

# Grape Growing and Pruning

Cowlitz County Master  
Gardener Program  
Workshop



# Why grow grapes in Western Washington?



- Coastal maritime climate.
- Mild, wet winters.
- Wet springs.
- Dry summers.
- Wet falls.
- Micro-climates.



# Topics:



- Site selection.
- Site preparation.
- Choosing plants.
- Types.
- Characteristics.
- Varieties.
- Structure.
- Trellising.
- Planting.
- Fertilization.
- Irrigation.





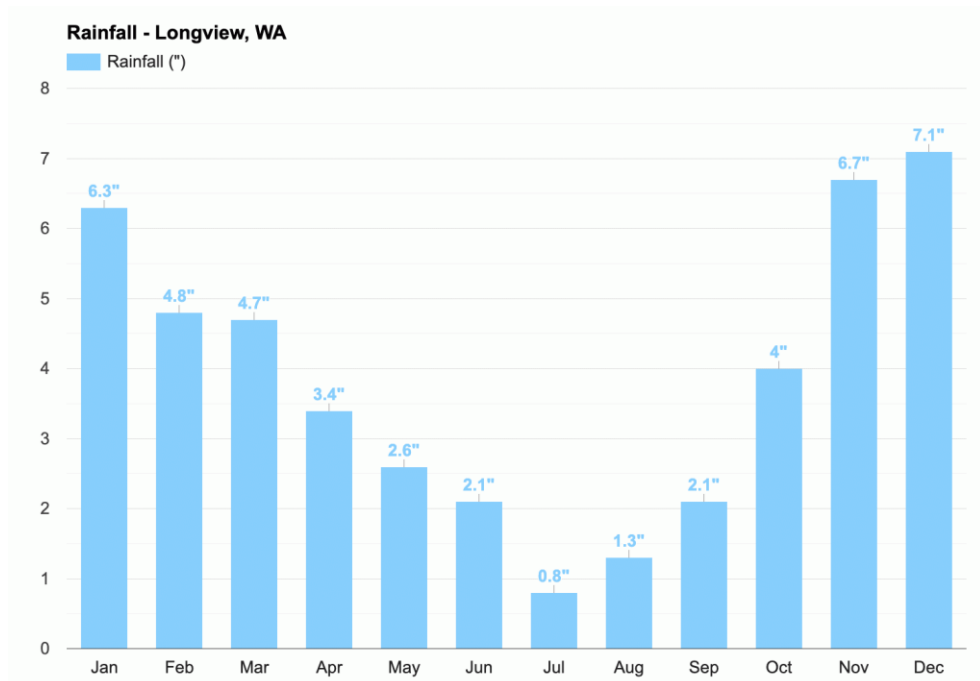
# Topics:

- Training Methods.
- Pruning (Dormant).
  - Bud Wiping.
- Tasks (Spring/Summer).
  - Shoot Thinning
  - Fruit Thinning.
  - Hedging.
  - Leaf Pulling.
- Harvest.
- Disease.
- Pests.



# Site Selection:

- Water availability (July - September).
- Early frost:
  - 18 April last frost day.
  - 2 November first frost day.
  - 197 frost free days (Grapes require 150 frost free days).



# Site Selection:

- Location:
  - South facing slope if on a hill.
  - Good air circulation and full sun.
- Soil characteristics:
  - Good drainage.
  - Sandy/gravelly soil.





# Site Selection:

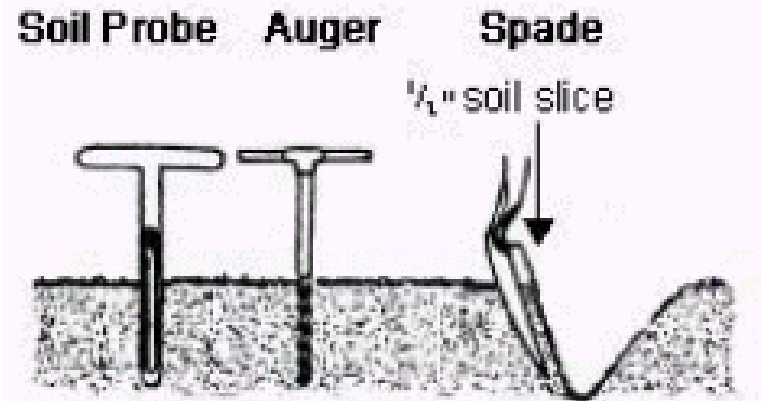


- Orientation: PLAN!!!!
  - Room to grow.
  - Type of grape you want to grow (table, juicing, or wine).
  - Planting and trellising methods.
  - Rows have a north and south orientation.



# Site Preparation:

- Soil testing:
  - Ideal soil pH 6.5 - 6.8.
  - Grapes are light nitrogen feeders.
- Cultivate area 1 year prior to planting.
- Remove competing vegetation.
  - Biggest concern is the 1<sup>st</sup> year.





# Soil Testing:



- Soil testing should be done every 2 - 3 years.
- The best way to determine where your soil nutrient and pH levels are at is to obtain a soil sample prior to planting and send it to a laboratory for testing.

[simplysoiltesting.com](http://simplysoiltesting.com)

- The important thing to remember is to be able to understand the results of the analysis.
- There are test kits that can be purchased such as Rapitest but, it will just give you an approximation where your soil primary nutrient and pH levels are at.

# Soil Testing:



## Soil Tests and Prices through Simply Soil Testing: Jan 2021

- Basic Soil Test - \$16 per sample
  - Includes pH, lime requirement, potassium, phosphorus, calcium, magnesium, soluble salts and fertilizer recommendations.
- Basic Test + Organic Matter - \$20
- Basic Test + Fe, Mn, Zn & Cu - \$20 (iron, manganese, zinc and copper)
- Basic Test + S and B - \$24 (sulfur and boron)
- Complete Test - \$32 All of the tests listed above.
- Soil Texture - \$16 Percentage of clay, silt, sand and gravel in the soil, and classification of the soil type.
- Toxic Metal Testing - \$24
  - Levels of lead, cadmium and arsenic in the soil, and interpretation of the results.

# Rapitest Soil Test Kit:

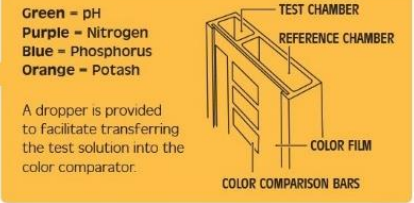


As for accuracy it does not give a precise reading. It basically tells you if your primary nutrients and pH levels are high or low. \$10 - \$14 per kit (10 tests).

A lab test will give you precise pH, primary and secondary nutrient and micronutrient levels.

The best part of this test kit is the table provided for pH levels for over 450 plants.

## What's Included with this Kit



Green - pH  
Purple - Nitrogen  
Blue - Phosphorus  
Orange - Potash

A dropper is provided to facilitate transferring the test solution into the color comparator.



- 4 Color Comparators
- Eye dropper for easy solution transfer
- 40 test capsules - 10 for each of pH, N, P, K
- Complete instructions and Fertilization guidelines
- pH preference list for over 450 plants

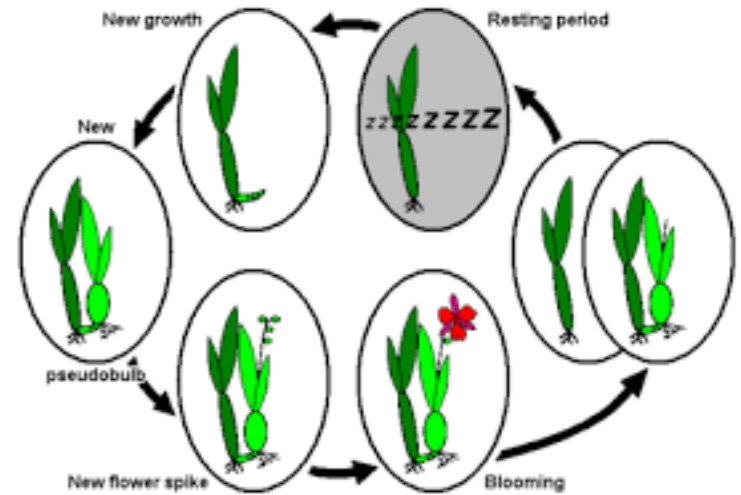


PLANT pH PREFERENCE LIST	
PLANT	PLANT pH PREFERENCE
Apple	5.5-6.5
Banana	5.5-6.5
Berries	5.5-6.5
Broad Beans	6.0-7.0
Broccoli	6.0-7.0
Brussels Sprouts	6.0-7.0
Cauliflower	6.0-7.0
Corn	6.0-7.0
Cucumbers	6.0-7.0
Garlic	6.0-7.0
Garlic Chives	6.0-7.0
Green Beans	6.0-7.0
Green Peas	6.0-7.0
Herbs	6.0-7.0
Jackfruit	5.5-6.5
Kale	6.0-7.0
Kidney Beans	6.0-7.0
Lentils	6.0-7.0
Onions	6.0-7.0
Peas	6.0-7.0
Potatoes	5.5-6.5
Spinach	6.0-7.0
Squash	6.0-7.0
Tomatoes	6.0-7.0
Turnips	6.0-7.0
Watermelon	5.5-6.5
Winter Squash	6.0-7.0
Zucchini	6.0-7.0



# Growing Degree Days (GDD):

- Indicator of amount of heat available to plants during its growth season.
- Cowlitz GDD averages 1864 - 1930 and is Region 1a IAW the Winkler Index (1500 - 2000 GDD).



**Daily GDD = (high T + low T)/2 – 50.**

**Example: 70° F + 50° F = 120° F divided by 2 = 60° F - 50° F = 10 GDD.**

**Yearly GDD for grapes is from 1 Apr - 7 Nov (total the daily GDD).**

<http://www.greencastonline.com/growing-degree-days/home>

Put in zip code & Voila!!! (great site referred to by Alice Slusher)

# Choosing Plants:



- Applicability:  
Usage (table, juicing, or wine).
- Acquiring plants:  
Create own from cuttings.  
Purchase 1 - 2 year old.  
Self rooted vs grafted.  
Healthy roots.



# Choosing Plants:



Growing Degree Days plays an important part in your decision making!

- Concord: 2000
- Canadice, Himrod, Interlaken, Reliance: 1500 - 2000
- Pinot Noir, Chardonnay, Riesling, Gewürztraminer: 2000 - 2500.
  - Cabernet Sauvignon, Merlot: >2500.



# Types:

- European.
- American.
- French Hybrids.



# Characteristics:

- European:
  - Wine and juices.
  - Upright growth.
  - Short internodes.
  - Larger diameter fruiting canes.
  - Less hardy than American grapes.



Siegerrebe



Chardonnay

# Characteristics:

- American:
  - Table & juice.
  - Trailing growth.
  - Longer Internodes.
  - Smaller diameter fruiting canes.
  - Cold hardy.



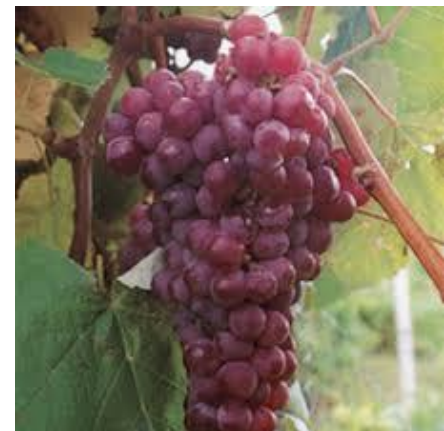
Canadice



Himrod



Interlaken



Reliance



# Characteristics:

- French hybrids:
  - Wine.
  - Small berry.
  - Trailing/upright growth.
  - Longer internodes.
  - Smaller diameter fruiting canes.



Baco Noir



Maréchal Foch

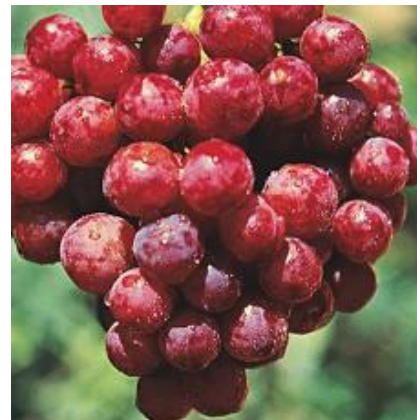
# Table Varieties:



- White:
  - Interlaken.
  - Himrod.
  - Lakemont.
  - Neptune.
  - Remaily.
  - Golden Muscat(s).
- White/Red:
  - Reliance.
  - Einset.



Remaily



Reliance

# Table Varieties:

- Red

- Canadice.
- Saturn.
- Vanessa.
- Suffolk Red.



Vanessa

- Blue - Black

- Buffalo.
- Mars.
- Venus.
- Lynden Blue.



Buffalo

# Wine Varieties:



- 1600 - 1650 GDD
  - Siegerrebe (w).
  - Madeline Angevine (w).
  - Iskorka (w).
  - Rondo (r).
  - Muscat of Norway (r).





# Wine Varieties:



- 1650 - 1900 GDD
  - Chardonnay clones (w).
  - Agria (r).
- Above 1900 GDD
  - Pinot Noir clones (r).
  - Dornfelder (r).
  - Zweigelt (r).



# Grape Workshop Handout:

## Grape Varieties:

Variety	Color	Ripening	American or European	Cane or Spur	Notes	Seeds
Baco	Black	Late	European (F h)*	Either	Wine / Juice	Seeded
Buffalo	Blue	Early to mid	American	Either	Table / Juice	Seeded
Campbell**	Black	Early	American	Spur (2-3 buds)	Table / Juice	Seeded
Canadice	Red	Early	American	Spur (2-3 buds)	Table / Juice	Seedless
Flame	Red	Late	American	Either	Table	Seedless
Foch	Blue	Early	European (F h)*	Either	Wine / Juice	Seeded
Glenora	Blue	Mid	American	Cane	Table	Seedless
Golden Muscat	Gold	Very late	American	Spur	Wine / Juice	Seeded
Himrod	White	Early	American	Cane	Table / Juice	Seedless
Interlaken	Green/Gold	Very early	American	Cane	Table / Juice / Rasins	Seedless
Lakemont	White	Mid	American	Cane	Table / Juice	Seedless
Lynden Blue	Blue	Mid	American	Cane	Table / Juice	Seeded
Marquis	White	Early/Mid	American	Cane	Table	Seedless
Okanogan Riesling	White	Early to mid	American	Cane	Wine / Table	Seedless
Price	Blue	Early	American	Cane	Table	Seeded
Reliance	Red	Mid	American	Cane	Table / Juice	Seedless
Siegenerbe	White/Gold	Early	European	Cane	Wine / Table	Seeded
Suffolk Red	Red	Mid	American	Either	Table	Seedless
Swensen Red	Red	Mid	American	Cane	Table	Seeded
Vanessa	Red	Early	American	Cane	Table	Seedless
Venus	Black	Early/Mid	American	Cane	Table	Seedless

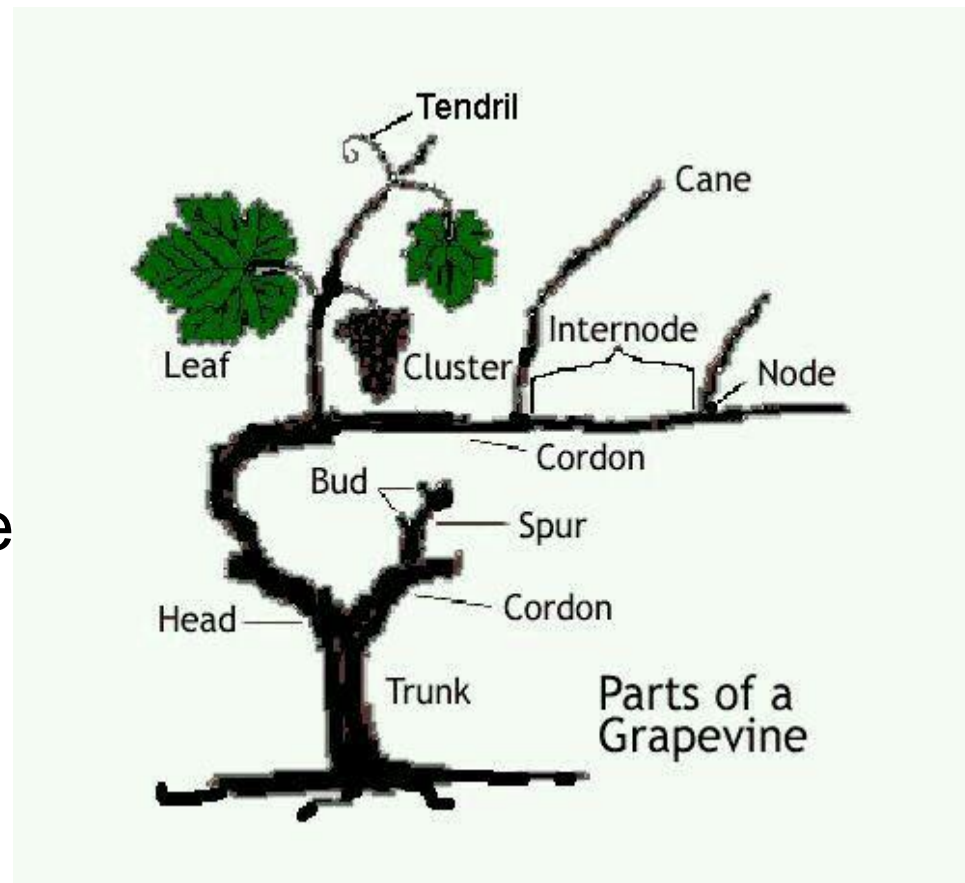
\* French hybrid

\*\* Campbell and Island Belle are often called the same plant.

\*\*\* Concord grape ripening in mid-September is point of reference for determining grape ripening category.

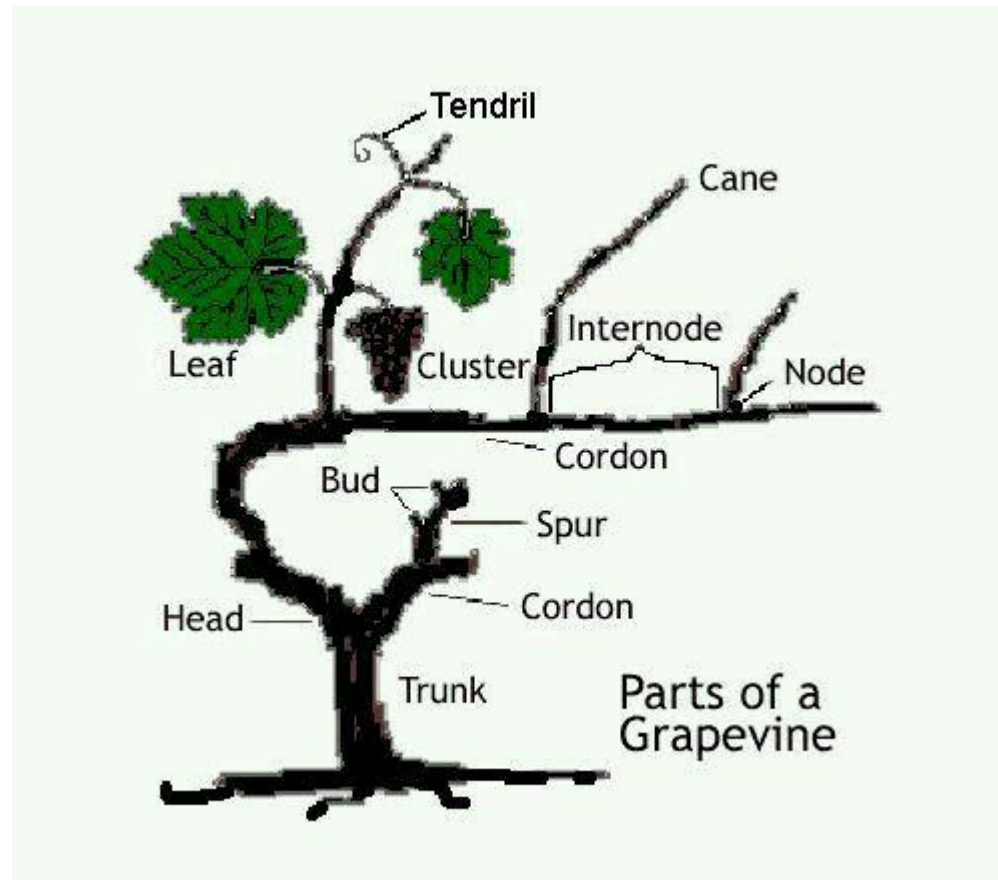
# Structure:

- Bud.
- Cane.
- Cordon.
- Node & Internode



# Structure:

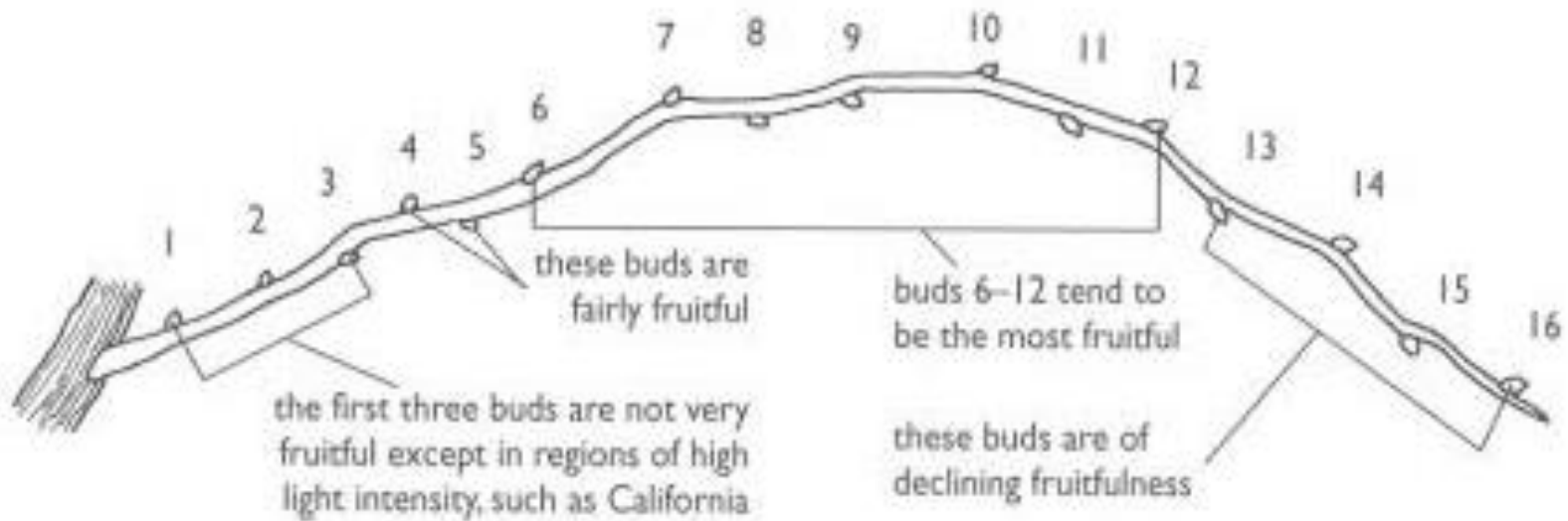
- Trunk.
- Spur.
- Shoot.
- Sucker.





# Structure:

## Cane



Fruitful Buds in a Typical French Hybrid Cane

# Trellising:

## Components:

- End posts (5 - 6" dia).
- Line posts (3 - 4" dia).
- Fruiting wire (10 - 12 gauge wire high tensile strength).
- Catch wires.
- Strainers, earth anchors & brace pins.

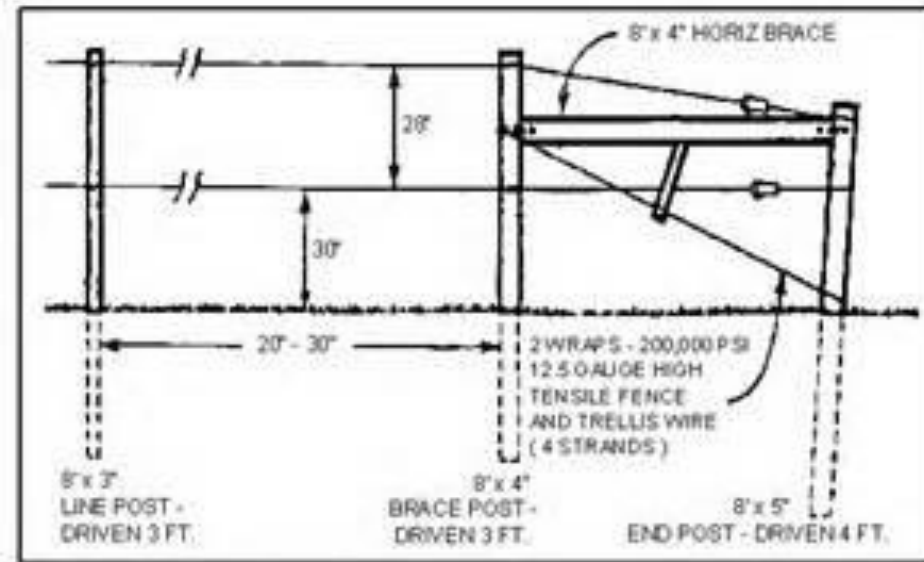
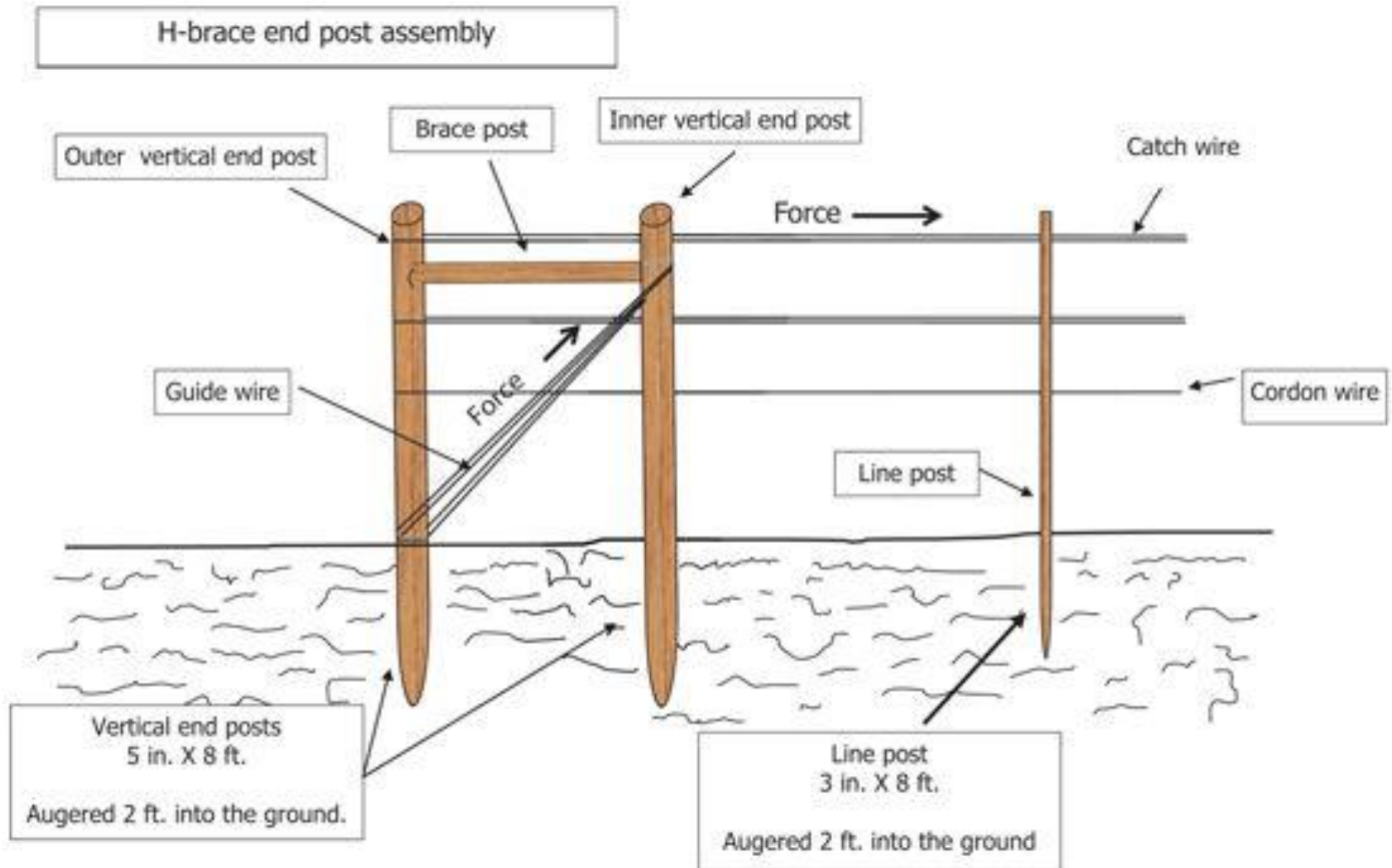


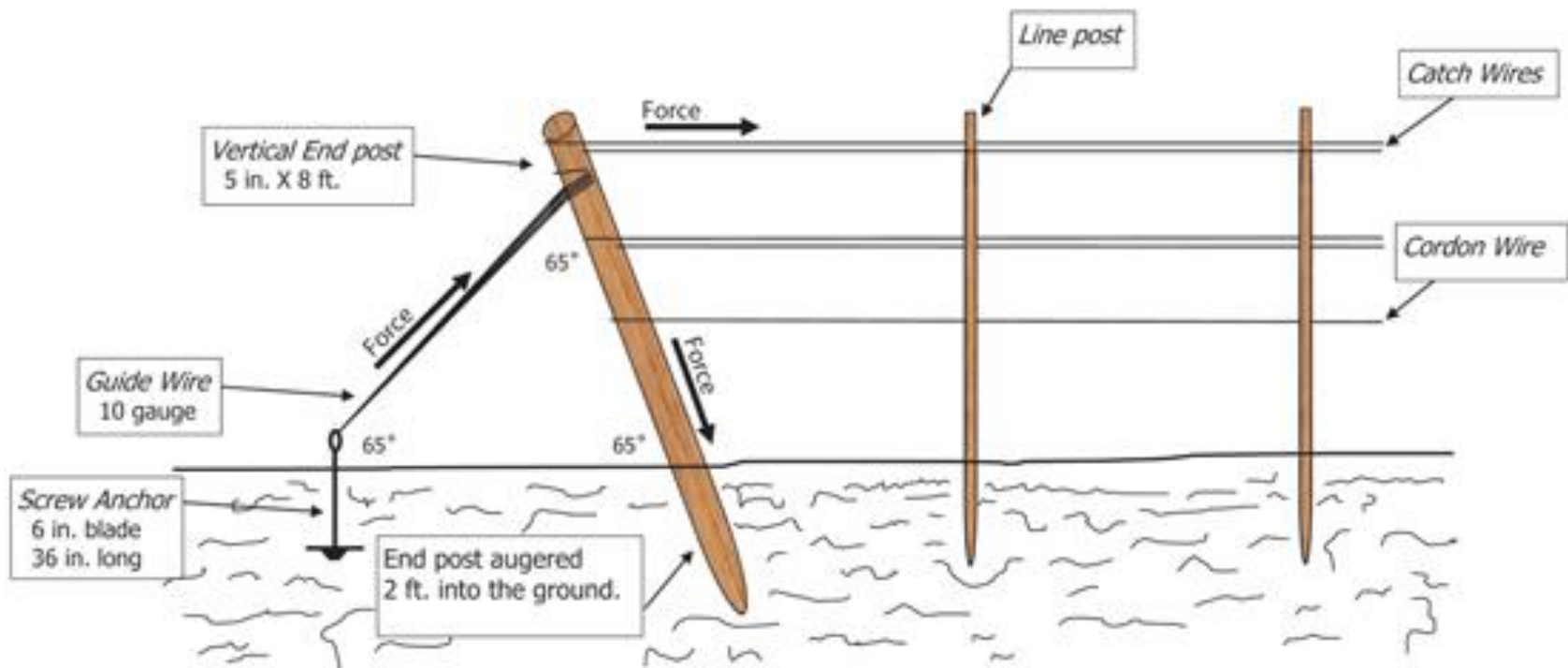
Figure 5B. Two-wire trellis for grapes. Revised from How to Build Orchard and Vineyard Trellises. Kwi Fence Systems, July 1962.



# Trellising:



# Trellising:



This end assembly is properly designed. As the wires exert a force on this assembly, the post is pushed into the ground.



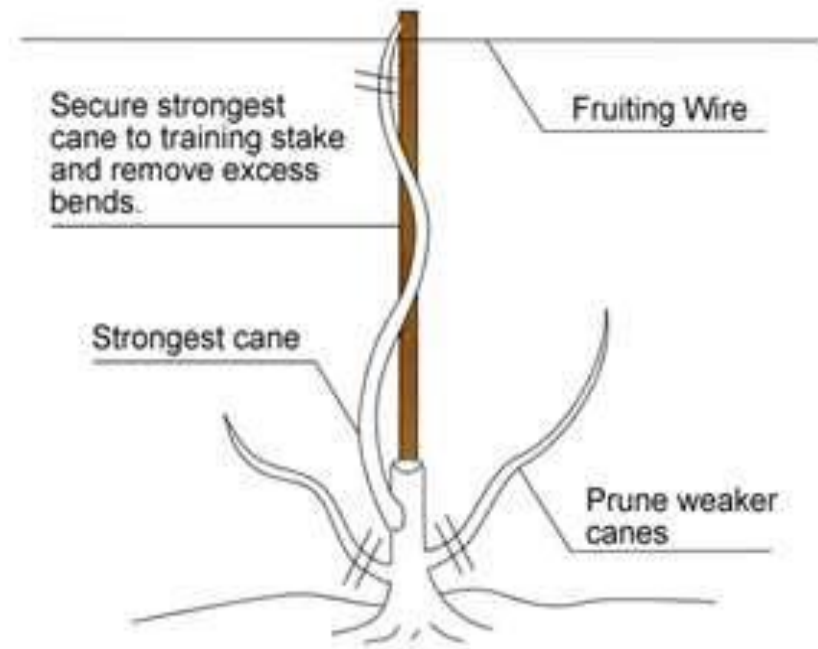
# Planting: Initial



- Plant rows north and south.
- Plant in early spring as soon as soil can be worked.
  - Remove all competing vegetation (1<sup>st</sup> year).
- If planting bare root ensure roots don't dry out and spread roots without bending (if too long or broken, trim roots).
- If planting propagated plants be careful not to break roots while digging.
  - If potted, plant at same height.
  - If grafted be careful not to bury the graft.
    - Most roots 18" deep.
  - Space plants 6 - 8' apart in row.
- Separate rows 8 - 10' apart to prevent shading and depending on training methods.

# Planting: Initial

- Stake to keep trunk straight.
- Gro-tubes protect and increase heat.
- Black plastic prevents weeds.



**Goal is to establish a strong trunk.**

# Fertilizing: Planting Year

- Fertilize grapes sparingly.
- More problems occur from overfeeding than from underfeeding.
- Fertilize each plant with a total of 0.5 to 1 ounce of nitrogen (N).
- Use a well-balanced fertilizer such as 16 -16 -16.
  - To calculate how much product to apply, divide the desired amount of N (in this case, 1 ounce) by the percentage of N in the fertilizer:  
 $16\% = 0.16. 1 \text{ oz} \div 0.16 = 6.3 \text{ oz product per plant.}$
- Manure or compost can be used.



# Fertilizing: 2<sup>nd</sup> Year

- Plants may be fertilized with 1 to 1.5 ounces of N per plant if needed.
- 9.4 ounces per plant when using a balanced fertilizer as 16 - 16 - 16.
- Broadcast the fertilizer in a circle about 6 to 18 inches from the trunk.
- Be careful not to get fertilizer right up against the trunk or to place it all in one spot near the vine.
- The best time to fertilize is around bud break.



What do the numbers on fertilizer mean?



**NITROGEN**

greens up plants

JUST THINK:



**NITROGEN**



**PHOSPHORUS**

reaches down to the roots and helps produce blooms

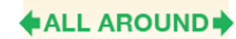


**PHOSPHORUS**



**POTASSIUM**

promotes all around wellbeing



**POTASSIUM**



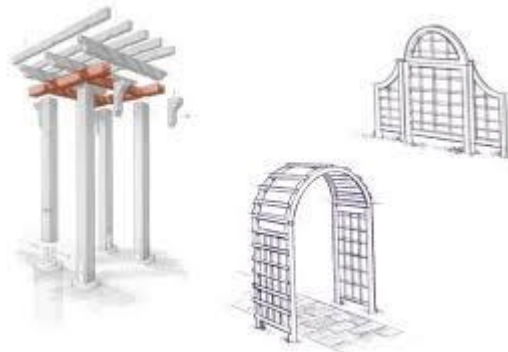
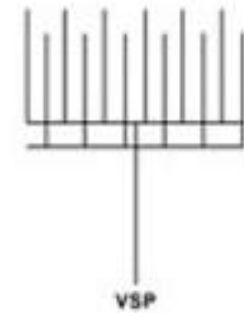
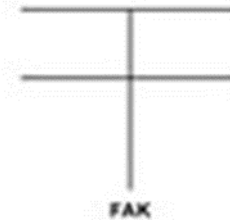
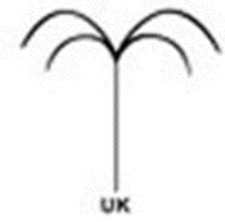
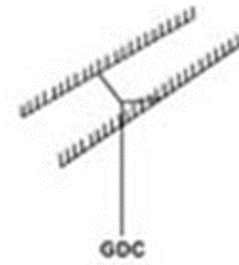
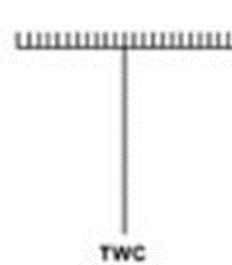
# Irrigation:

- 1<sup>st</sup> year is most critical until roots are established.
- Vigorous watering during the 1<sup>st</sup> year.
- Avoid overhead watering.
- Drip irrigation is preferred.
- After 1<sup>st</sup> year you can decrease watering.



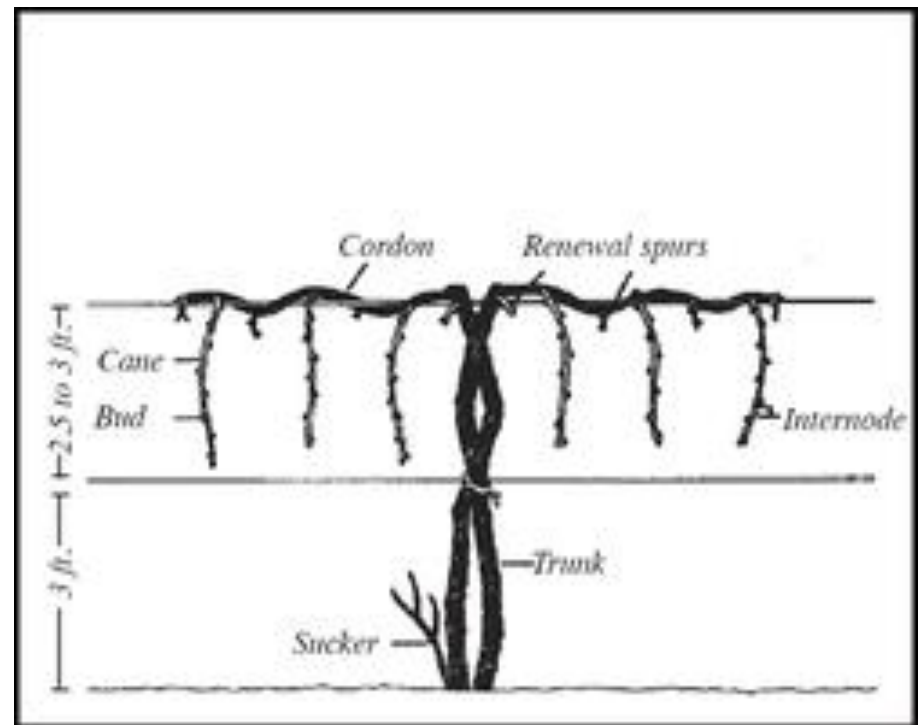
# Training Methods:

- Top Wire Cordon (TWC).
- Geneva Double Curtain (GDC).
- Umbrella Kniffen (UK).
- Four Arm Kniffen (FAK).
- Vertical Shoot Positioning (VSP).
- Arbors.



# Training Methods:

- Number of wires.
- Table grapes.
- Fruiting canes horizontal.



# Training: Second Year



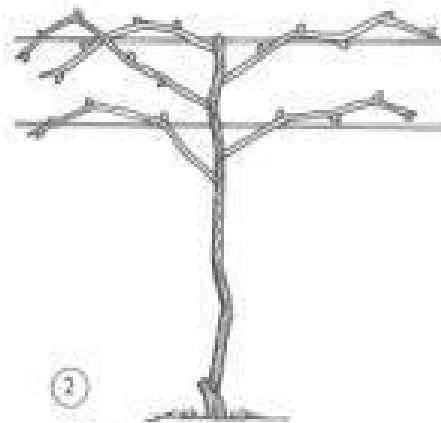
- Cut back to 2 - 3 buds if cane did not reach fruiting wire.
- If wire was reached, cut 3 - 4" above fruiting wire through node.
  - Tie off cane to wire.
  - Train to trellis system.
  - Supplemental water.



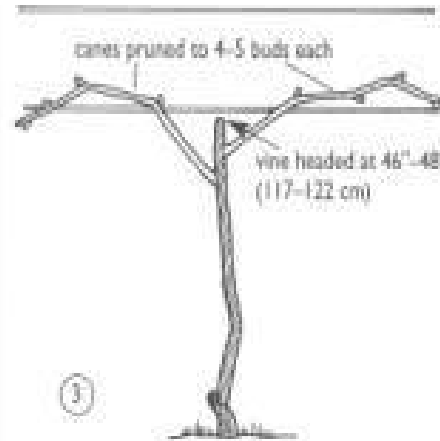
# Training: Second Year



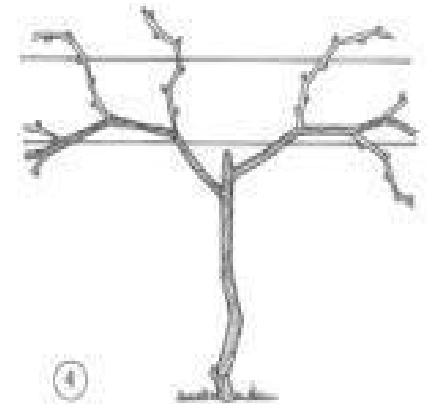
① The young trunk is established.



② Its five buds grow into five canes.



③ The vine is headed to 48 inches and two canes are placed on the lower wire to begin the next spring's growth.



④ The lower-wire canes become cordons, or arms, for the new canes that grow from its buds.

## Developing Cordons

# Pruning Tools:

- Bypass Pruners.
- Loppers.
- Disinfectant.
  - 70% Alcohol
  - 10% Clorox/Water Solution (corrosive)
- Sharpening Tools.



# Winter Pruning:



Grapes are produced from buds that will grow into shoots on 1-year old canes (the long stems or “shoots” after they’ve born fruit for at least one year).

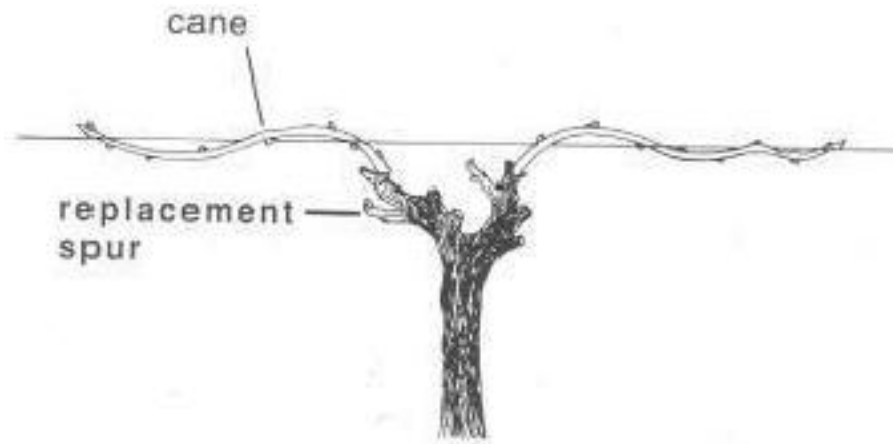
The most fruitful canes will be those that were exposed to light during the growing season.

These are thicker than a pencil in width and as close to the trunk as possible.

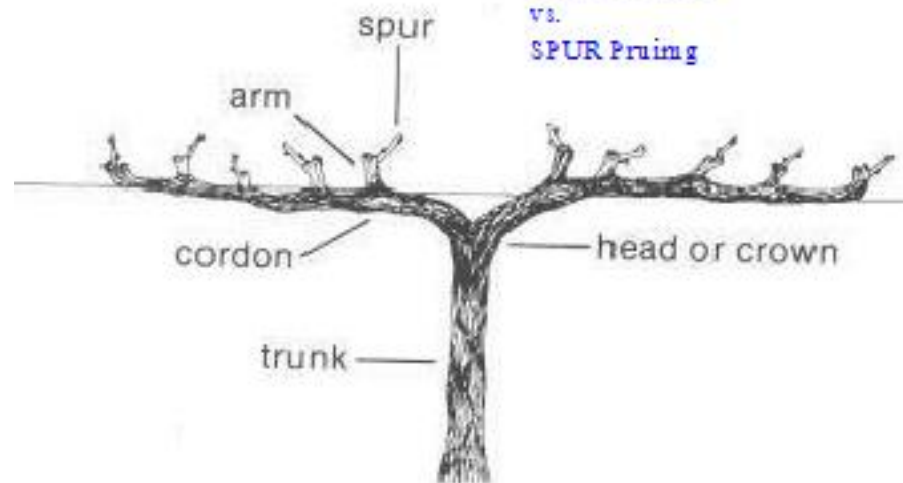
Mature plants should be pruned yearly to remove all growth except new 1-year-old fruiting canes and renewal spurs (a cane pruned back to one to five buds).

Pruning vines should be done between January and the 1<sup>st</sup> of March.

# Winter Pruning:

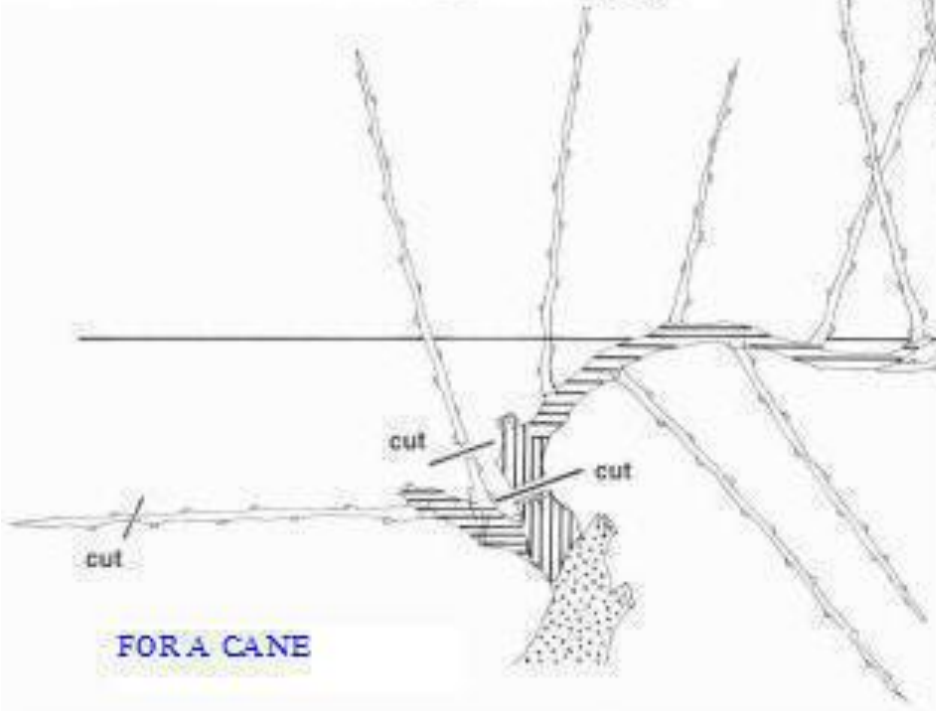
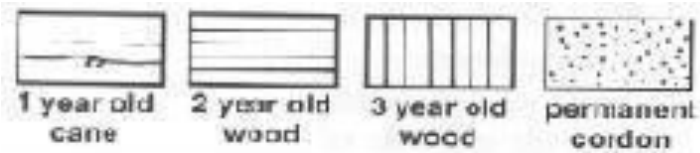


CANE Pruning  
vs.  
SPUR Pruning



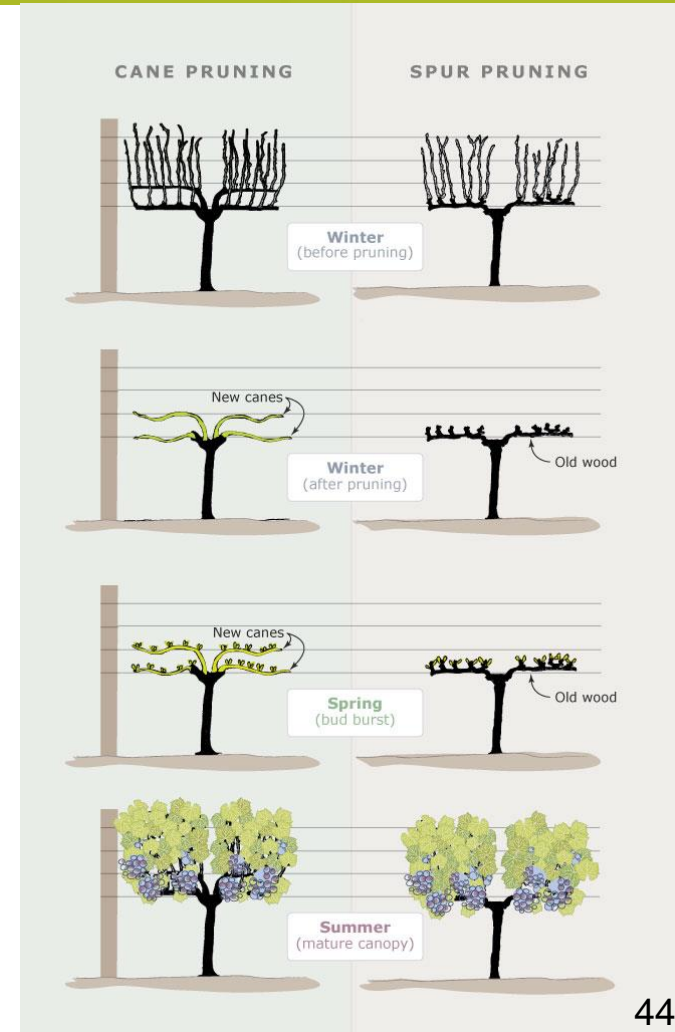


# Winter Pruning:



# Winter Pruning:

Illustrates difference of growth between cane and spur pruning methods.



# Winter Pruning: Spur



**Spur pruning** is done on vines that retain one or two pairs of long canes (a permanent cordon) trained along a trellis system.

Each winter, new canes that have grown along the permanent cordon are cut back to a small shoot containing two buds, known as a **spur**.

In spring new growth develops from the buds on the **spur**.

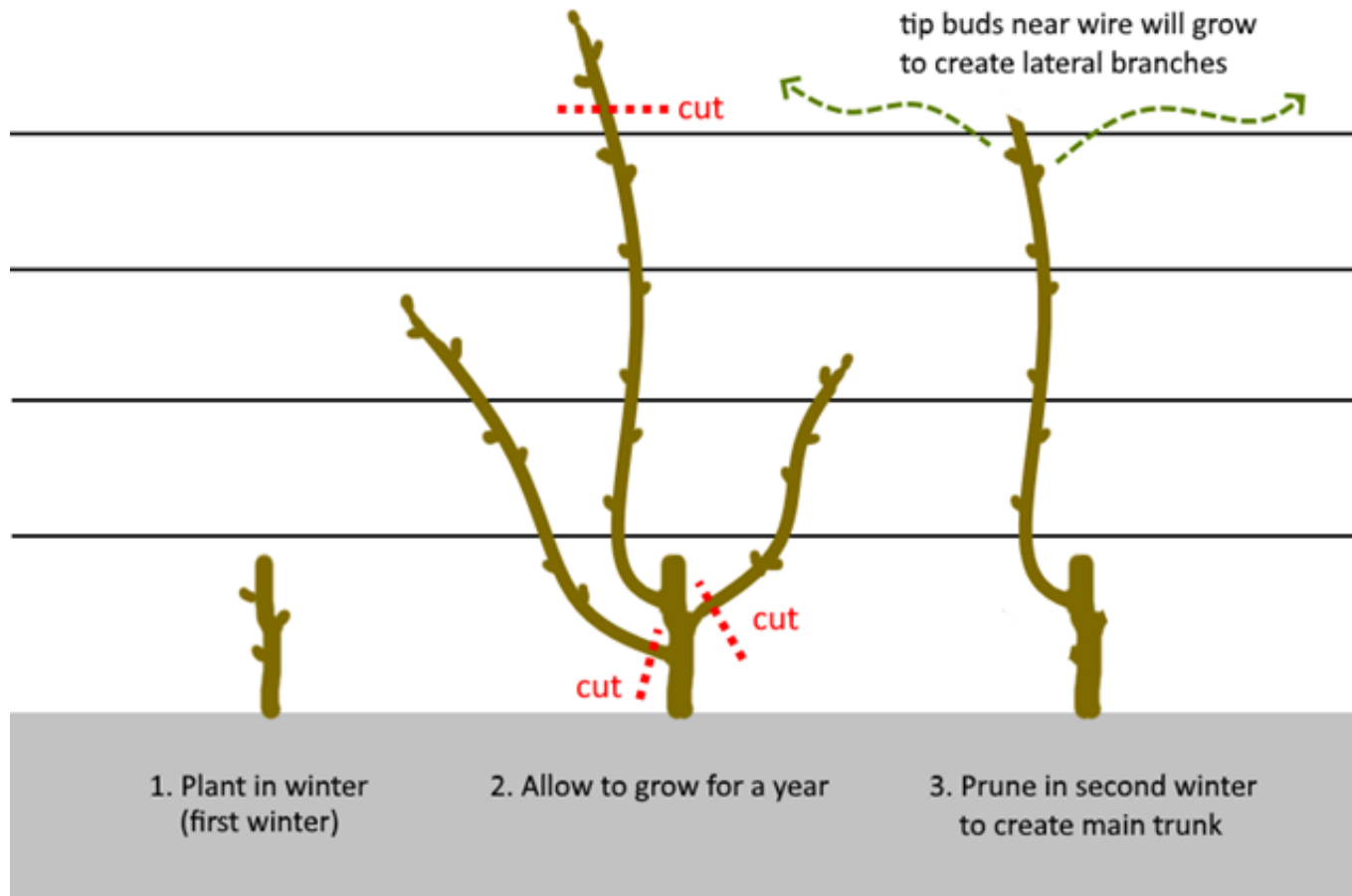
To spur prune, prune along main canes to leave two- to three- bud spurs, each four to six inches apart.

Leave no more than 20 to 80 buds per plant, depending on the type of grape. Remove all other 1-year-old wood.

# Winter Pruning: Spur



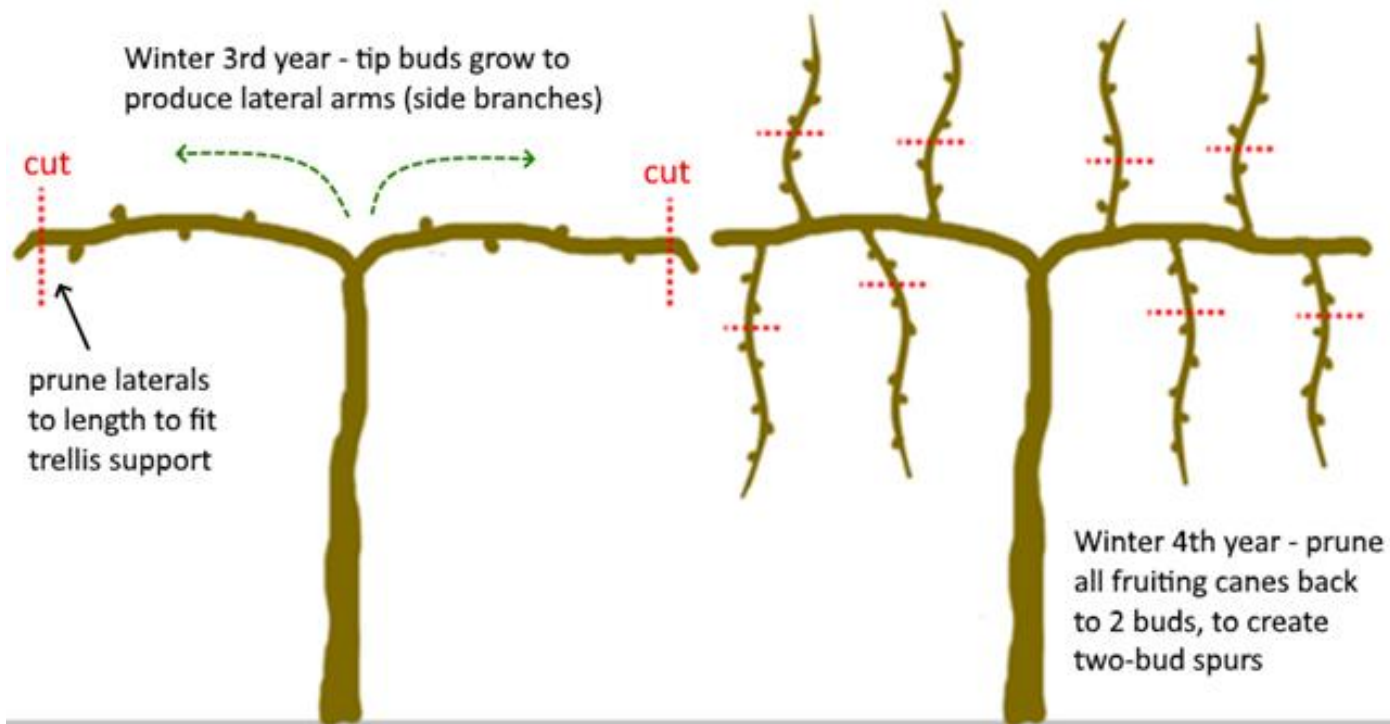
Pruning to Establish Grapevine Framework - 1st and 2nd Year





# Winter Pruning: Spur

## Spur Pruning - 3rd and 4th Year

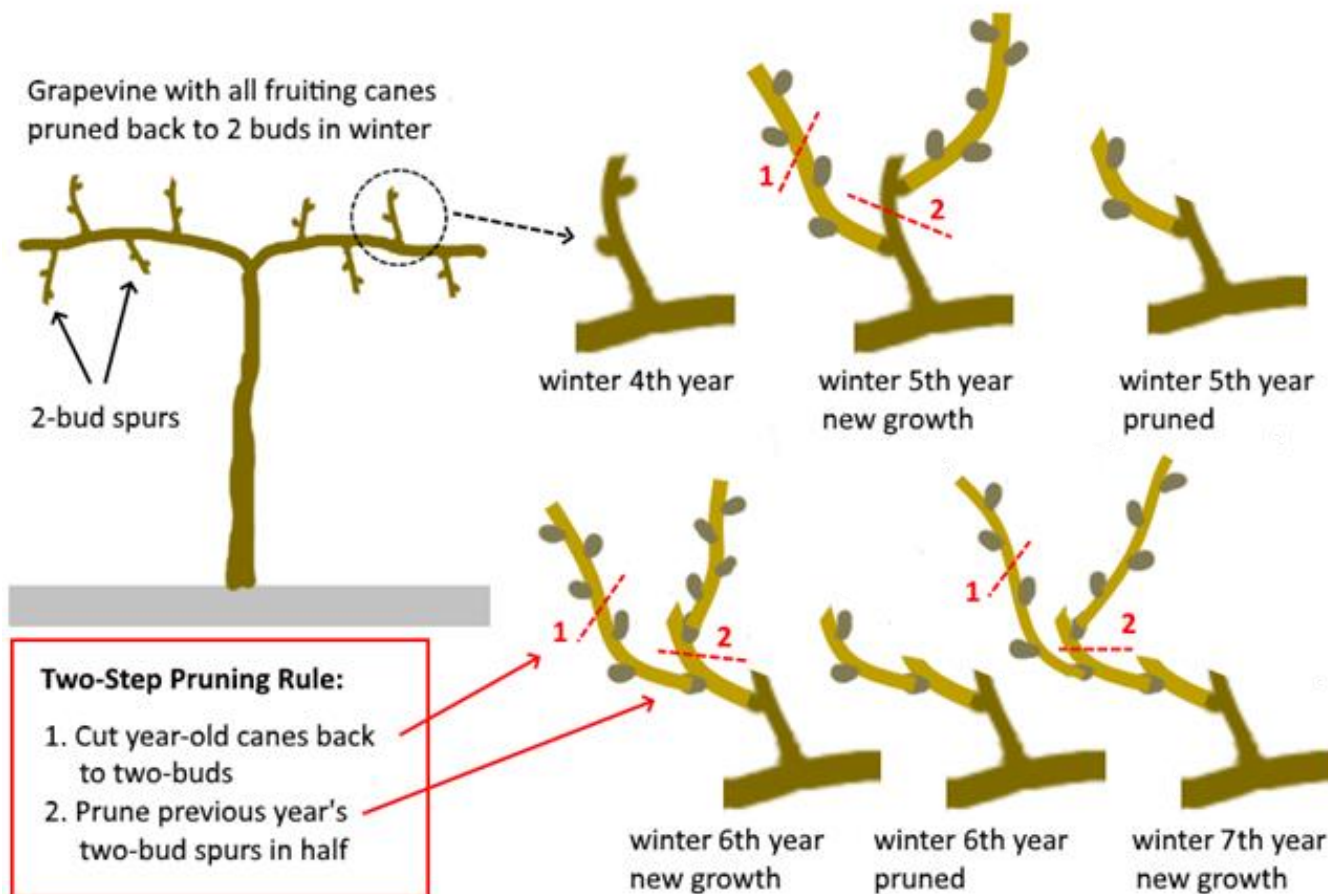


1. In third year, the two tip buds will grow to form the lateral arms, train these canes onto trellis wire in winter and prune to required length.

2. In fourth year, buds on lateral arms will grow to produce fruiting canes. Prune all fruiting canes back to 2 buds in winter.

# Winter Pruning: Spur

## Spur Pruning - 5th Year and Onwards



# Winter Pruning: Cane



**Cane pruning** involves cutting back about 90 percent of the last year's growth.

To **cane prune** you first remove the dead two-year-old **canes**.

You then select two well-formed **canes** growing out of the head of the vine.

The **canes** you select should be one-year-old wood, containing tightly spaced, healthy buds.

**When in doubt about cultivar 'basal buds', cane prune.**

# Winter Pruning: Cane



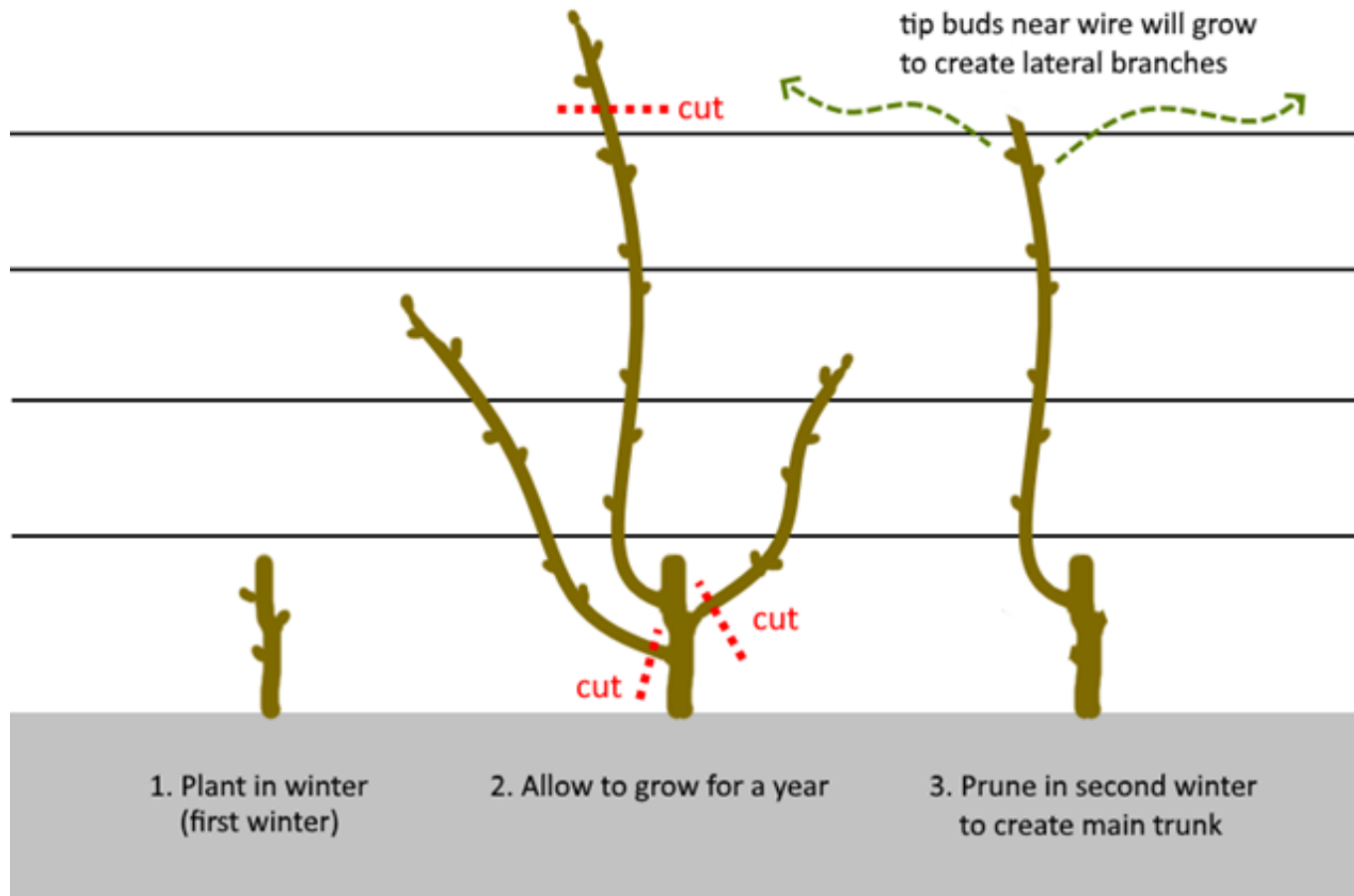
- To cane prune, select two to four new fruiting canes per vine.
- Cut back each of these to leave about 15 buds per cane for wine grapes (20 - 30 buds per plant) and about 40 for table grapes (50 - 80 per plant).
- Leave a one - or two-bud spur cane near the fruiting cane with one or two buds each. These are "renewal spurs" and will produce the fruiting canes for the following year and thus maintain fruiting close to the trunk.
- All other cane growth should be pruned off.



# Winter Pruning: Cane



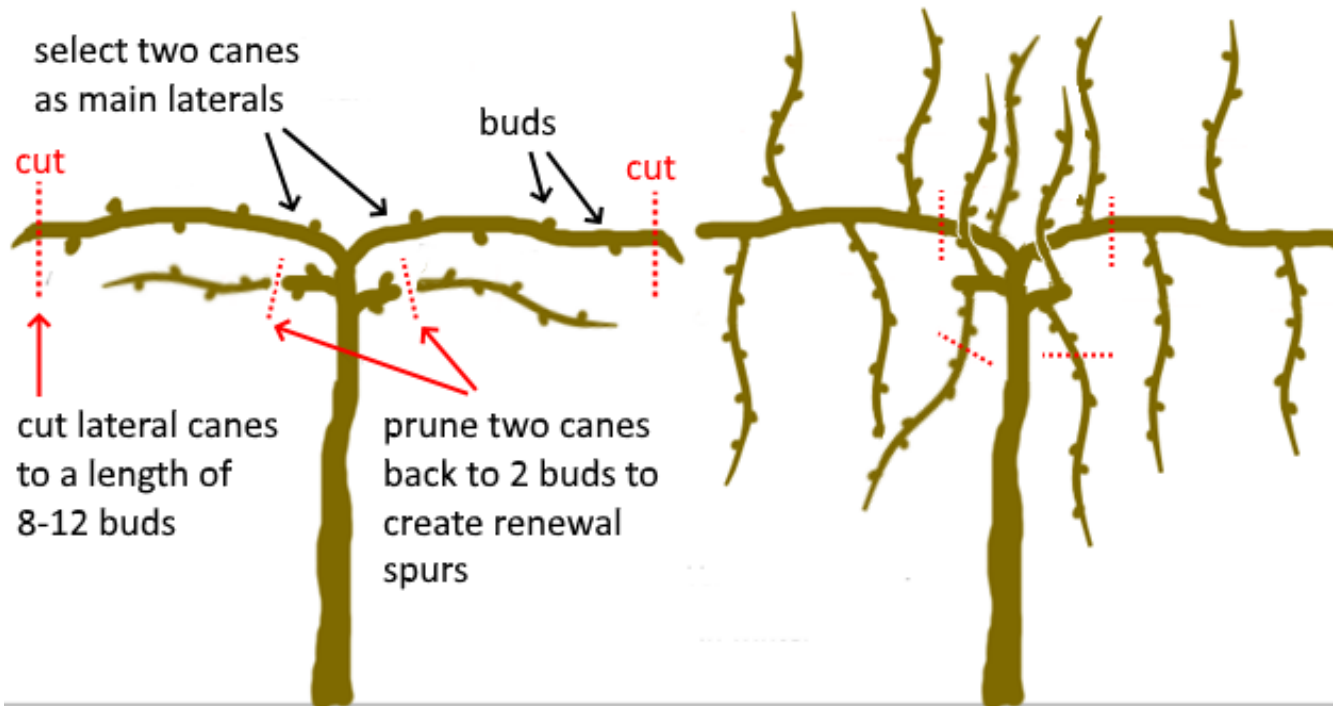
Pruning to Establish Grapevine Framework - 1st and 2nd Year



# Winter Pruning: Cane



## Cane Pruning - 3rd Year

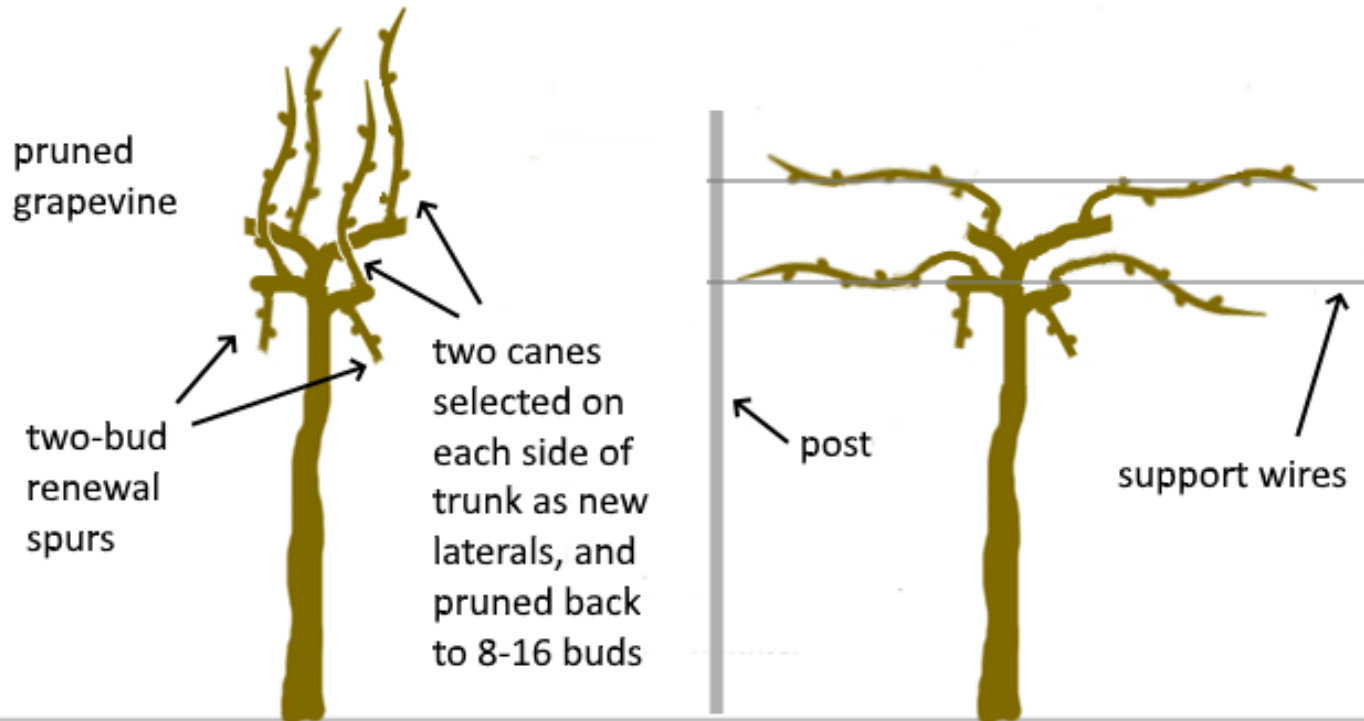


1. In third year, select two buds to grow as lateral canes and two for renewal spurs, prune to length

2. After third year, all buds on laterals and renewal spurs will have grown into fruiting canes

# Winter Pruning: Cane

## Cane Pruning - 4th Year



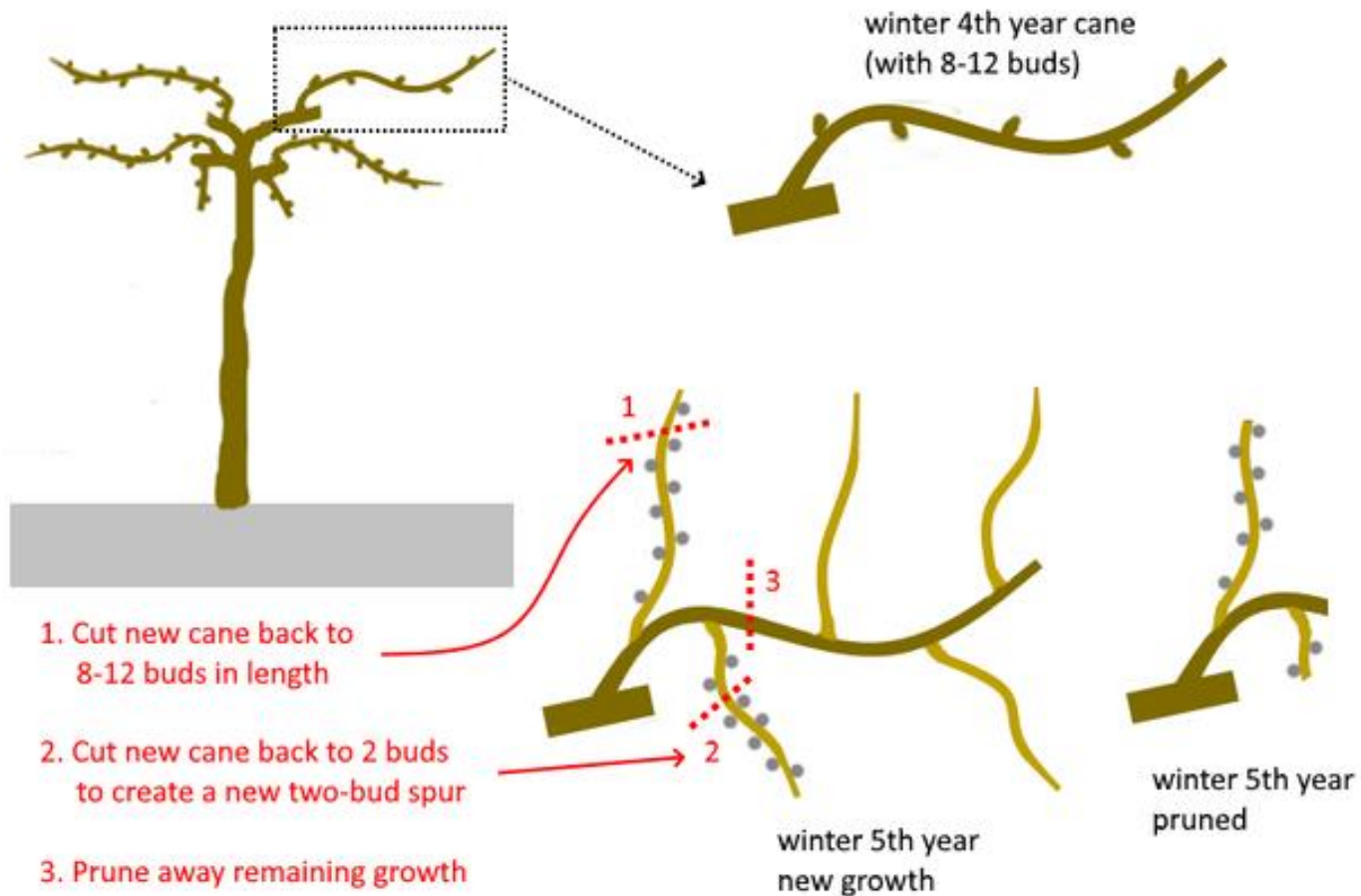
3. Select two canes on each side as replacement laterals and one cane on each side as renewal spurs

4. Train canes horizontally along trellis wires

# Winter Pruning: Cane



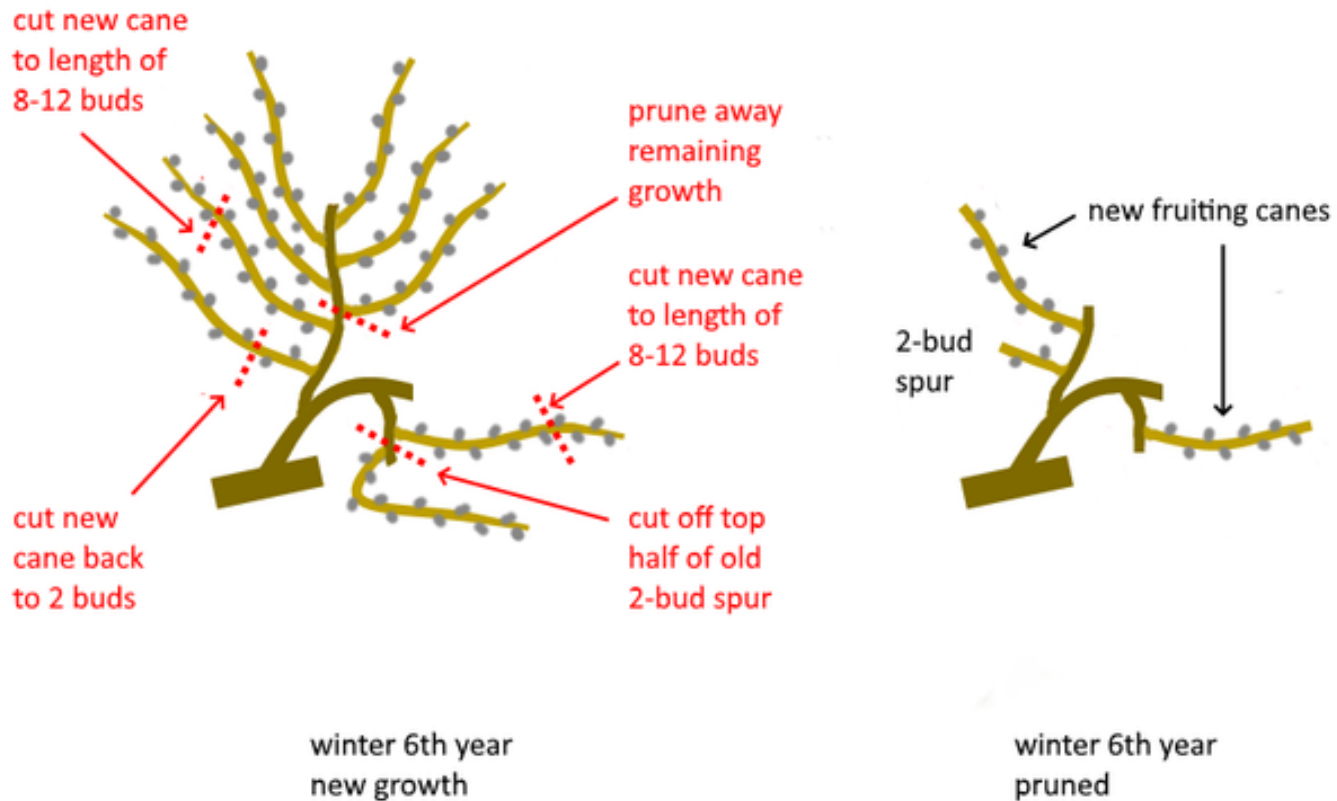
Cane Pruning - 5th Year and Onwards



# Winter Pruning: Cane



## Cane Pruning - 5th Year and Onwards



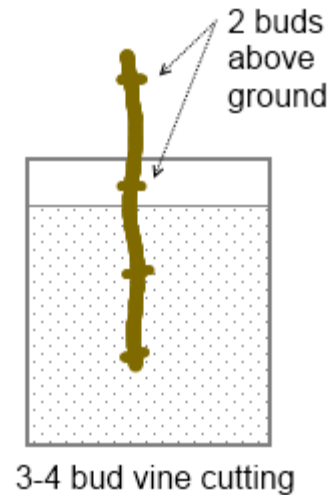
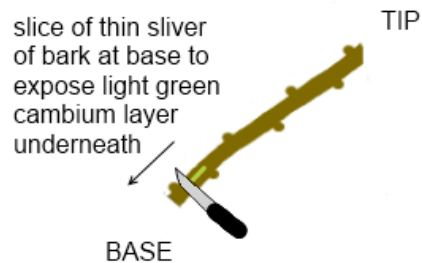
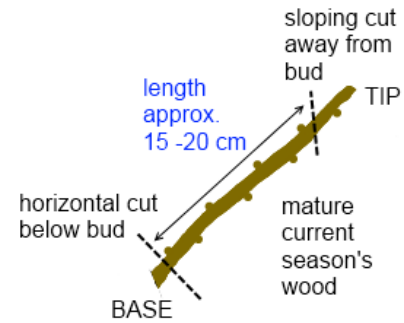
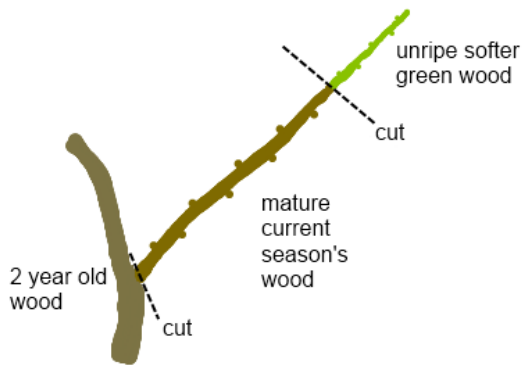


# Winter Pruning: Propagation

- During pruning take cuttings to use for propagation.
- Leaf scar indicates basal end of cutting (leaf scar is underneath bud when planting).
  - Make a flat cut between nodes at base (calluses over).
- Count 3 nodes up and make a diagonal cut half way between nodes.
  - Soak base end in water for 24 hours prior to propagating. Scrape base with knife. It is not necessary to use rooting solution.
- Place cuttings in potting soil with two nodes below and one node above soil level.
  - Root system will develop if left undisturbed.



# Winter Pruning: Propagation



# Spring/Summer Tasks:



- Shoot thinning
  - 3 buds per node
  - Thin once
  - Keep longest shoot



# Spring/Summer Tasks:



- Shoot thinning, a grapevine can produce up to three shoots per bud at a node.
- When you prune to a certain number of buds per vine, you are estimating yield by assuming there will be only one fruitful shoot per node.
- Shoot thinning is removing extra shoots to leave just one shoot per node.
- Thin shoots once in spring when the main shoot is about 6 inches long. You can usually determine the shoot to keep because it's longer than the secondary or tertiary shoots (shorter shoots at the same node).
- Remove the extra shoot(s) by carefully snapping them.
- Avoid shoot thinning when shoots are too long, so you won't accidentally remove the main (primary) shoot.

# Fruit Thinning:

- Thin just before bloom (Apr/May).
- Remove all but one or two clusters per shoot.





# Fruit Thinning:



- It's best to limit young vines to one cluster per shoot.
- Thin fruit right before bloom to improve fruit set on the remaining clusters.
- Fruit thinning can also be done later in the season, if you feel you haven't pruned the vine severely enough and there's too much fruit for the crop to ripen well.
- If you remove fruit clusters before veraison (ripening), berry size increases, yield is less affected, and the grape clusters ripen sooner.
- If you thin fruit soon after veraison, there is little effect on berry size, but yield is reduced, and the remaining fruit ripens sooner.
- In general, shoots need to be at least 3 feet long to support a fruit crop. Remove clusters from shorter shoots.

# Hedging & Bud Wiping:



**Hedging:** Usually, 3 to 4 feet of growth per shoot is enough to ripen a crop. If plants become too vigorous, you can top or trim shoots. Be sure not to shorten too much the shoots that are to become next year's new fruiting canes. Hedged or tipped shoots produce lateral branches. Trim these also to prevent too much shading of the fruiting zone.

Each cluster that is left on a fruiting shoot/cane requires 12 - 14 leaves on that shoot/cane for photosynthesis (this includes the leaves on laterals).

**Bud Wiping:** Remove all dormant buds on trunk below those you may want as new.

# Leaf Pulling:



- Remove 2 - 4 leaves per cluster.
- Goal to expose cluster to sunlight.
- Remove before veraison (ripening).
- Minimum 12 - 14 leaves per cluster.



# Leaf Pulling:



- Good exposure to sun improves fruit quality.
- In cooler climates, you can remove two to four leaves per shoot in the fruiting zone so that clusters are less shaded.
- Remove leaves only on the side of the row that gets morning sun.
- Do not remove leaves on the side that gets afternoon sun, or clusters may get sunburned.
- If you pull leaves off when fruit are pea-size (about late June) or earlier, the clusters won't get sunburned.

# Harvest: Table or Wine

- Several signs of maturing:
  - Birds eating.
  - Color changing.
  - Supporting stem browns.
  - Taste.
  - Refractometer.
    - Brix scale read in degrees.
    - Increments mean 1 gram of sucrose per 100 grams solution.
    - For wine 22 or above.
    - For table 17 - 19.





# Disease:

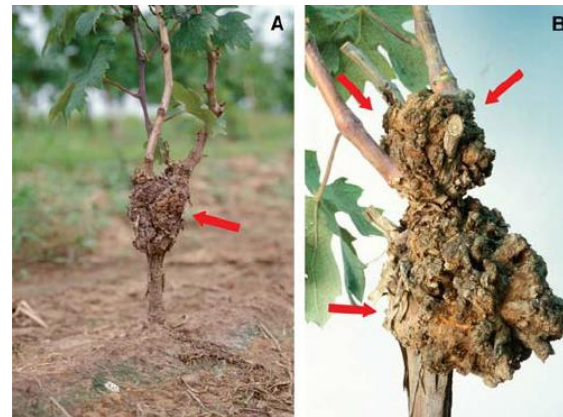


- May - June critical for disease management.
- Know the susceptibility of diseases to your cultivars.
- Canopy management will help in controlling.

Grapes are very sensitive to herbicide injury. Distorted leaves and shoot tips are common symptoms in areas where herbicide drift (particularly of a 2,4-D product) has occurred. Avoid using these herbicide products near grapes or on days when drift may occur (hot or windy conditions).

# Disease:

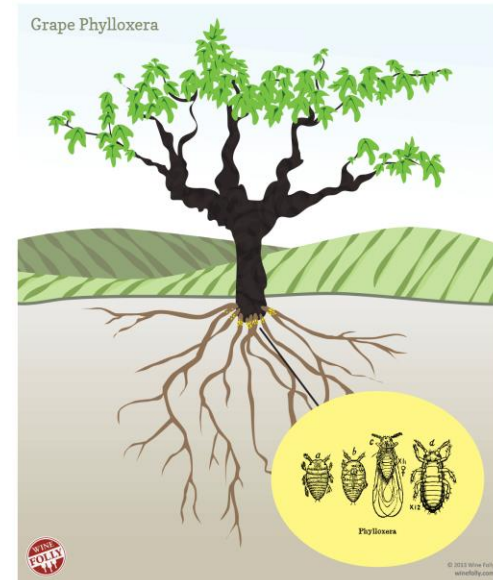
- Powdery Mildew:
  - European cultivars more susceptible to powdery mildew than American.
- Crown gall.
- Botrytis (gray mold).



# Pests:

July - August: critical for pests:

- Wasps and hornets.
- Deer, two-legged predators, birds, rodents.
  - Voles may harbor in mulch.
- Phylloxera (aphid like insect that lives on and feeds on the roots). Most American cultivars are tolerant.
- Grape erineum mite.



# Questions?



Q - Why are my grapes smaller than the stores?

A - Many commercial table grapes available in supermarkets are larger than the fruit of the same cultivars you grow at home. Commercial table grapes are often girdled (or may be treated with a naturally occurring growth hormone, gibberellic acid) to enhance berry size.

Q - Why do table grapes taste sweeter than wine grapes when their sugar content is lower?

A - Due to the acid content is higher in a wine grape than a table grape.

Q - What pruning technique do I use if I don't know grape cultivar I have?

A - Prune one arm of the trunk with spur pruning method and the other side with cane pruning method and see which side produces better.

# References:



- Growing Table Grapes. OSU EC1639
- Growing Wine Grapes in Maritime Western Wash. EM068E
- <https://extension.wsu.edu/maritimefruit/grape-research/pruning-grapes-in-home-gardens-some-basic-guidelines/> J. King, WSU – Mount Vernon
- Jeff Cox, *From Vines to Wines*
- Pest Management Guide for Grapes in Washington. EB0762
- 2014 Pest Management Guide for Wine Grapes in Oregon. EM8413
- <http://www.greencastonline.com/growing-degree-days/home>
- <https://s3.wp.wsu.edu/uploads/sites/2076/2017/06/C053-Grapes-15a.pdf>. Grapes C053 WSU



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2 - 16	Shopping to Save Money
2 - 23	Rose Care
3 - 02	Blueberries
3 - 09	Raspberries
3 - 16	Strawberries
3 - 23	Who Gets Grandma's Yellow Plate
3 - 30	Composting

Wednesday at 6 P.M.	
2 - 17	Growing Vegetables from Seeds
2 - 24	Fruit Growing for the Beginner
3 - 03	Soils and Fertilizers
3 - 10	Rain Barrels
3 - 17	Right Plant, Right Place
3 - 24	Choosing Fruit Varieties for West WA
3 - 31	Worm Composting



# Grape Growing and Pruning



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