



CANE PRUNING

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OVERVIEW

- What is cane pruning?
- Why cane prune?
- Cane versus spur pruning
- How to cane prune

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THE GOALS OF PRUNING

- To maintain vines in a form that facilitates vineyard operations
- To promote uniform shoot & fruit growth & development, including ripening
- To minimize the need for shoot thinning, leaf removal, & cluster thinning

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WHAT IS CANE PRUNING?

CANES

- Last years stems, after they become woody (lignify) also become canes
 - When all is well in a vineyard, canes ripen along with or ahead



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CANES

- Commonly, canes are pruned short, 1 or 2 buds long, to make spurs
- Spur pruning works with head & cordon training



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TRAINING SYSTEMS FOR SPUR PRUNING



CANES

- Canes may be pruned less severely into longer fruit bearing units, 8 to 15 nodes long
- The bearing units are also called “canes”
- Canes may also work in combination with spurs on cordon trained vines (kicker canes)
- But typically, cane pruning is used with head training
 - It is not a cane only system because spurs are required for cane renewal for the next season

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TRAINING SYSTEMS WITH CANE PRUNING



Cordon Training with
Spurs & Canes

TRAINING SYSTEMS FOR CANE PRUNING



TRAINING SYSTEMS FOR CANE PRUNING



WHY CANE PRUNE?

WHY CANE PRUNE?

- #1 reason to cane prune: poor basal bud fruitfulness
- Low basal bud fruitfulness is an inherent characteristic of some varieties
 - Thompson seedless, Teroldego
- Low basal bud fruitfulness is prevalent in cool climate vineyards across varieties

FOR OPTIMAL CANE PRUNING

- Design vineyards for cane pruning
- Include appropriately positioned & spaced cane support wires
 - Facilitating cane exposure to sunlight
 - Elevating canes above renewal spurs
- Include foliage support wires to limit cane rolling

WHY CANE PRUNE?

- #2 reason to cane prune: to devigorate grapevine growth
 - Varieties commonly tamed through cane pruning: Sauvignon blanc, Chenin blanc
- In these cases, cane pruning is often enacted after a vineyard is established
 - The result of an ill-suited vineyard design
 - May involve kicker canes or a spur-cordon to cane-head conversion

CANE-HEAD VERSUS SPUR-CORDON

CANE-HEAD VERSUS SPUR-CORDON - PHYSIOLOGICAL

Cane-Head

- Less permanent wood
- Less growth capacity
- Less shoot growth vigor
- Less root growth vigor
- Budbreak less uniform
- Shoots less uniform

Spur-Cordon

- More permanent wood
- More growth capacity
- More shoot growth vigor
- More root growth vigor
- Budbreak more uniform
- Shoots more uniform

BLIND BUDS

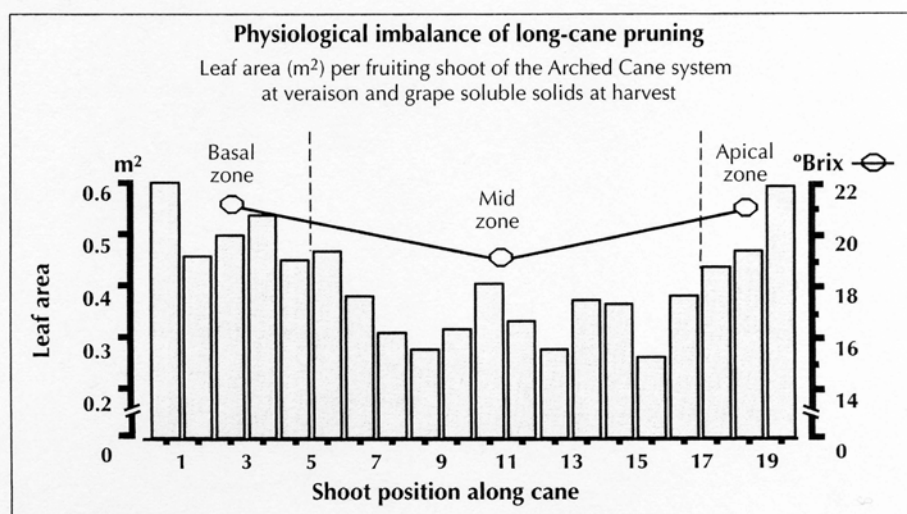


Table II: In arched cane system, shoot growth along the cane is irregular and cluster ripening growth is not uniform. Vertical bars represent the leaf area of shoots arising from buds along the arched cane.

Source: Intrieri & Poni, PWV, 2005

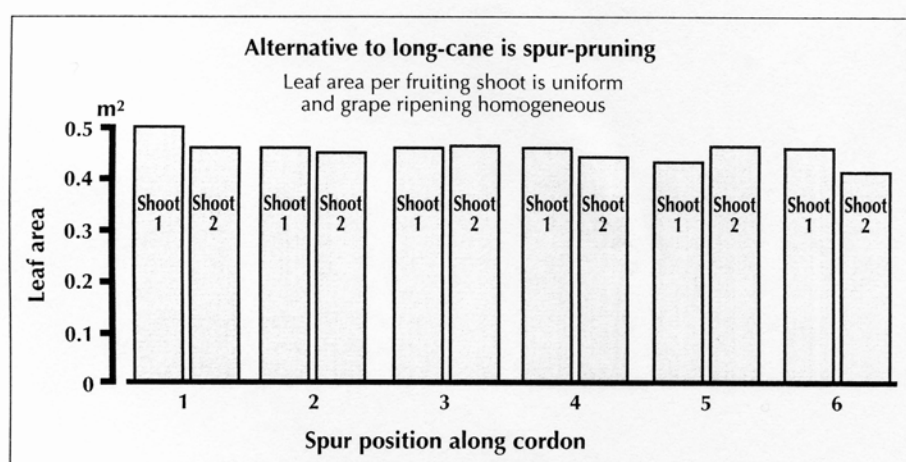


Table III: Spur number 1, 2, 3, 4, 5, and 6 along the cordon, since in the experiment, the cordon-trained vines were pruned to six two-bud spurs on each cordon. Vertical bars for shoot #1 and shoot #2 represent the leaf area of shoot 1 and shoot 2 arising from count node 1 and count node 2 on each two-bud spur after pruning.

Source: Intrieri & Poni, PWV, 2005

CANE-HEAD VERSUS SPUR-CORDON - OPERATIONAL

Cane-Head

- Pruning is more complex
- Few large pruning cuts
- More risk per bearing unit
- Less non-count shoots
- Shoots sometimes roll
- Some renewal shoot shade
- Most fruit on canes, but some on renewal spurs
- Vine form harder to sustain

Spur-Cordon

- Pruning is less complex
- Some large pruning cuts
- Less risk per bearing unit
- More non-count shoots
- Shoots seldom roll
- Not applicable
- All fruit on spurs
- Vine form easier to sustain

CANE WINTERKILL



CANE ROLLING



MAINTAINING VINE FORM



MAINTAINING VINE FORM



CANE-HEAD VINE MANAGEMENT SOLUTIONS

Cane-Head Challenges

- Pruning more complex
- More risk per unit
- Budbreak less uniform
- Less growth vigor
- Canopy rolling
- Vine form hard to sustain

Cane-Head Solutions

- Acquire skilled labor
- Promote cane ripening
- Support roots, arch canes
- Increase fertilization
- Foliage positioning wires
- Acquire skilled labor

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ARCHED CANES



ARCHED CANES ON CANE + SPUR VINE



CANE-HEAD VERSUS SPUR-CORDON – FRUIT YIELD

- In cool climates, cane-head (double Guyot) out yields spur-cordon due to bud fruitfulness
- In California, the reverse appears to be true for most wine grape varieties
 - Cab. Sauv. (Oakville) cane-head clusters & berries were smaller than spur-cordon
 - No difference in wine scores between systems
 - Until the 1970's, cane-head was the common system for California Cab. Sauv., Sauv. blanc, & Pinot noir

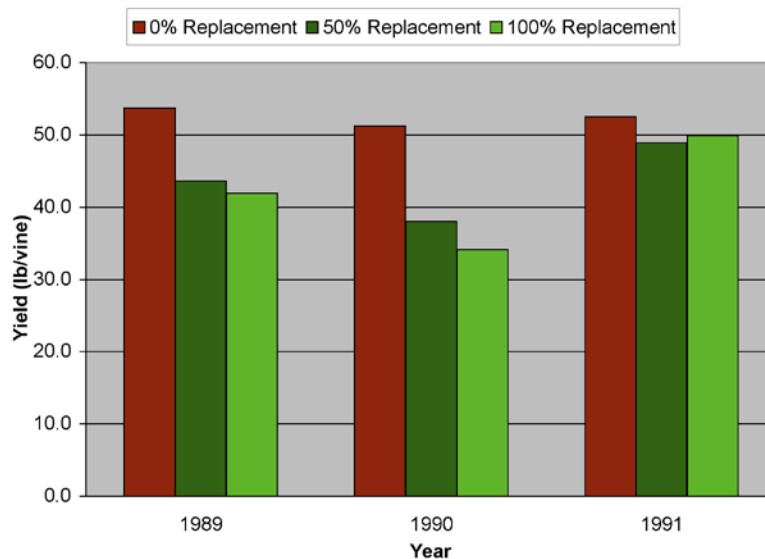
CANE-HEAD VERSUS SPUR-CORDON – FRUIT YIELD

- Higher yield in warm climates may be related to bearing unit nutrient storage capacity
- Recent measurements in a mature vineyard
 - Cane diameter \approx 10 mm at base & 5 mm at apex
 - Cordon diameter \geq 70 mm over entire length (\geq 5.5x the median cane diameter)
 - Potential storage capacity of cordons > 90% that of canes

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Sauvignon blanc Yields for Replaced Cordons



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Source: Norton, MVK; Grant, RS. Unpublished

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CANE PRUNING: HOW TO DO IT

HOW TO CANE PRUNE

- Cut & remove last years cane from the cane support wire of the trellis

CANE PRUNING



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HOW TO CANE PRUNE

- Carefully select a new cane
 - For position relative to cane support wires
 - For maturity, diameter, form, & viability
- Desirable cane characteristics
 - Well ripened (completely woody) & hardened
 - Internode diameter $\approx \frac{1}{4}$ to $\frac{1}{2}$ inch
 - Rounded internodes (not flattened)
 - Internodes ≈ 3 to 4 inches long (\approx hand width)
- Such canes are fruitful & well nourished with nutrient reserves

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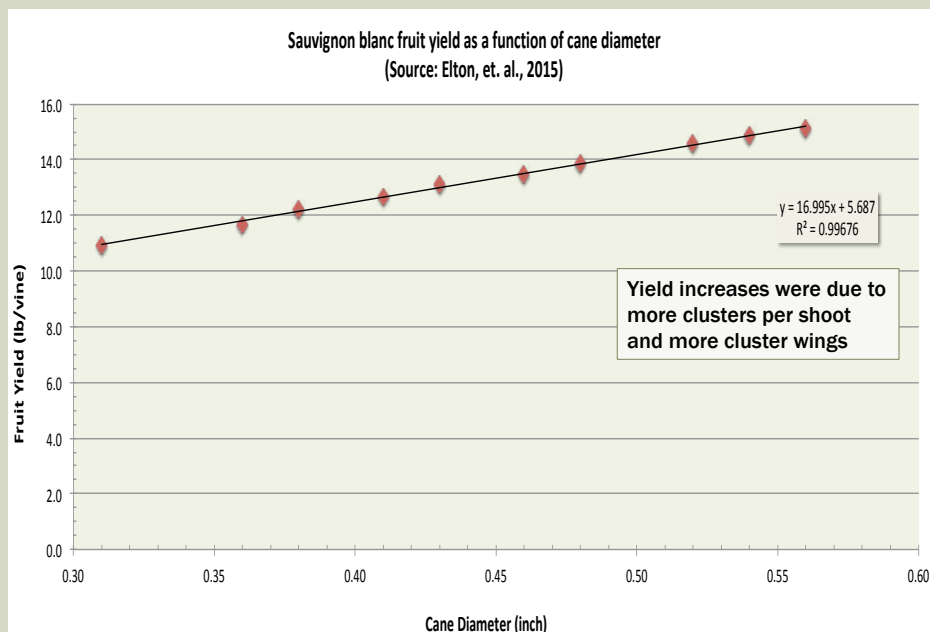
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HOW TO CANE PRUNE

- Avoid canes (“shade canes”) that developed within the shade of the vine canopy
 - Instead, favor canes that developed mainly in the sun (“sun canes”)
 - Sun canes are better formed & more fruitful
- The apparent quality of canes is more important than their position of origin (on young spur wood vs. old vine trunk or head wood)

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HOW TO CANE PRUNE

- Carefully cut canes
 - To the length of exposed cane wire, leaving a partial internode beyond the last bud for securely tying to the wire
 - Canes may be wrapped & tied anytime before bud swell

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HOW TO CANE PRUNE

- Carefully select renewal spurs
 - For position below & in close proximity to cane support wires

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CANE PRUNING: CONCLUSIONS

CONCLUSIONS

- Cane pruning with head training is viable option for:
 - Varieties with low basal bud fruitfulness & for cool climate vineyards
 - Devigorating overly vigorous vineyards
- Successful cane pruning has trellising, labor, & other requirements that differ from spur-cordon systems

THANK YOU



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