

Corky Ringspot Disease of Potato

Corky ringspot disease of potato is caused by **tobacco rattle virus**. It can severely damage tuber quality, leading to crop rejection by commercial processors. The disease was first detected in Wisconsin in Buffalo County in 2007. Corky ringspot has also been confirmed in California, Colorado, Florida, Idaho, Michigan, Minnesota, Oregon, and Washington. In Wisconsin, intensive eradication and control efforts at the site of introduction have been undertaken to prevent in-state spread but out-of-state seed sources continue to be a risk for introduction of this disease.

Life cycle -Tobacco rattle virus (TRV) is transmitted to healthy potatoes by worm-like creatures called stubby-root nematodes (*Paratrichodorus spp.* and *Trichodorus spp.*). When these soil-living nematodes feed on roots and tubers they infect plants with this virus. Nematodes can spread the disease over short distances as they actively move from plant to plant. Soil contaminated equipment or flowing water can transport these virus-infected nematodes and the disease over longer distances. Many plant species besides potatoes can be infected with TRV, including a great number of common weeds which may serve as reservoirs.

Symptoms - Tuber symptoms are often not apparent until a potato tuber is cut. Dark brown arcs or rings, called **spraing** (Figure 1) or small brown flecks (Figure 2) discolor and damage the tuber flesh. The rings or flecks may have a dry, corky appearance. In some cultivars, distinct external rings may be visible on the potato surface (Figure 3, next page). Other potato viruses, including potato virus Y (PVY-N), alfalfa mosaic virus (AMV), and potato mop-top virus (PMTV) can cause symptoms indistinguishable from TRV without laboratory testing. Foliar symptoms of corky ringspot on potato leaves are rare, but include pale to bright yellow mottling in patterns of arcs and small rings on the leaves, called **calico**.

Figure 1. Symptoms of CRS include necrotic brown rings, shown here in the cultivar Ranger Russet.



Photo provided by Jim Crosslin, USDA-ARS, Prosser, WA

Figure 2. Brown corky flecks caused by CRS in a Russet Burbank potato.



Photo provided by Jim Crosslin, USDA-ARS, Prosser, WA

Other hosts - Common weed hosts include: chickweed, cocklebur, nightshade, pigweed, purslane, prickly lettuce, and shepherd's purse. Garden plant hosts include: Hosta, daffodil, gladiola, coral bells, bleeding heart, calendula, and sunflower. TRV has been documented on ornamental plants in Wisconsin, but infected seed potatoes pose a far greater risk for spreading corky ringspot.

Prevention - Planting certified seed potatoes is the best method to reduce the risk of all potato virus diseases, including corky ringspot. However, potatoes from locations with a history of the disease may have a higher risk of spreading this problem. Good weed management reduces the risk of wild hosts acting as a reservoir for the virus. Once established in a field, it is difficult to eradicate, due to weed hosts and the persistent presence of stubby-root nematodes which can transmit the virus for several years.

Management - If corky ringspot disease is suspected, submit a sample to a plant disease diagnosis lab for testing, as other viruses such as AMV, PVY, and PMTV can cause similar symptoms. If TRV is confirmed, the disease is best managed by resistant cultivars, fumigation, or crop rotation. Among the potato cultivars grown in Wisconsin, tests have indicated Russet Norkotah has a moderate level of resistance. Fumigant treatments may have limited success, since even low populations of infected nematodes can cause a severe disease outbreak. Research has also indicated that crop rotation with alfalfa reduces disease severity in the following potato crop, provided host weeds acting as reservoirs for TRV are well-managed.

Regulations - Wisconsin potato seed certification standards do not specifically address corky ringspot disease or TRV. However TRV does contribute to total virus load, and causes both external and internal necrosis, which are subject to standards described in Wisconsin administrative code chapter ATCP 156.

https://docs.legis.wisconsin.gov/code/admin_code/atcp/140/156/1/01

For phytosanitary certification guidelines see the DATCP website:

https://datcp.wi.gov/Pages/Programs_Services/ShippingPlantMaterial.aspx

Information on soil fumigants, nematicides and certified applicators can be downloaded from the following web sites: <https://www.kellysolutions.com/WI/index.asp>

References

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Figure 3. External rings on potato surface are a less common symptom of CRS, shown here on the cultivar Yukon Gold.



Photo provided by Phil Hamm, Oregon State University,