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"To do list" for post-harvest vineyard management in Florida

Rationale: *To unlocked the potential of your vines for the next growing season by helping to recover and go healthy to dormancy*

Fertilize to rebuild the nutrient levels: *We have an extended growing period and enough time for the vines to convert nitrogen and benefit from fall nutrients. After harvest is a good time to collect your soil samples for analysis and plan your compensatory fertilization program for the next season.*

Irrigate if it is dry to prevent the 'shut down' mode of the vines: *Water stress can alter the growth pattern of healthy vines for the next season*

Keep the vine canopy healthy by treating for pest and diseases. *Common disease causing organisms in our vineyards in the fall include:*

Black Rot

Black rot, caused by the fungus *Guignardia bidwellii* f. *muscadinii*, is a serious disease of grapes and can be destructive during warm and wet seasons. It is mainly a disease of immature berries, young canes and leaves. Warm, wet weather in the spring and summer, along with unsprayed susceptible grape varieties, may cause fruit to become almost completely rotted by harvest time. Symptoms appear on all aerial parts of the plants can be affected by this disease. In particular, leaves have a small concentric spots. The spots change to grayish-brown with a black line margin. Circular spots appear on the upper surface of the leaves starting in late spring or early summer. Lesions have black pycnidia (speck-sized fruiting bodies) and are present on young and rapidly growing leaves as less concentric rings.



Variety affected: Carlos, Noble, Fry

Powdery Mildew

Powdery mildew, caused by the fungus *Uncinula necator* (Schw) Burr., is a problem on grapes in most commercial production areas. It is, without a doubt, the most enduring and persistent disease problem faced by grape producers, especially among vineyards planted with muscadine and American native grapes in the southeast region of the United States. The fungus can infect all green tissues of the grapevine. The disease appears on leaves as a white or grayish-white powdery covering of the upper and lower surfaces. Heavily infected leaves may turn dull, dry out, and drop prematurely in the autumn, whereas very young leaves that become infected may become distorted and stunted as they expand.



Variety affected: Stover

Downy Mildew

Downy mildew is caused by fungal organism, *Plasmopara viticola*. Typically, it occurs in excessively wet and warm season and rain is considered the primary factor driving infection by the disease. Humid nights followed by rainy conditions increase the risk of downy mildew infection. The pathogen attacks all green parts of the vine and often causes significant premature defoliation. If serious enough, this can cause sufficient stress to plants, making them prone to other diseases or disorders such as winter injury. Downy mildew is most damaging when factors exist that increases the moisture of soil, air, and the host plant. Downy white sporulation will be evident on the underside of the leaf.



Variety affected: Stover

Phomopsis cane and Leaf spots

Phomopsis cane and leafspot, caused by *Phomopsis viticola*, appears as tiny dark spots with yellowish margins on leaf blades and veins. Infected leaves have small, yellowish spots with dark brown centers (see tiny spots on leaves). Symptoms show 21 to 30 days after infection and prolonged rain promotes the disease. Leaf death may occur if large numbers of spots build up. Basal leaves with heavy infection become distorted and usually never develop to full size. On shoots, small spots with black centers similar to those found on leaves occur usually on a basal portion of the shoot. After spots lengthen a few millimeters, the epidermal layers of the shoots usually crack at the point of infection. Heavy infection usually results in a scabby appearance of the basal portions of the shoot. The fungus overwinters in bark of infected canes.



Variety affected: Carlos

Black Measles

Grapevine measles, also called esca, black measles or Spanish measles. Specific cause of the disease, but two genera of fungi (*Phaeoconiella chlamydospora* and *Phaeoacremonium* spp.) have been implicated as the cause of measles and grapevine decline. Recently, the two fungi were isolated from infected young vineyards in the US. However, the disease has long plagued grape growers with its cryptic expression of symptoms, for a long time, due to lack of identifiable causal organism(s). Spots can develop anytime between fruit set and a few days prior to harvest. Leaf symptoms are characterized by a 'tiger stripe' patterns (see lesions on the right surrounded by areas with chlorosis) during severe infection. However, mild infections can be confused with other diseases or nutritional deficiencies.



Varieties affected: Fry, Carlos.

Leaf Blight

Leaf blight (formerly known as Isariopsis leaf spot), is caused by the fungus *Pseudocercospora vitis*. The disease is characterized by large, irregular shaped spots, which are initially dull red to brown in color but turn black and brittle with age. However, it is a minor disease and most common late in the season on poorly sprayed grapes.



Variety affected: Cynthiana

Zonate Leaf Spot

Zonate leaf spot, caused by the fungus *Cristulariella moricola*, is characterized by large, circular lesions with a concentric zonate appearance. As the leaf spots become old, the central portion may disintegrate and fall out. Although it is a minor disease of grapevines, infections can occur throughout the growing season. The fungus is known to attack leaves of many such as wild grapes, maples, other Florida ornamentals etc. which spread inoculum to the vineyard.



Variety affected: Cynthiana

Pierce's Disease

It is caused by a gram-negative bacterium, *Xylella fastidiosa*, which is spread by xylem feeding leafhoppers known as sharpshooters. Pierce's Disease (PD) is a deadly disease of grapevines and it is the greatest threat to long-term survivability of susceptible grape cultivars. The bacterium multiplies and clogs the xylem, a tissue which conducts the water around the plant. Pierce's disease infection is dependent upon the presence of a susceptible host, the bacterium (*X. fastidiosa*), and an insect vector to inoculate the susceptible host. Symptoms include chlorosis and scorching of leaves, and entire vines usually die after 1-5 years. Numerous symptoms expressed by susceptible cultivars after infection. The first symptom is usually uneven marginal leaf necrosis that often appears near the point of infection. Since the disease inhibits water movement in the vine, symptoms often appear during heat stress or near veràison (color change) in the cluster. Another diagnostic symptom of PD is the abscission of leaf blades from shoots with retention of leaf petioles, leaving behind irregular patches of lesions on the cane.



Variety affected: Stover

Integrated disease management strategies

1. **Sanitation.** Keep the surrounding areas free of weeds and tall grass. This practice will promote lower relative humidity and rapid drying of vines and thereby limit fungal infection.
2. **Pruning.** Prune and remove black mummified fruits and canes in early winter during dormancy.
3. **Fungicides.** Pesticides registered to protect the developing new growth include copper-based fungicides, captan, myclobutanil (Rally), ferbam, mancozeb, maneb, and azoxystrobin (Abound). Important spraying times are as new shoots are 2 to 4 inches long, and again when they are 10 to 15 inches long, just before bloom, just after bloom, and when the fruit has set. Fall spray should include manzate and captan and copper-based fungicide (recommended for the dormant period).

Presently, there are no effective management strategies for Black measles. Remove infected fruit prior to harvest and cultivate the vineyard to bury diseased tissues. In addition, protect pruning wounds from fungal infections to minimize suspect fungi from colonizing fresh wounds.

Enjoy the fruit of your labor and rewind before you get ready for pruning season!