

The ~~F~~-Word Ph-Word

Every activity on Earth has its own special curse, and grapegrowing is no exception. The story of this one begins back in the 18th century. Settlers in the new colonies were struck first by the abundance of wild grapes (after all, the Vikings named it Vinland when they visited almost a thousand years ago), and then by the truly awful wine these “fox grapes” made. Thomas Jefferson (among others) imported grape vines from France in an attempt to grow grapes suitable for winemaking in the new country, only to find that after a few years, the vines withered and died from some unknown malady.

Some time later, an enterprising soul whose name has been mercifully lost, imported some of the New World vines to France to see if the vigor they displayed in America could improve the vines of Europe. That he had brought in the worst kind of Trojan Horse was not discovered until, in the 1870’s, the local vines began a gradual demise, showing remarkably similar symptoms to the way imported vines had perished in colonial America. Panicked by the devastation of its proud heritage, not to mention the loss of the most significant agricultural pursuit in France, biologists began a feverish search for the cause of the plague.

Aids of the Grapevine?

Before long, they found it. A microscopic louse was feeding on the newly formed root hairs, sucking nourishment and eventually life from the vine. They named it “*phylloxera vastatrix*,” and began to learn ever more alarming things about its lifestyle. The louse has no other host than grapevines, travels easily from vineyard to vineyard (even on the boots of workers), and can produce up to seven generations each year since its mode of reproduction is “parthenogenic” (all are female, and with no need to mate for reproduction, they are often described as being “born pregnant”). One phase of its life is even “aerial,” meaning that they can travel several miles in the wind. No effective pesticide was found, and indeed has not been found to this day.

It was learned that phylloxera is native to North America, and that the vines here had evolved to be resistant to its predation. The discovery sparked an intense burst of activity as biologists and growers tried to plant American rootstock and graft onto it cuttings from the surviving vines, but with poor success. It seemed that there was too much genetic difference between the two species: *vitis vinifera* in Europe and the native *vitis labrusca* in this country. A major effort was then undertaken to produce hybrids of the two vines that would combine pest resistance with grapes that made good wine. The process is painstaking, involving pollinating a single grape flower with pollen from another, then tracking the individual resulting berry to harvest its seeds and plant the next generation. Between one in a thousand and one in ten thousand of the offspring of these arranged marriages will produce the desired combination, and it’s about ten years before you know which ones succeeded.

The varieties that resulted (called French Hybrids here and “*Produceurs Directs*” in France), can provide some decent, even very good wines, and are still widely planted in the Eastern U.S. and the south of France. The districts of Bordeaux and Burgundy, however, would not be satisfied with less than the noble varieties that had elevated them to the pinnacle of wine quality, and the process continued. By careful and patient hybridizing, rootstocks were developed which resisted phylloxera and contributed minimal changes to the quality of the wine. They had names like Rupestris St. George, Riparia Gloire, Dog Ridge, and AxR1 (for Aramon Rupestris Ganzin No.1).

The Rootstock of the Century

The last rootstock, AxR1, took California by storm with its high vigor, disease resistance and large crop loads, and was the overwhelming choice of grapegrowers in the post-WWII expansion of American vineyards. In the 1980’s, stormclouds began to gather when a few isolated cases of phylloxera were found in the Napa Valley. Following the disastrous flooding of the Napa River in 1982 and 1986, more and more vineyards began to see the slow but inevitable destruction of phylloxera. “How could this happen?” cried the incredulous viticulturists, as they turned moist eyes to the gods of grape and wine in Davis. The French were quick to say, “We told you that AxR1 was susceptible, but you were blinded by the quantity of grapes it produced.” Now we know, too, as most of the vineyards in Napa (and soon Sonoma) are being ripped out, that AxR1 was a false friend, hiding its true nature and weaknesses. The vineyards are being replanted with “absolutely” resistant (we hope) rootstocks with names such as 110R, 5C, and SO4.

What does this mean for El Dorado County? “The hot, dry climate, the sandy soils, and our elevation combine to make this area inhospitable to phylloxera,” we said, “After all, the vineyards of Argentina and Chile have always been planted on their own roots and have never shown evidence of phylloxera.” We knew all along that the louse was present for decades just south of us in Amador County, but had shown no inclination to move up the slopes. Until a few years ago, that is, when one vineyard here began to display the tell-tale signs and was confirmed to have been infested. “Oh, that’s all right,” we said, firmly in denial, “We always knew it could happen to own-rooted cuttings, but we’re still secure on our high-country AxR1.”

WRONG!

In August, five adjacent vines in our own De Cascabel vineyards started to look suspicious. Lack of vigor, poor fruit set, and a skull-and-crossbones circular pattern radiating out from a single central vine. We can’t be absolutely sure yet, since this is one of the few times the roots and therefore the phylloxera are relatively quiet. The symptoms are serious, however, right down to abrupt right-angle bends of the root hairs where the lice feed. We’ll confirm the diagnosis with other tests, but we know we have to prepare for the worst.

What can you do when this kind of calamity strikes? Most important, you learn from it, so we’ll use the opportunity to educate ourselves and others. Even though the progress is definite, it’s very slow-moving, and it will be many years before our vineyard output is

seriously affected. There are a couple of promising experimental biological controls that might arrest future infestation, and we'll certainly try those. In vineyards where the vine trunks are moderate in size, you can use a technique called "approach grafting," where a new, resistant rootstock is planted next to each vine. When the rootstock reaches proper size, the existing vine can be severed from its failing AxR1 and grafted to the new roots. It costs money and takes time, but it can be reasonably successful. Our vines, because of good fortune and deep soils, have trunks four to five inches in diameter and are not good candidates for this process.

The next best approach is called "interplanting," where new vines, already grafted, are planted midway between the existing vines. The new babies need sunlight, so it's advisable to reduce the "canopy" of fruit and leaves above them, leading to reduced crops until the new vines can begin to supply fruit and the old, diseased vines can be pulled out. The final solution, if none of these works, is to rip out the vines, fumigate the soil to decrease (not eliminate) the phylloxera population, and plant new vines. Not a pleasant thought, but a good vineyard site is worth saving, and all the infrastructure of irrigation and trellising is already in place.

Philosophy

As a coworker of mine wisely said on learning of his diagnosis with a dread disease, "This is not a tragedy, it's a transition." Nietzsche said that whatever doesn't kill you makes you stronger, and we intend to exit this experience stronger, wiser, and more ready to take on the next challenge.

(Note: it turned out that the cause of our vine decline was not phylloxera, and has not spread. We apologize for the undue alarm and thank all who expressed concern.)