WERA-0020 REPORT FOR 2009 --COLORADO

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Objectives:

1. Continue pot trial to examine Cherry Rasp Leaf Virus (CRLV) susceptibility for Bing cherry on Citation/Z-interstem and on Mazzard rootstocks (re-inoculated with viruliferous dagger nematodes).
2. Identify the species of dagger nematode and variability among populations in relation to Cherry Rasp Leaf Virus transmission.
3. Study transmission and host resistance in cherry varieties and rootstocks to Cherry Rasp Leaf Virus.
4. Watch for, identify, and confirm any unusual fruit virus problems that may occur in Colorado's fruit industry.

Impact Statement: Grapevine fanleaf virus was detected and confirmed in one western Colorado vineyard in 2007 through virus test samples collected in association with Colorado's fruit virus research program. Cooperative efforts with the producer resulted in the prompt removal of the affected vineyard block and fumigation of the block that fall to kill all potential infected root systems and the dagger nematode vector for the virus. The effort appears to have been successful as subsequent testing has failed to show the presence of grapevine fanleaf virus in the replanted block or adjacent vineyard block. This action has protected the young, growing wine grape industry in Colorado (annual valuation of $2.5 million for the crop, $20 - 25 million for the wine product, and $100 - 200 million for the associated agritourism).

Results:

1. A pot-in-pot trial was established to examine susceptibility of Bing cherry on Citation/Z-interstem rootstock and on Mazzard in Spring of 2006. Potting soil was inoculated with viruliferous dagger nematodes (via rooted symptomatic root suckers + surrounding soil added to pot soil of inoculated replicates). No symptoms were evident on any of the inoculated trees as of spring 2009.
2. Dagger nematodes from different crops (peach, cherry, plum, pear, apple and grapes) and locations in western Colorado were collected, identified and counted. High variability in morphological characters was observed, so dagger nematode samples were sent for molecular identification to Allen Szalanski, University of Arkansas (collaboration)
3. Cherry Rasp Leaf Virus inoculation of *Nicotiana benthamiana* test plants failed to produce symptoms. Further transmission of virus from infected bark (cherry) to peach and apple is underway. To confirm growers observation on susceptibility of Bing on Gisela 5 against resistance of Van on Gisela 7 plants, Bing and Van cherry trees were established in pots and these trees will be inoculated with Cherry Rasp Leaf Virus at the end of June, 2009. However, in the field Bing and Van on rootstocks other than the Gisela series rootstocks had Rasp Leaf Virus. Thus a greenhouse study is ongoing to evaluate the susceptibility of different rootstocks to dagger nematode and/or Rasp Leaf Virus.
4. We are continuing monitoring of viruses in crops, especially in cherry and grape. Cherry bud samples were collected during the 2008-09 dormant period from symptomatic trees in Mesa County, Colorado on East Orchard Mesa (severely symptomatic trees) and from Dominguez Canyon on the southern border of Mesa County(moderate symptom trees) and

sent to USDA, Beltsville for identification. Three different viruses were found in the samples from severe symptomatic trees at the East Orchard Mesa site: Cherry Rasp Leaf Virus, Cherry Virus A and Prune Dwarf Virus. The samples from the less severely symptomatic trees in Dominguez Canyon had only two viruses: Cherry Rasp Leaf Virus and Cherry Virus A. This is the first report of Cherry Virus A from Colorado, but it is likely that Cherry Virus A is widely distributed in cherry orchards in western Colorado.

Proposed Objectives for 2008/2009:

1. Continue Cherry Rasp Leaf Virus (CRLV) susceptibility studies for the Citation / Z-interstem combination rootstock. Work to verify identity of the dagger nematodes via molecular ID methods.
2. Evaluate cherry rootstocks (field and greenhouse studies), especially the Gisela series for the transmission of virus from dagger nematodes.
4. Estimate the incidence and severity of viruses, especially the Cherry Rasp Leaf Virus in western Colorado cherry orchards.
3 Watch for, identify, and confirm any unusual fruit virus problems that may occur in Colorado's fruit industry.

WERA-0020 Related Publications during 2008/2009:

None