

Major Vineyard Pest & Diseases

Birds and Animals

- Rabbits, hares, gophers, deer, kangaroos, and wild boars are known to strip off the bark of vines and eat grapes.
- Birds tend to eat grapes once they start to ripen.
- Dogs, flags, scarecrows are common deterrents.

Nematodes & Parasites

Nematode – Refers to more than 15,000 species of worms in the class Nematoda (phylum Aschelminthes). Nematodes include plant parasites and free-living forms found in soil and water that can damage grapevines. Treatment is very difficult. Prevention is highly recommended and includes sanitizing the soil before replanting a vineyard as well as using resistant rootstocks.

Other Important Parasitic Nematodes include: Citrus, Dagger & American Dagger, Lesion, Needle, Pin, Reniform, Ring, Root-knot, Spiral, stubby-root, stunt

Insects and Mites

Phylloxera vastatrix – Grape louse that can attack both the leaves and root systems of grapevines. The most dangerous is found in the soil where the pest causes fungal infections that destroy the plants ability to transport nutrients and water. No known way to eradicate, grafting onto resistant rootstock and planting in sandy soils is the only way to avoid.

Margarodes Vitus – Also referred to as ground pearls, earth pearls or pearl scale. An insect that feeds on the rootstocks. Damage to the vine includes stunted growth, leaf discoloration and death, low or no crop, reduced vine vigor, and ultimately vine death. Insect cannot survive in soil depths past 3-4 meters. Heavy rainfall and flood irrigation can reduce infestation. As of now American rootstocks are not resistant. Most common in Chile and South Africa.

Grape Erineum Mites – Grape leaf blister mite. Lives on the underside of leaves and cause blisters that affect the growth of young vines.

Rust Mites – Belong to the same species as Erineum Mites, but they live on the top of the leaf. Cause reduction in yield.

Major Vineyard Pest & Diseases

Spider Mites – Red and Yellow mites-not actual spiders-that infest the leaves and restrict growth.

Grape moths – Flying insects such as Cochylis, Pyralis, and Eudemis. The caterpillars of these moths eat the buds and fruit thus allowing diseases to set in.

Grapevine Beetle - Hollows out new buds in the spring leaving them susceptible for diseases.

Other Insects that eat plant material and cause harm to grapevines include:

- Green Hornworm, Brown Hornworm, Adult Grape Rootworm, Adult Grape Root Borer

Diseases: Fungal

Black Measles – also called ‘Spanish Measles’, ‘Apoplexy’ and in France it is called ‘Esca’. Typically found in areas with high summer temperatures and in vines that are 10 years and older. Identified by multiple black spots that have a brown-purple ring on the berries. The spots can appear between fruit set and ripening. Berries infested with the disease will dry and rot. Canes and leaves are heavily affected as well and growth is severely damaged. Treatment includes the application of the Pesticides sodium arsenite to the trunks of infected vines, but this is often not allowed in some areas because it is hazardous.

Black Rot – (*Guignardia bidwellii*) a fungal disease identified by small yellow spots on the leaf in its early stages. As the disease progresses, the spots become reddish colored lesions with a dark outer border. This disease spreads fast developing small black spots that contain the fungus. Lesions may also manifest on young shoots, stems, and tendrils. The lesions are purple to black, oval in outline, and sunken. Infected berries are referred to as ‘mummies’ because they dry up, shrivel and die. Diseased parts must be removed from the plant to reduce spreading. Black Rot thrives in wet conditions where vines are exposed to little air flow. Treatment with antifungal sprays as a preventive measure can reduce, but maintaining air flow in the vineyard after heavy rainfalls is the safest and most natural way of combating the fungus. Vineyard fans are very useful in maintaining air flow in vineyards, but can be costly to the winery.

Major Vineyard Pest & Diseases

Black Spot – (*elsinoe ampelina*) a fungal disease that attacks the leaves, stem and fruit.

Produces spores- brownish black spots-that form on younger canes. Identified by the sunken centre and raised margin. The disease can move to the flowers and fruit causes them to wither and fall off. Spots will also spread to the leaves and initially turn them grey with reddish brown edges. As the fungus further develops the leaves with turn black and form holes in the leaves. Thrives in wet conditions. Preventive measures work the best. Disease can be treated by spraying Copper Oxychloride or Mancozeb.

Botrytis Cinerea – Fungal disease that manifest in a positive way, noble rot and a negative way, grey rot. The noble rot is the major factor in creating the greatest dessert wines in the industry by extracting all of the water content of the grape and leaving the sugars intact. Noble Rot is not an easy thing to achieve. Conditions have to be a certain way for the fungus to work in a positive way. During the later part of the growing season when the grapes are beginning to ripen, there needs to be a short period of high humidity or rain followed by a cool dry spell where temperatures hover around 60°F. This allows the fungus to set in during the damp period and the cool dry period controls the destruction. If damp and wet conditions continue then grey rot, the destructive disease, will set in.

Chlorosis – When the leaves do not produce enough chlorophyll. The term ‘chlorotic’ refers to when leaves are pale, yellow, or yellow-white because of the deficiency in the green element of chlorophyll. Can occur when soils are deficient in iron, waterlogged, PH is too low, or as a result of herbicides and pesticides. In my reading I learned that there is a correlation between plant iron deficiencies in with soils that are rich in limestone.

Crown Rot – (*Phytophthora megasperma*) Classed as a pathogen, this disease occurs more frequently in vineyards with standing water and in young vines on drip irrigation systems. Above ground, vines with wounds from pruning or other trauma can be infected with the pathogen as well. The disease can survive for many years in the soil in the form of spores. My research has encountered that lime sulphur as a chemical spray is the only solution in combating the pathogen that causes this disease. Careful care has to be taken not to mix in contaminated dirt into other areas of the vineyards. Infected vines should be removed and destroyed to avoid contaminating other vines. In harsh cases large plots of land can carry the disease which renders the area unusable. Since the pathogen moves freely through standing water, careful irrigation techniques must be followed.

Major Vineyard Pest & Diseases

Downy Mildew – (*plasmopara viticola*) also known as ‘Peronospera’, a fungal disease. Identified by dense white growths on the underside of grape leaves. Causes the berry to shrivel and become leathery in texture. Treated with a mixture of sulphite and lime known as “Bordeaux Mixture” that dispenses in the form of a spray. Side effects of the spraying with Bordeaux mixture include a blue tint on the vines and soil area. Outbreak typically occurs when rainfall amounts to 10 mm and over in a twenty-four hour period. Thrives in wet areas with warm temperatures.

Eutypa Dieback – Dead-Arm disease or Eutyposis. Caused by the fungal pathogen *Eutypa lata*. It is one of the most common canker diseases found in California grapevines. “Eutypa dieback shoot symptoms are always accompanied by a canker, which often appears V-shaped in a cross-section of the perennial wood”.⁵ Older vines are in more danger because they tend to have more pruning wounds though the pathogen is just as easily spread by wind and rain in freshly pruned young vines. The disease starts in spurs and slowly makes its way through the arms of the vine until it overtakes the plant. The fungus has a long incubation period. In some cases plants can survive for many years before visible symptoms appear. Some of the research articles that I found stated that symptoms don’t emerge until after 6 years. Some grapevines have one side that is dead and one side that is healthy. **Example:** D’Arenburg Dead Arm Shiraz, from Australia, is made from vines affected with Eutypa Dieback. The theory is that since the vine is stressed and half dead all of its energy is focused to the live side of the vine, therefore producing better fruit.

Grey Rot – caused by the fungus *Botrytis cinerea*, when conditions are less favorable. Identified by a grey powder covering grape clusters. “Yields are greatly reduced and wine made from this fruit will taste moldy and oxidize easily. In some climates, grey rot is a severe problem with most all grape varieties.”⁶

Phomopsis – (*Phomopsis viticola*) A fungal disease that is prevalent in New Zealand as well as other cooler production areas. Thrives in damp wet areas. The disease causes black spots and yellow rings to form around shoots. The shoots begin to develop black cracks, eventually decay and fall off.

Powdery Mildew – (*uncinula necator*) Also known as odium, a fungal disease. Causes pale grey spores to grow on the leaf of the vine. Once infected the plants buds are damaged and the fruit typically begins to shrivel up. Commonly found in vines that are dense in foliage in areas that are damp and wet. Can be treated by dusting the vine in sulphur powder.

Major Vineyard Pest & Diseases

Diseases: Bacterial

Flavescence Dorée – (*Candidatus Phytoplasma vitis*) a bacterial disease carried by the *leafhopper* (insect). It can kill young vines and seriously reduce performance in older vines. The disease is classified as a **Phytoplasma** – specialized bacterial that obligate insects and parasites.

Pierce's Disease – The most serious bacteria disease which is spread by small insects called sharpshooters. At this time there is no known cure. An infected vine will die within five years once it is infected. The only prevention method known as of now is a **cordon sanitaire**, which is the method of quarantining the vines. According to my research, Chardonnay and Pinot Noir varieties are extremely susceptible

Diseases: Viral

Alfalfa Mosaic Virus (AMV) – Can lead to necrosis of plant tissue. Research suggests that this plant virus infects over 600 plant species in 70 families.

Grapevine Fan leaf Virus (GFLV) - is a plant pathogenic virus that is spread through the vector nematode *Xiphinema index* and by infected plant material throughout the vineyard. Identified by short sporadic shaped internodes, zig zag shoot growth, asymmetry of the leaf blade “Fan-like”, yellow mosaic distortion on the leaf, poor fruit set, and small clusters with aborted berries. Overall productivity is reduced by 50% and lifespan is low. Preventive measures are best with heat treated and meristem cultured plants.

Leafroll – Symptoms vary between black and white varieties, easier to detect in black varieties. Leaf curling, Chlorosis and reduced vigor are among the effects of the virus. “Additionally, symptoms often differ among rootstocks, varieties and clones. The complexity of the disease itself adds to the difficulty in recognizing the symptoms.”⁷

Other harmful viruses include: arabis mosaic, bois noir, grapevine virus B or corky bark,

Major Vineyard Pest & Diseases

Misc Diseases & Disorders

Fasciation – When plant tissues and organs-mainly stems, shoots and leaves- become physically distorted because of a genetic disorder as a result of a viral, fungal or bacterial infection.

Little Leaf – Disease that results from a deficiency in zinc.

Rupestris Speckle - Physiological disorder that causes necrotic lesions on leaves. Mainly affects *V. rupestris* species.

Stem Necrosis - (water berry, grape peduncle necrosis) Physiological disorder.

Further Reading

Verma, L.R. and R. C Sharma. Diseases of Horticultural Crops – Fruits, Indus Publishing Co 1999

European Journal of Plant Pathology, Springer Netherlands 2002