



Potato Progress

Research and Extension for Washington's Potato Industry

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Tuber Symptoms Associated With Tobacco Rattle Virus Infections

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Tobacco rattle virus (TRV) is a soil-borne pathogen that is transmitted by stubby root nematodes. In the Columbia Basin of Washington and Oregon the only nematode positively shown to transmit the virus is *Paratrichodorus allius*. Another species recently identified in the region is *P. teres* and this species is suspected to transmit the virus in southern Oregon and other potato growing areas. When the virus is transmitted to young tubers by the nematode, various symptoms will subsequently develop in tuber tissue. In many cases dark, corky tissue occurring in arcs or rings will be produced thus giving the disease its common name, corky ringspot (CRS). In Europe the disease is referred to as spraing. The ring or arc symptoms may or may not be visible on the tuber surface.

Although corky arcs are the "classic" symptom of TRV infection, the symptoms of CRS vary greatly depending upon time of infection, cultivar, and environmental conditions and arcs or rings are not always present. Several other viruses may cause similar types of symptoms and these include the necrotic strains of potato virus Y (PVY-N), alfalfa mosaic virus (AMV), tomato spotted wilt virus (TSWV), and potato mop top virus (PMTV).

Because of the overlap in symptoms produced by these various viruses, testing is usually necessary for positive identification of the causal virus. In our laboratories we routinely use the reverse transcription polymerase chain reaction (RT-PCR) for this purpose. The photos shown below document the wide variability in tuber symptoms associated with TRV infections. All of the tubers shown tested positive for TRV by RT-PCR and some of the viruses were subsequently transmitted to tobacco indicator plants for further study.

The photographs represent tubers grown in seven states. For "political" reasons, the specific states will not be identified. Some of the cultivars shown include Russet Burbank (Figures 1 and 3), Ranger Russet (Figure 13), Umatilla Russet (Figure 14), Yukon Gold (Figure 12), Rio Grande (Figures 4 and 5), unidentified Russet types (Figures 2 and 10), and unknown breeding materials or cultivars (Figures 6-9 and 11). The symptoms vary from distinct external rings (Figures 6 and 12) to large internal rings (Figures 11, 13, 14), more diffuse arcs (Figures 8 and 9), minor spots (Figure 10), and severely affected tubers with numerous dark blotches (Figures 1-3).

Our purpose in putting this pictorial together is to aid growers and processors in correctly identifying symptoms associated with TRV infections.



Figure 1. CRS in Russet Burbank.



Figure 2. CRS in an unidentified russet cultivar.



Figure 3. CRS in Russet Burbank.



Figure 4. CRS in cultivar Rio Grande.



Figure 5. CRS in cultivar Rio Grande.



Figure 6. CRS in an unknown cultivar.



Figure 7. CRS in an unknown cultivar.

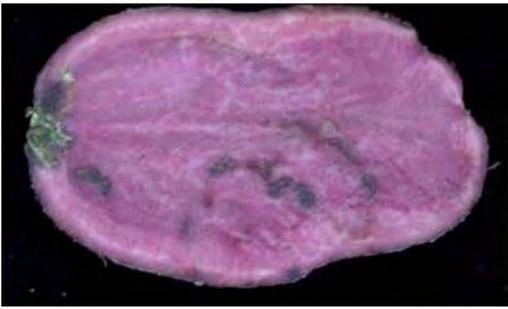


Figure 8. CRS in an unknown cultivar.



Figure 9. CRS in an unknown cultivar.



Figure 10. CRS in an unknown russet.



Figure 11. CRS in an unknown cultivar.



Figure 12. CRS external symptoms in Yukon Gold.



Figure 13. CRS in cultivar Ranger Russet.



Figure 14. CRS in cultivar Umatilla Russet.

Annual Basin Producers 2008 Pesticide Re-certification Day

January 22, TRAC in Pasco
January 23, ATEC-BBCC, Moses Lake
8:30 a.m. – 4:30 p.m., both locations

Organized by:

Columbia Basin Crop Consultants Association
Lower Columbia Basin Fieldmen Dealers
Association

For additional information:

509-754-2011 ext.413 or amcguire@wsu.edu

2008 Topics

- *Pesticide Drift
- *Sprayer Calibration, Maintenance and Technology
- *Chemigation
- *Pesticides and the Environment; Separating Hazards and Risk
- *Pesticide-Related Liability
- *Beneficial Insects of the Pacific Northwest

An agenda and registration forms for these events can be found online at <http://www.grant-adams.wsu.edu/> or may be requested by calling WSU Extension at 509-754-2011, ext. 413.

Train the Trainer Workshop for Trainers of Pesticide Handlers and Agricultural Field Workers

Train the Trainer

The Train-the-Trainer workshop has been specially designed to assist people who conduct pesticide safety training at agricultural establishments. The workshop provides trainers with basic pesticide information, Worker Protection Standard regulations and training tools to deliver effective pesticide safety training to Pesticide Handlers and Fieldworkers as mandated by the state and federal Worker Protection Standard (WPS). Trainers will be qualified to issue WPS worker and handler training verification cards. Course graduates will receive a WSDA Certified Trainer card, a certificate of completion, and EPA training materials.

Training Modules

- ** Basic pesticide information
- ** Pre-Training & Training Process
- ** Federal & State WPS regulations
- ** Training Methodology

Credits: Participants will receive 6 pesticide license re-certification credits.

When and Where: The course will be held from 8 am to 5 pm on February 13, 2008 at TRAC (6600 Burden Blvd. Pasco, WA). The cost of the course will be \$25 and lunch is included.

Registration: Registration closes on February 1st 2008 and space is limited to 30 participants.

Send \$25 Check (Payable to: Lower Columbia Basin Fieldmen Dealers Association.)

TO: Franklin County Extension Office 1016 N. 4th Ave. Pasco, WA 99301

Direct any questions to Tim Waters, Franklin County Extension (509) 545-3511 or twaters@wsu.edu.