



Seed Transmission and Seed Treatment of Fusarium wilt, race 3

Fusarium oxysporum f. sp. lycopersici



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**2016 SOUTH SACRAMENTO VALLEY PROCESSING
TOMATO PRODUCTION MEETING**

Importance of *Fusarium* spp. in tomato

Fusarium Foot Rot

Fusarium solani f. sp. *eumartii*

Fusarium Crown and Stem Rot

Fusarium striatum

Fusarium Crown and Root Rot

Fusarium oxysporum f. sp. *radicis-lycopersici*

Fusarium Wilt

Fusarium oxysporum f. sp. *lycopersici*

Race 1

Race 2

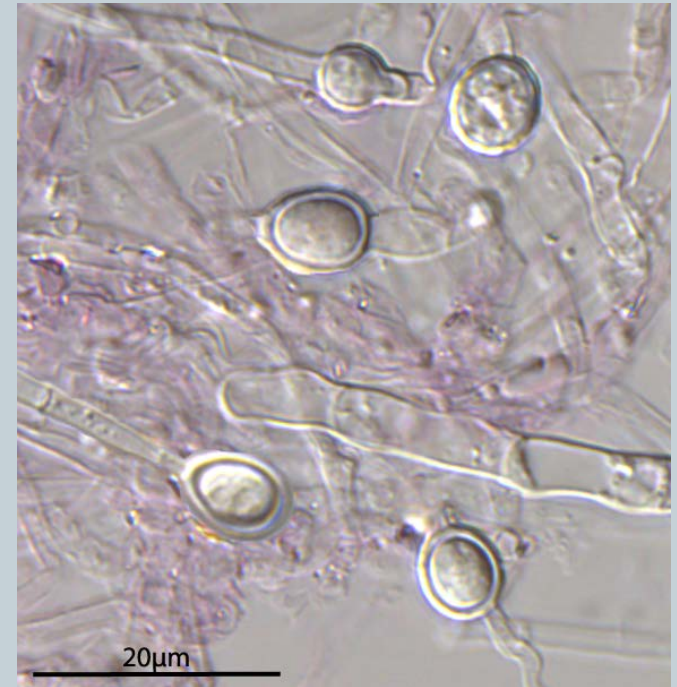
Race 3



What makes Fusarium so devastating?



- Once established, Fusarium persists in the soil indefinitely because of its saprophytic ability on other crops and weeds.
- Overwinters as chlamydospores.
- Spreads relatively easily by infested soil and crop debris.



Seedborne?



- Seed infection of tomato by *Fusarium* spp. has been suspected to be a source of movement.
- There is no strong evidence (publications) on the incidence of *Fusarium* spp. in commercial seeds.



Seedborne?



- We hypothesize that natural seed infection provides a very important source of infection for the long range movement of *Fusarium* species
- This is a significant problem because with the emergence of new races/genotypes and the globalization of the seed industry, the potential for movement of exotic genotypes is high.



Materials and Methods



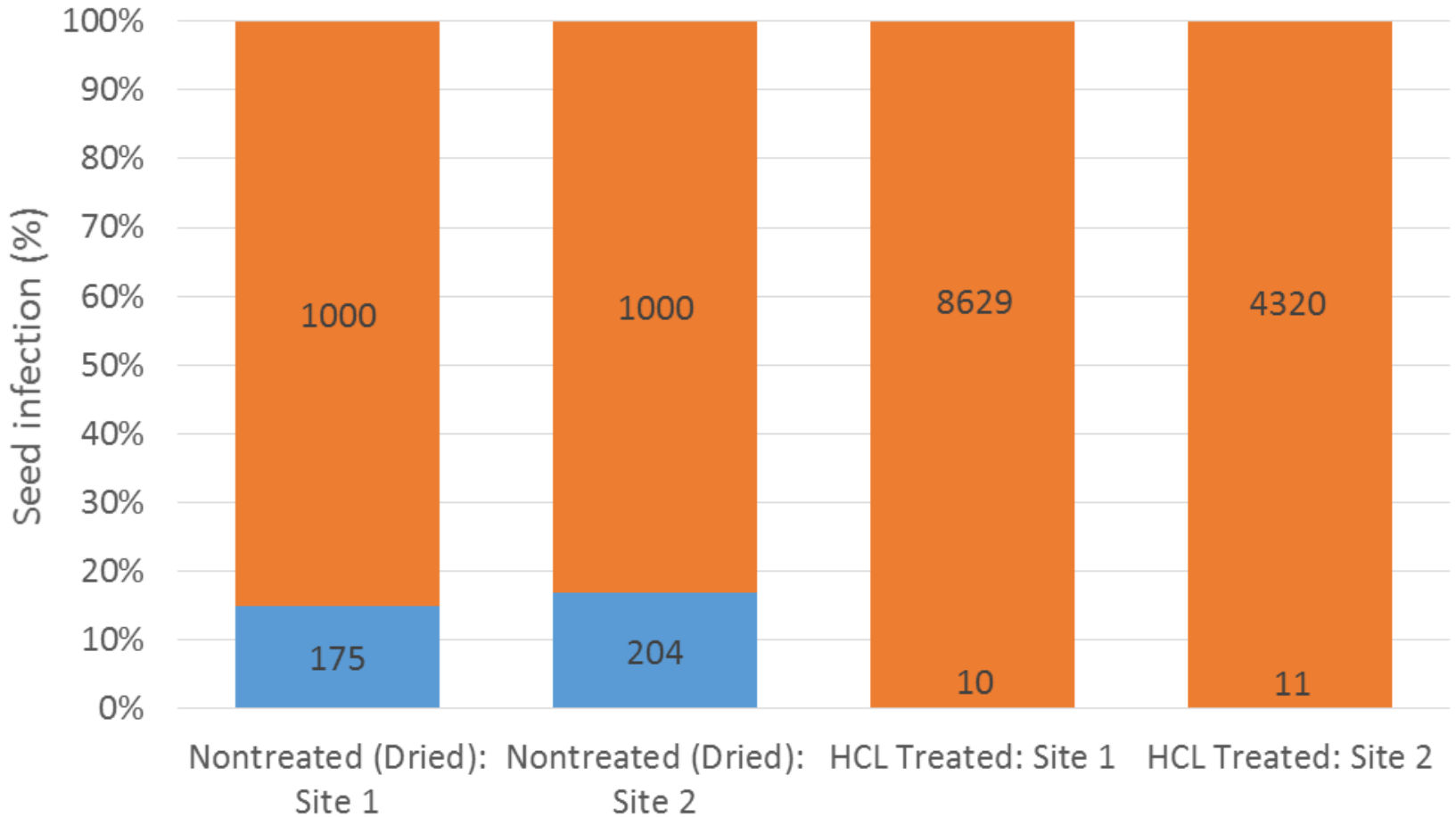
Objective 1: Evaluate the importance of the seed-borne potential of FOL in the long-distance dissemination of FOL genotypes.



RACE1	268	CAATCTG'
RACE2B	211	CAATCTG'
RACE1B	211	CAATCTG'
RACE1C	211	CAATCTG'
RACE3B	254	CAATCCG'
RACE3C	211	CAATCCG'
RACE3	211	CAATCCG'
RACE2	254	CAATCCG'



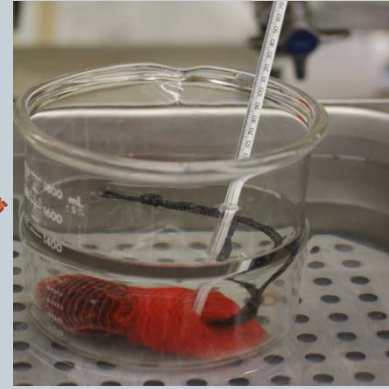
Recovery of FOL race 3 From Seeds Harvested in Commercial Fields from diseased plants



Seed Treatment



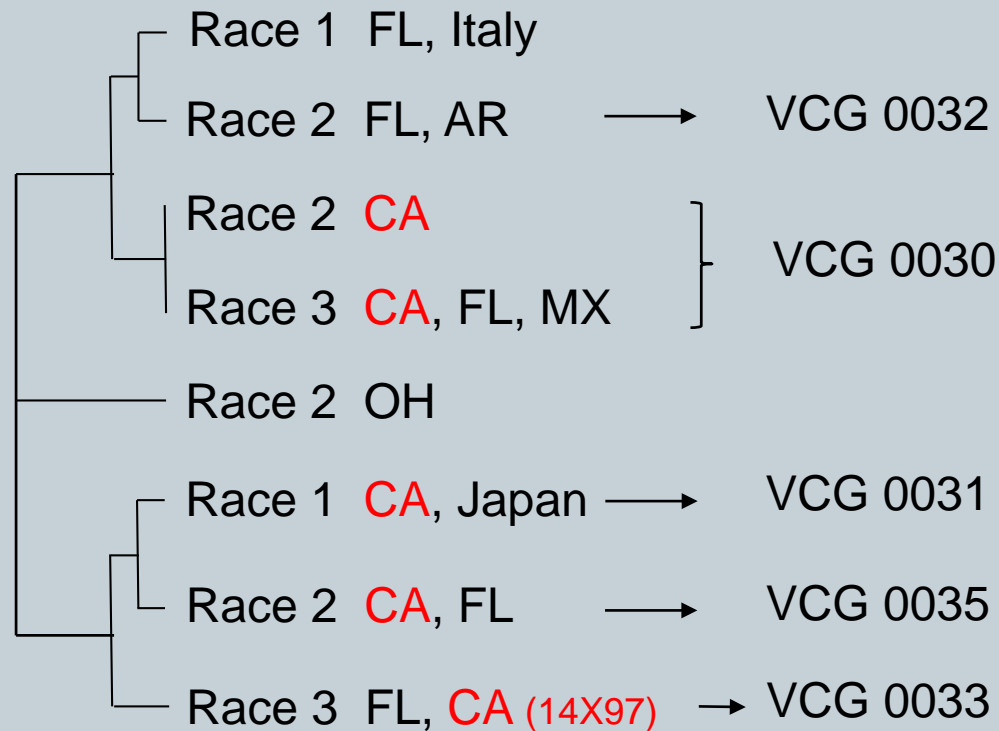
Objective 2: Develop a seed treatment procedure for the elimination of *Fusarium* spp. from infected tomato seeds.



RACE1	268	CAATCTG
RACE2B	211	CAATCTG
RACE1B	211	CAATCTG
RACE1C	211	CAATCTG
RACE3B	254	CAATCCG
RACE3C	211	CAATCCG
RACE3	211	CAATCCG
RACE2	254	CAATCCG

**Pathogen characterization of Fusarium wilt &
Fusarium crown and root rot
in California**

Fusarium oxysporum f. sp. *lycopersici*



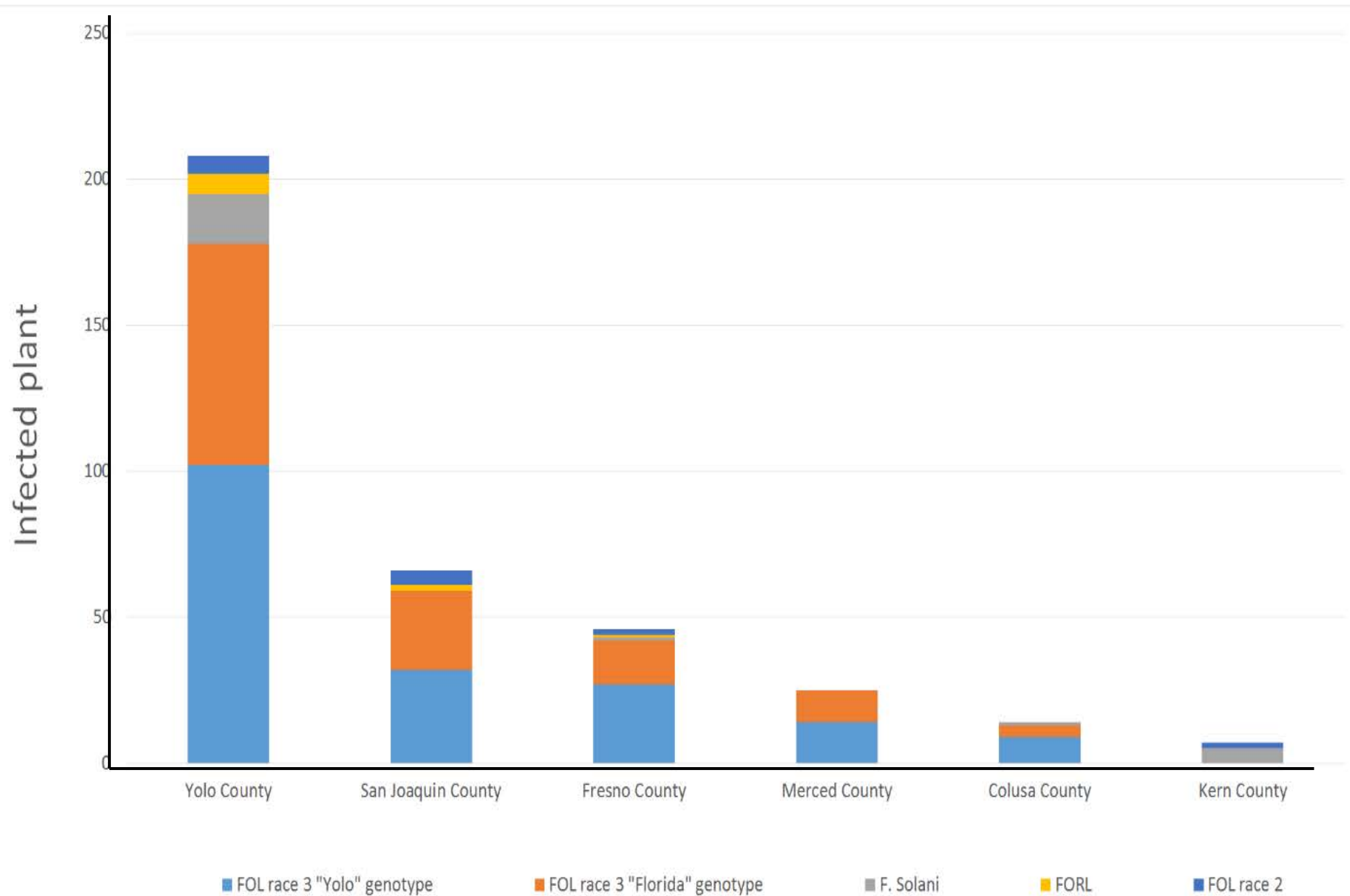
New Genotypes of Fusarium Wilt



- In a two-year diagnostic survey (2014-2015), we isolated a new genotype of *F. oxysporum* f. sp. *lycopersici* race 3 in CA



Fusarium spp. Isolated from 2015



Ongoing Research



- Since its discovery in 2014, FOL race 3 Florida genotype has been confirmed in an increasing number of fields due possibly to its ability to colonize other hosts, pathogenicity on tomato, or seedborne dissemination.
- Because FORL infects many crops, tests need to be conducted on FOL race 3 Florida genotype to determine its host range.
- It will be important to know the host range of FOL race 3 Florida genotype because tomatoes are planted in rotation with other crops.

Ongoing Research



We are working on developing reliable and efficient PCR primers for the rapid detection of FOL race 3.

We are working on characterize isolates of FORL and FOL in California using both molecular markers and pathogenicity tests

Questions



Thanks for listening