Viruses in the Vineyard

Propagation and Vector Problems

That can become Yield and Quality Problems

LWC IPM Meeting Series
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Sources of Virus Problems

Propagation
• Grafting
• Budding
• Other

Virus Vectors
• Dagger nematodes
• Mealy bugs
• Other?
Changes and Complications

- Varieties vary in virus tolerance
- Rootstocks also vary; more choices
  - Own roots to St George
  - Dogridge and Salt Creek (Ramsey)
  - Freedom and 039-16
  - 1103 P, SO4, Teleki 5C, Kober 5BB, 110R (101-14Mgt, 3309C)
  - GRN and others?
- Irrigation management
- Nutrient management
- More propagation (shorter economic life and increased demand)
- Invasive species (some vectors)
- Age of production area (more disease)
<table>
<thead>
<tr>
<th></th>
<th>Description</th>
<th>Species</th>
<th>Origin</th>
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<tbody>
<tr>
<td>Scion</td>
<td>“fruiting” variety</td>
<td>V. vinifera</td>
<td>European</td>
</tr>
<tr>
<td>Rootstock</td>
<td>resistant hybrid (pure)</td>
<td>Vitis hybrid (pure)</td>
<td>American</td>
</tr>
<tr>
<td>Own Root</td>
<td>“domestic” (tame) root</td>
<td>V. vinifera</td>
<td></td>
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Precautions to Minimize Problems

- Certified wood
- Know history of source
- Observe the field source
- Obtain wood yourself or verify
- Minimize combination variance
- Preliminary propagation test if possible
- Use skilled labor
Field Selections

Health Status
Source
Site History
Rootstock
Track Record
Use virus tested material or

Know history of mother vines

Use same scion/rootstock combination or run test
Vine Propagation

- Cutting
- Rooting
- Field Budding
- Disbud
- Benchgraft
- Nursery Field
  - Dormant (1 yr)
  - Field Planted (8 wks+)
    - Green Potted
      - Dormant Nursery
        - Dormant Potted (1 yr)

Vine Trained Year 2
Vine Planted Year 2
Field (Fall) Budding

A small section of bark with one bud from a desired variety is inserted on to a rootstock.
Chip bud

Chip budding
Fall or Late winter/Early spring
Benchgrafts

- Dormant
- Potted
  - green growing
  - dormant
Late Fall
Winter
Grafting

Mature vines are "top worked" by inserting scion wood (short 2-bud section of dormant cane from desired variety) on a fully established vine.
Cleft graft

Side-whip graft graft
Budding

A small section of bark with one bud from a desired variety is inserted on a rootstock.

Late spring to early summer
“T” budding shields

1 ¼ to 1 ½ inches
(3 to 4 cm)

Late Spring budding
Backup for grafting misses
So what could go wrong?
GLRaV

(on white variety)

GVB (‘corky bark’)
Fieldbudded Zinfandel/Freedom

Virus Infected

Healthy
GFLV
Bottom line

Yields Lower
Maturity problems
Fruit Quality less
Longevity decreased
Competitiveness reduced
Other Problems with Similar Symptoms

?
Young Vine Decline (Esca)

Spring vs Fall
Esca, Measles, Vine Decline
Nutrient Deficiency

- **Phosphorus**
  - Black leaf/Silver leaf/’Chocolate’ leaf

- **Potassium**
  - Potassium Related

Black leaf/Silver leaf/’Chocolate’ leaf
Manganese

Alfalfa hopper (single leaves or shoots)

Spider Mites

Voles or Meadow mice (scattered vines)

More
Salinity
fertilizer / water quality / drought

Pierce’s Disease
paraquat phytotoxicity
Extreme vigor on new vines

And More
Summary

• Use Certified Wood
  – Or Use Same Scion/Rootstock Combination
• Know History of Source
• Observe the Field of Source Wood
• Obtain the Wood Yourself
• Confirm Budder’s Track Record
• Provide Post Propagation Care
• Don’t Assume What You Don’t Know
• Get reliable diagnosis of problem (IPM)
• Keep good records for future
“You been farming long?”