Important grape diseases

- Downy Mildew
- Powdery Mildew
- Pierce’s Disease
- Grey Mold

Downy Mildew (*Plasmopara viticola*)

Survival: As oospores in fallen, dead leaves

IPM practices:

- **Cultural:** Eliminate humidity and moisture around impacted plants.
- Selective pruning to improve air circulation is helpful.
- Use drip irrigation
- Enclosed environments (houses or greenhouses) aid in reducing humidity and thus reducing the chance of this mildew from harming the grapevines.
- **Chemical:** Chemical applications, such as copper fungicides, dithiocarbamates, mancozeb, give effective control.

Powdery Mildew (*Uncinula necator*)

Survival: Infected plant tissues

IPM practices:

- **Cultural:** Canopy management and row orientation are important factors
- Conditions that increase direct sunlight and air movement within the canopy are not favorable
- **Resistant cultivars:** Use proper genetic materials
- **Chemical:** Sulfur fungicides are used as well as silicon, which assists plant cells in fighting against the fungus and strengthening the epidermal cells of the plants.
- Tebuconazole also provide good control

Pierce's Disease (*Xylella fastidiosa*)

Survival: Xylem-inhabiting, vector-transmitted

IPM practices:

- There is no cure for Pierce's Disease.
- However, current research involves using bacteriophages (viruses that kill bacteria) to stop and prevent the spread of Pierce's Disease on wine grapes. More research is being conducted to learn precisely which bacteriophages can kill the toxic bacteria. A phage cocktail, consisting of four different phages, is used on plants that have already been infected and on plants that have not been infected. The result has been the same so far, that infection is prevented and the existing disease is controlled and not allowed to grow and spread.

Grey Mold (*Botryotinia fuckelina*)

Survival: Infected trees and soil as sclerotia

IPM practices:

- **Cultural:** Prune or stake plants to improve air circulation between plants.
- Keep the soil under plants clean and rake up any fallen debris.
- Add a good amount of organic compost or mulch under plants. Mulches will prevent the fungal spores from splashing back up onto flowers and leaves.
- Water in the early morning hours
- **Biological:** Apply bio-fungicide based on *Bacillus subtilis*
- **Chemical:** Copper fungicides are effective.