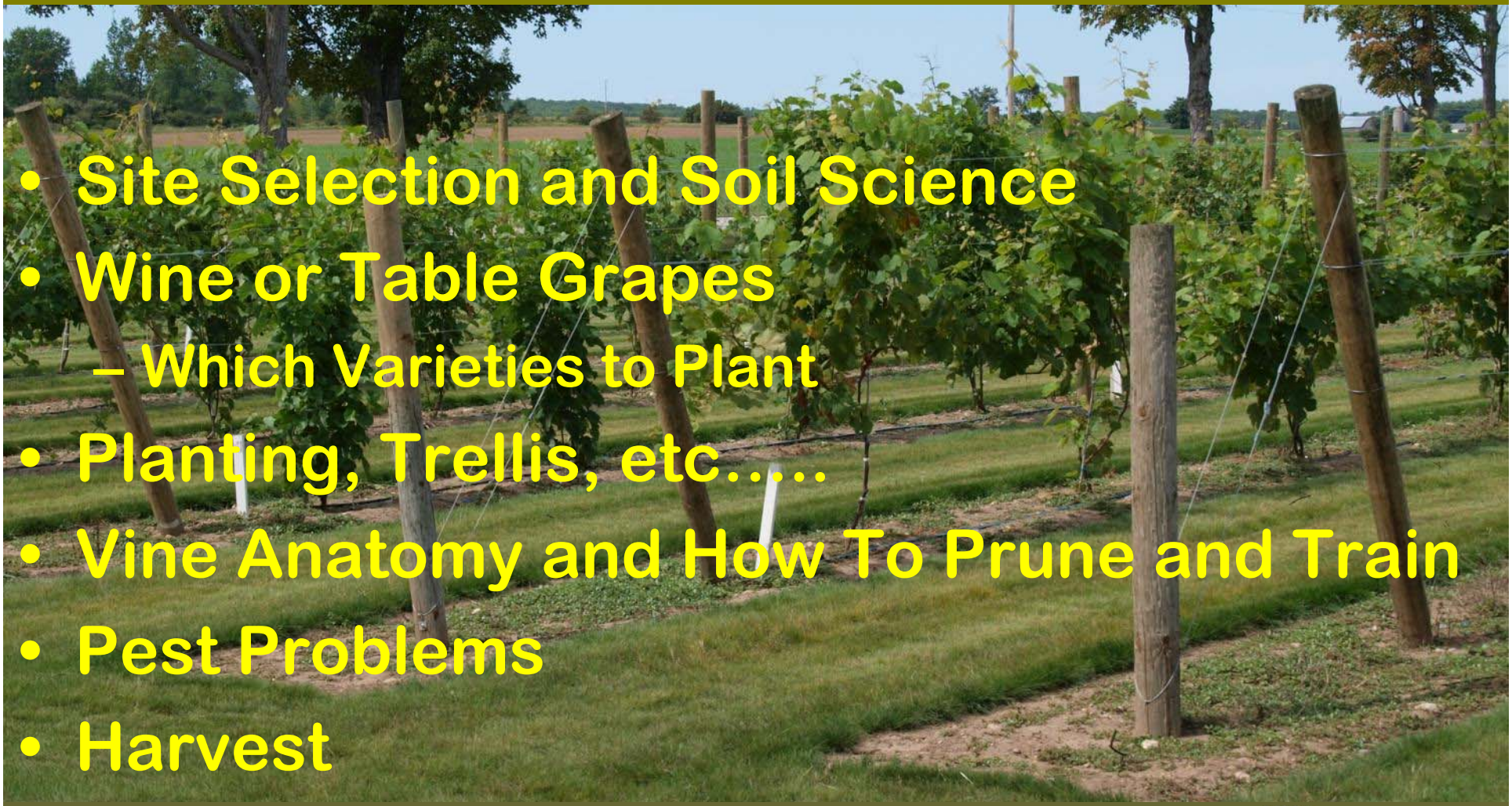
Grape Growing 101

Dean Volenberg-Door County UW-Extension

Updated 2.21.14

Questions



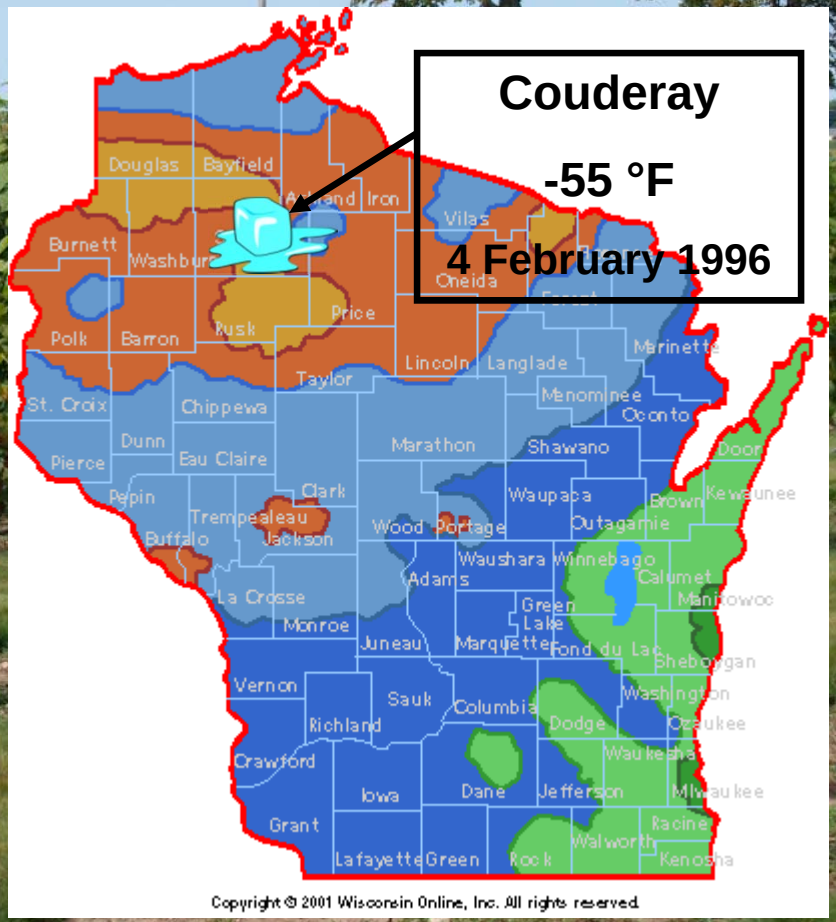
- Site Selection and Soil Science
- Wine or Table Grapes
  - Which Varieties to Plant
- Planting, Trellis, etc…..
- Vine Anatomy and How To Prune and Train
- Pest Problems
- Harvest

UW Extension Door County

Site Selection
Location

- **SE-SW facing slope**
  - **Air drainage down slope to open area**
  - **Avoid cold air traps at bottom of slope**
  - **Avoid sheltered areas with little air movement**

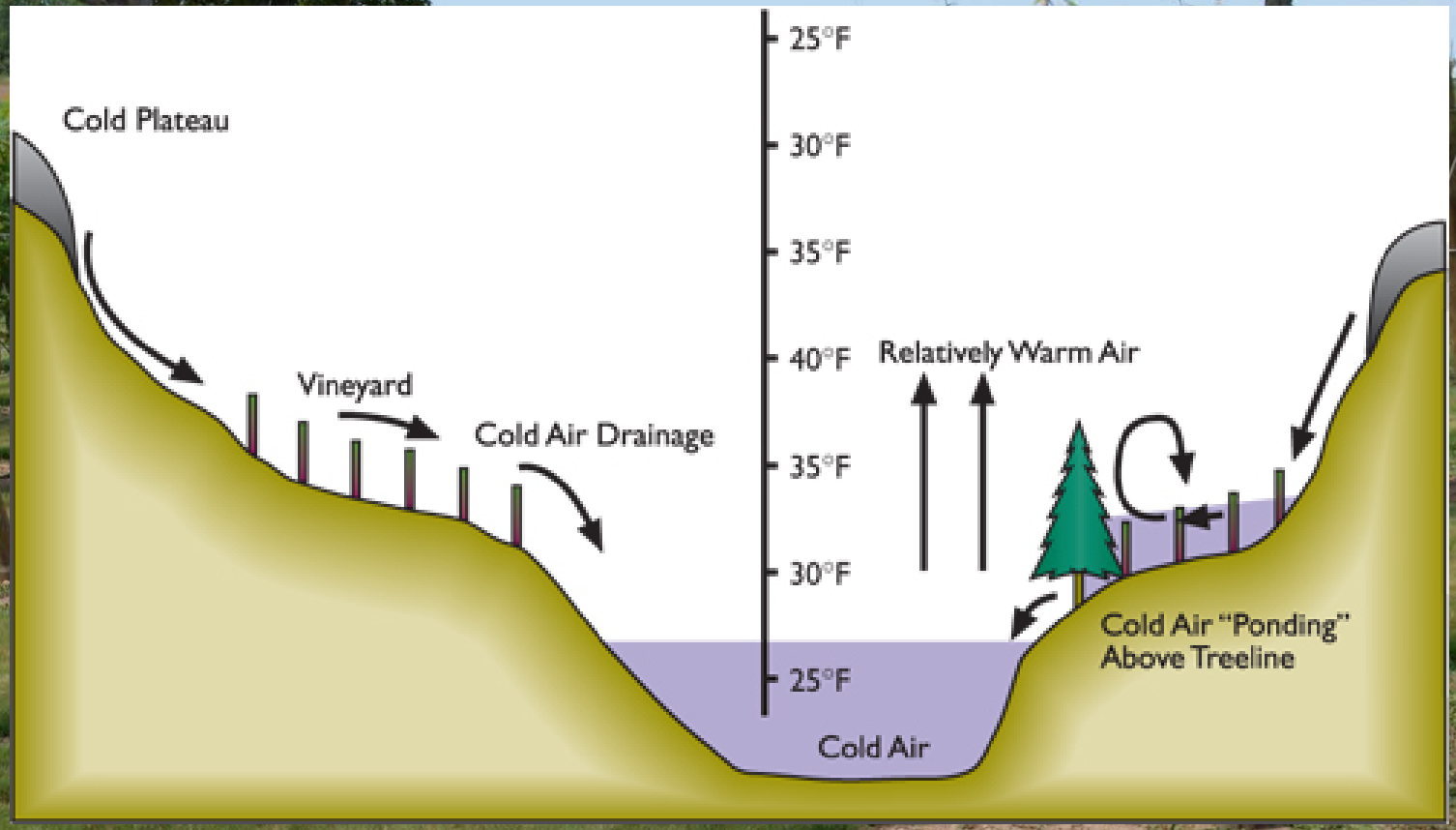
- **Frost free season of 140-150 days**
  - **2000 Heat Units 50 °F**
  - **Lowest temps. -10 to (-15) °F is ideal, -20 °F tolerable**



For More Information on Wisconsin Climate.
State Climatology Office
http://www.aos.wisc.edu/~sco/seasons/winter.html#Temperature

UW Extension
Door County

Site Selection
Location



UW Extension Door County

Bud Break

Spring Frost Events

UW Extension Door County

Bud Break

Spring Frost Events

UW Extension
Door County

Temperatures and Bud Break

Temperatures at which 50% of the buds are killed at four phenological stages of Concord grapevines.

Phenological Stage	Influence of surface moisture of bud	
	Wet[1]	Dry
Scale Crack	22° F[2]	15° F[2]
First swell	24° F	18° F
Full swell	26° F	19° F
Bud burst	27° F	21° F

[1]Indicates presence of hoar frost, dew, ice or water from precipitation or irrigation.
[2]Values are T_{50}, temperature at which 50% of the buds are killed.

Data from: Johnson, D.E. and G. S. Howell. 1981. Factors influencing critical temperature for spring freeze damage to developing primary shoots of Concord grapevines. Am. J. Enol. Viticult. 32:144-149.

Site Selection
Soil and Soil Test

- **Soil**
  - **Well-drained loam**
  - **pH 6.0 to 7.2**
  - **125-150 ppm K_2O**
  - **30-50 ppm P205**
  - **1 to 2 oz nitrogen/plant**

    Split application during first year

- Soil Sampling
  - Sampling Soils for Testing A2100

    http://learningstore.uwex.edu/Assets/pdfs/A2100.pdf

  - Sampling garden soils and turf areas for testing A2166

    http://learningstore.uwex.edu/Assets/pdfs/A2166.pdf

UW Extension Door County

http://websoilsurvey.sc.egov.usda.gov/App/HomePage.htm

UW Extension Door County

SoilWeb: An Online Soil Survey Browser | California Soil Resource Lab - Windows Internet Explorer

http://casoilresource.lawr.ucdavis.edu/drupal/node/902

File Edit View Favorites Tools Help

Favorites | Cold temperatures raise con... | Wisconsin Degree Days | U.S. Commercial Bushel Sizes | ONE-WAY ANOVA | Repair XP | $1179 HP dv7-7012nr, HP P... | http--download.lenovo.com...

SoilWeb: An Online Soil Survey Browser | California So...

Page Safety Tools

California Soil Resource Lab

Home Links Online Soil Survey People Projects Software Site Map

SoilWeb: An Online Soil Survey Browser

- Accessing Soil Survey Data via Web-Services
- Dynamic Export of Soil Survey Data to KML through Soil-Web
- Initial SoilWeb Concept on Paper
- Major updates to CA, AZ, NV online soil survey system
- Migrating to Ka-Map! Online Soil Survey for AZ, CA and NV
- Planned Improvements in SoilWeb
- Saving Chunks of SSURGO Data in SoilWeb for Google Earth
- Soil Properties Visualized on a 1km Grid
- SoilWeb for the iPhone
- SoilWeb Usage Statistics
- Streaming Soil Survey Data in Google Earth (updates)
- Three New Soils-

SoilWeb: An Online Soil Survey Browser

Submitted by dylan on Fri, 2010-02-26 16:13.

Our online soil survey can be used to access USDA-NCSS 1:24,000 scale detailed soil survey data (SSURGO) in many parts of the lower 48 states. Where this data is not yet available, 1:250,000 scale generalized soils data (STATSGO) can be accessed instead. An interactive map interface allows for panning and zooming, with highways, streets, and aerial photos to assist navigation (Figure 1). Soil polygons become visible near a scale of 1:30,000. Alternatively, a GPS point, CA Zip code, or a street address can be used to zoom in on a specific location. General usage notes and information on how our online soil survey work can be found here. Statistics on who is using our online soil survey can be found here. Technical details on SoilWeb can be found in this publication. Please note that we are currently transitioning to a new server, and planning to have our local copy of the SSURGO, STATSGO, and OSD databases updated in the coming months.

The SoilWeb app is a portable version of the UC Davis California Soil Resource Lab's Web-based interface to digital soil survey data from USDA's Natural Resources Conservation Service (NRCS).

SSURGO Map Units

STATSGO Map Units

Select an Interface to SoilWeb

- An iPhone App for real-time, location-based soil queries! [details] [SSSA News Brief] [ANR News Article] [UCD Aggie Article]
- Similar App for AndroidOS smartphones
- Google Maps interface
- Google Earth Interface
- A Text-only interface to SSURGO

- HTTP SoilWeb API:
  1. WMS queries (access our data in QGIS etc.)
     - WMS GetCapabilities request
  2. Text-based queries

REAL TIME SOIL DESCRIPTIONS BASED ON YOUR CURRENT LOCATION

start | 1:38 PM

Samples Analyzed By:
UW Soil & Plant Analysis Lab
8452 Mineral Point Road
Verona, WI 53593
(608) 262-4364

SOIL TEST REPORT

COOPERATIVE EXTENSION
University of Wisconsin-Extension
University of Wisconsin-Madison
Department of Soil Science

Results also available on-line at http://uwlab.soils.wisc.edu/reports
lab number: 5839 access code: q8h55

LAB #: 5839

DOOR CO UWEX OFFICE -
CO GOVERNMENT CTR, 421 NEBRASKA ST
STURGEON BAY, WI 54235

This Report is for:
[redacted]

County	Account No.
Door	555015

Date Received	Date Processed
4/16/2009	5/1/2009

Slope	Acres	Plow Depth	Irrigated
0%	5	7"	No

Soil Name
unknown (group D)

Field Name
WI

Previous Crop
no crop

NUTRIENT RECOMMENDATIONS

Cropping Sequence	Yield Goal	Crop Nutrient Need N	Crop Nutrient Need P2O5	Crop Nutrient Need K2O	Legume N	Fertilizer Credit Manure N	Fertilizer Credit P2O5	Fertilizer Credit K2O	Nutrients to Apply N	Nutrients to Apply P2O5	Nutrients to Apply K2O
	per acre	lbs/a	lbs/a	lbs/a	lbs/a	lbs/a	lbs/a	lbs/a	lbs/a	lbs/a	lbs/a
Grape, establishment	all	see below	0	250	0	0	0	0	see below	0	250
(no crop)	n/a										
(no crop)	n/a										
(no crop)	n/a										

There is no lime recommendation.

ADDITI

Lime recommendations for apples and cherries apply only to pre-plant test... it
crops must also be limed or amended with an acidifying material and incor...

Recommended rates are the total amount of nutrients to apply (N-P-K), inc...

This soil should be monitored more closely because of it has a relatively lo...

P_2O_5 and K_2O nutrient application rates are provided for establishment of fr...
on tissue testing with the goal of achieving and maintaining tissue nutrient ...

1 oz. N/plant x 544 plants/acre x 2 =

68 lbs/N acre

Because of very high P levels, P_2O_5 applications from fertilizer or manure should be redu... ...crops with a high P removal should be grown.

Year 1: Apply 1 ounce of N per plant two times during the establishment year. This rate applies for the establishment year only. After establishment use tissue testing to guide fertilizer application.

N.R.=Not required for calculation of lime requirement when soil pH is 6.6 or higher.

TEST INTERPRETATION

Cropping Sequence	Very Low	Low	Optimum	High	Very High	Excessive
Grape, establishment	PPPPPPPPPPPPPPPPPPPPPPPPPPPPPPPPPPPPPPPPPPPPPPPPPPPPPPPPPPPPPPPPPPPPPPPPPPPPPPPPPPPPPPPPPPPPPPPPP KKKKKKK					
(no crop)						
(no crop)						
(no crop)						
Rotation pH	XXXXXXX... ...XXXXX... ...XXXXXX					

102
lbs P/acre

90
lbs K/acre

Sample Identification	Soil pH	O.M %	Phosphorus ppm	Potassium ppm	60-69 Lime Req (T/a)					Manganese ppm	Zinc ppm	Sulfate-Sulfur ppm	Sulfur Avail. Index	Texture Code	Sample Density	Buffer pH
1	7.4	2.7	51	45										2	1.10	N.R.
Adjusted Averages	7.4	2.7	51	45												

Soil and Macro-Nutrients

- Soil Test Results
  - P_2O_5
  - K_2O
  - N
- Plants take up
  - $H_2PO_4^-$ or HPO_4^{2-}
  - K^+
  - NO_3^- or NH_4^+
- Soil Mobility
  - N>K>P
- Soil negatively charged
  - Clay particles
  - Organic matter
- $H_2PO_4^-$ or HPO_4^{2-} form complexes with
  - FE
  - AL
  - CA

Wine or Dine

- Wine Grapes
  - Numerous hardy varieties to choose from
  - White or red wine
  - Quality dependent on
    - Growing conditions
    - Crop load management
    - Training system
- Table Grapes
  - Seedless varieties both blue, red, and green/white
  - Somewhat reduced hardiness
  - Easy to grow
  - Unique flavors and qualities
  - Juice options for some seeded varieties

UW Extension Door County

Table Grape Varieties

- **Red Seedless Varieties**
  - Reliance (Arkansas)
  - Einset (New York)
  - Vanessa (Ontario)
  - Canadice (New York)
  - Petite Jewel (Wisconsin,Swenson)
  - Somerset seedless

UW Extension
Door County

Reliance

- Vines are hardy and vigorous
- Early ripening
- High production potential
- Medium sized cling skin berries
- Mild flavor and good quality
- Variable fruit color if shaded
- Consistent performance
- Hardy -15 to -25 °F

Einset

- Vines are hardy with moderate vigor
- Early ripening after Reliance
- Medium sized berries, slightly thick cling-slip skin
- Mild flavor, strawberry after taste
- Production level variable
- Good storage potential
- Hardy -15 to -25 °F

Vanessa

- Moderately hardy, vigorous vines
- Prefers well-drained fertile soils
- Early ripening with Einset
- Medium sized berries,thin skinned cling skin with very firm crisp flesh
- Production and vigor site dependent
- Very high quality and storage life
- Hardy -15 to -25 °F

Red Table Grape

UW Extension Door County

Canadice

- Vines are hardy, moderate vigor
- Sets heavy crops limiting vigor
- Ripens with Einset
- Medium sized berries slip skin tendency, somewhat soft flesh
- Good quality, similar flavor to Delaware. *Labrusca* (foxy) flavor
- Cluster thin to maintain vigor
- Hardy -10 to -20 °F

Petite Jewel

- Very hardy, moderate vigor vine
- Ripens with or before Reliance
- Berries small-medium size
- Firm flesh, fruity-spicy flavor
- Small loose clusters
- Very consistent performer for harsh winter conditions

Red Table Grape

UW Extension Door County

Somerset Seedless

- Very vigorous vine
- First to ripen at WMARS trial – end of August
- Berries small-medium size
- Clusters ~ ¼ lb
- Loose clusters
- Very consistent performer for harsh winter conditions

Table Grape Varieties

- **White/Green Seedless**
  - **Marquis (New York)**
  - **Himrod (New York)**

UW Extension Door County

Marquis

- Vines are hardy of moderate vigor
- Ripens with,- slightly after Vanessa
- Large round berries borne in long loose clusters
- Skin thickness reduces with maturity
- Good production; slow to establish
- Best green for Midwest
- Long maturity, best for southern WI

White/Green Table Grape

UW Extension Door County

Himrod

- Moderately hardy and vigorous
- Medium sized cling skin berries
- Ripens with Einset
- High quality fruit and flavor
- Excellent storage potential
- Hardiness is still questionable for reliable production in northern areas of WI

White/Green Table Grape

UW Extension Door County

Table Grape Varieties

- **Blue seedless**
  - **Trollhaugen**
  - **Mars**

UW Extension
Door County

Mars

- Hardy vigorous vines
- Early – midseason maturity
- Medium-large, slip skin berries, somewhat thick skinned
- Concord type flavor, good quality and storage potential
- Very productive and reliable

Trollhaugen

- Very hardy vines of moderate vigor
- Early maturity before Mars
- Small, thin skinned slip skin berries
- Excellent mild Concord flavor for fresh market sales
- Very productive and reliable with good storage potential
- Excellent for harsh winter conditions

Blue Table Grape

UW Extension Door County

Seeded Varieties

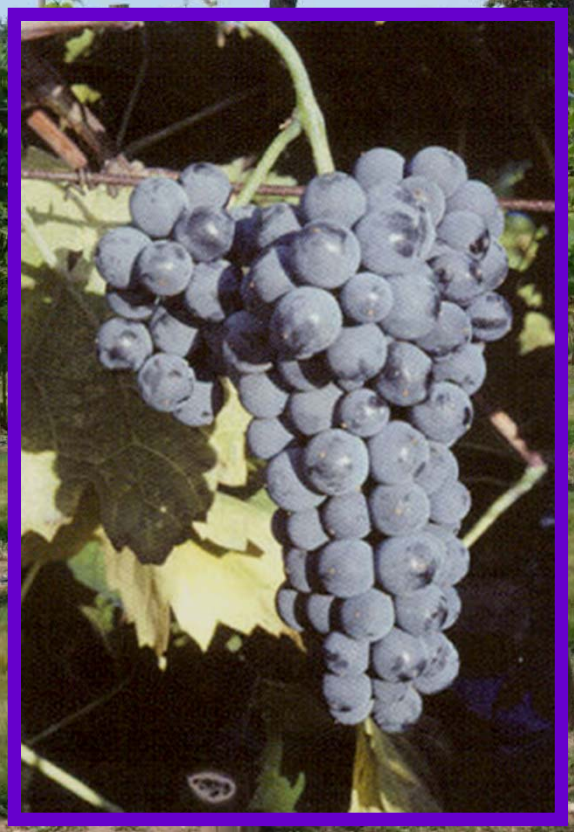
- **Buffalo**
  - Concord type, hardy, vigorous, early maturity
  - Large fruit of excellent quality
- **Swenson Red**
  - Red variety, very hardy, late maturity
  - Large fruit, firm, excellent quality, needs heat
- **Bluebell**
  - Concord type, early maturity
  - Very hardy
  - Reported as best juice variety
- **Concord**
  - Old favorite
  - Very hardy, very vigorous
  - Needs heat and long season

Wine Varieties

- **Red Wine**
  - Foch
  - St. Croix
  - Frontenac
  - Leon Millot
  - Marquette
  - Baltica
  - Petite Pearl
- **White Wine**
  - La Crescent
  - La Crosse
  - St. Pepin
  - Frontenac gris
  - Brianna

Marechal Foch

- Very hardy vines
- Low to moderate vigor
- Early maturity
- High sugar and high acid
- Making some nice wines



Red Wine Grape

UW Extension Door County

St. Croix

- Very hardy vines
- Moderate vigor
- Matures early
- Harvested at low sugar
- Very productive
- Popular wine variety in MN

Red Wine Grape

UW Extension Door County

Frontenac

- Very hardy MN introduction
- Vigorous and very productive
- Good disease resistance
- Susceptible to Grape Phylloxera
- High sugar 24-28%
- Very high acid
- Matures early October
- Deep red color for ports

Leon Millot

- Hardy, vigorous vines
- Ripens before Foch, early season
- Produces good quality Burgundy
- Very productive
- Relatively disease free
- Good choice in short season area

Red Wine Grape

UW Extension Door County

Marquette

- Very hardy MN introduction
- Moderate vigor
- Production levels of 3 T/A
- Matures mid-late September
- High sugar relatively low acid
- Good disease resistance

Red Wine Grape

UW Extension Door County

Baltica

- Introduction from Estonia
- Parentage: *V. amurensis, V. labrusca, V. riparia, and V. vinifera*
- Long loose clusters
- Small sized berries (2 g)
- Disease resistant except P. mildew
- Makes a light red to full complex red wine, climate dependant
- Excellent variety for short growing season

Red Wine Grape

UW Extension Door County

Petite Pearl

- Introduction from MN Breeder Tom Plocher
- Matures mid-September to early October in MN
- Compact cluster with small berries
- Breaks bud late (frost protection)
- Disease resistant to P. mildew, D. mildew, and black rot
- High tannin levels and low TA

Red Wine Grape

UW Extension Door County

La Crescent

- Very hardy
- Vigorous and productive
- Resembles Vignoles in flavor
- High acid/High sugar
- Low disease susceptibility
- Matures late September

White Wine Grape

UW Extension Door County

La Crosse

- Very hardy vines, moderate vigor
- Early midseason maturity
- Produces fruity non-labrusca wine
- Very productive
- Unique flavor even as a table grape
- Consistent producer

White Wine Grape

UW Extension Door County

St. Pepin

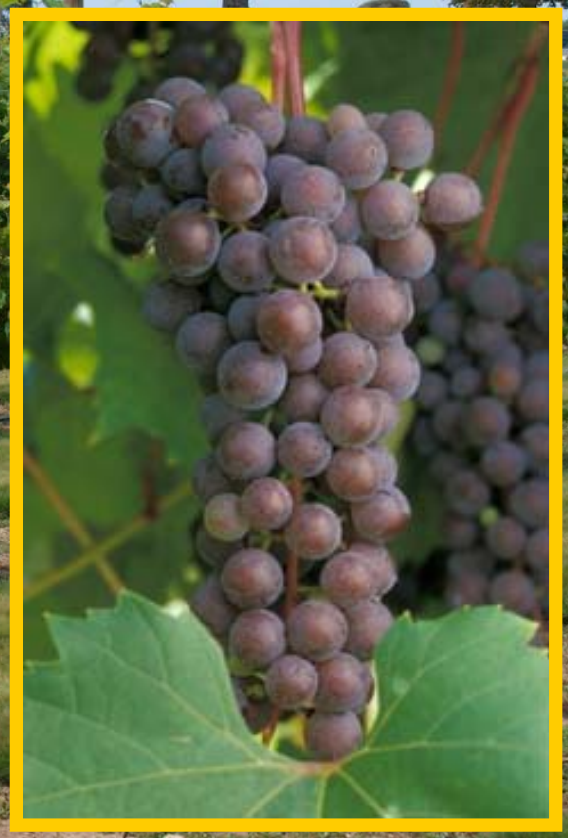
- Very hardy, vigorous vines
- Midseason maturity
- Pistillate type needs pollinator
- Produces fruity Riesling type wine
- Moderate production
- Blends well Like La Crosse is a good table grape

White Wine Grape

UW Extension Door County

Frontenac Gris

- Bud sport of Frontenac
- Same viticultural characteristics as Frontenac
- Late midseason 24 to 25° Brix (MN)
- Peach, apricot, and tropical aromas



White Wine Grape

UW Extension Door County

Brianna

- Bred by Elmer Swenson and named by Ed Swanson
- Medium to large berries
- Medium to small tight clusters
- Vigorous growth
- Very cold hardy
- Grapefruit, tropical, floral characteristics
- Often harvested at low brix 16 to 18, as ripening progresses foxy notes become apparent

White Wine Grape

UW Extension Door County

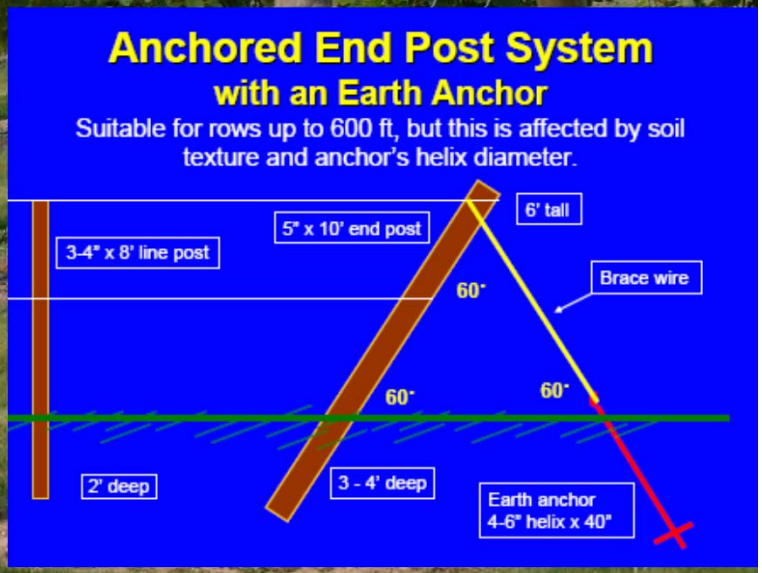
Planting

- Select North-South row orientation
- Spring plant into well tilled weed-free soil
- Row spacing greater than trellis height
- Plant spacing 6-8’ apart
- Root prune vs. plant all roots
  - Excessively long roots cut back
  - Prevent twisting and entangling of roots
- Plants pruned back to 2-3 expanding buds
  - Best done after bud swell

UW Extension Door County

Trellis Construction

- Trellis responsible for vine + crop weight
  - Provides platform for pruning and training
  - Needs to function for 20-30 yrs.
  - Construct once and only once
- In place year one preferred
  - Wire available for initial shoot
  - Keep shoots off of ground
- Training systems for trellis
  - Cane pruning
  - Spur(2-3 bud cane) pruning



UW Extension
Door County

Major Trellis Components

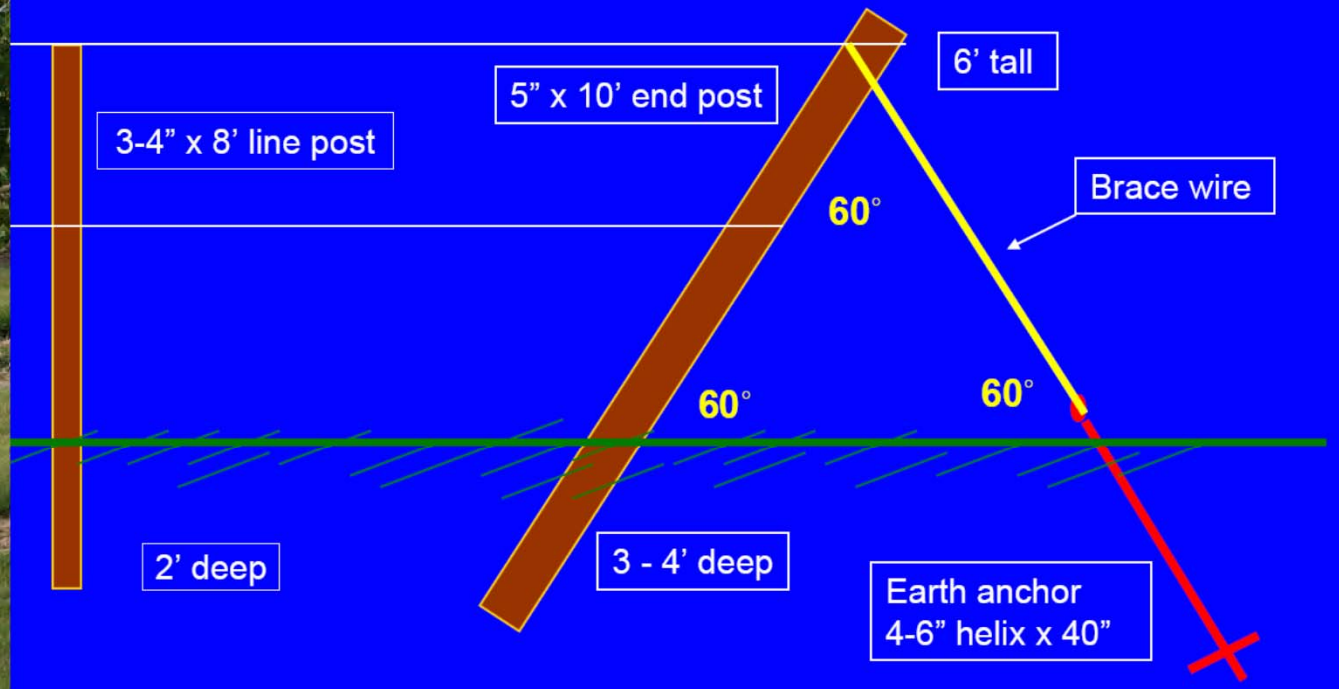
- **Posts: Wood (preferred)**
  - **Line Posts**
    - **Spaced 21, 24 or 28 ft apart - Dependent on vine spacing**
  - **End Posts**
    - **Anchored: earth anchor or tie-back post for rows less than 600 ft.**
    - **Braced: H-brace or slant brace for rows over 600 ft.**
- **Wire Support**
  - **High-tensile galvanized steel wire-12 gauge**
    - **High cordon, or Kniffen: 1 to 3 wires**
    - **Vertical shoot positioning: 5 to 7 wires**
    - **Geneva Double Curtain: 3 or 4 wires**

UW Extension Door County

End Post

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.

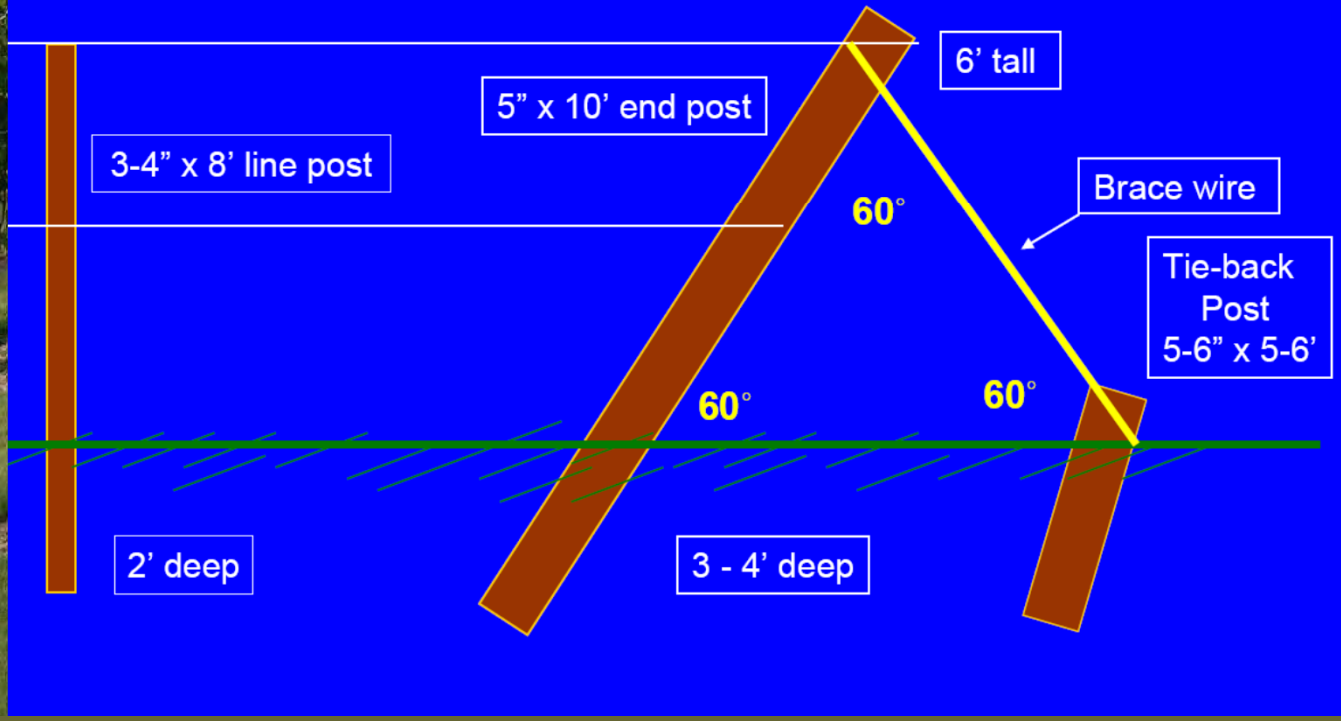


UW Extension
Door County

End Post

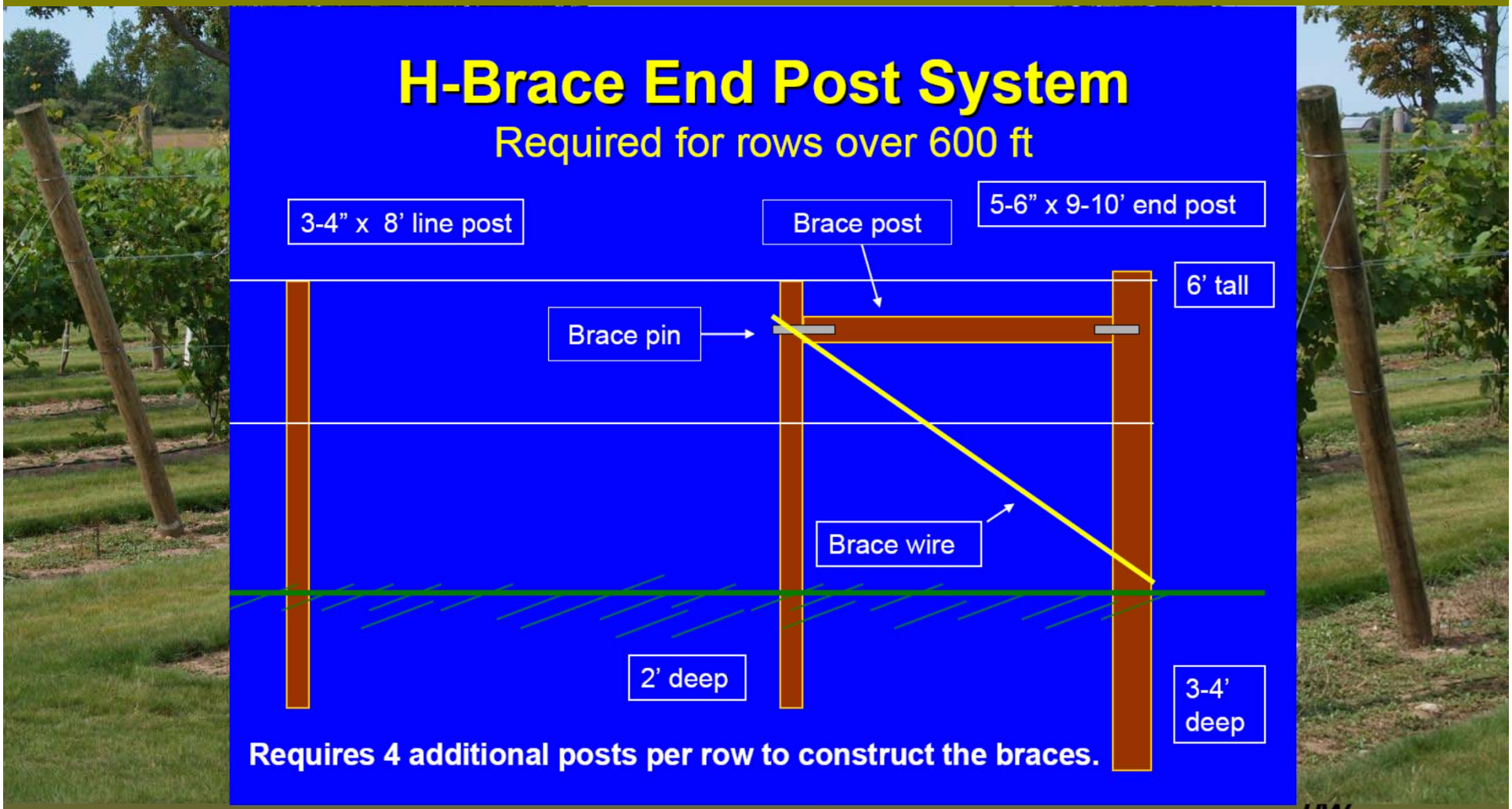
Anchored End Post System
with a Tie-back Post

Suitable for rows up to 600 ft. Cost of materials will often determine whether an earth anchor or tie-back post is used.



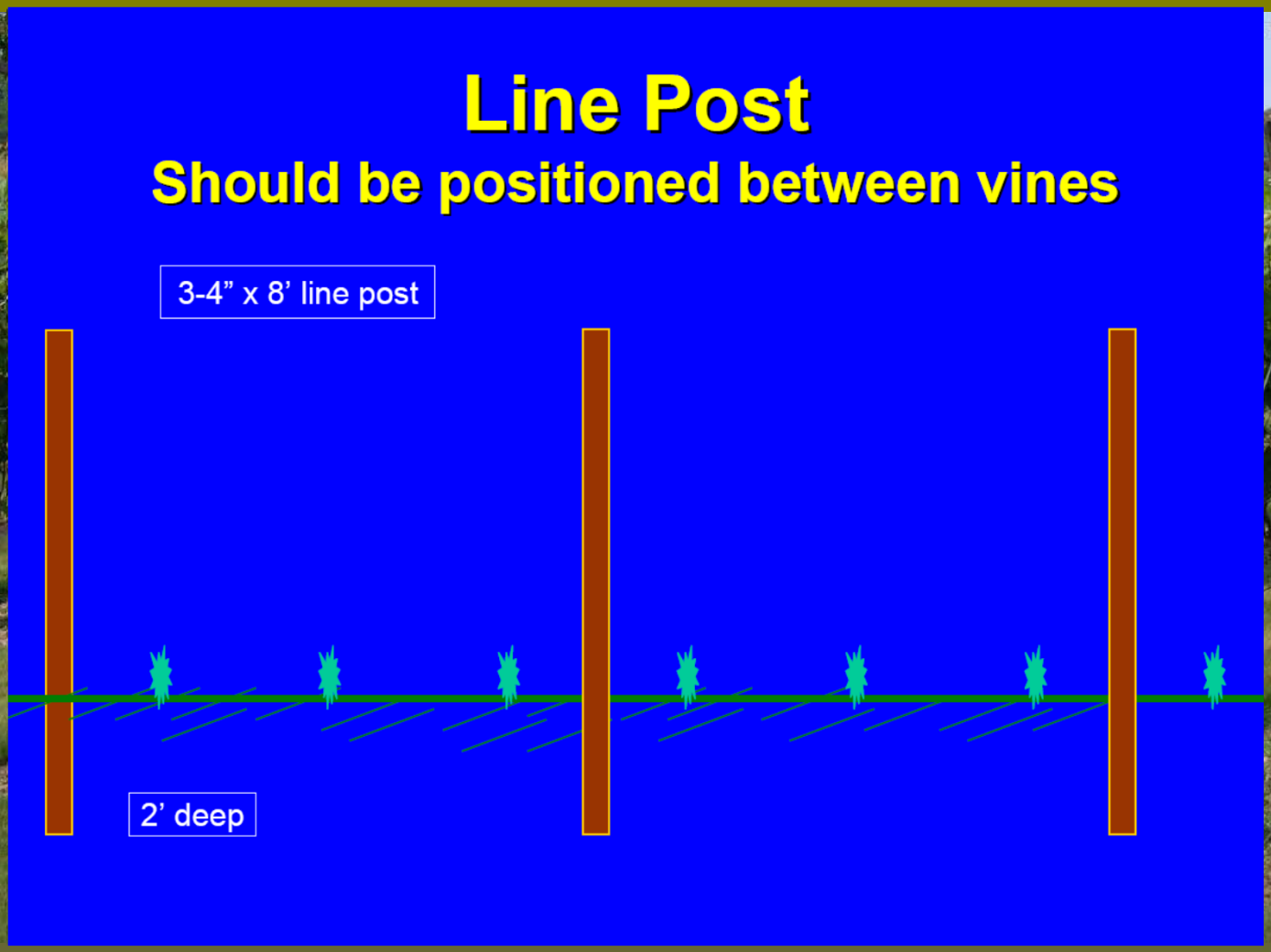
UW Extension Door County

End Post



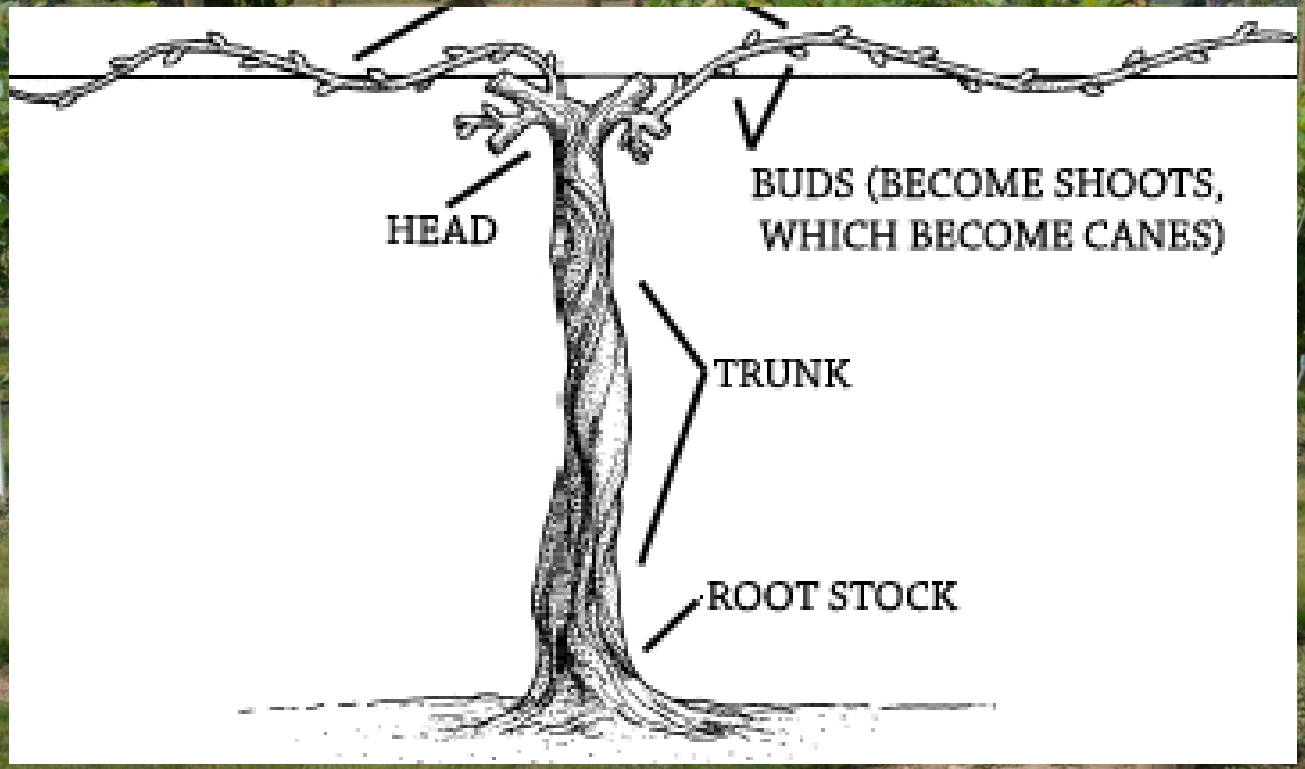
UW Extension Door County

Line Post



UW Extension
Door County

Vine Anatomy

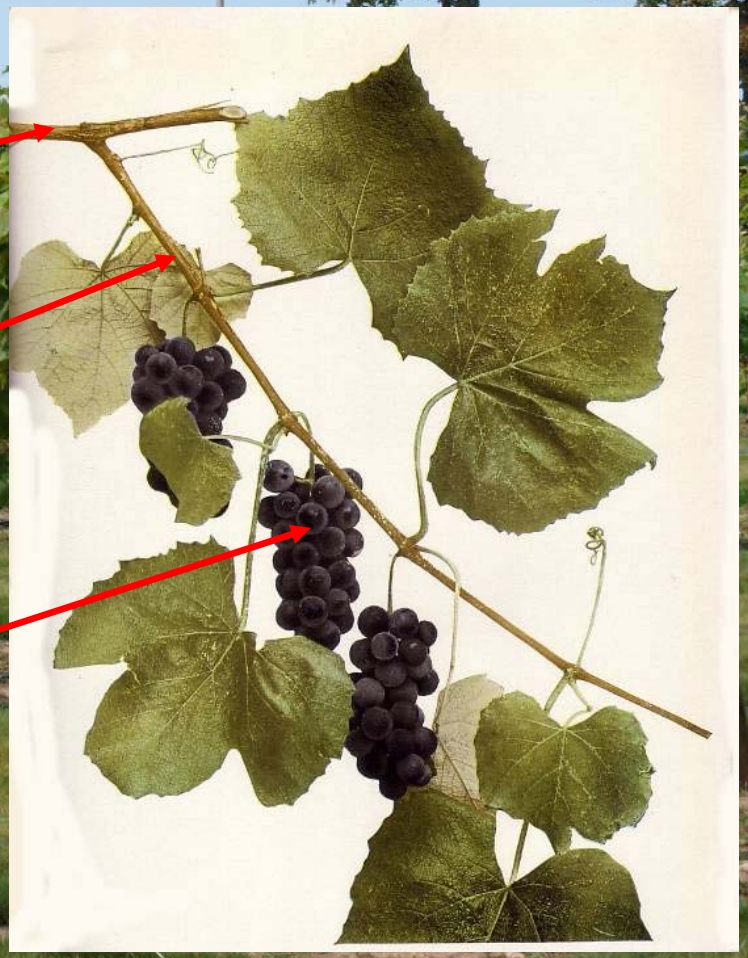


UW Extension Door County

Vine Anatomy

CANES, CORDONS AND SHOOTS… OH MY!

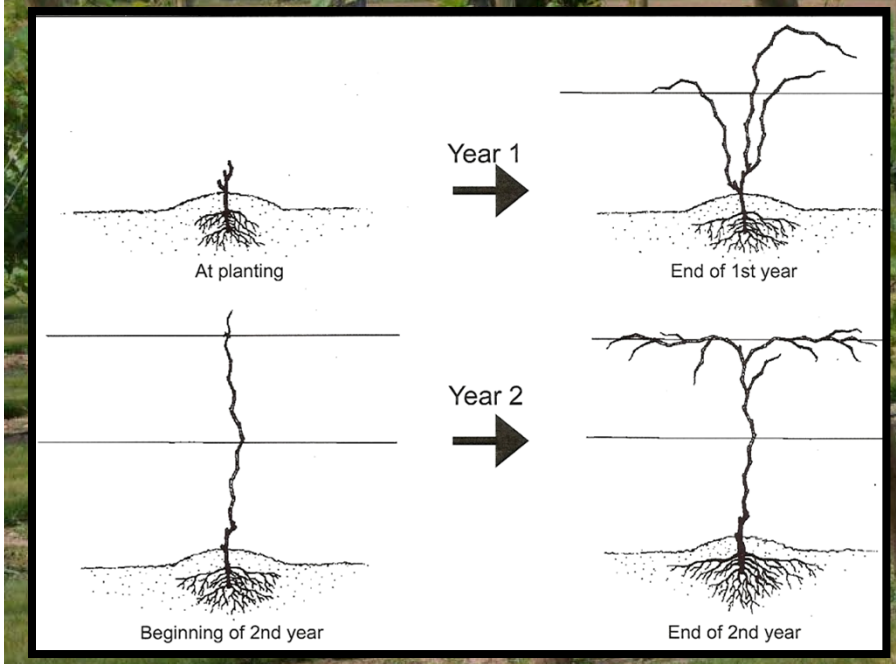
- Cordon-permanent stem
  - Trained horizontally
  - Not all systems have cordons
- Cane
  - One year old shoot
  - SPUR- Canes pruned to 2-3 buds
- Shoot
  - Current seasons growth
  - Bear fruit clusters

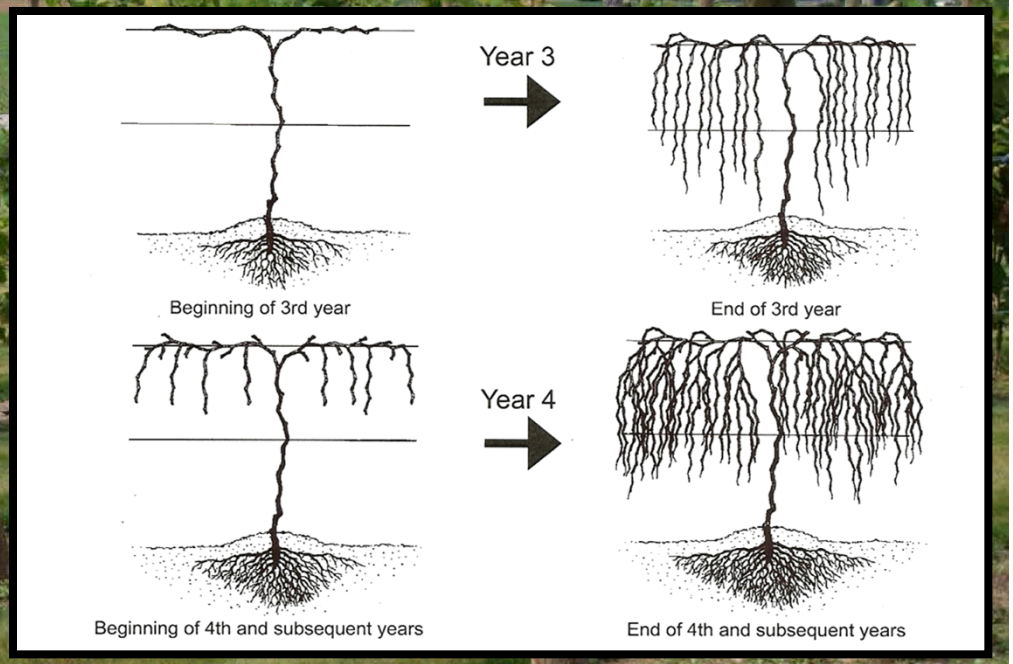


UW Extension Door County

Pruning and Training

Initial Pruning from planting to fruiting



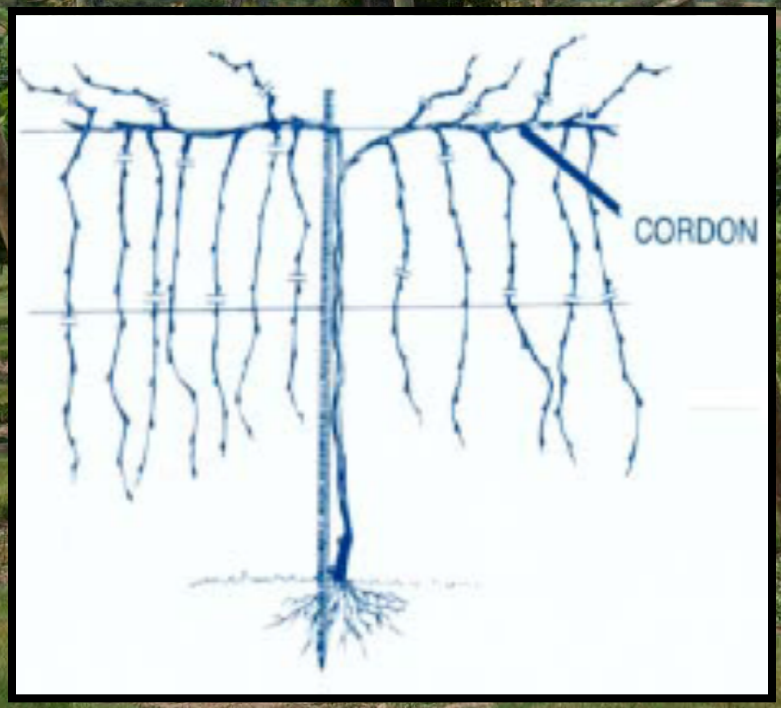


High Bi-Lateral Cordon
Relies on downward combing of new growth

UW Extension
Door County

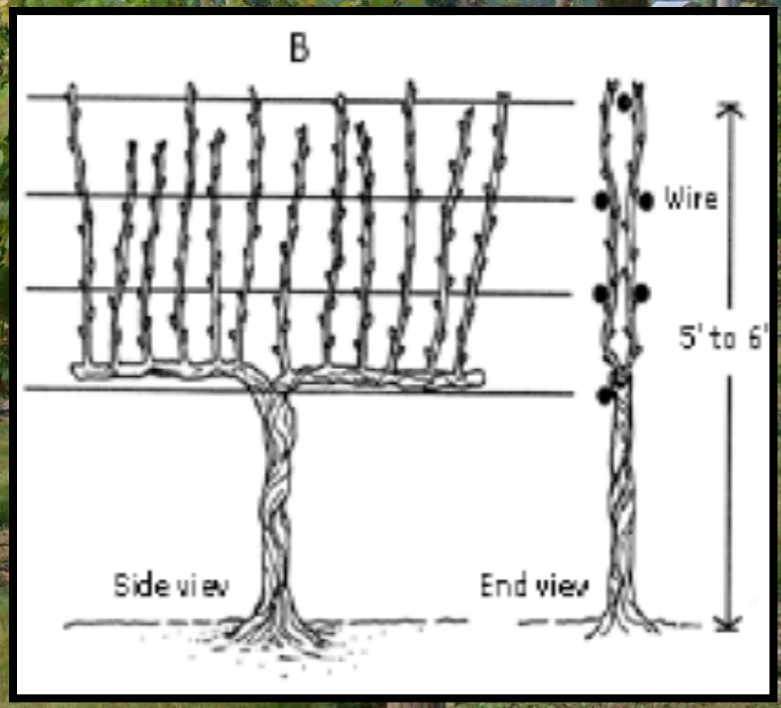
Training Methods

High Cordon



Use for trailing grape cultivars

Low Cordon



Use for upright grape cultivars

UW Extension Door County

Training Methods

Low-Cordon Vertical Shoot Positioning

UW Extension
Door County

Grape Pests

- Weed management critical during establishment years
  - Start weed free
  - Maintain weed free zone in rows
  - Weeds impede air flow-resulting in potential higher incidence of grape diseases

UW Extension
Door County

Diseases Problems

- Powdery Mildew
- Downy Mildew
- Black Rot
- Phomopsis Cane and Leaf spot
- Anthracnose

UW Extension
Door County

Powdery Mildew

- Fungal Disease
- Can infect all green tissue
- Cluster petioles and stems
  - Susceptible all season
- Berries susceptibility
  - Based on sugar content
  - <10% high, >10% none
- Overwinters in buds & canes
- Dependent on environment
  - Temps. 68-80F
  - Cloudy and High Humidity

UW Extension Door County

Powdery Mildew Management

Early Control is Critical

- Heavy rains will disrupt development
- Dry, warm, am/pm dews favor development
- Fungicide applications; 8-10” shoot-pre-bloom
  - 2-3 Applications ,repeat Sept-Oct.; Weather dependent
- Commercial
  - Rally, Elite, Procure
  - Strobilurins; Sovran, Flint
    - Broader spectrum; Control other diseases
    - Protective qualities
- Home vineyards
  - Immunox (Myclobutanil)

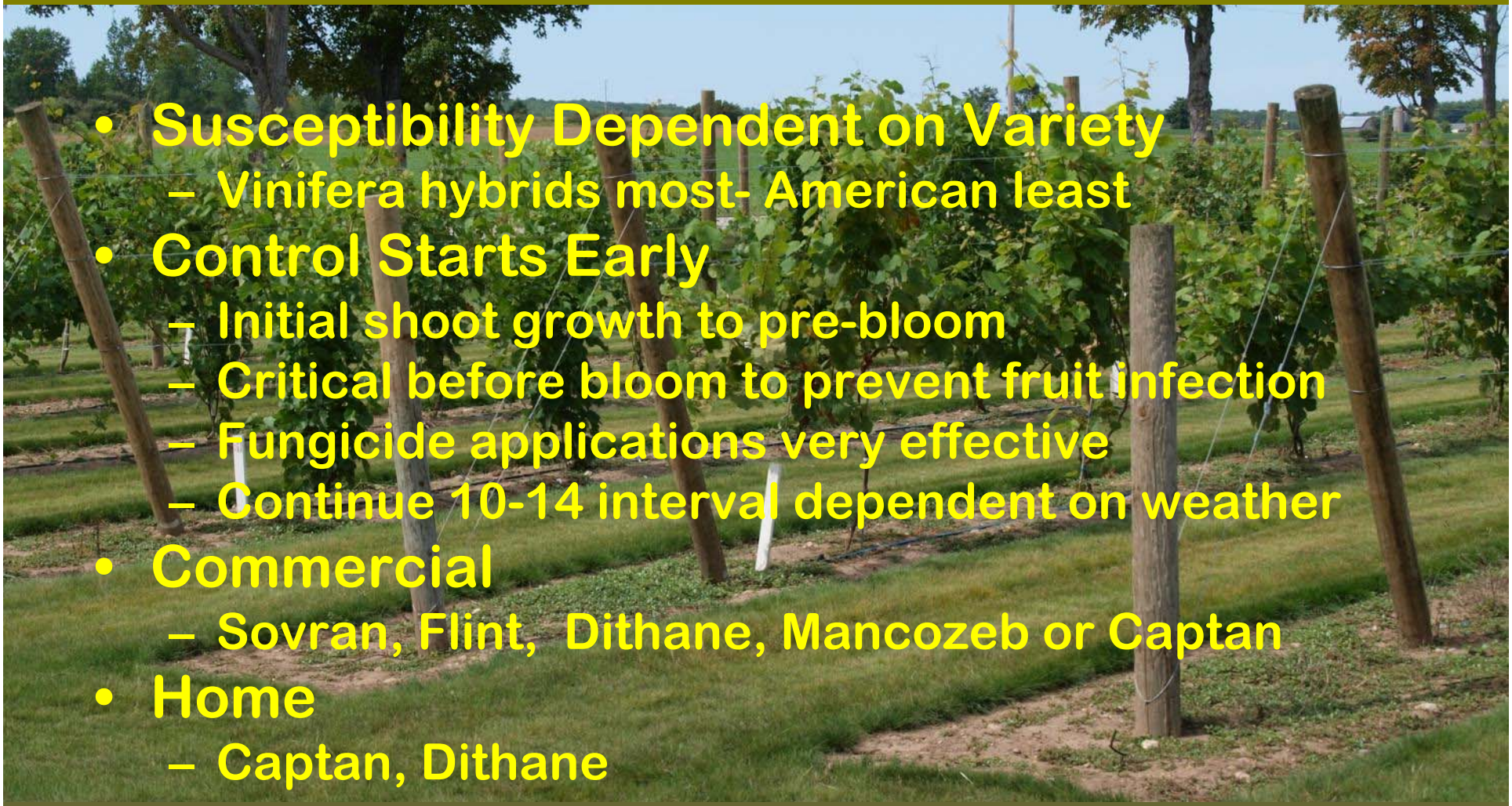
UW Extension Door County

Downy Mildew

- Water mold-fungi-like filamentous hyphae
- Overwinters in infected leaves
- Early leaf infection moves to blossoms
- Favored by rapid growth + wet conditions
- Ideal temperature for infection 65° F

UW Extension
Door County

Downy Mildew Management



- **Susceptibility Dependent on Variety**
  - Vinifera hybrids most- American least
- **Control Starts Early**
  - Initial shoot growth to pre-bloom
  - Critical before bloom to prevent fruit infection
  - Fungicide applications very effective
  - Continue 10-14 interval dependent on weather
- **Commercial**
  - Sovran, Flint, Dithane, Mancozeb or Captan
- **Home**
  - Captan, Dithane

UW Extension Door County

Black Rot

- Fungal disease infecting leaves - fruit
  - Overwinters in mummified fruit
- Infects early leaves
  - Requires a wetting period
    - Temperature + rainfall(.1”+) + Hrs. leaf wetness
  - Sporulates on leaves and infects fruit
  - Susceptibility lessens as leaves, fruit mature
  - Vinifera+++, riparia, resistant
  - Control with Captan, Dithane
    - Begin at Pre-bloom – Verasion (fruit coloring)
    - Intervals of 14 days, 21 days dry weather

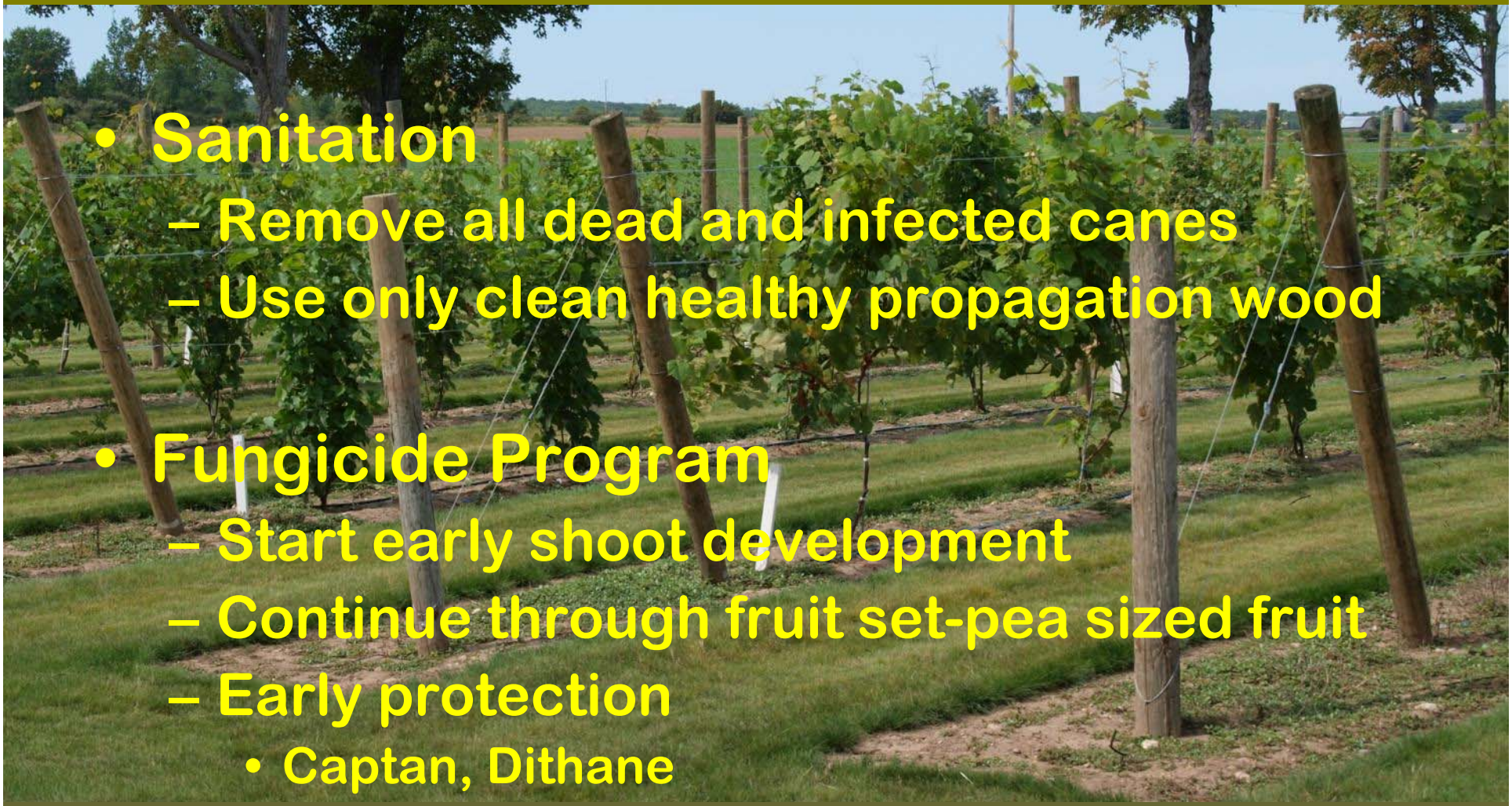
UW Extension Door County

Phomopsis

- Fungus Overwinters In Canes and Buds
- Spores Released in Spring
  - Needs Free Water
  - Optimum Temps. Of 65-70° F
  - Susceptibility
    - Very Young Tissue of Stems and Fruit
    - Bud Break – Early Fruit Set
    - Varies Among Varieties

UW Extension
Door County

Phomopsis Management



- **Sanitation**
  - Remove all dead and infected canes
  - Use only clean healthy propagation wood
- **Fungicide Program**
  - Start early shoot development
  - Continue through fruit set-pea sized fruit
  - Early protection
    - Captan, Dithane

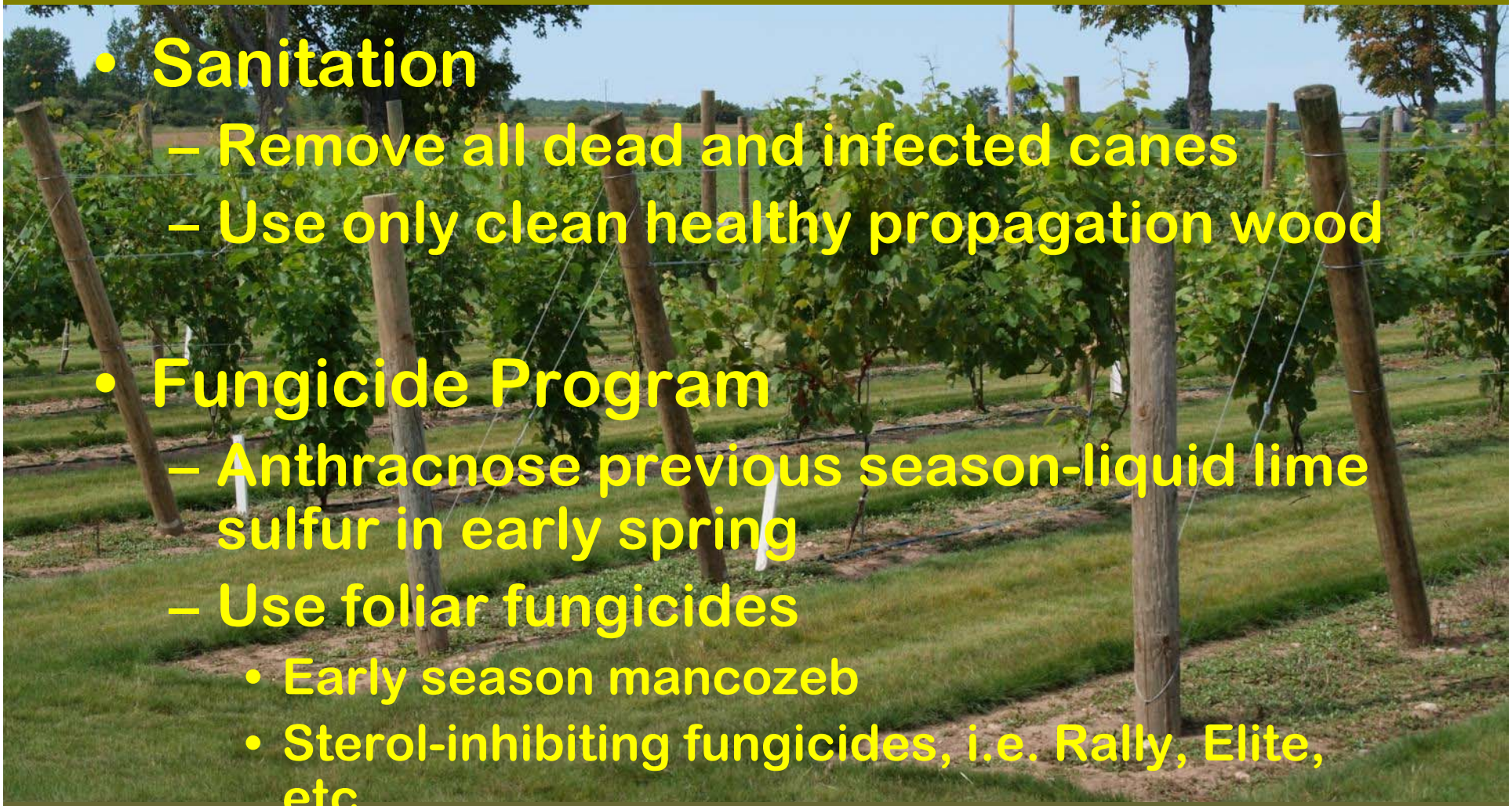
UW Extension Door County

Anthracnose

- Fungus Overwinters In Canes
- Spores Released in Spring
  - Needs Free Water
  - Optimum Temps. Of 36 to 90° F
  - Susceptibility
    - Very Young Tissue in Spring
    - Bud Break – Harvest
    - Varies Among Varieties

UW Extension
Door County

Anthracnose Management



- **Sanitation**
  - Remove all dead and infected canes
  - Use only clean healthy propagation wood

- **Fungicide Program**
  - Anthracnose previous season-liquid lime sulfur in early spring
  - Use foliar fungicides
    - Early season mancozeb
    - Sterol-inhibiting fungicides, i.e. Rally, Elite, etc.

UW Extension Door County

Grape Crown Gall

- *Agrobacterium vitis*
  - Bacterium enters wounds
  - No chemical controls
- Management
  - Select cold-hardy varieties
  - Double-trunks
  - Site selection
  - Pruning & sanitation

UW Extension Door County

Grape Insects

- Grape Berry Moth
- Grape Leafhopper
- Grape Flea Beetle
- Rose Chafer
- Sporadic Pests

UW Extension
Door County

Grape Berry Moth

- Overwinters in cocoon on ground
- Adults emerge May 15-June 15
- Eggs laid near/On grape clusters
- Look for webs on clusters
- 1st Generation pupate in leaf
- 2nd Generation larva enter fruit
- Larvae leave fruit to pupate in leaves and debris on ground
- Control with Sevin if detected

UW Extension Door County

Leafhoppers

- Grape and Potato
- Overwinter or migrate
- Feeding speckles leaves
- Examine leaf undersides
- High populations
  - Can Stunt Vines
  - Fruit Quality Affected
- Treatment
  - Imidacloprid, Imidan, Sevin

UW Extension Door County

Grape Flea Beetle

- Emerge in Spring
  - Feed on swelling suds
- Lay eggs on emerging leaves
- Hatching larvae feed on lvs.
- Monitor on warm spring days
  - Apply Danitol or Sevin to active adults
  - Can cause significant damage

UW Extension Door County

Grape Flea Beetle

UW Extension
Door County

Rose Chafer

- Larvae overwinter in soil
- Adults emerge at bloom
- Adults feed on blossoms developing, fruit, and leaves
- Common pest in light sandy soils
- Control with Sevin, Danitol, and Assail

UW Extension
Door County

Sporadic Pests

- **Phylloxera**
  - Aphid-like insect
  - Foliar most important to Midwest
  - Root feeding important to Vinifera hybrids
  - Produces galls on leaves
  - Sevin or Danitol at pre-bloom if galls present
- **Japanese Beetle**
  - Biggest problem in southern WI
  - *Vinifera* hybrids most susceptible
  - Monitor and spray
  - Do not use Japanese beetle traps

UW Extension Door County

Sporadic Pests

UW Extension
Door County

Abiotic Problems

UW Extension
Door County

Abiotic Problems

UW Extension
Door County

Abiotic Problems

UW Extension
Door County

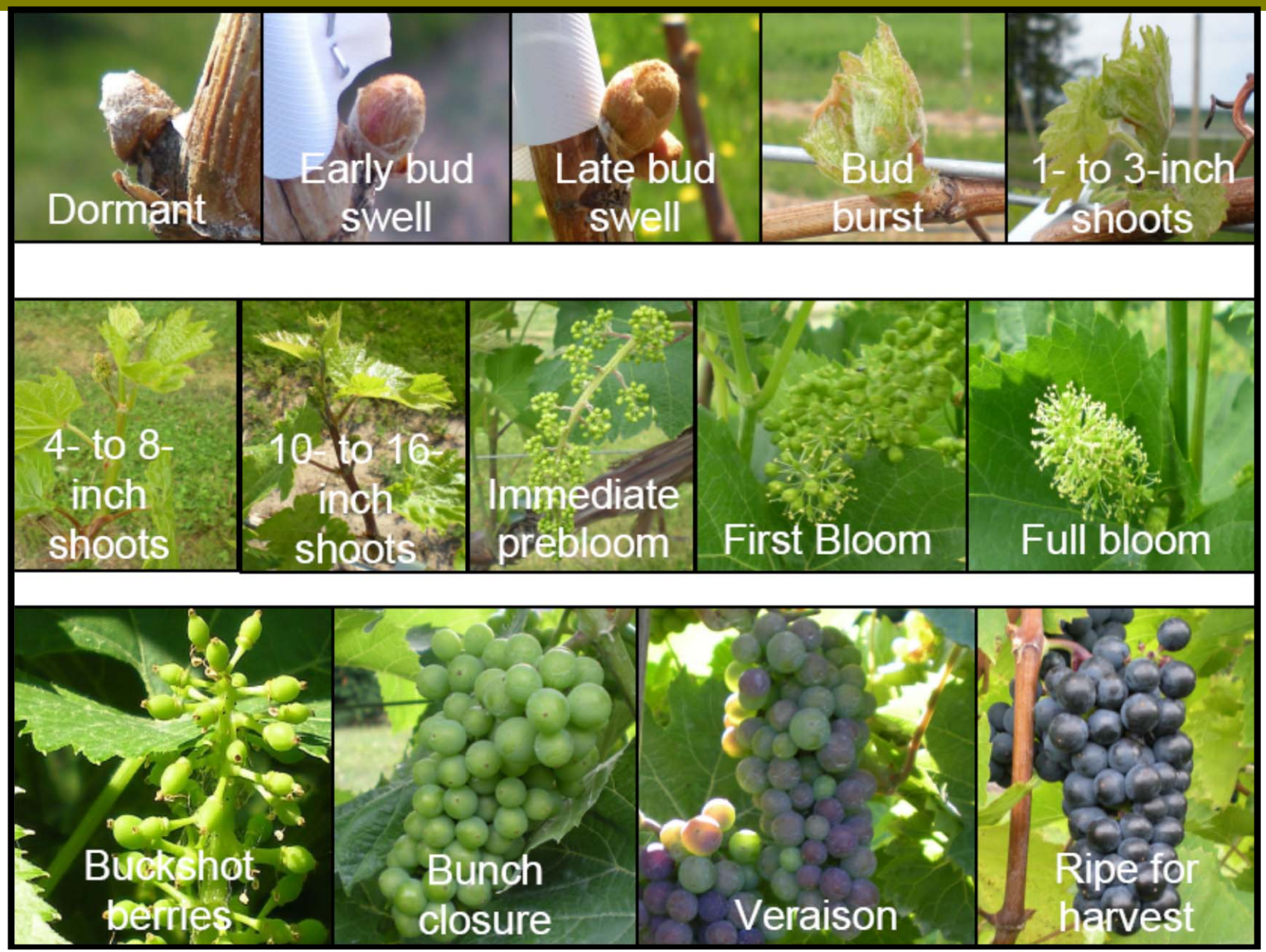
Abiotic Problems

UW Extension
Door County

Grape Pests and Phenology

Growth stage Visual	Bud swell	Shoot 1-5”	Shoot 8-12”	Pre-bloom	Bloom	Pea-sized	Berry touch	Bunch closing	Veraison	Pre-harvest	Harvest	Post-Harvest
Growth stage Modified Eichhorn-Lorenz	2-3	7-13	14-18	19-22	23	31	32	33-34	35	36-37	38	39-47
Insects												
Cutworm	+	+										
Grape Flea beetle	+											
Rose Chafer				+	+	+						
Grape Berry Moth				+	+	+	+	+	+	+	+	+
Grape Leafhopper				+	+		+	+	+	+	+	
Potato Leafhopper			+	+	+		+	+	+			
Japanese beetle								+	+	+		
Diseases												
Phomopsis		+	+	+	+	+	+	+	+	+	+	
Black rot		+	+	+	+	+	+	+	+			
Downy mildew			+	+	+	+	+	+	+	+	+	+
Powdery mildew		+	+	+	+	+	+	+	+	+	+	+
Botrytis bunch rot					+			+	+	+	+	

Grape Pests and Phenology



Harvest

- **Pre-Harvest**
  - Leaf removal completed prior to bunch closure
    - Color and sugar development
    - Late cluster thinning
    - Two clusters per shoot for ripening
- **Harvest**
  - Table grape harvest
    - Multiple harvests for color and flavor
    - Grapes do not develop more flavor after harvest
    - Store at 35 °F for up to 7 days
  - Wine grape harvest
    - Sugar development
    - Should be 20% + (variety dependent)
      - Use of refractometer to test

UW Extension Door County

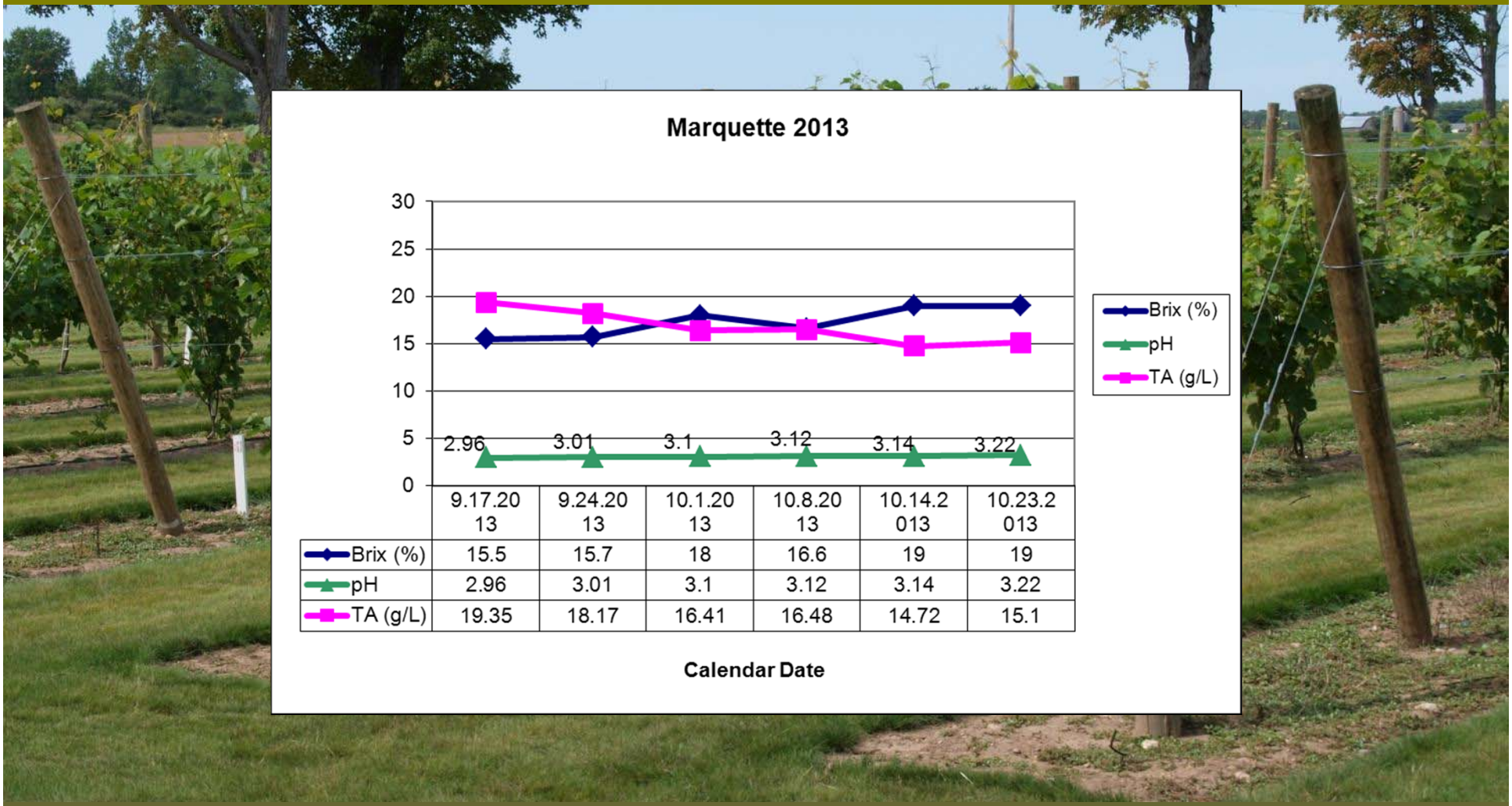
Harvest

UW Extension
Door County

Harvest

UW Extension
Door County

Harvest



	9.17.2013	9.24.2013	10.1.2013	10.8.2013	10.14.2013	10.23.2013
Brix (%)	15.5	15.7	18	16.6	19	19
pH	2.96	3.01	3.1	3.12	3.14	3.22
TA (g/L)	19.35	18.17	16.41	16.48	14.72	15.1

UW Extension Door County

Information

- Wisconsin Grape Growers Association
  http://wigrapes.org/
- Weekly Grape IPM Scouting Reports
  http://www.uwex.edu/ces/cty/door/
- Grape Cultivar Trials @
  - West Madison ARS
  - Peninsular ARS
  - Spooner ARS
- Dean Volenberg
  dean.volenberg@ces.uwex.edu
- Tim Rehbein
  trehbein@vernoncounty.org

Resources

- Sampling Soils For Testing

http://www.soils.wisc.edu/extension/pubs/A2100.pdf

- For More Information on Wisconsin Climate. State Climatology Office

http://www.aos.wisc.edu/~sco/seasons/winter.html#Temperature

- USDA Plant Hardiness Zones

http://planthardiness.ars.usda.gov/PHZMWeb/#

Resources

- Midwest Regional Climate Center –County climate data

http://mrcc.sws.uiuc.edu/climate_midwest/mwclimate_data_summaries.htm

- Web Soil Survey

http://websoilsurvey.sc.egov.usda.gov/App/HomePage.htm

- SoilWeb-Real Time Soil Descriptions

http://casoilresource.lawr.ucdavis.edu/drupal/node/902

Resources

- For More Information on Vineyard Site Selection and Layout.

Wolf, T. K. (editor). 2008. **Wine Grape Production Guide**. Natural Resource, Agriculture, and Engineering Service. Cooperative Extension. NRAES-145. Ithaca, N.Y. 336 p.

- Grape IPM Scouting Reports

http://wigrapes.org/

http://door.uwex.edu/

Resources

- **Northern Grapes Project**

http://northerngrapesproject.org/

- **2014 Midwest Small Fruit and Grape Spray Guide**

http://learningstore.uwex.edu/

- **University of Minnesota Grapes**

http://www.grapes.umn.edu/

- **Cornell University Viticulture and Enology**

http://grapesandwine.cals.cornell.edu/

Upcoming Events

To learn more about the school, contact Regina Hirsch at the Center for Integrated Agricultural Systems, UW-Madison, 608-335-7755 or rmhirsch@wisc.edu

The 2014 Midwest School for Beginning Grape Growers is sponsored by the UW-Madison Center for Integrated Agricultural Systems with funding from the USDA National Institute of Food and Agriculture.

Additional support is provided by

UW Extension University of Wisconsin-Extension
Northeast Wisconsin Technical College
Wollersheim Winery
VESTA
Vines & Rushes Winery
Wisconsin Grape Growers Association
Parallel 44
Pirro Spada

The 2014

Midwest School for Beginning Grape Growers

This intensive three-day school demonstrates what it takes to set up and run a successful vineyard business.

Topics include:

- *business planning*
- *current markets*
- *site selection*
- *variety selection—both table and wine grapes*
- *site prep*
- *vineyard management*
- *IPM for insect pests and diseases*

March 16, 17 and 18, 2014

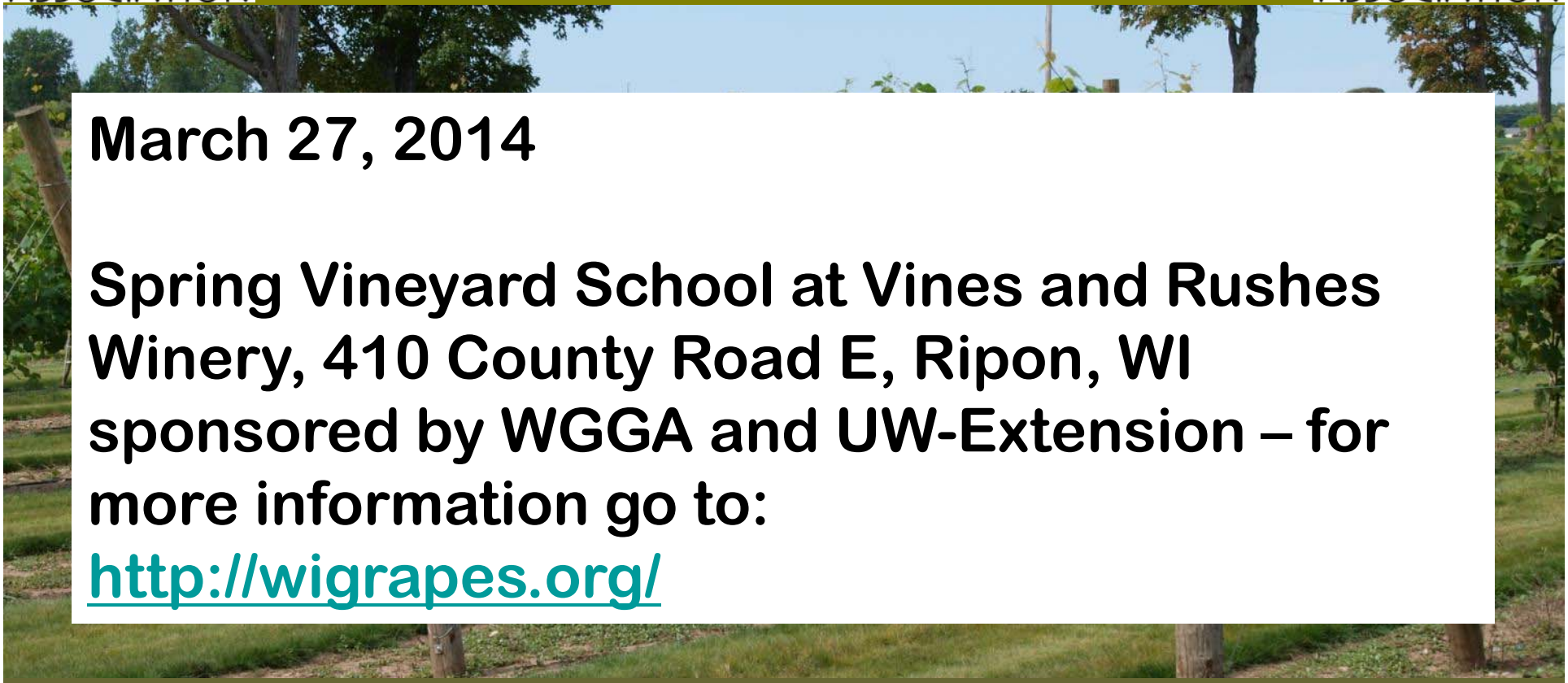
Wisconsin Dells, Wisconsin

UW-Madison CIAS Center for Integrated Agricultural Systems

UW Extension Door County

Updated 2.21.14

Upcoming Events



March 27, 2014

Spring Vineyard School at Vines and Rushes Winery, 410 County Road E, Ripon, WI sponsored by WGGA and UW-Extension – for more information go to:
http://wigrapes.org/

Updated 2.21.14

Grape Growing 101

Thank you to the following for contributing to this presentation:

- **Rebecca Harbut** - University of Wisconsin Madison, Extension Fruit Specialist
- **Judith Reith-Rozelle** - Assistant Superintendant West Madison Agricultural Research Station
- **Tim Rehbein** - Agricultural Agent Vernon County
- **Dean Volenberg** - Agricultural Agent Door County
- **Wisconsin Grape Growers Association**

Updated 2.21.14