Principles and Practices
of
Pruning Grapevines

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Common Pruning Questions

- What?
- Why?
- When?
- How?
  - what to leave
  - what to remove
  - etc. etc.

What is Pruning?

- "Dormant Pruning" = Annual removal of wood during the dormant season.

- Dormant pruning is most <u>important</u> and most <u>expensive</u> vineyard management practice.

Why Prune?

- To control or regulate crop size - Avoid overcropping.

- To achieve a "balance" between shoot growth and fruit production.

- To maintain vine shape consistent with the chosen training system.

Grape Biology

Each bud should grow a primary shoot (ex blind nodes)

Secondary shoots should grow if primary is damaged
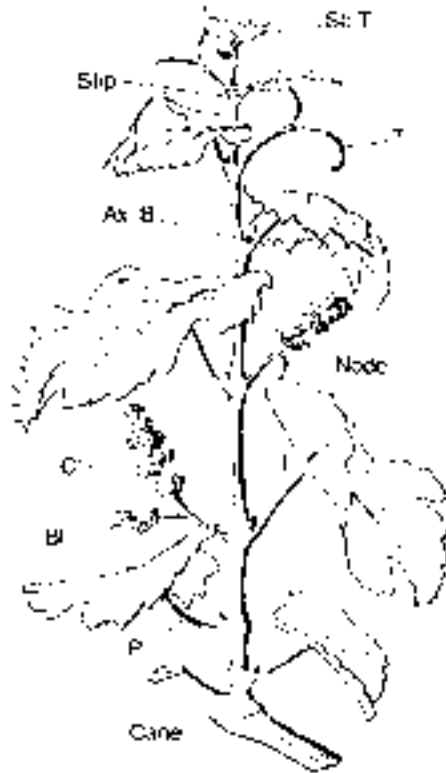
When to Prune?

- ## Dormant period: leaf fall - bud break
  - Fall-pruned vines are more susceptible to winter injury than unpruned vines
  - Delayed pruning allows for compensation in case of winter injury

- ## Best time: Late winter – early spring
  - Prune hardy varieties before tender ones
  - Finish initial pruning and wood removal before bud swell to avoid bud breakage
  - Double pruning helps avoid damage from late frost

Assessing Winter Injury

Live primary bud

Dead primary bud

Adjusting for Winter Injury

- Leave additional buds to make up for loses of 20% or more

- If 50% or more buds are damaged then only minimally prune until full extent of damage can be determined.

Double Pruning to Avoid Frost

Apical Dominance

Buds at distal ends of long canes tend to develop before those at base, delaying development by up to two weeks in some years.

SWPAC 2002

How to Prune?

- Manual
  - hand pruners, loppers
- Semi-mechanized
  - Pneumatic or electric pruners
- Mechanized
  - Various tractor mounted pruning devices

What to Retain?

- Select canes exposed to sun, located on outside of vine canopy
- Select canes with good wood maturation
  - Dark brown* periderm (*appropriate for variety)
  - Short to medium internodes (4" to 6")
  - Cane diameter of 1/4" to 1/2"
- Select canes with less persistent laterals

Good Quality Canes

Balanced Pruning

- Number of buds retained depends on "vine size"

- Vine size = weight of 1-year-old cane prunings

- Use of "Pruning Formula" for specific variety

Balanced Pruning Formulas

Grape Variety	Pruning Formula	Cluster Thinning
American	30 + 10	No
French Hybrids	20 + 10, 15 + 5	Yes/No/Maybe
New Hybrids	20 + 20?	Yes/No/Maybe
Vinifera	20 + 20	Yes/No/Maybe

Example of Balanced Pruning

- Pruning Formula: 30 + 10
  - Leave 30 nodes ("count buds") for first pound of canes removed plus an additional 10 for each additional pound

- Pruning wt = 1 lb – leave 30 nodes
- Pruning wt = 2 lb – leave 40 nodes
- Pruning wt = 2.5 lb – leave 45 nodes
- Pruning wt = 3 lb – leave 50 nodes

Sound Simple?

- Unfortunately, it is more complicated
- Works best on American-type varieties
- Hybrids tend to be more fruitful
  - More clusters per shoot
  - More shoots per "count" node
- Hybrids require more management to maintain "vine balance"

One shoot per node

Non-count shoots

Non-count shoots

Problem with balanced pruning formulas:

- On small vines they tend to suggest a very low number of shoots, which would produce far below the optimum leaf area for the vine. (e.g. 5+10 for Seyval)
- They don't take into account non-count buds

Another approach to balancing vines

- Instead of applying a formula to determine number of buds, why not leave enough shoots to fill the trellis space then use a formula to adjust the number of clusters to meet a targeted "crop load" value?
- That will help maximize "vine capacity" (leaf area) without causing vine imbalance.

Using Target Crop Load Approach

1. Prune and thin to 40-50 shoots per vine (at 8 ft vine spacing)
2. Use long-term average cluster weight data to calculate number of clusters needed for yield that will give a desired "crop load ratio" based on "vine size" data.
3. Thin clusters to appropriate number

Required data:
-   Vine size (pruning weight)
-   Vine yield (crop weight)
-   Cluster weight (number of clusters per vine)

Variety Performance over 12 years
Southwest Purdue Ag Center

Variety	Yield (lb)	Vine Size (lb)	Crop load ratio	Cluster wt (lb)	Clusters per vine	Clusters for crop load ratio =10
Chambourcin	19	1.1	17	0.41	47	24
Chardonel	17	1.0	17	0.39	44	26
Seyval	22	1.0	22	0.45	49	22
Norton	17	3.2	5	0.19	90	168
Foch	24	2.2	11	0.21	115	105
Frontenac	12	1.2	10	0.29	41	41

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Variety performance over 6 yrs at Lafayette

Variety	Yield (lb)	Vine Size (lb)	Crop load ratio	Cluster wt (lb)	Clusters per vine	Clusters for crop load ratio =10
Cayuga White	24	1.0	24	.32	75	31
Corot Noir	18	1.2	16	.31	58	39
Frontenac	12	0.9	13	.17	71	53
LaCrescent	12	1.3	9	.18	67	72
Noiret	15	2.5	5	.31	48	80
Traminette	14	2.2	6	.22	64	100

Summary

- Pruning and crop load adjustment are the most important management practices for achieving vine balance and good fruit quality.
- Goals
  - Balance fruit production with vegetative growth
    - Produce maximum yields of highest quality fruit possible
  - Maintain consistent vine balance
  - Reduce fruit and vine variability
- Growers need to collect data on yield, pruning weight, cluster weight, shoots per vine, etc.