

A Mite, A Mildew And Money - The Three Trials of the French Wine Industry.

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In the late 1800's three separate and different agents nearly destroyed the French wine industry.

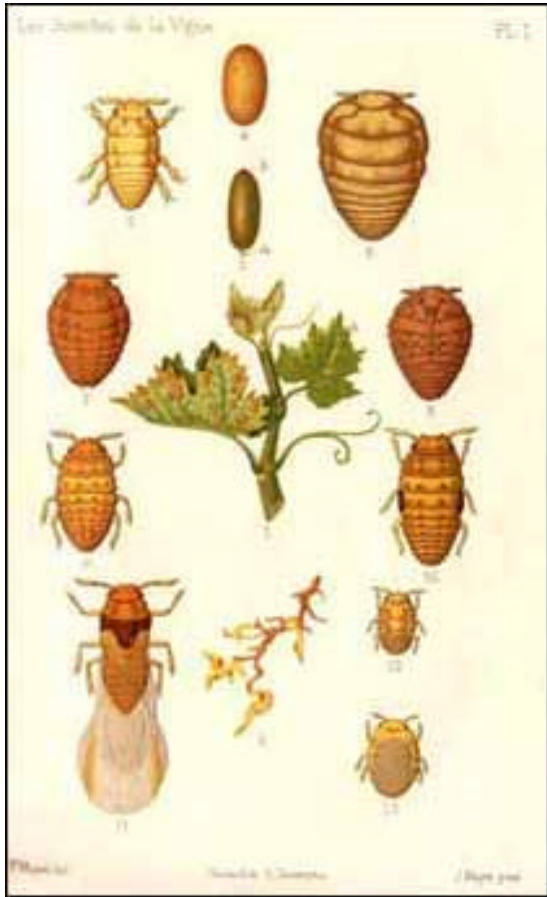
In 1865, the grape vines (*Vitis vitifera*) in the Valley of the Rhone began dying from a disease that began with reddening and yellowing of the leaves which withered and fell, the roots were swollen with irregular galls while the grapes only partially ripened and by the following season, the plants were almost dead. Careful examination of the swollen areas of the root revealed that there were insects, a species of aphid that had invaded the roots, later identified as *Phylloxera vastatrix*. An American entomologist, Charles Riley identified *P. vastatrix* to be native to America, where it attacked only the leaves of the native grapes. In 1872, noting that American vines growing in France were free of damage except for some leaf galls, Riley suggested the use of those species of American *Phylloxera* resistant vines as root stock and to graft them to the French plants. The implementation of the suggestion solved the *Phylloxera* problem, but soon another disastrous attack on the wine industry occurred; this time by a fungus; Downy Mildew (*Plasmopara viticola*).

In America the fungus grew on the native grapes, attacking the leaves but seemed to do little harm, indeed the shrivelling of the vine leaves helped with better summer ripening of the grapes. As most downy mildews require high humidity for sporulation and either free moisture or high humidity for spore germination, in the moister French climate, the fungus had the potential to be as destructive as *Phylloxera*. First reported in 1878 in France, probably introduced with the American rootstocks to combat *Phylloxera*, by 1882, it was in every wine growing district in France and invading the vines of Italy and Germany. While all cultivars derived from European (*Vitis vinifera*) and American (*V. labrusca*) varieties are susceptible, some varieties of American species such as *V. rupestris* and *V. riparia* and their hybrids with *V. vinifera* are resistant. However, these species and hybrids are generally not eating varieties and their use was not a solution to the problem of downy mildew. Research over several years from 1880 by Pierre Millardet, Professor of Botany at Bordeaux University, had identified *P. viticola* as the cause of the fungal infection. In late 1882, while strolling around a vineyard Millardet found that while most vines were severely affected by downy mildew, the vines nearest the road were healthy, having been sprayed with a bluish-white material to deter passer-bys from picking the grapes. The healthy vines had been treated with Bordeaux Mixture, as it became known, (a mixture of copper sulphate and lime), the first non-systemic inorganic copper fungicide had been found and again the French wine industry survived.

With the combined affects of both *Phylloxera* and Downy Mildew nearly destroying the French wine industry, it was near ruin, fraud and adulteration was common and widespread, some Mediterranean countries had substantially increased their outputs, giving rise to a glut of inferior quality wines, while the demand for fine wines reached a historically high level. To deal with these problems the French government introduced laws in the beginning of the 20th Century to end the deceptions.

Substantially a quality assurance process, the system that evolved from the legislative framework came to be called Appellation d'Origine Contrôlée (AOC), a system for designating, controlling and protecting the quality of French wines.

So, with a little luck, some insightful scientific research and hard work together with a good helping of serendipity and forceful quality assurance, the French wine industry survived the trials of a mite, a mildew and money!



Phylloxera vastatrix life cycle



Downey Mildew on top of juvenile leaf



Downy Mildew on Adult leaf



Downy Mildew on Grapes

Photos ; SA Wine Industry Council.