WERA-020 Report – 2008 - Washington (Eastwell)

Little cherry disease: Monoclonal antibodies were successfully produced against the bacterially-expressed coat protein of *Little cherry virus 1*. The antibody works well is antigen trapped indirect ELISA. The ELISA is currently being evaluated for its ability to detect various isolates, and the best tissues and season to perform the tests. The rather weak reaction of *Little cherry virus 1* isolates on current biological indicators has raised concern about the ability of quarantine and/or certification programs to reliably detect this virus. The molecular and serological assays will help in this effort.

Cherry leafroll virus: *Cherry leafroll virus* (CLRV) is a pollen-borne virus, but the role of pollen in virus transmission between cherry trees is not certain. We exposed virus-free trees to pollen collected from CLRV-infected trees. Our results indicate that the virus is readily transmitted from pollen to the developing fruit and to the fruit stem. Immunolocalization suggests that CLRV can readily migrate from virus-infected pollen through the floral parts to the sub-epidermal cell layer of the pedicel. However, after controlled pollination of several thousand blossoms, transmission of the virus to the fruit-bearing tree has not been demonstrated.

Foveaviruses: Foveaviruses that infect fruit trees and grapevines are being characterized. The foveaviruses that infect cherry are a diverse group of viruses with a broad range of sequence variants and symptomatologies. Sequence analysis of the coat protein sequences of the cherry viruses reveal four distinct clades. Polyclonal antibodies were developed to the bacterially-expressed coat protein of a representative virus of one cluster; this antibody reacts with all viruses in the same cluster. Antibodies are being developed against viruses that populate other clades.

A polyclonal antibody was developed for *Rupestris stem pitting associated virus* (RSPaV). The antibody is being evaluated for its ability to recognize different isolates of RSPaV, and to determine the distribution of the virus within the plant. Doctoral student Dan Villamor is examining the interaction of RSPaV, GLRaV3 and Grapevine yellow speckle viroid-1 on grape production characteristics.

Hop stunt viroid: *Hop stunt viroid* (HSVd) is of growing concern to hop producers. A hop root certification program has been revitalized to provide HSVd and virus free roots to nurseries. The first releases from the reactivated program were made in the autumn of 2007 and more than 6,000 plants were produced from the foundation material. A ten-year program is anticipated to reduce the incidence of HSVd in U.S. production. The Washington Hop Commission invested heavily in equipment and facilities for the molecular detection of HSVd to minimize the cost of ongoing testing of material for propagation and of plants in commercial production.

NRSP-005 activities: Main activities included: 1) rescuing the Michigan State University peach breeding program after the discovery of Plum pox virus at an MSU research station; 2) assisting USDA-APHIS-PPQ by providing therapy to virus-infected clones; 3) distributing over 17,700 virus-tested buds to researchers and industry, and 4) virus testing and therapy of 185 new acquisitions of stone and pome fruit cultivars from nine foreign countries and eight U.S. states. Virus therapy chambers designed and built at the Prosser station have greatly improved the efficiency of thermal therapy.

The creation of a National Clean Plant Network was mandated in the 2008 Farm Bill under the The Food, Conservation, and Energy Act of 2008: “The USDA Secretary shall establish “National Clean Plant Network” of clean plant centers for pathogen

diagnosis and elimination to produce clean propagative material and maintenance of foundation blocks of pathogen-tested plant material throughout USA".

Organizational meetings have been held in Prosser, WA and Davis, CA with broad representation of the fruit tree and grape industries to create a structural model for the network. The goal is to have the organization in place by October, 2008. Significant progress will be required to help with renewal of the program when the Farm Bill is renegotiated in 2012. Other perennial specialty crops may be considered for inclusion in the program once the fruit tree and grape programs are functional.

Publications:

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