Grape Pruning and Bud Fruitfulness

Beginner Grape School

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Dean Volenberg

Viticulture and Winery Operations Extension Specialist

volenbergd@missouri.edu

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Fruitfulness

- % buds that produce flower clusters
- Fruitfulness determined in buds during the prior year
- Inflorescences may or may not initiate in each bud
- Fruit buds can through processes other than cold damage become unfruitful

Photo credits:
http://www.growingproduce.com/americanfruitgrower/?storyid=1434

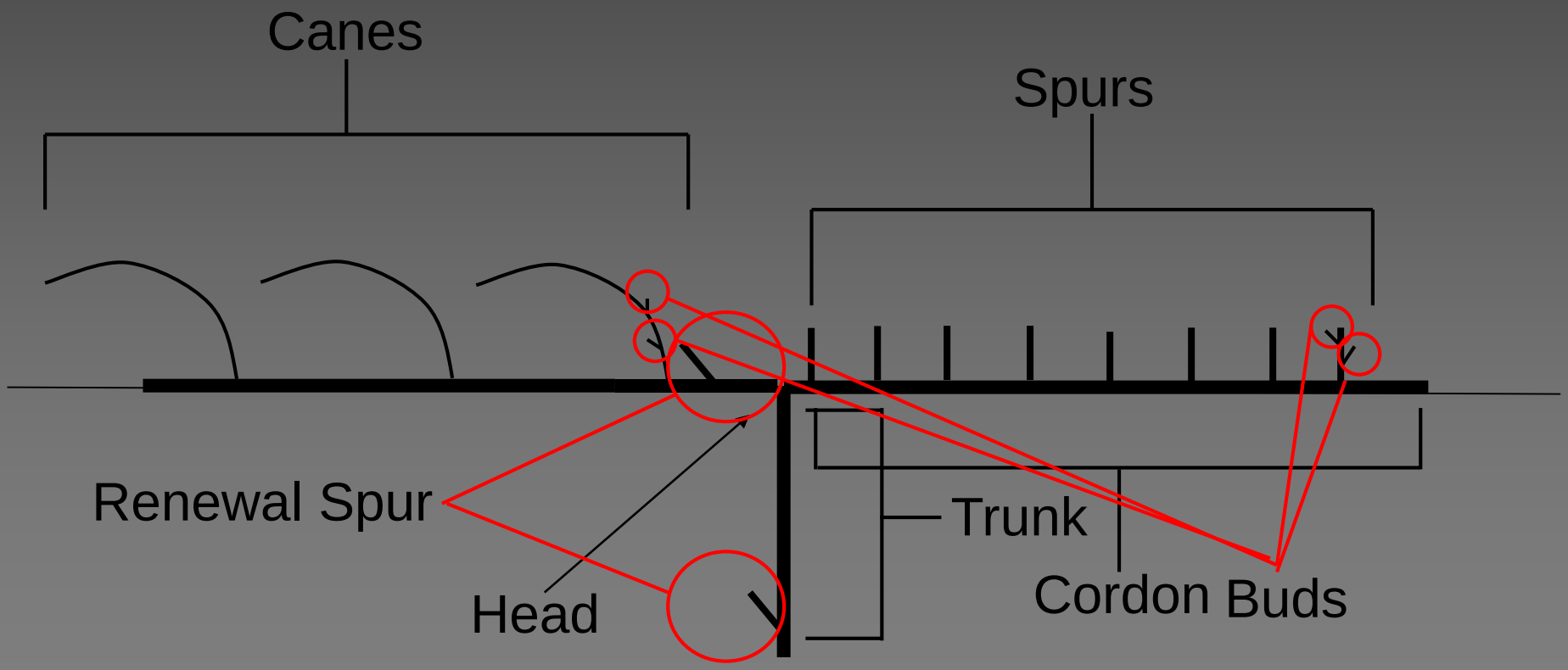
“Bud”

- A “bud” occurs at each node on cane
- The “bud” composed of three “buds”
  - Primary
  - Secondary
  - Tertiary
- What is within the “bud”

“Bud”

- In each bud is a 6 to 12-node compressed shoot with primordial
  - Leaves
  - Flower clusters
  - Tendrils.

Grape Anatomy

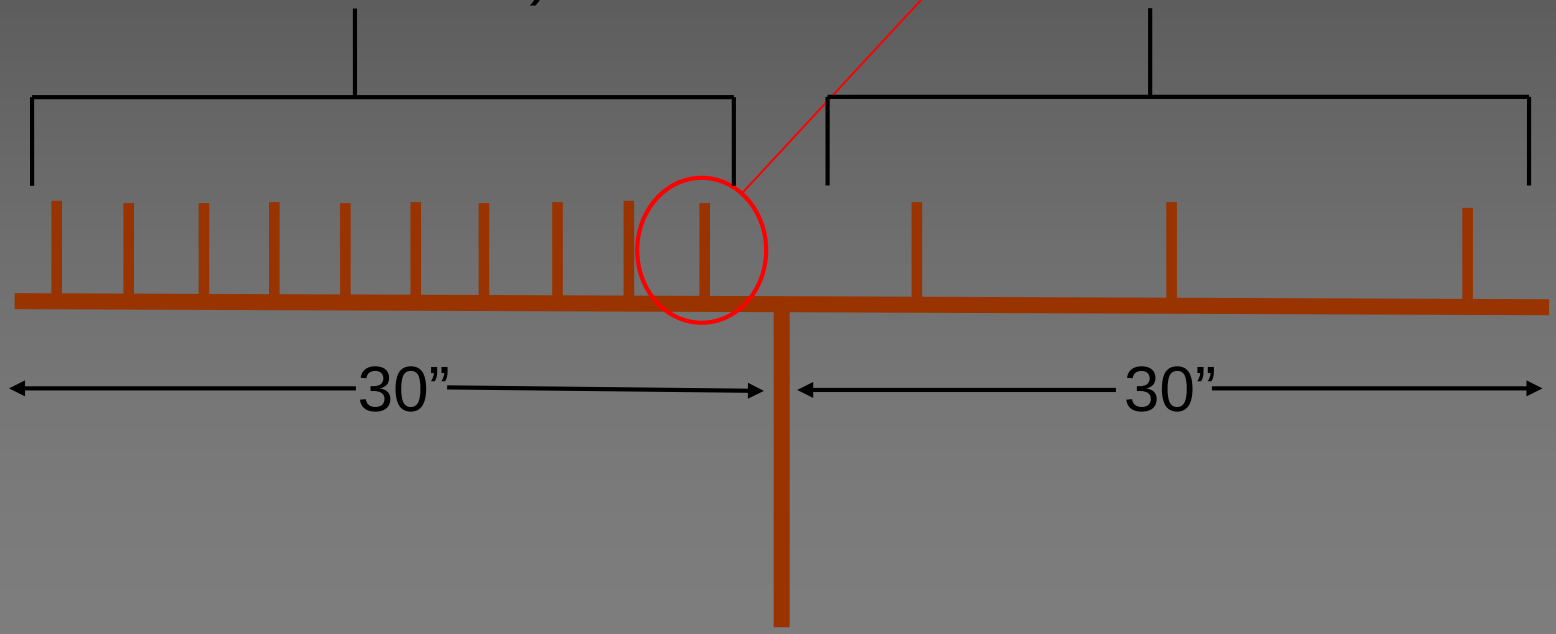


How many Nodes?

VSP: 3 to 5 SHOOTS/FT

(10 SPURS X 2 BUDS)/2.5 FT = 8 BUDS/FT

(8 SPURS X 2 bud spurs)/2.5 FT = 6.4 BUDS/FT



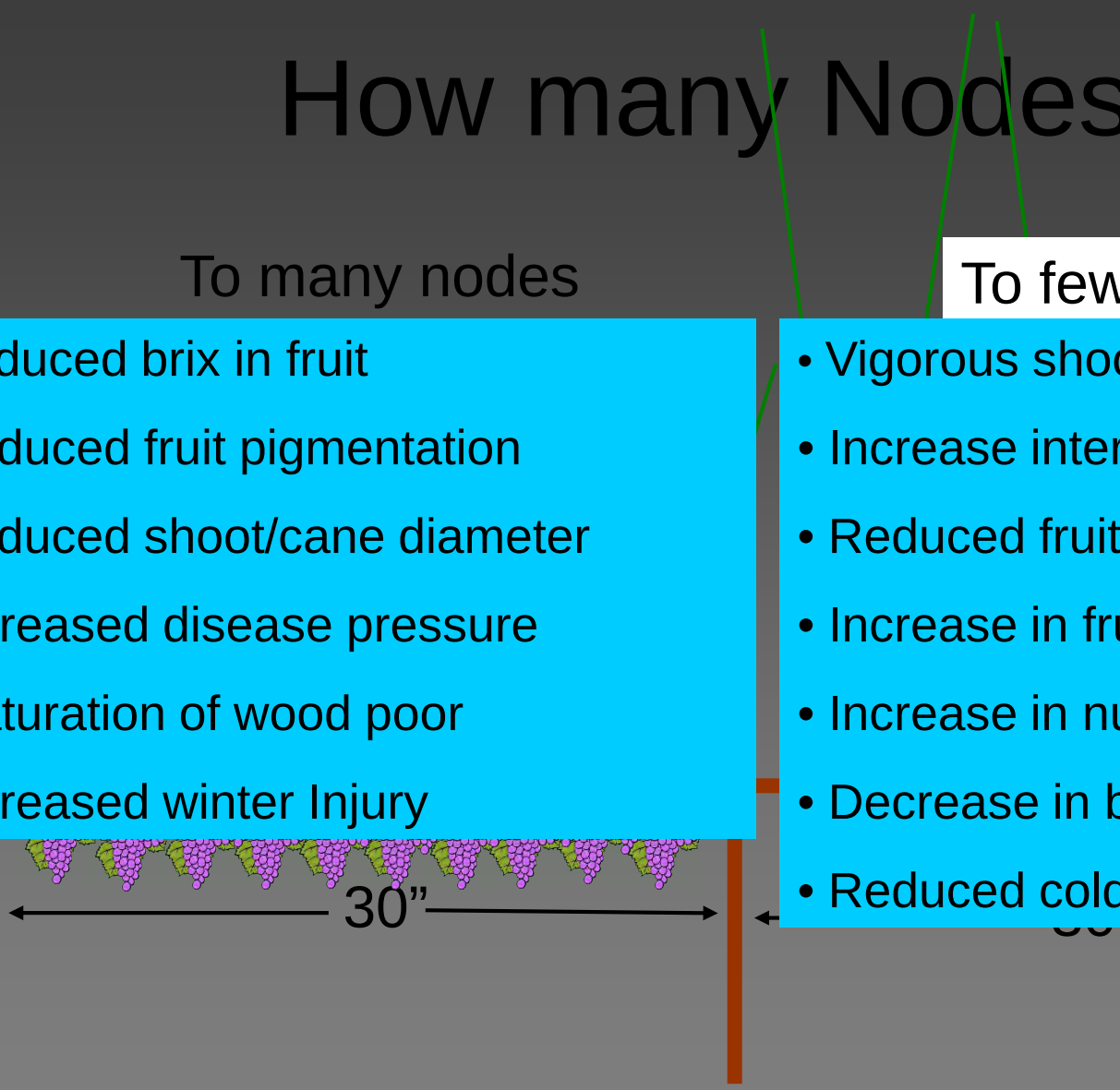
How many Nodes?

To many nodes

- Reduced brix in fruit
- Reduced fruit pigmentation
- Reduced shoot/cane diameter
- Increased disease pressure
- Maturation of wood poor
- Increased winter Injury

To few nodes

- Vigorous shoot growth
- Increase internode lengths
- Reduced fruit set
- Increase in fruit shading
- Increase in number of “bull canes”
- Decrease in bud fruitfullness
- Reduced cold hardiness



How much fruit ?

3 to 5 shoots ft

- 4 ft cordon
  - 12 to 20 shoots
  - Each shoot = 2 grape clusters
  - 24 to 40 clusters
  - Each cluster 3.5 oz
  - 6.75 to 11 lbs per cordon
  - 2 cordons per plant
  - 13.5 to 22 lbs per plant
- 575 plants per acre
  - 2.9 to 4.8 tons per acre

Economics of the Vine

- 545 vines/acre

  10’row x 8’ plant
- 15 lbs/vine

  8,175 lbs = 4.1 ton/acre
- ~3.5 oz/cluster

  70 clusters/vine

  3.6 lbs/bottle

  4 bottles (750 ml)/vine

  2,180 bottles/acre
- $1,400/ton = $5,740/acre
- $14.00/bottle = $30,520/acre

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Training Systems

- Vertical shoot positioning (VSP)
  - Bilateral cordons 32 to 36” from ground
  - Catch wires above cordons
  - Shoot growth directed upward

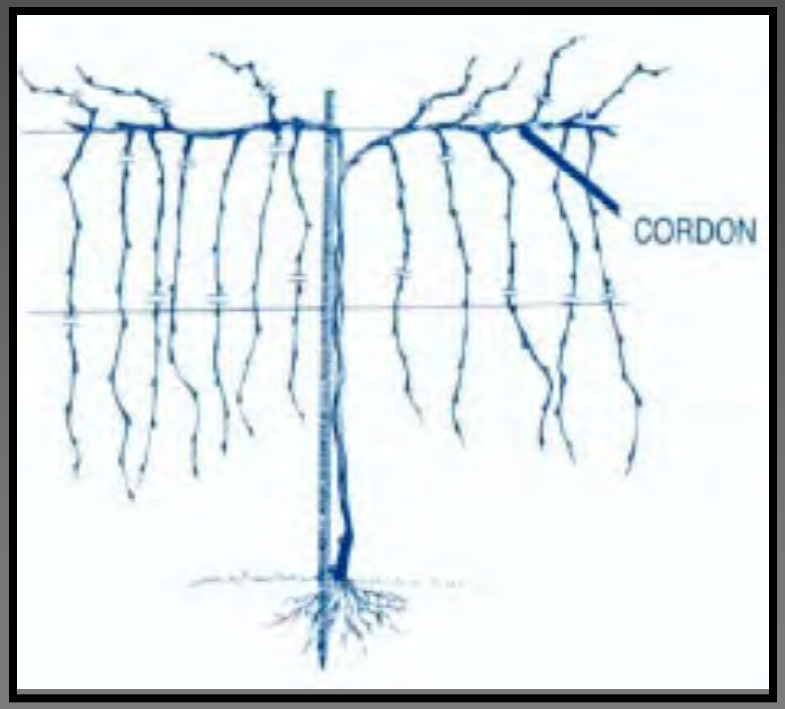
- High Wire
  - Bilateral cordons 66 to 72” from ground
  - Shoots combined downward

Training Methods

Low-Cordon Vertical Shoot Positioning

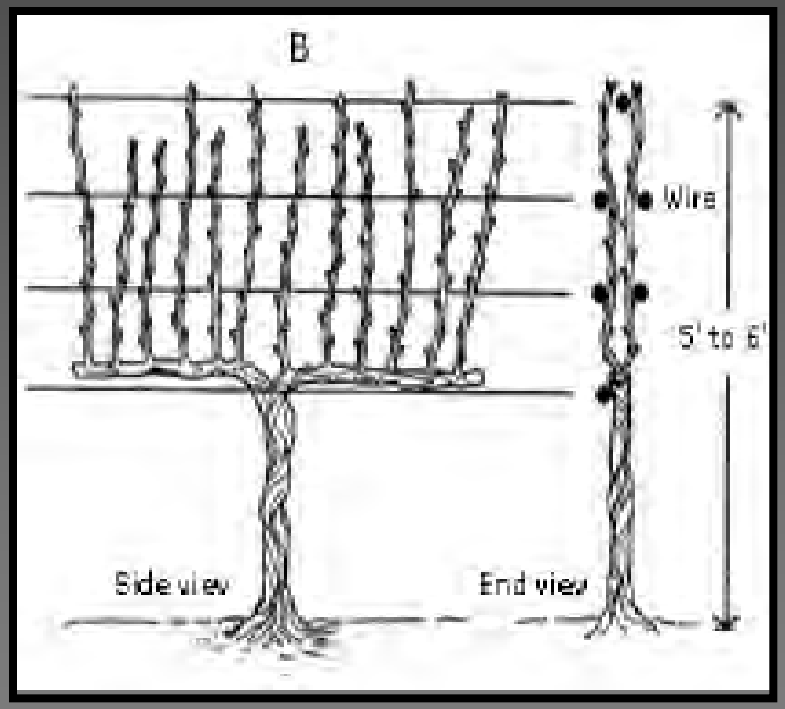
Training Methods

High Cordon



Use for trailing grape cultivars

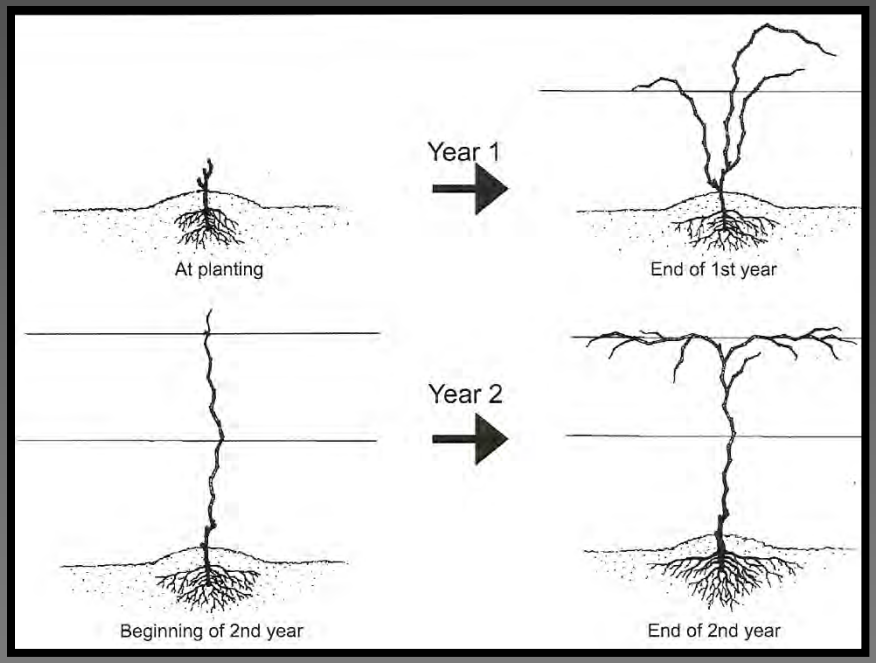
Low Cordon

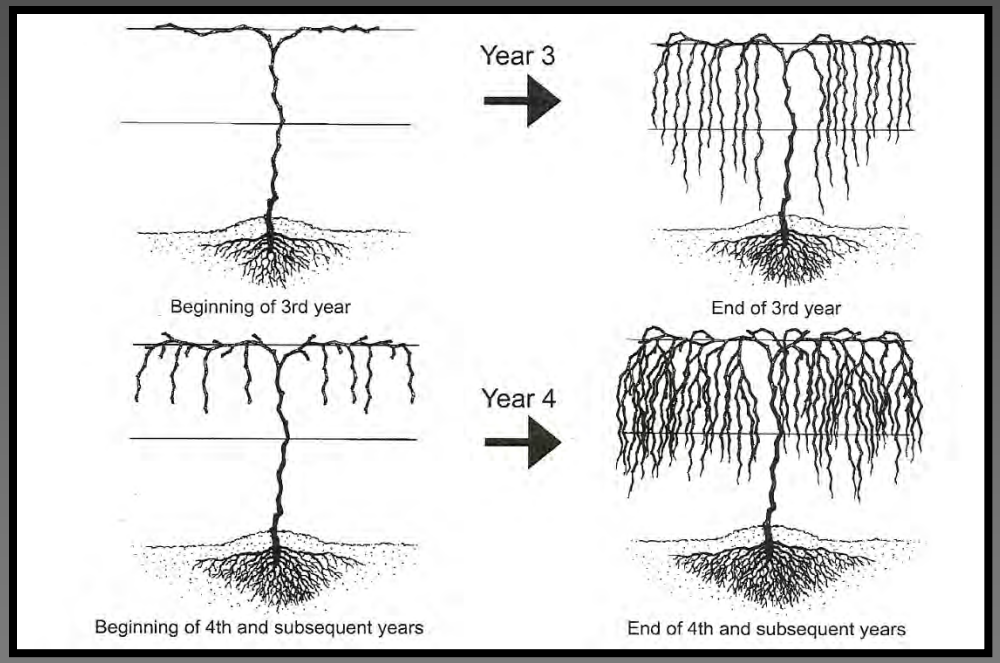


Use for upright grape cultivars

Pruning and Training

Initial Pruning from planting to fruiting





High Bi-Lateral Cordon
Relies on downward combing of new growth

Balanced Pruning

Vegetative growth is in proportion to fruit load to ripen the crop

- Dormant pruning is first step in in balancing the vine
- Amount of pruning is based on vine vigor

Balanced Pruning

Step 1: Quantifying Vine Vigor

- Weight of one-year cane pruning's
  - Roughly prune vine leaving extra buds
  - Weigh cane pruning's
  - Apply pruning formula

Balanced Pruning

Pruning Formulas

Grape Type	Formula
American	30+10
French Hybrids	20+10, 15 +5
New Hybrids	20+20
European (Vinifera)	20+20

Example Balanced Pruning

Pruning Formula: 20 +10

20 count buds for first pound of canes and an additional 10 count buds for each additional pound of canes

Cane weight = 1 lb: 20 count buds

Cane weight = 2 lb: 30 count buds

Cane weight = 3 lb: 40 count buds

Problems with Balanced Pruning

Hybrid Grape Cultivars Typically

- Multiple shoots from count buds
- Multiple clusters per shoot

Alternative

- 5 to 6 shoots/ft of vine
- Calculate number of clusters needed for yield
- Cluster thin and or shoot thin

Spare parts are good to have around

Balanced Pruning

Bring your experience to the vineyard

Pruning Formulas

- Grape cultivars perform differently based on vineyard site
  - High vigor sites
  - Low vigor sites
- Each vine is an individual

After pruning a few vines using balanced pruning – you become calibrated

Pruning and Disease Management

Remove old dead wood from grapevine

- **Cordon Renewal**
- **Trunk Renewal**
  - **Own rooted versus rootstock**
- **Liquid Lime Sulfur Application Timing**
  - **Bud swell**

Large Pruning Cuts

Large Pruning Cuts

Avoid large pruning cuts until early summer
Large cuts and trunk diseases

- *Botryosphaeria* spp.
- *Eutypa lata*
- *Pestolotiopsis*
- *Phomopsis viticola*

Time of pruning, size of wound and wood age all play role in infection

Wound susceptibility declines at high temperatures

Pruning and Sanitation

First: always have sharp pruning shears. Sharp shears make clean cuts that heal quickly compared to rough cuts

Removing cane prunings from the vineyard if practical

- If going to this effort take the next step and destroy the prunings

No need to sterilize pruning shears

Remove old cluster rachises and mummy berries

Pruning Timing

What to prune first should be prioritized based on a grape cultivars susceptibility to winter cold injury

1. **Prune American cultivars first**
2. **Prune cold tolerant hybrids (Vignoles, Seyval, Norton)**
3. **Prune cold sensitive hybrids (Vidal, Traminette, Chambourcin)**
4. **Prune Vinifera that are less winter cold sensitive, Cabernet Franc**
5. **Prune Vinifera that are more cold sensitive**

Use your experience to decide as vineyard to vineyard variation will play a role

Pruning and You

Remember that you grow with your vines. Each year you learn something about your vineyards growth and production. Apply that knowledge as you prepare to prune your vines

Select sentinel vines in your vineyard

- Quantify dormant cane weights
- Quantify cluster weights and numbers
- Quantify crop load

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Thanks to my colleagues at the Grape and Wine Institute

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Megan Hall – Viticulture Research Leader

Dean Volenberg
University of Missouri Grape and Wine Institute
214 Waters Hall
Columbia, MO 65211

573-882-0476
volenbergd@Missouri.edu