

Notes from a Rogue entomologist

Vines, viruses and vectors

BY RICHARD J. HILTON

Wine grapes are afflicted with a variety of viruses that have negative impacts on vine growth and production.

In last spring's *Applegater*, I discussed the rise of grape mealybugs as a vineyard pest. It turns out that the grape mealybug is a pest in two very different fashions: mealybugs can infest grape bunches and degrade fruit quality directly, and they are also very good vectors of grapevine leafroll viruses. These viruses cause leaves to roll and turn red and result in lower yields, reduced sugar in the fruit, and delayed harvest.

Mealybugs are members of a large order of insects, Hemiptera; the unifying characteristic of this group is a piercing-sucking mouthpart. Most insects that can vector plant viruses are in this group. Just as a mosquito can spread yellow

fever or malaria from person to person through its feeding, the same is true of these plant-feeding insects as they pick up the virus from a diseased plant and then inject it into a previously uninfected plant. As with mosquitoes and human disease, specific insects act as the primary vector for specific plant viruses.

I was part of the research team that was investigating mealybugs and leafroll virus in vineyards. The team tracked the movement of disease by assessing plants visually to see if they had the symptoms of leafroll virus. We then took samples of the plant tissue to verify the presence of the disease in the laboratory.

We kept finding symptomatic vines that were *not* testing positive for the virus. At first we thought it might

be a new strain of leafroll virus, but in 2012 other researchers discovered that there was an entirely new virus causing similar red leaf symptoms. Dubbed "red blotch virus" (it appears that plant virologists are rather prosaic), this new virus was different from leafroll viruses and belonged to a group of viruses that were often transmitted by leafhoppers.

Leafhoppers are prevalent in vineyards, the western grape leafhopper being our most common vineyard pest. The immatures feed on and damage leaves by puncturing the leaf cells, while the jumping and flying adults (about 1/8" long) create a nuisance for pickers at harvest by jumping into their faces when the vine is disturbed. Like mealybugs, though otherwise very different, leafhoppers have piercing-sucking mouthparts and belong to that same order of insects, Hemiptera, which are so adept at transmitting plant viruses.

With the discovery of this new red blotch disease and the rapid development of molecular tools to identify it, we began to search for possible vectors of the disease. Leafhoppers seemed to be a promising place to start. Researchers at Washington State University did some studies that indicated that the Virginia creeper leafhopper, a species related to the western grape leafhopper and

which will also attack grapes, was able to transmit the virus. However, researchers at University of California-Davis tried to replicate this research and have not been successful. While it is possible to retrieve the virus from leafhoppers that feed on infected plants, that, by itself, is not an indication that the insect is able to infect a healthy plant. Successful transmission can be a complicated process and evolves over time, so, as we researchers like to say (often to some derision), "more research is needed." That is certainly the case here.

And a final note: the Virginia creeper leafhopper is present in the eastern US and Washington State and, beginning in 2012, showed up in northern California where it has become a vineyard pest. However, it has yet to be found in southern Oregon. The fact that this leafhopper is a potential vector of red blotch virus makes it even more important that we find out if it is here locally or identify it when it arrives. While the western grape and Virginia creeper leafhoppers are similar in appearance, the Virginia creeper leafhopper has darker markings and, as the name implies, can be found feeding on Virginia creeper as well as grapes.

So keep an eye out for any new leafhoppers on Virginia creeper, and let me know if you see anything unusual.

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Photo (left): Western grape leafhopper adult (*Erythroneura elegantula*).
(right) Virginia creeper leafhopper adult (*Erythroneura ziczac*). Photos: agf.gov.bc.ca.



BOOK REVIEW

Hiking Sasquatch Country: Exploring Bigfoot's Backyard

Wendy and Gary Swanson



I've spent quite a bit of time in southern Oregon's forests and mountains and never heard an unexplained movement in the bushes, seen a big footprint, or heard a strange grunt. Well, there was a time recently when I came across a bag left along the trail that was marked by some Pacific Coast Trail hiker with a note to the effect that due to weather some food had to be left behind. Two hours later, when I returned down the same trail, the bag was gone. I had not encountered another hiker on the trail that day. A wild animal would have torn into the bag to check out the food smells and left some telltale trash, but this bag just vanished. Maybe a Sasquatch made off with it and cooked up some Kraft mac and cheese for himself?

It's good and somewhat comforting to have a ready explanation for the mysteries we can't explain. A strange grunting noise, a rustling in the bushes or a missing bag: I can't explain it so it must have been Bigfoot. There, now that's settled.

This book by the Swansons really only touches here and there on the whole Bigfoot mythology. Those skeptics among us will be amused by their three stories of possible Bigfoot encounters (including a photo purported to show a gorilla-like face in the bushes) and then move on to the meat of the book: dozens of pleasant hikes in the area and interesting historical tidbits that enhance the hiker's experience.

Five years ago, recently transplanted Grants Pass area residents Wendy and Gary Swanson and their dogs began exploring their environs. They took many photos and began documenting their hikes on a blog. Now they've published *Hiking Sasquatch Country*. Many of their photos appear in the book as well as GPS coordinates, driving directions and descriptions.

Mining gold and other minerals drove many fortune seekers to this area from

the 1850s to the early part of the 1900s. We learn from the book that a gold nugget weighing 17 pounds, the biggest ever found in Oregon, came from the Illinois Valley. To serve these miners, there were towns of several thousands in the Illinois, Rogue and Applegate valleys that have now completely vanished with little evidence left behind. The Swansons have a particular interest in this aspect of southern Oregon's past. They give us a little history with each of their 39 hikes, taking us to some of these mining sites and showing us traces of mines and mining towns to give us a sense of this history.

Each hike has a personal commentary describing their experience and drawing us into their friendly circle. Many of the hikes are less than three miles long.

Their excursions extend to other interests besides mining: an old tombstone quarry near Hugo, nature walks through the Kalmiopsis, mountain lakes, view-rewarding hikes and more. At the back of the book is a list and brief description of 37 additional local points of interest like museums, cemeteries and landmark homes.

At historical sites, we get a sense of the presence of lives and times that preceded us. A spirit of those olden times remains, and it's a bit eerie and mysterious. Deep in the ancient woods and mountains, that awareness of the ages is perhaps even more deeply felt. The Sasquatch, real or imagined, might just be that sense in us that there is a presence in the forests of southern Oregon that challenges our rational understanding of the world.

Hiking Sasquatch Country is an excellent book for those new to the area wishing to explore its beauty and understand its history, as well as any old-timer hungry for some new areas to explore that might have been overlooked by other hiking books.

The book is available in Grants Pass at Oregon Books, Armadillo Mining Shop, Service Drugs, and the Old Town Antique Mall. It is also available at the Illinois Valley Visitors Center, the Chateau Gift Shop at Oregon Caves, and on Amazon.

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