

Trellis Design & Construction

**2 to 2:30 p.m.
Friday March 8th, 2019
Show-Me Grape & Wine Conference**



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1-800-DIG-RITE
811 or
mo1call.com

Contact Missouri One Call a least 3 days and not more than 10 days prior to digging.

<https://www.mo1call.com/>

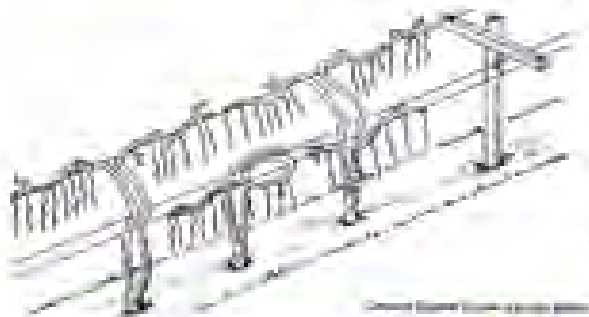
Many Systems



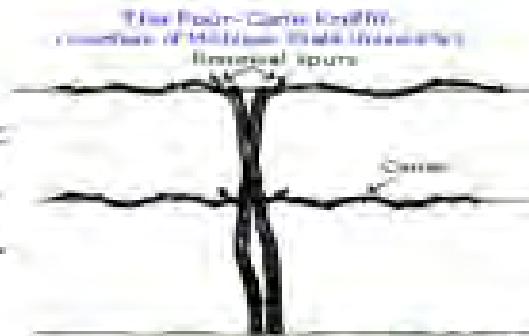
Arbor



Scott Henry



Geneva Double Curtain

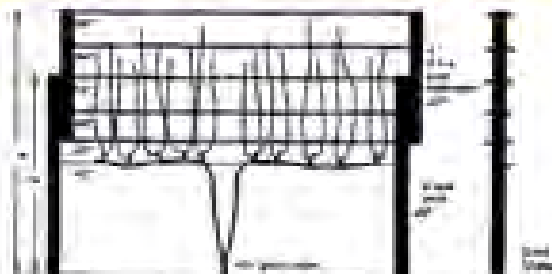


4 cane kniffin

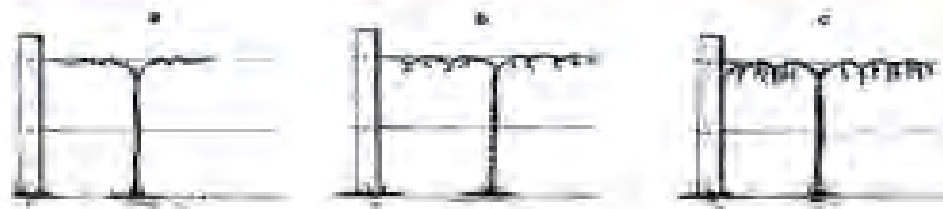


Munson

Vertical Shoot Positioned



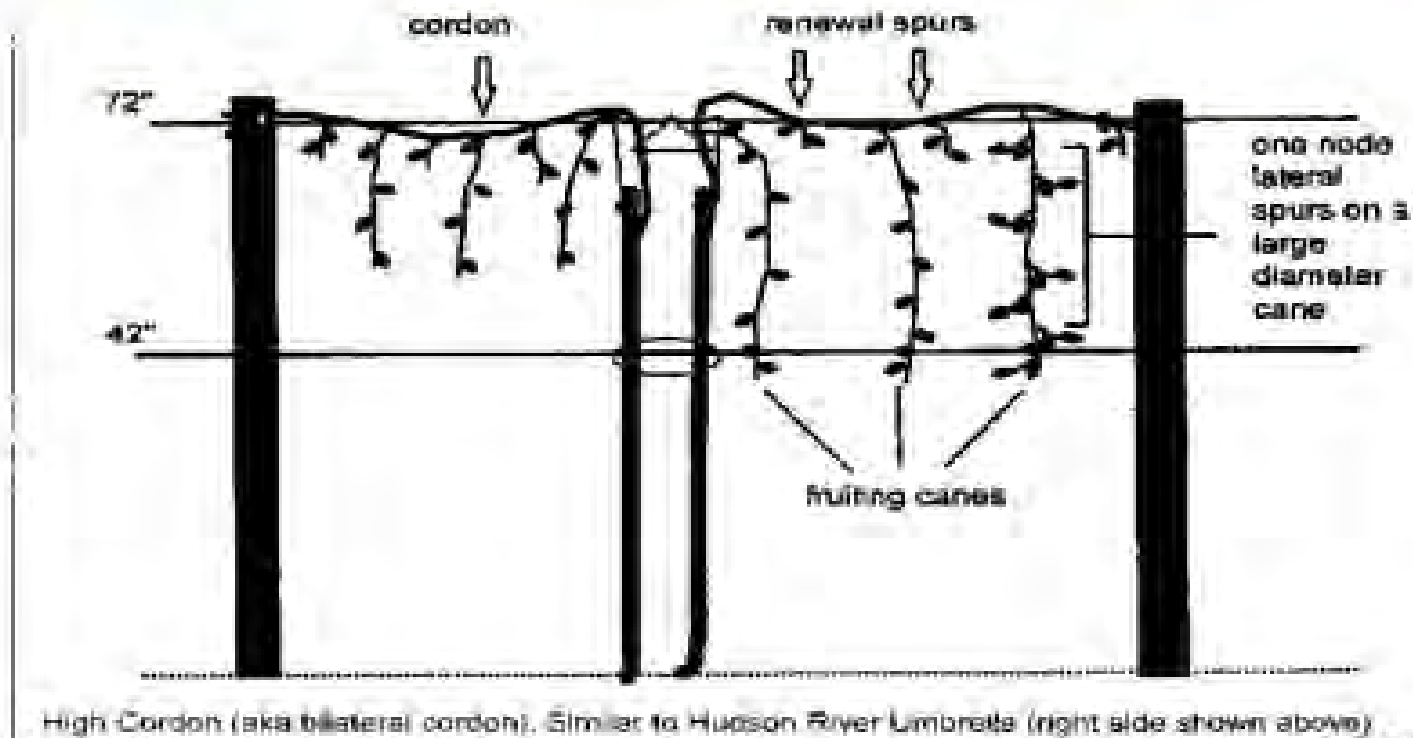
Single curtain, bilateral cordon or high cordon





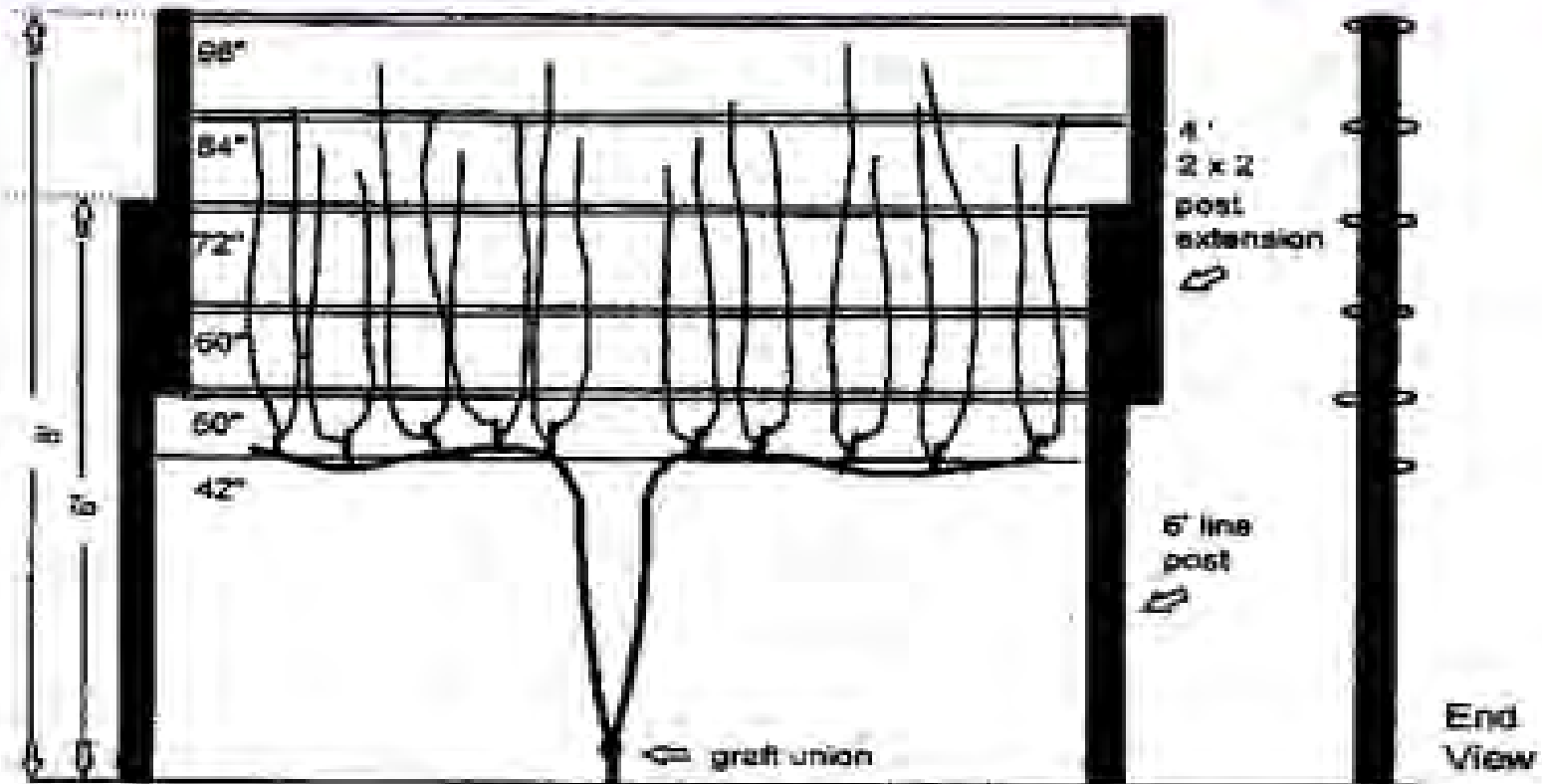
South Dakota Hutterite Vineyard

High Cordon Bilateral

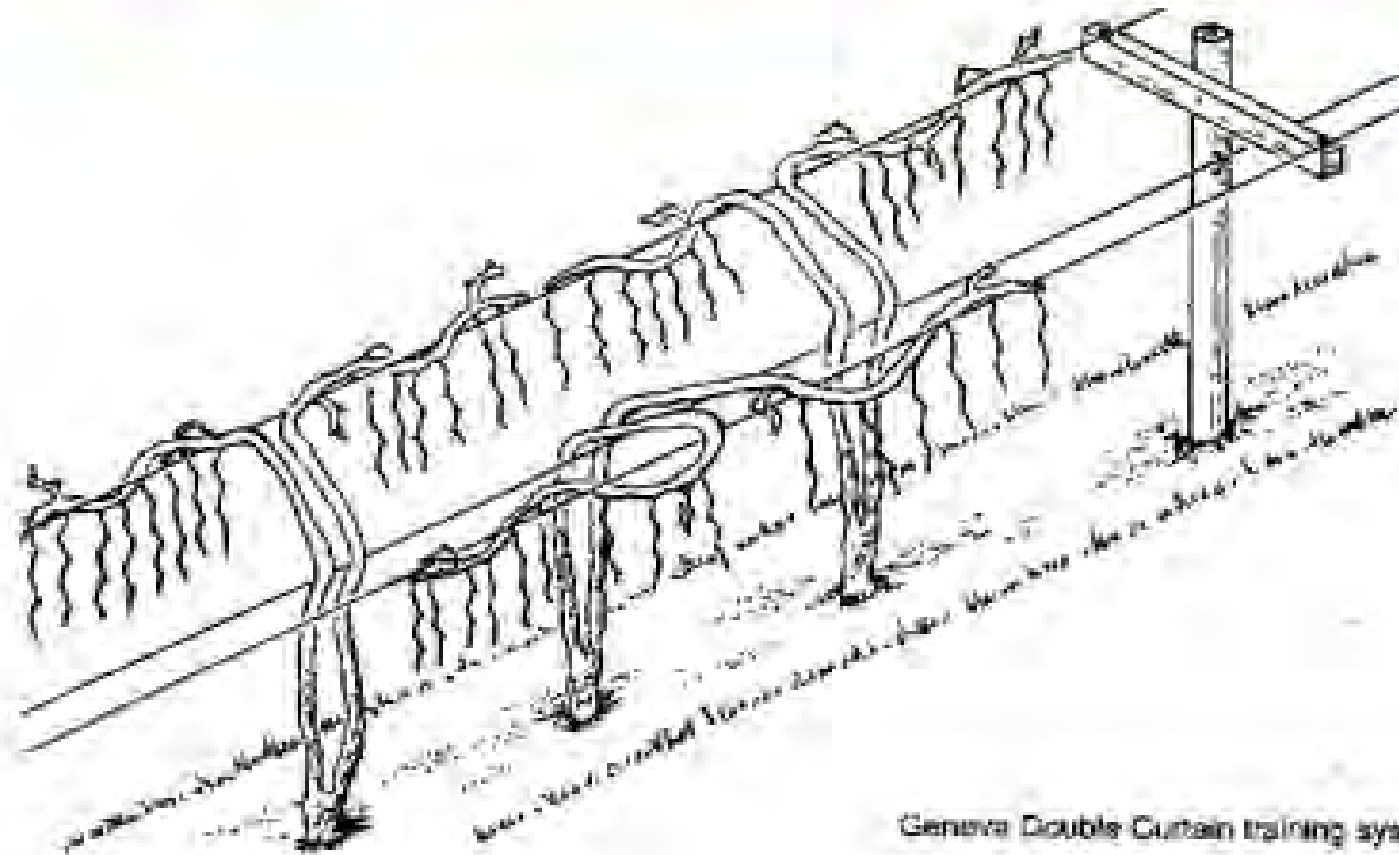


AKA: Single High Wire

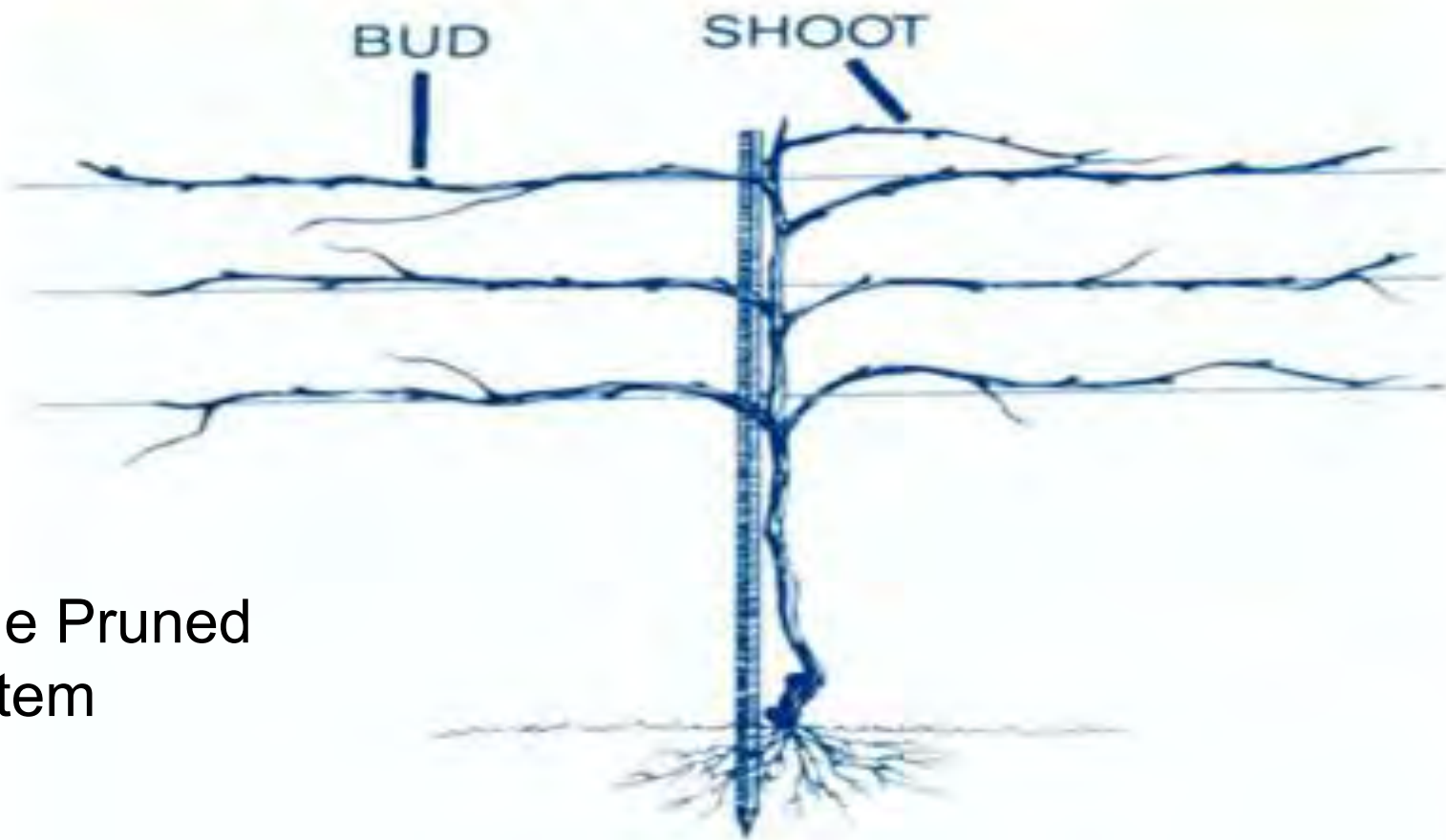
Vertical Shoot Position (VSP)



Geneva Double Curtain (GDC)



Six Cane Kniffin



Cane Pruned
System

Specialized Trellising Tools



Hydraulic Post Driver



Post Hole Auger



Wire Spinning Jenny



Chain-Grab Wire Puller



Crimping Tool

Trellising Hardware



12.5 ga High-tensile Wire
& 9 ga Soft Wire



Wire Strainers



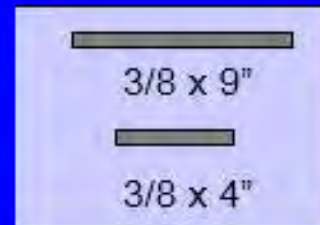
1 Strainer
handle



Crimping
Sleeves



Tension Indicator Spring
(Optional)



Steel Brace Pins
(for H-Brace)



Wire Vise
(for Rows < 200 ft)

Other Tools & Materials

Tools:

- Hammer
- Fencing pliers
- Steel bar
- Tape measure
- 6 ft measuring stick
- Plumb bob
- Cordless Drill w/ 3/8" bit
(for brace construction)

Materials:

- 1 3/4" or 2" Staples
- (Grounding rods, wire,
& clamps)
- (Hardwood twitch
sticks)

Trellis Post Materials

Red, southern yellow, or lodgepole pine:

- Pressure-treated with chromated copper arsenate (CCA).
- Life expectancy of 20 to 30 years (suppliers should be able to provide a guarantee).

Steel stakes:

- Can be substituted for line posts.
- Subject to bending and leaning.
- Should be used in combination with wood posts.

Other alternatives:

- Native timber
- Fiberglass
- Recycled plastic
- Reinforced concrete



Landscape Timbers Typically Last Only 2-5 Yrs. Before Replacement is Needed

Using Untreated Native Timber *

Resistance to Decay

Osage Orange	Exceptional
Black Locust	Exceptional
Red Mulberry	Exceptional
Eastern Red Cedar	Very resistant
Honey Locust	Moderate

*** Native woods do not have useful natural resistance to termites.**

Charring the buried portion of a post may have merit. It reduces the availability of a food source, and generates wood tar that has some anti-microbial activity. There is no proof of benefit, but it might not hurt and may very well help to prolong the life of a post.

Wood Trellis Post Comparison

Size vs Strength

Size *	Cross-sectional Area		Lateral Breaking Point	
	Dia. (in)	Sq. in.	% of 4"Post	Lbs
2.5	4.91	39	238	25
3	7.07	56	408	42
3.5	9.62	77	650	67
4	12.57	100	970	100
5	19.64	156	1893	195
6	28.27	225	3268	337

* Measured at narrow end

Preferred Post Size:

Line Post: 3 to 4 inch diameter

End Post: 5 to 6 inch diameter

8 ft Steel Stakes being used in combination with native timber posts



Mike White, ISU Extension

Driving Posts

In proper position:

- Straight
- Narrow end down
- Correct depth

A pre-cut measuring stick provides a quick reference for gauging the proper depth.



Dr. Bruce Bordelon,
Dept. of Horticulture, Purdue University



Wheatheart Post Pounder

Approx. \$14,000+

Two Saints
Winery
St. Charles, IA



Earth Anchor Requirements

Shaft:

Minimum: 1/2" x 36"

Preferred: $\geq 5/8"$ x $\geq 40"$

Helix:

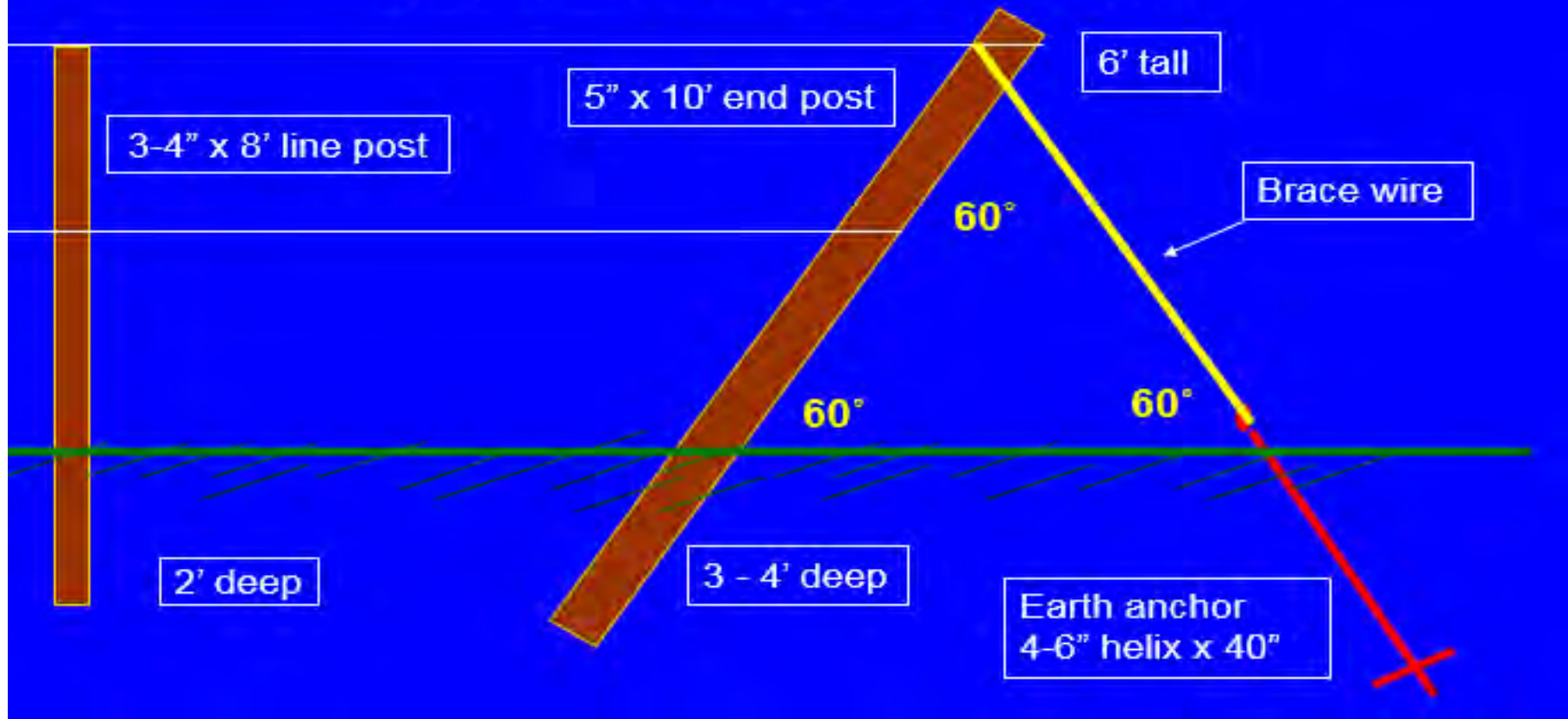
Dia. (in.)	4	6
Area (sq. in.)	12.6	28.3
% of 6-inch	44.5	100
Suitable for rows up to (ft)*	~250	600



* Suitable row length decreases on lighter, sandy soils.

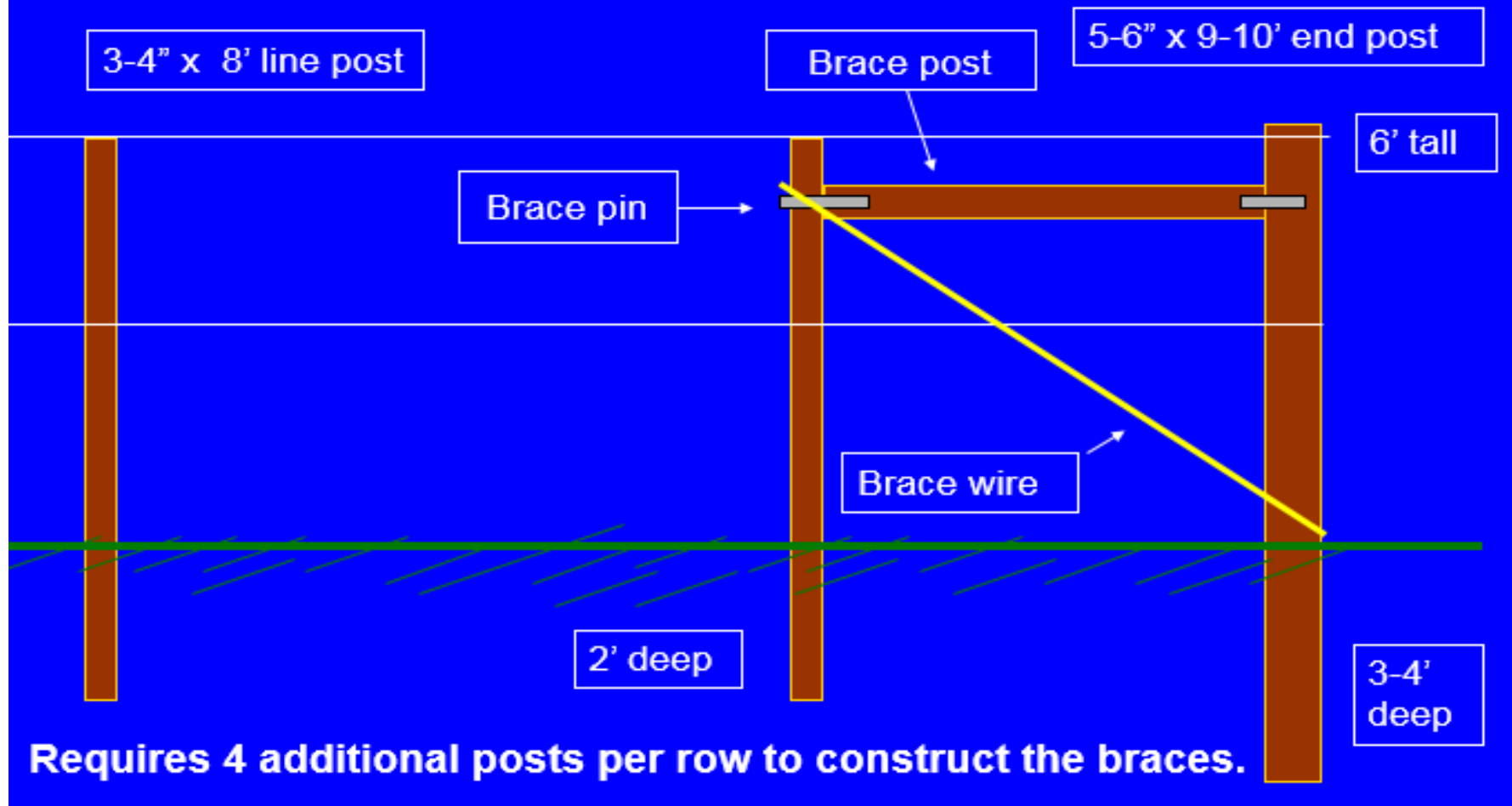
Anchored End Post System with an Earth Anchor

Suitable for rows up to 600 ft, but this is affected by soil texture and anchor's helix diameter.

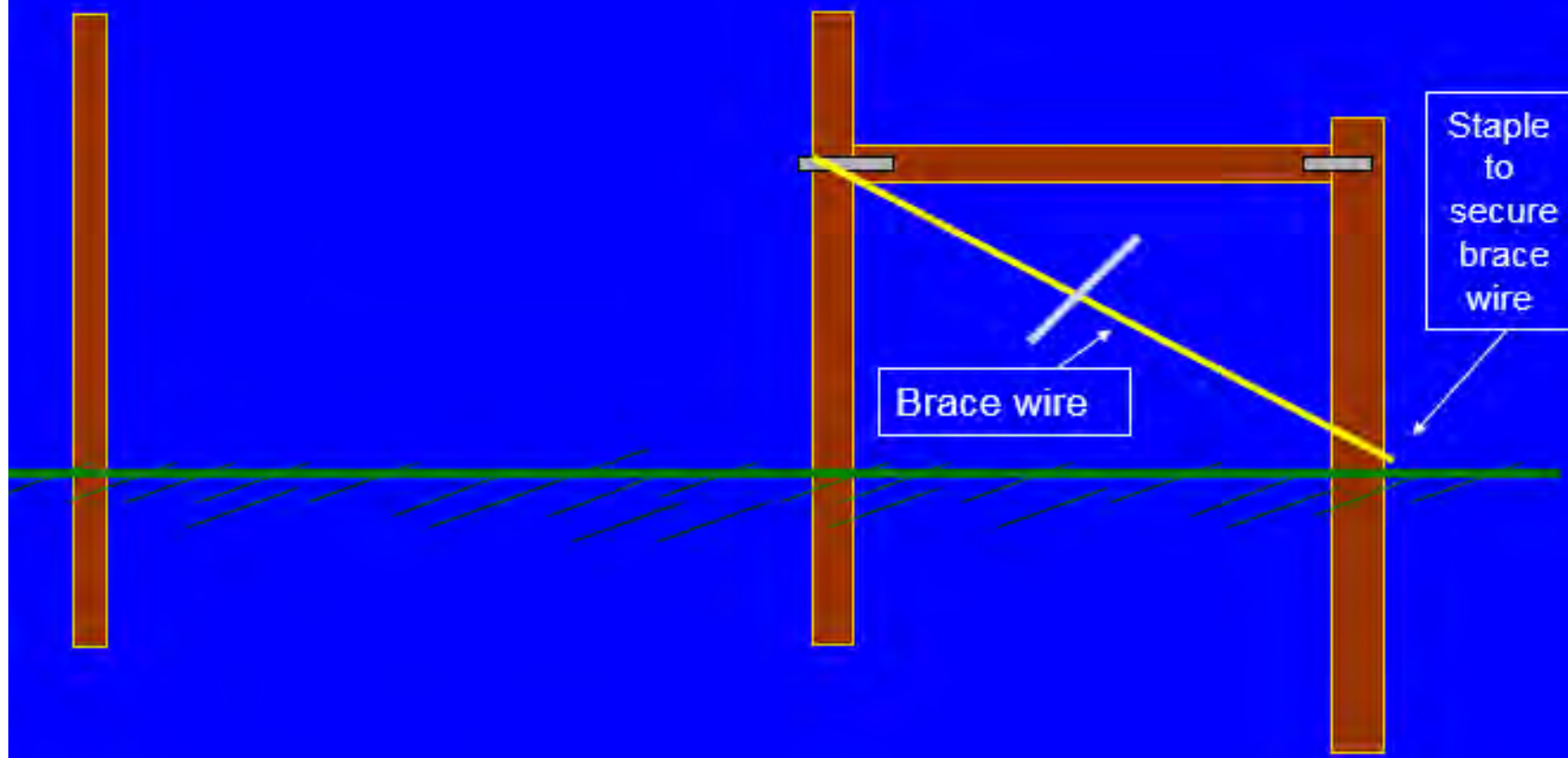


H-Brace End Post System

Required for rows over 600 ft



Attach Brace Wire forming a loop & twist to tighten



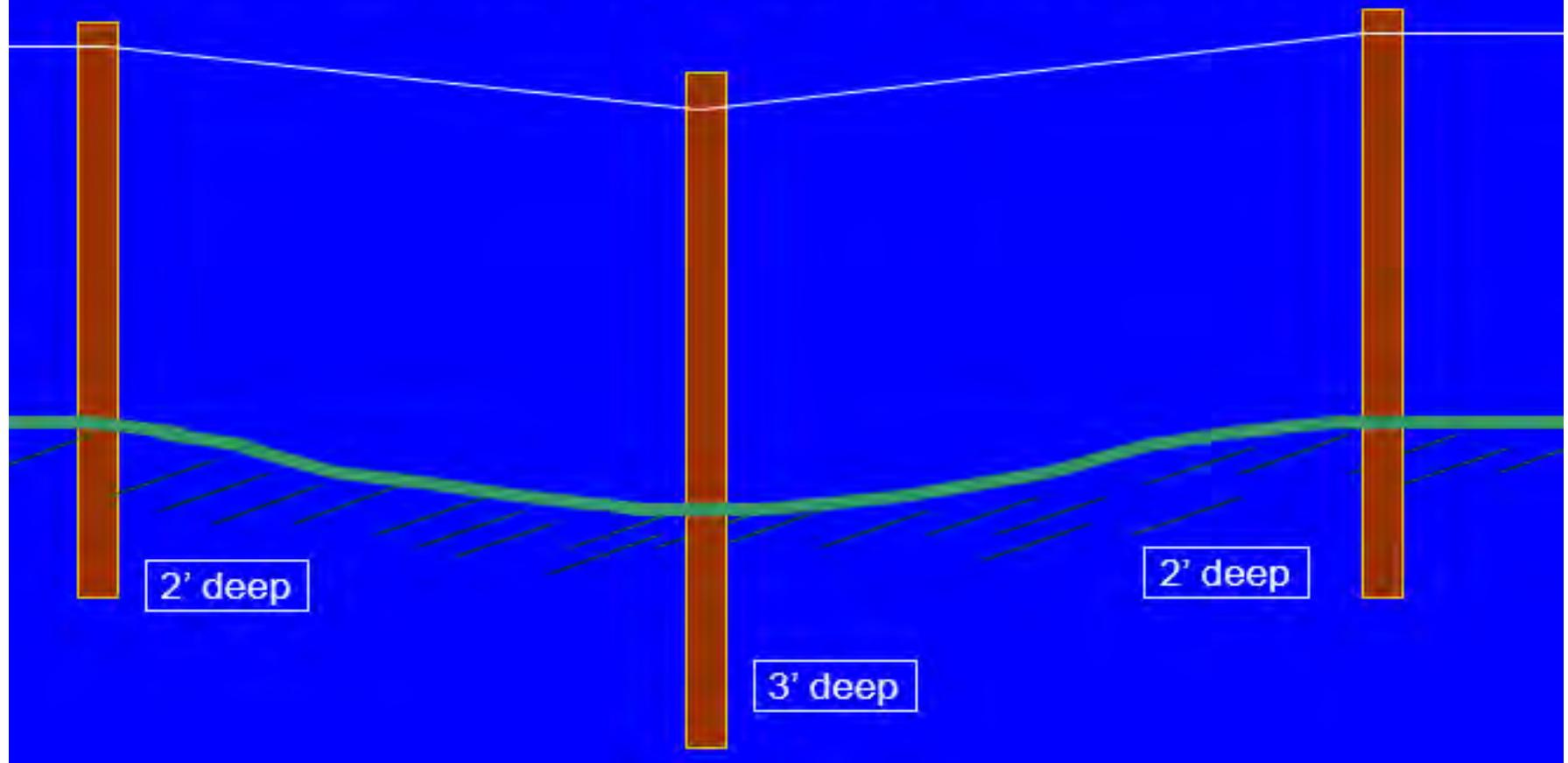
End Post System with a Tie-back Post



(Mike White, ISU Extension)

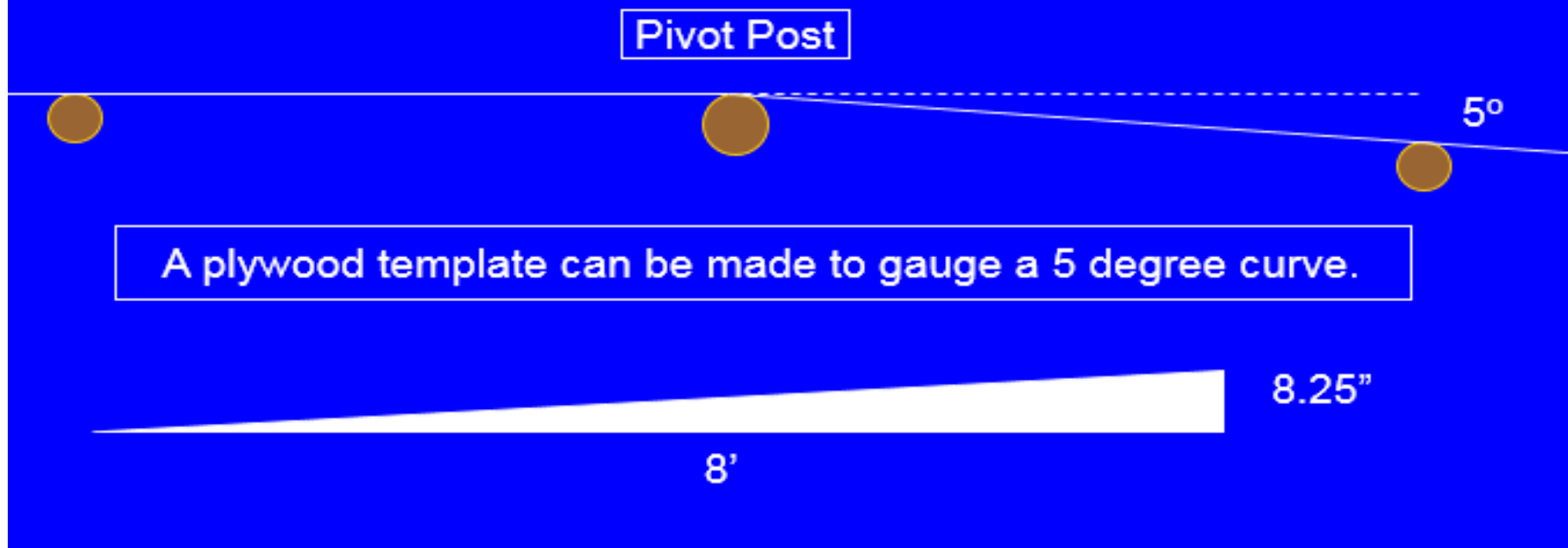
Posts in Swales

Posts in swales are prone to being pulled out by the wire tension. Use longer posts, and drive them deeper.



Planting on a Contour

Straight rows are preferred for stretching wire, but rows can be planted on a contour if the sharpness of the curve does not exceed 5 degrees per 30 ft of span. Pivot posts should be at least 4" dia. x 9' and driven 3' deep.





TJ's Fencing
Harpers Ferry, IA

563-586-2023

Ron Corey, Corning, IA

Uses fiberglass oil well sucker pipe
for fence posts.





Stone Hill Winery
Vignoles
Metal H-Brace



Signs are a
REAL help!

Dave
Cunningham
Rippey, Ia.

Wire Tension Gauge

40" nail span by $\frac{1}{2}$ inch depth

lbs. to pull wire $\frac{1}{2}$ inch \times 20 = lbs of Tension.

250 lbs is Ideal

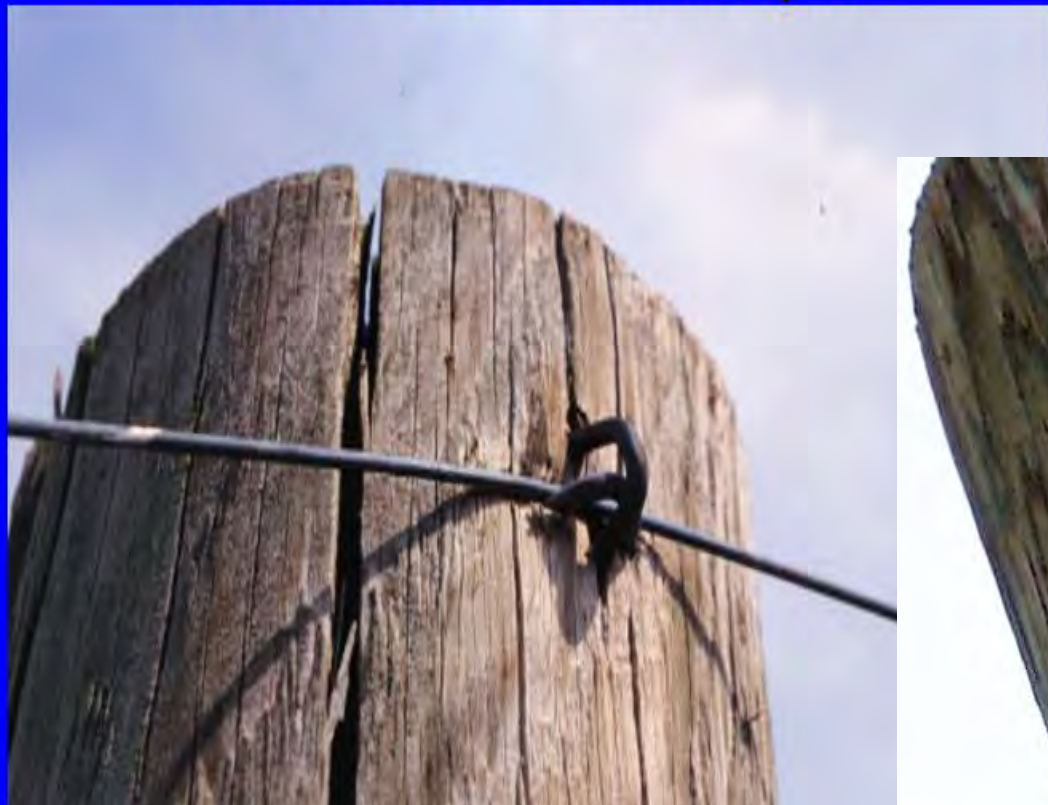
Loosen in
the Winter

- Estimated that a temperature drop from 80° to -20° F can increase the tension on 500 ft of 12.5 gauge high-tensile wire by 130 pounds due to shrinkage.
- Tension indicator springs will absorb most of the additional tension.



Tricks of the Trade

Double Stapling to attach wire to the side of a post



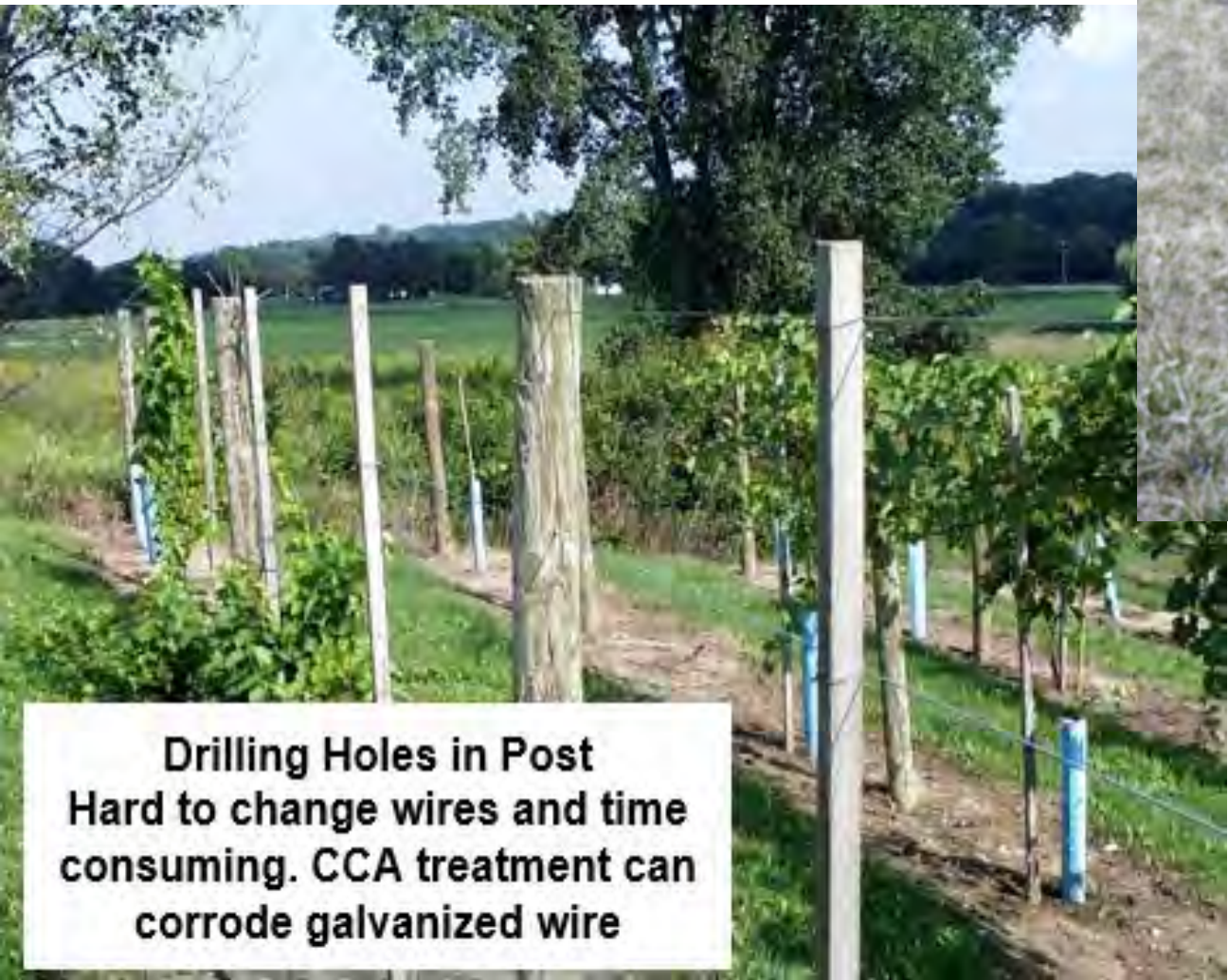
Drive staples at an angle to wood grain.

Wire Connectors



Recycled Metal Cans





Drilling Holes in Post
Hard to change wires and time consuming. CCA treatment can corrode galvanized wire



Galvanized wire rubbing against mild steel will rust.



Cover metal post ends to keep from snagging nets.



Wire Vice ??

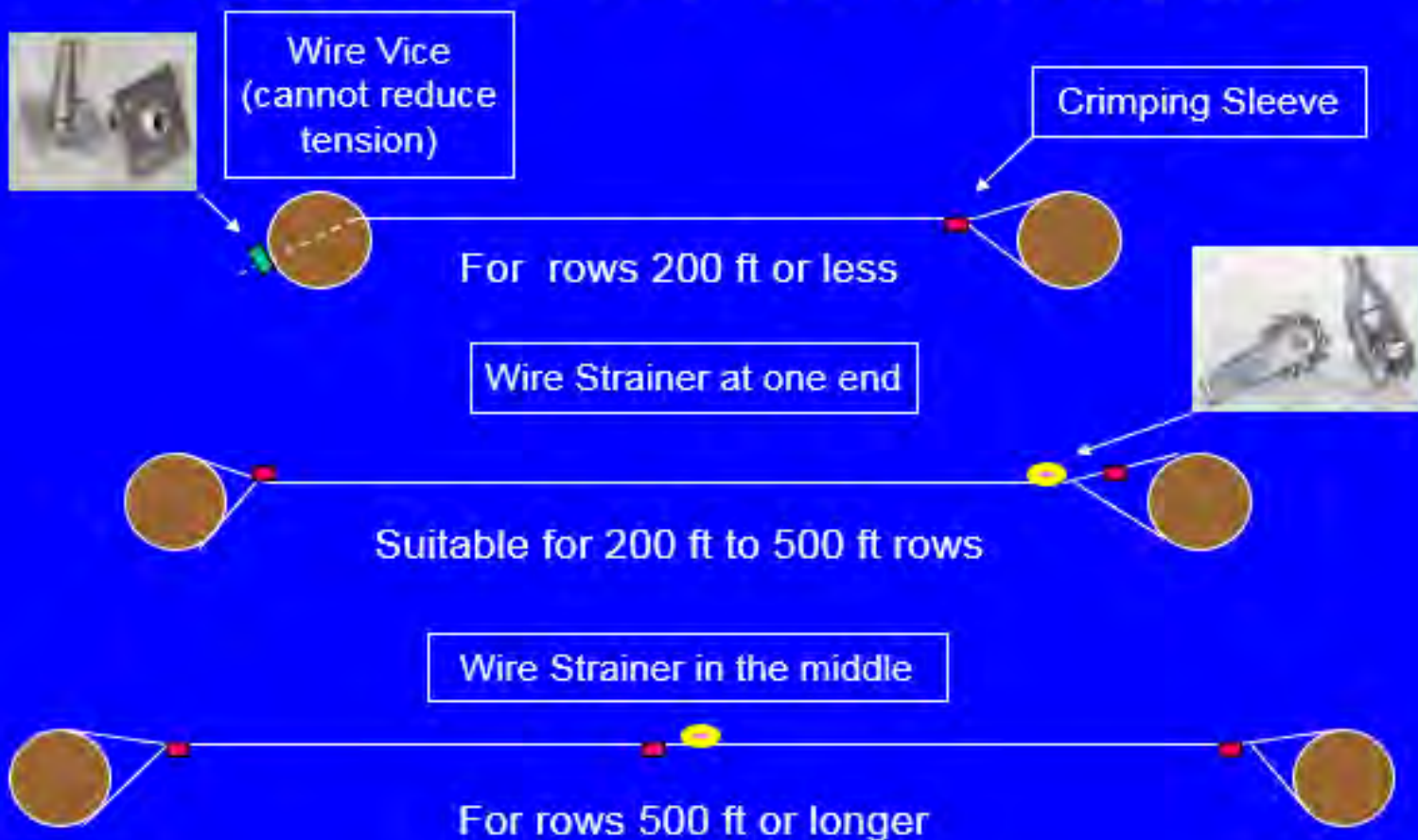
Often cuts
Galvanization
on Wire

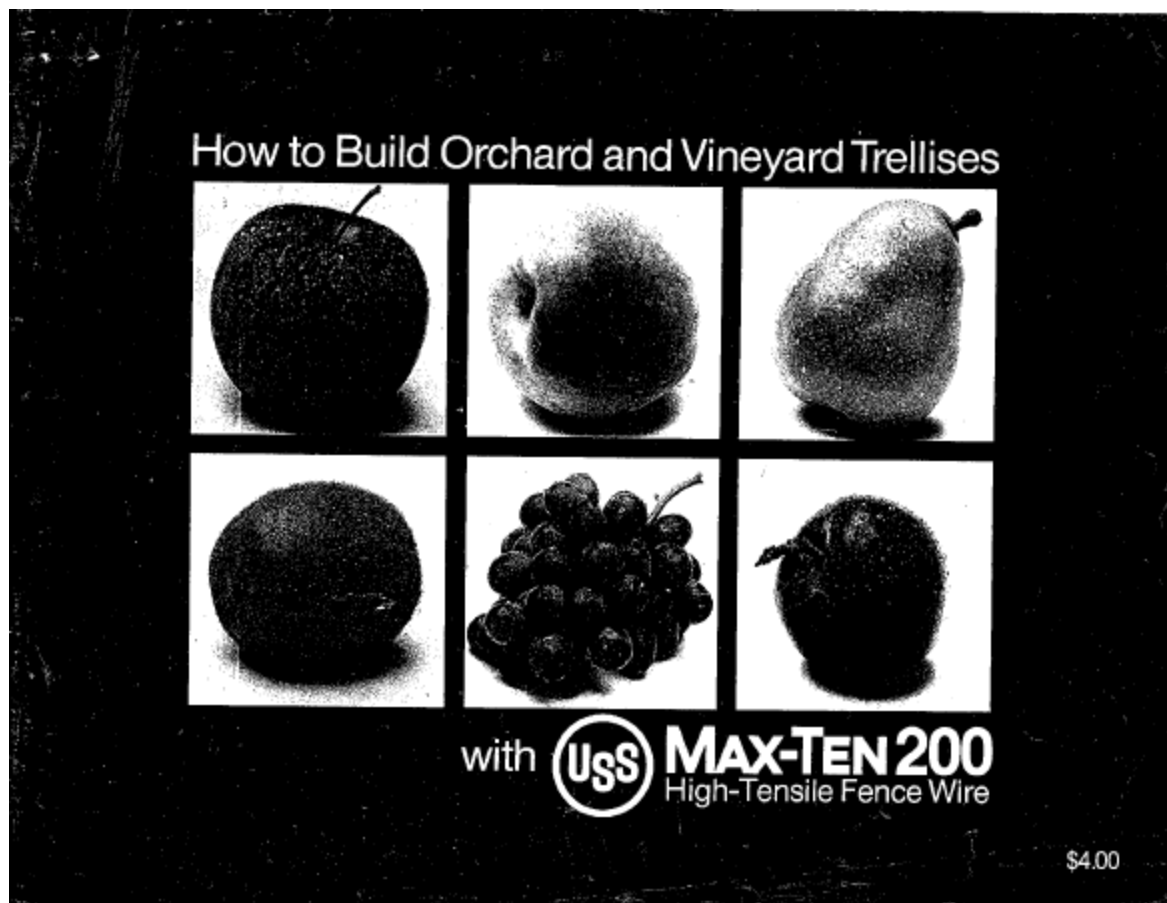
Don't recommend trellis wire tightener at anchor.



Winterhaven Vineyard &
Nursery – Janesville, MN

Alternate Tie-off Methods





U.S. Steel 1982, 48 pp. EXCELLENT!

<https://iastate.box.com/s/vau55ozir20nZRabb55kygw8uf72kcg2>

Remove Vineyard Acres out of USDA Farm Program Acres Prior to Planting Grapes!



Contact Your County FSA Office

<https://www.fsa.usda.gov/>