

Oregon Wine Advisory Board Research Progress Report

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Smuggling Vines: A WARNING

Steve Price
Oregon State University

One of the most important decisions growers make is the choice of planting stock. The right variety and clone matched to the right site is a solid foundation for success. But choosing planting stock involves more than choosing the genetic make-up of the grape. Grapes are hosts to a large range of biotic guests: fungi, bacteria, mycoplasmas, viruses, insects, and nematodes all can be carried on, or in, grape plant material. If the choice of plant material does not include consideration of these factors, then growers could be incorporating serious problems into the vineyard, both for themselves and their neighbors. There is no surer way to be unsure about these factors than by smuggling plant material.

There has been a quarantine in Oregon since the 1930's and the current regulations allow importation only of certified cuttings or certified plants grown in sterile, soilless media. This program has been successful in maintaining the health of Oregon vineyards. There are only two serious diseases that occur in Oregon every year: botrytis and powdery mildew. There are many other pests and diseases that would do just fine in our climate and soils, if they could just get started. It is the responsibility of every grower in Oregon to see that they don't. The following article is a list of problems we don't have, but could.

INSECTS AND NEMATODES

The most important pest to keep out of Oregon is grape phylloxera. Phylloxera is a root-feeding insect that occurs worldwide. It easily moves on the roots of vines and, once established in a region, it can move from vineyard to vineyard in soil, on machines, or even in the wind. They can kill entire vineyards of self-rooted vines. There is no cure. Infected vineyards must be replanted on resistant rootstocks. **Never** bring any rooted vine from anywhere outside of Oregon unless it has been grown only in soilless media.

Nematodes can also be carried on the roots of vines. They can cause serious damage to vines on their own and can also be vectors of some viruses (see below). A nematode population infected with a damaging virus can take a piece of ground out of grape production for years. They can be a more serious problem for an individual vineyard than phylloxera.

FUNGI

Botrytis and powdery mildew are two fungi common in Oregon. Why worry about them? Both of these fungi can travel on cuttings, and strains of both of these fungi have been found in Europe and California that are resistant to commonly used fungicides. The selection of chemicals available to combat these diseases is already limited. Resistant fungi would reduce this selection even further.

Black rot, anthracnose, and downy mildew are serious plant and fruit rots common in Europe and the

eastern United States. It is not expected that these diseases will do well in the drier climate of Oregon. All the same, let's not bring them in and find out.

BACTERIA AND MYCOPLASMAS

Two bacterial diseases capable of causing significant damage to Oregon vineyards are bacterial blight and Pierce's disease. Both are systemic in grapevines (capable of spreading throughout the plant).

Bacterial blight is a vascular disease that causes shoot blights and cankers. It is reported in much of Europe, including France. Bacterial blight is a persistent disease and can be spread from vineyard to vineyard by propagating with infected cuttings. It spreads within a vineyard by infected pruning tools. The main control methods are quarantine and the use of clean propagating stock.

Pierce's disease is also a vascular bacteria that can cause significant vine losses. It is found in California and the southeastern United States. The bacteria causing Pierce's disease has a wide range of wild host plants and is spread from plant to plant to leaf hoppers and spittle bugs. It is the bacterial concentration in these host plants that causes problems in California. "Hot spots" with infected wild hosts continue to infect healthy grape tissue planted in the area. It is possible that wild hosts and vectors capable of spreading Pierce's disease already exist in Oregon, but so far the bacteria does not.

Mycoplasmas are bacteria-like organisms which cause dysfunction of the phloem. They are transmitted by leaf hoppers and grafting and, because they are systemic in the plant, are easily carried in cuttings.

Flavescence Doree is suspected of being a mycoplasma-caused disease. It causes shoot wilts and vine death in susceptible varieties. Epidemics of this disease are associated with the leaf hopper, *Scaphoideus littoralis*. This leaf hopper was introduced from the eastern United States into France. It lays eggs in the bark of canes. During the dormant season, leaf hopper eggs and the mycoplasma can travel with dormant cuttings. Varieties differ in their susceptibility, but Pinot noir is a susceptible variety.

VIRUS DISEASES

Viruses are transmitted by budding, grafting, and rooting cuttings in all perennial plants. In grapes, viruses spread slowly by natural means. It is the propagation of infected plant material that has been responsible for the worldwide distribution of viruses. Clean stock programs have been set up to provide virus-free stock for propagation. Oregon is unique in the viticultural world for its lack of serious viruses. This is the result of the clean stock programs. Almost all of the grape plants in Oregon originated from clean stock from U.C. Davis or Oregon State University.

With the quarantine and the health of grape plants currently in the state, growers can propagate from any vineyard without concern for serious viruses. That will all change if virus-infected plants are imported illegally into Oregon. The natural spread of some viruses and the mixing of healthy and infected stock would make the choice of planting stock much more of an issue than it is now.

Nepoviruses (nematode-transmitted, polyhedral viruses) all cause grape declines and are all spread by soil nematodes. Grapevine fanleaf virus, tomato ring spot virus, and peach rosette virus are all nepoviruses.

Fanleaf degeneration is spread worldwide. It causes leaf malformation, poor fruit set, yield reduction, and vine decline. It is spread by the dagger nematode, *Xiphinema index*, and by propagation. *Xiphinema index* is not known to be in Oregon. However, it is common in the Napa Valley and most likely could

survive in Oregon if it were introduced on soil or rooted plants. Grapevine fanleaf virus has also not been seen in Oregon, but it could be easily introduced by importing non-certified stock. Fanleaf is frequently seen in plants coming into virus indexing programs from Europe. Registered clones in France are selected to be free of fanleaf, but after they are released they can be grafted onto infected rootstocks or planted into infected ground. Fanleaf has been detected in registered Pinot noir clones from Burgundy by the indexing program in British Columbia.

Peach rosette virus is not a problem in *Vitis vinifera*, but it can be a problem on *V. labrusca*, interspecific hybrids, and some rootstocks. It is spread by the nematode *X. americanum*, which is widely distributed in Oregon. The disease could be introduced into a vineyard by bringing in infected nematodes or planting stock.

Tomato ringspot virus causes yellow spots on the leaves and reduced fruit set. It is common in the eastern United States and is seen in California. The virus is spread by *X. americanum*, *X. californicum*, and *X. rivesi*. *X. americanum* is common in Oregon and *X. rivesi* has been found in Oregon vineyards. A vineyard could be infected by importing infected nematodes or planting stock or by planting in infected ground. Tomato ringspot is already in Oregon in other fruit species and in some weed hosts, including dandelions. It has not been identified on grapes yet.

Leafroll and corky bark are two viruses that are not commonly spread by nematodes or insects. Both viruses are common worldwide. Infected vines show leaf symptoms, bark symptoms, and can have reduced size and yield. Leafroll can delay ripening and reduce color on black varieties. Both viruses can cause red leaves on Pinot noir. The yellow color of our vineyards in the fall is an indication of healthy vines. If a grower smuggled in vines infected with these viruses, the resulting red leaves in the fall would be visible for miles. The only way the virus can be introduced into a vineyard is by planting infected stock.

Rupestris stem pitting is the only widespread virus in grapes in Oregon. It was introduced in plant material from the clean stock program at Davis. Several commonly planted clones in Oregon are infected, including the "Pommard" clone of Pinot noir. Leaf and bark symptoms have not been seen on infected material in Oregon and no apparent crop losses or vine declines have been observed. All material introduced into Oregon should be checked for the presence of rupestris stem pitting, however. It is possible that grafting onto rootstocks could cause some problems and, like knowing which clone you have, it could be important to know the virus status of your vines.

CONCLUSION

The health of grapevines in Oregon is dependent on the cooperation of all growers in the state. The Oregon Wine Advisory Board, through its Vine Improvement Committee, is working to develop an orderly method of importing vines into the state. The indexing, quarantine, and distribution of tested stock takes time, however. A minimum of three to four years are required from importation to distribution. Be patient. If a variety or clone is important for the Oregon wine industry, it can be introduced legally and safely. If we do it right, we will all benefit in the long run.

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Much of the information in this article came from the Compendium of Grape Diseases. This book, published by the American Phytopathological Society, is the most up-to-date general reference on grape diseases and disorders. It is available through the APS Press, 3340 Pilot Knobb Road, St. Paul, MN 55121.

