

Outline

- Update on strawberry Neopestalotiopsis leaf spot and fruit rot (THANK YOU- Kelly Ivors, Driscoll's, Plant Pathology Senior Manager)
- Re-operate UCCE diagnostic service

2025 Diagnostic service: limited number of sample submissions

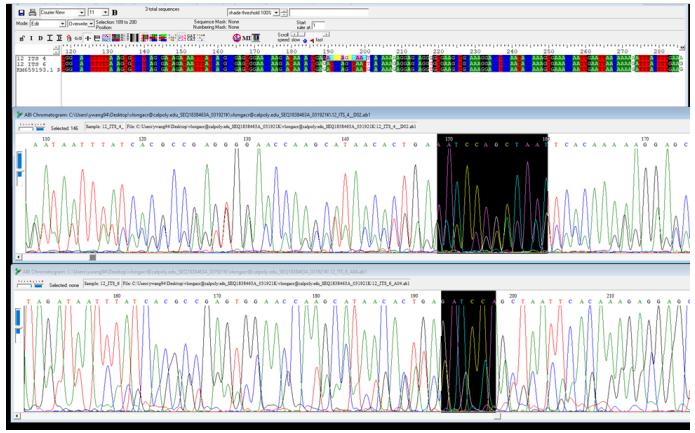
- Watsonville/ Salinas district
- Sample type: plant tissue

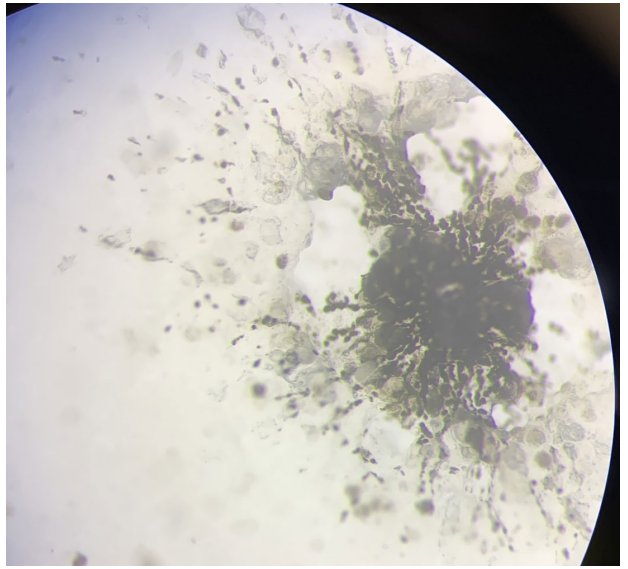
- Provide a complimentary disease diagnostic report

CALIFORNIA STRAWBERRY™ COMMISSION

Optimized lab assays

- Standard plating for bacterial and fungal pathogens
  - Morphology based identification; assisted with DNA Sanger Sequencing
  - Upcoming: strawberry Fusarium wilt race 2 (if funded by the commission)
- Turn around time: 2 weeks
- Viral pathogens and Neopestalotiopsis strain identification: forward to other labs





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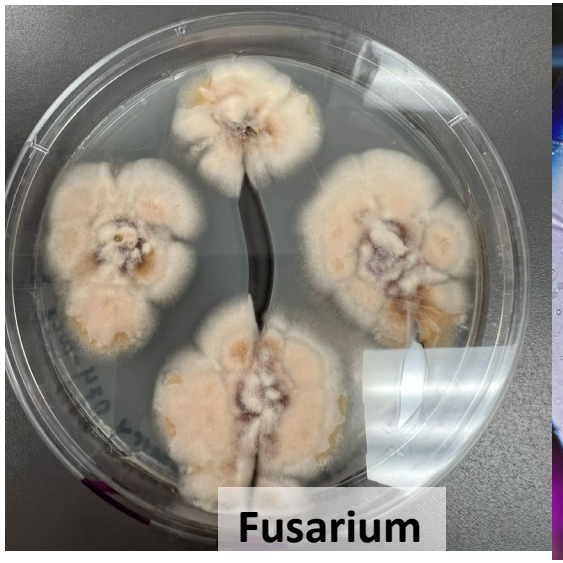
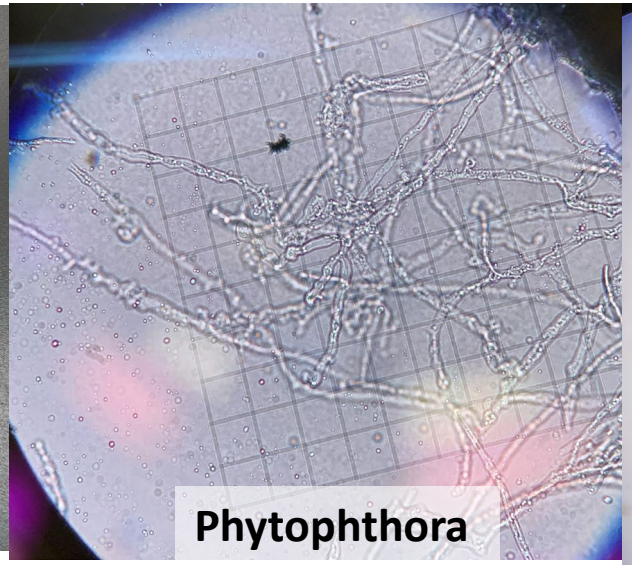
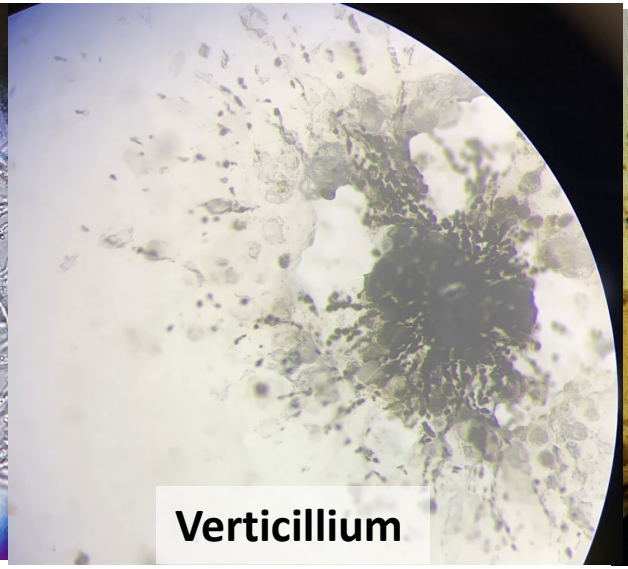
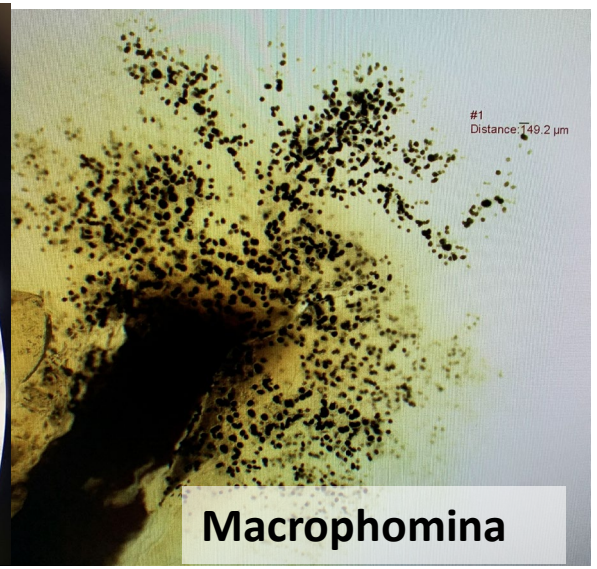
Lab analysis by semi-selective media, microscopy

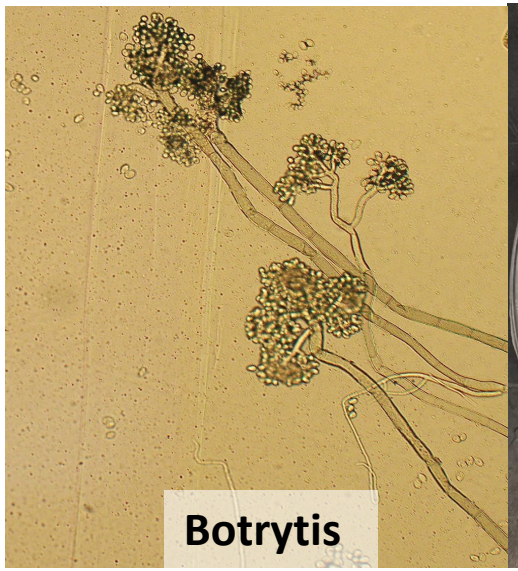

Fusarium

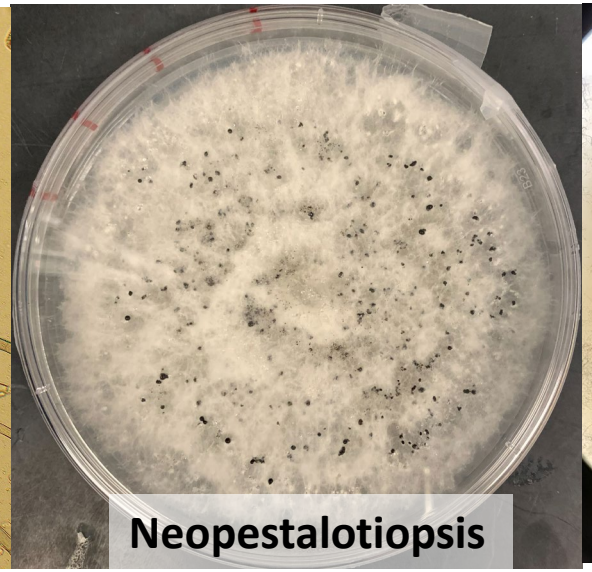

Phytophthora

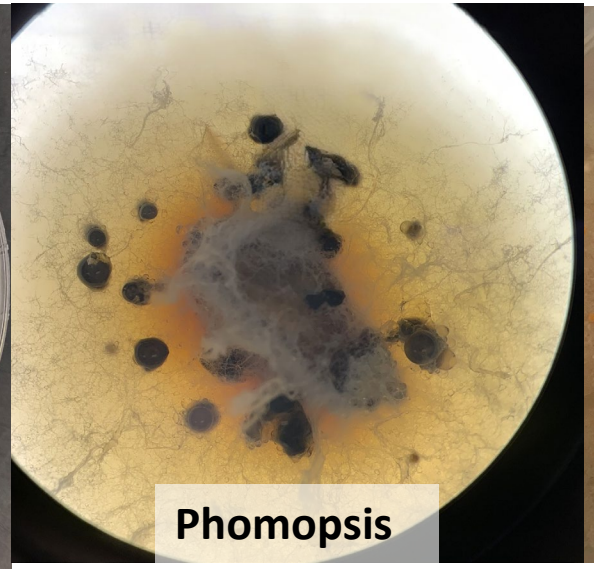

Verticillium



Macrophomina


Botrytis

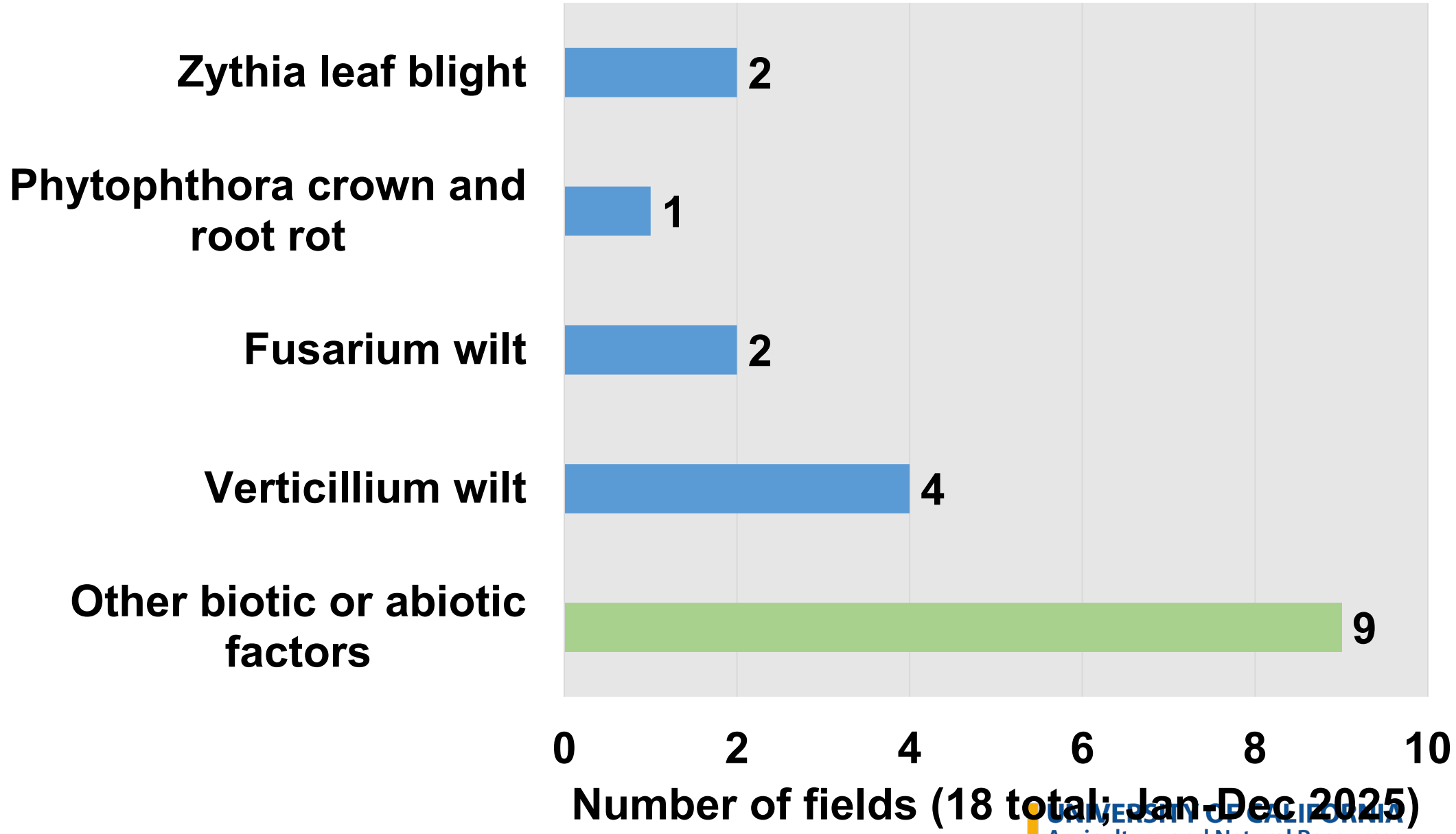

Neopestalotiopsis


Phomopsis

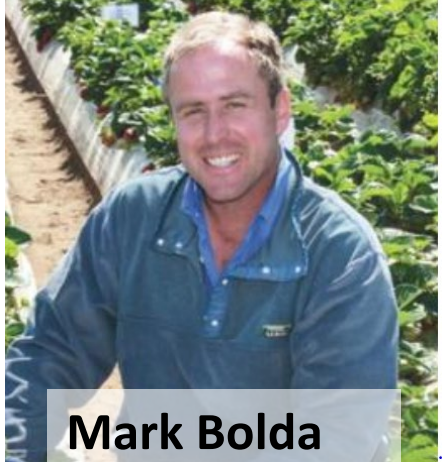

Colletotrichum

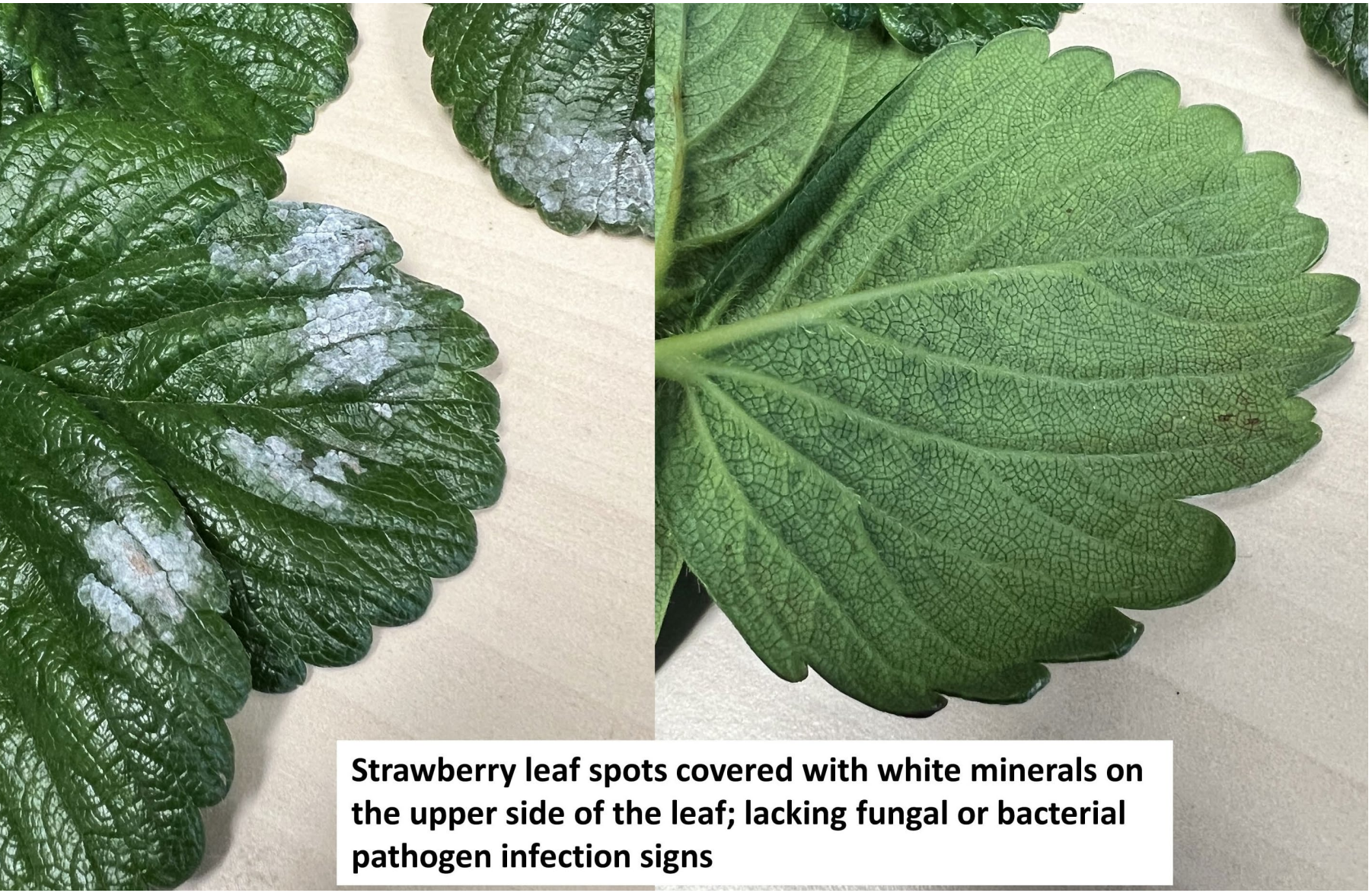
ORNIA
Sources

2025 Results



Unknown white deposits on leaves





Strawberry leaf spots covered with white minerals on the upper side of the leaf; lacking fungal or bacterial pathogen infection signs

- Reports at the end of February, 2025
- Salinas and Watsonville
- Widespread

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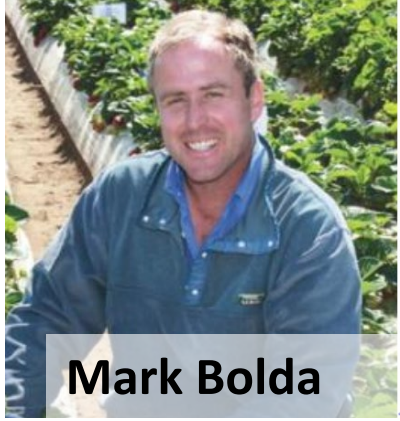
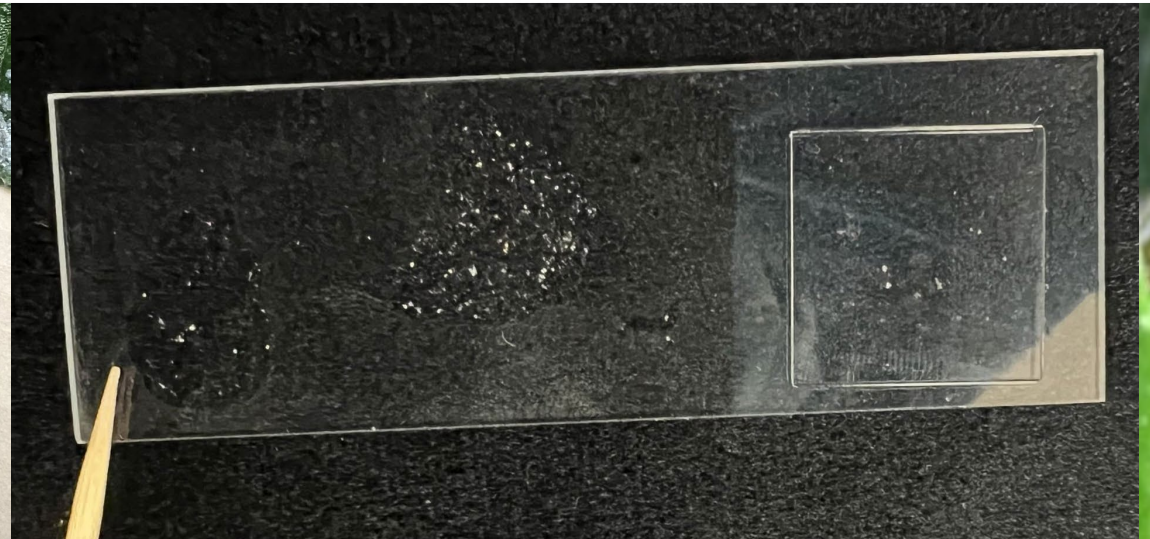


- White minerals were not soluble in water droplets
- 4 inches of rains; followed by windy days
- Suspected cause: guttation, then blown by the wind and evaporated
- Guttation occurs when there is an excess of water while the stomata (openings) are closed at high humidity nights. So the fluid gets forced out of the leaf edges
  - Sugar, proteins, potassium….

Photo by: Ohio State University

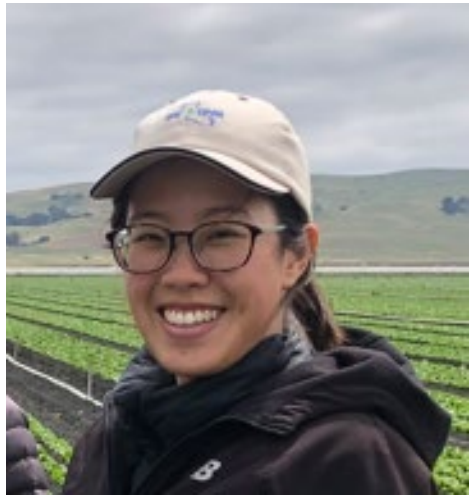


Moving forward- UCCE strawberry diagnostic service

- In proposal:
  - In collaboration with Mark Bolda
  - An ongoing service serving the Watsonville and Salinas district
  - Monitor and provide earning warning to the industry
    - Emerging diseases such as Fusarium wilt race 2
    - High-concerned diseases such as Neopestalotiopsis

Thank you for your attention!

For more information:



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