



Evaluating Grape Cultivars for a Cold Climate

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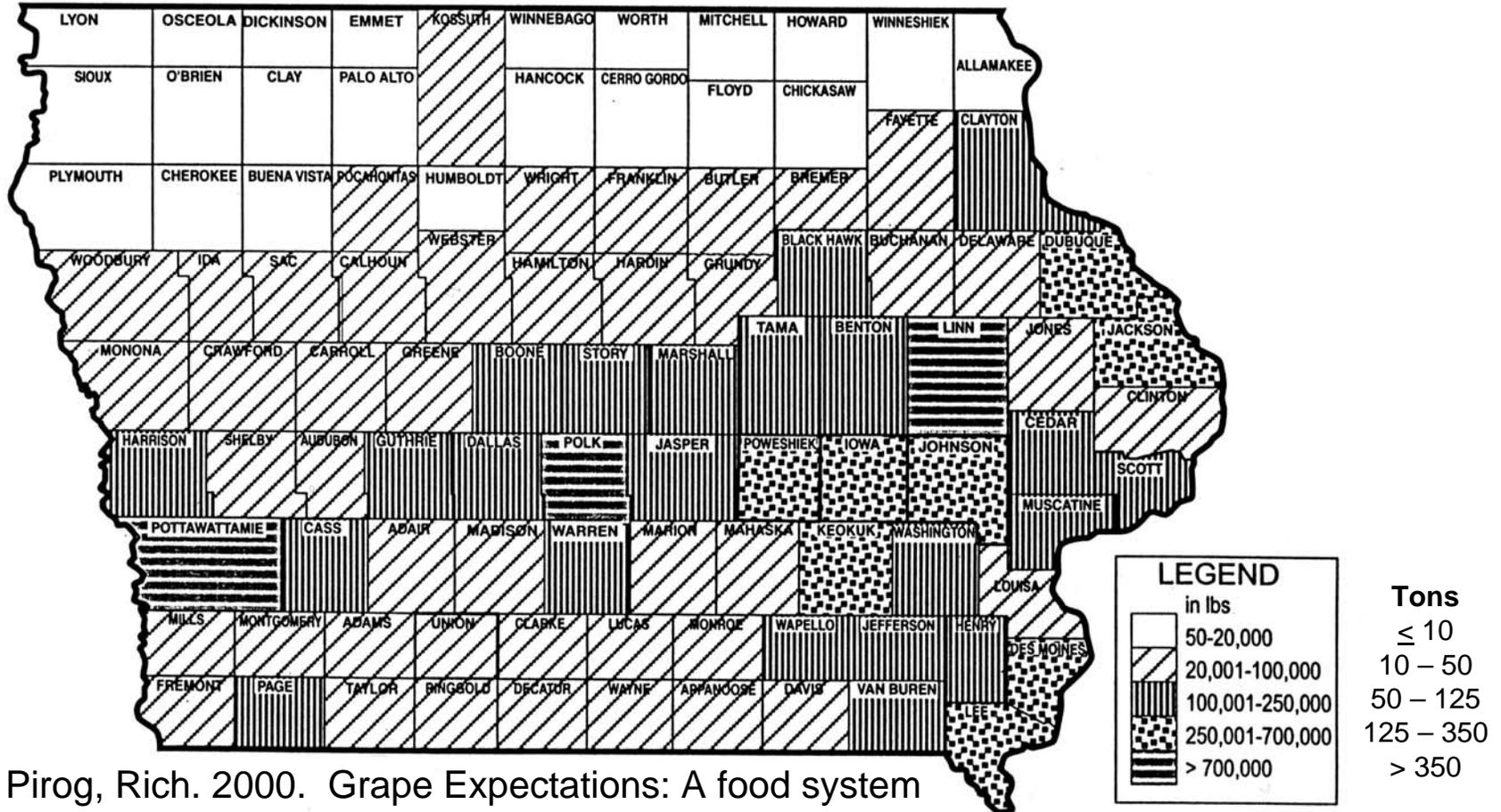
Southwestern Iowa



Figure 1: Iowa Grape Production

Data from U.S. Agricultural Census 1920

Represents 1919 grape production in pounds



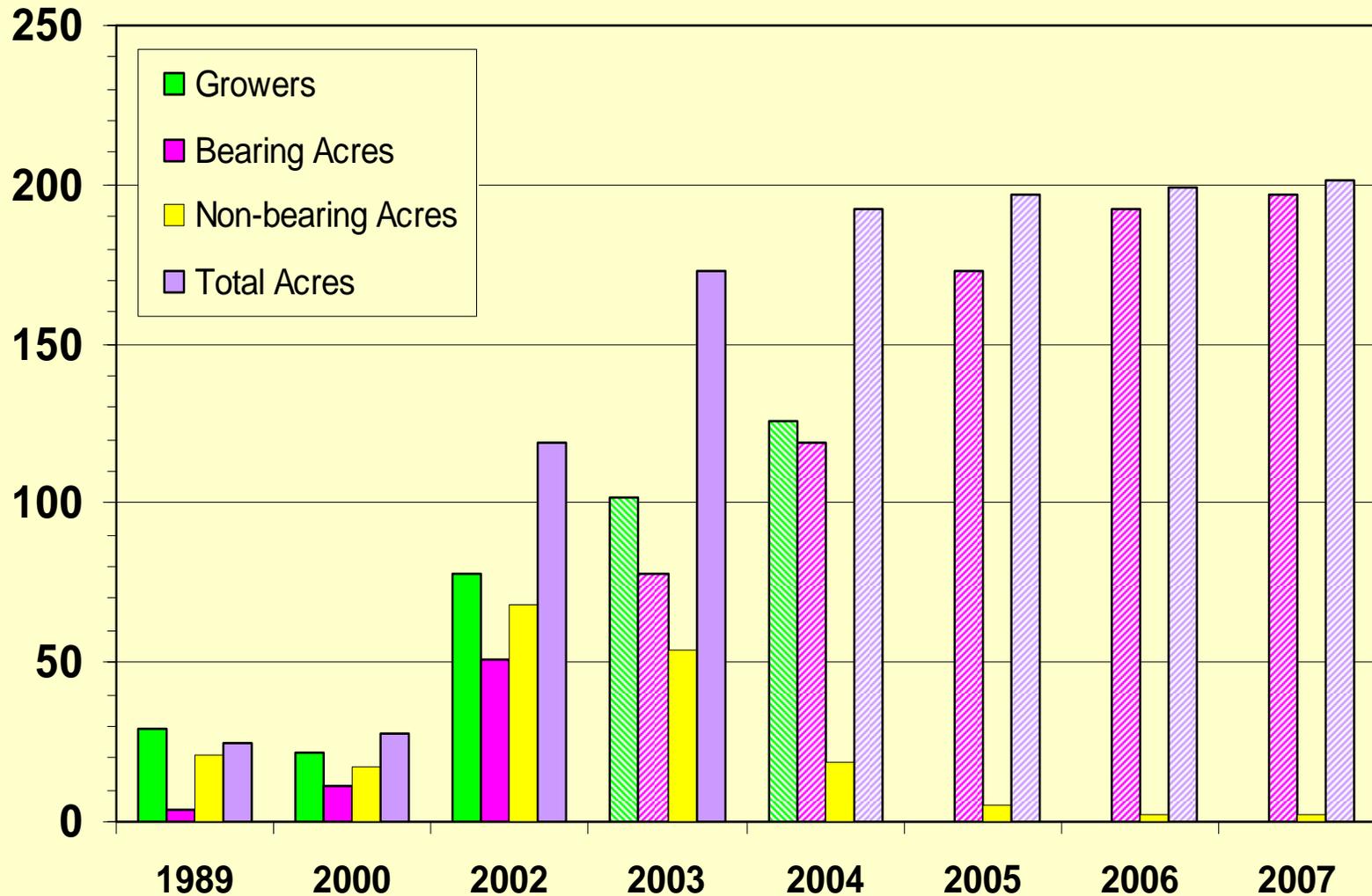
See: Pirog, Rich. 2000. Grape Expectations: A food system perspective on redeveloping the Iowa grape industry. Leopold Center for Sustainable Agriculture.



2,4-D drift injury



Grape Grower Surveys

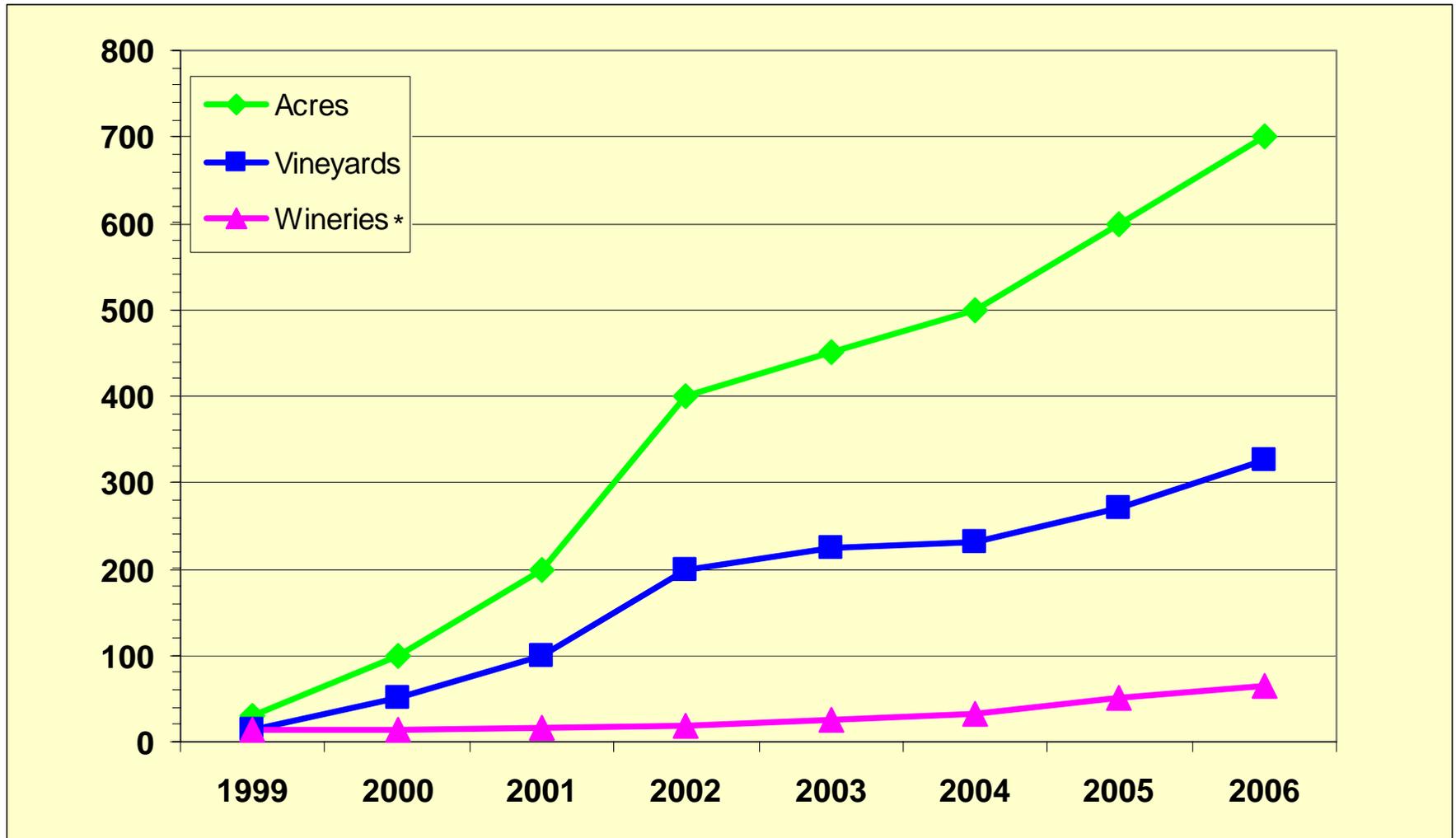


IDALS

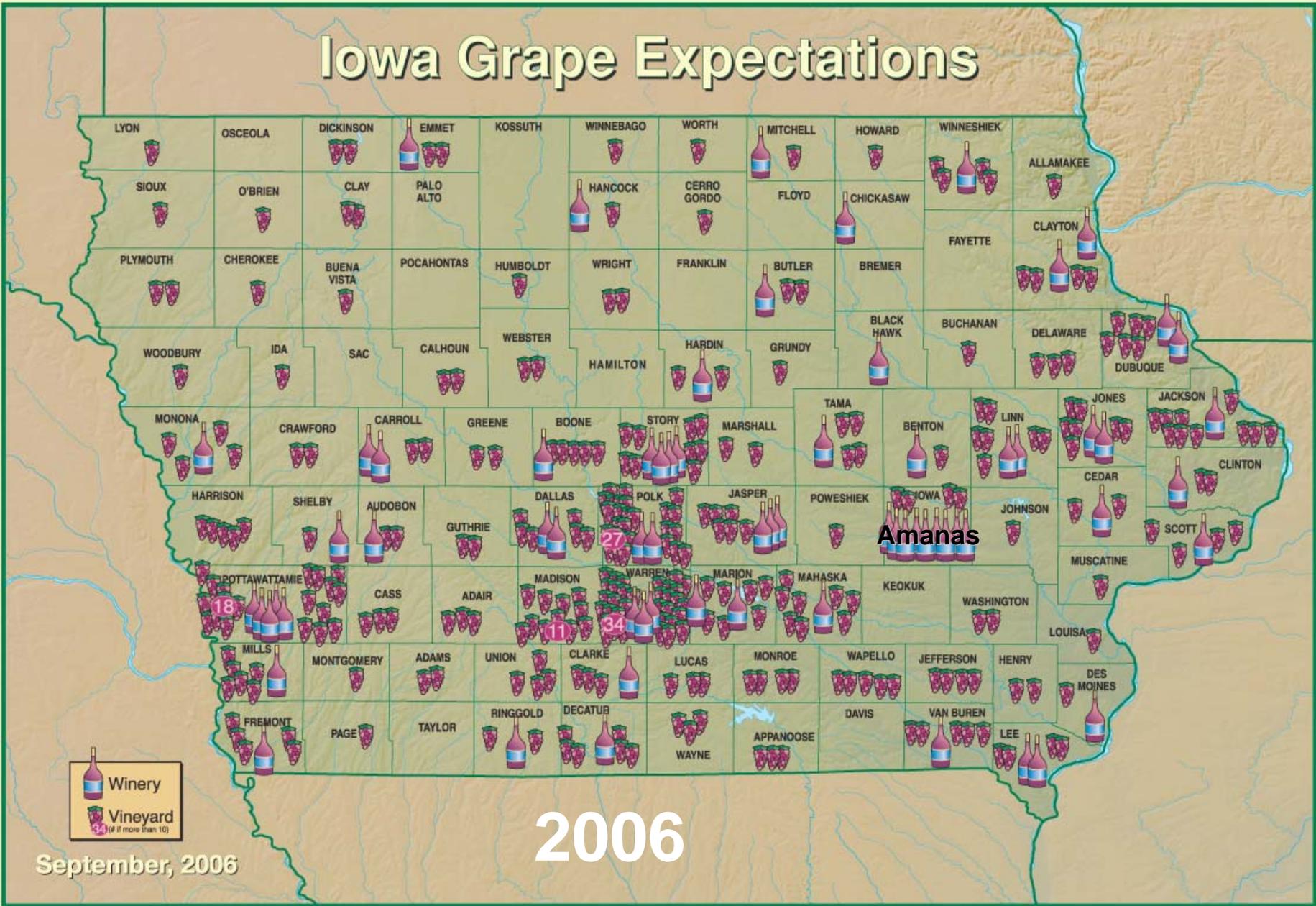
IDALS

IDALS / Golden Hills RC&D (Winter 02/03)

Iowa's Grape Industry



Iowa Grape Expectations



2006

September, 2006

ISU Grape Team



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ISU

Grape Research

Focus Areas

- Cultivar adaptation
- Disease management
- Culture / sustainability



Grape Cultivar Studies

Project Leaders

Drs. Paul Domoto &
Gail Nonnecke

Objectives:

- Identify grape cultivars that are adapted to the various regions of Iowa.
- Assess the cultural requirements of grapes cultivars grown under Iowa climatic conditions.
- Evaluate the quality and wine making potential of grape cultivars under different Iowa climatic and soil conditions.

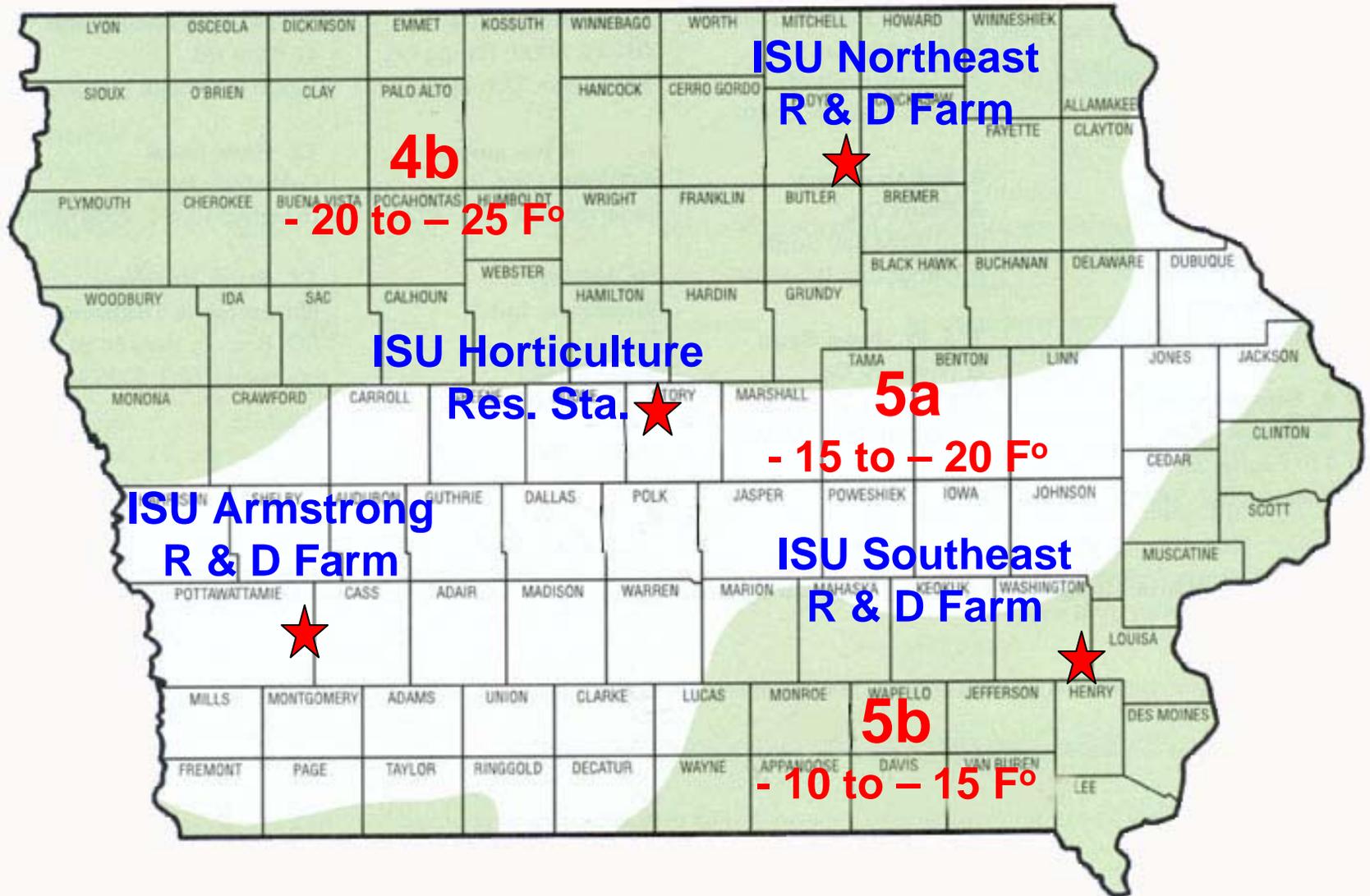
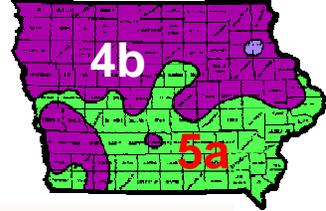


Grape Cultivar Trials



- **2002 Leopold Grape Cultivar x Management System Trial**
 - ISU Horticulture Res. Sta., Ames
 - ISU Armstrong R&D Farm, Lewis
- **2003 Wine Grape Cultivar Trial**
 - ISU Horticulture Res. Sta., Ames
 - ISU Armstrong R&D Farm, Lewis
 - ISU Northeast R&D Farm, Nashua
 - ISU Southeast R&D Farm, Crawfordsville

ISU Grape Research Sites



2002 Leopold Center Grape Cultivar x Management System Trial

Wine		Seedless Table
Maréchal Foch (H)	Seyval Blanc (MH)	Marquis (MH)
Frontenac (VH)	La Crosse (H)	Vanessa (MH)
Cynthiana (MH)	Vignole (MH)	Reliance (MH)
St. Croix (VH)	Traminette (MH)	Mars (MH)
Chambourcin (CT)	Edelweiss (H)	Jupiter (MH)

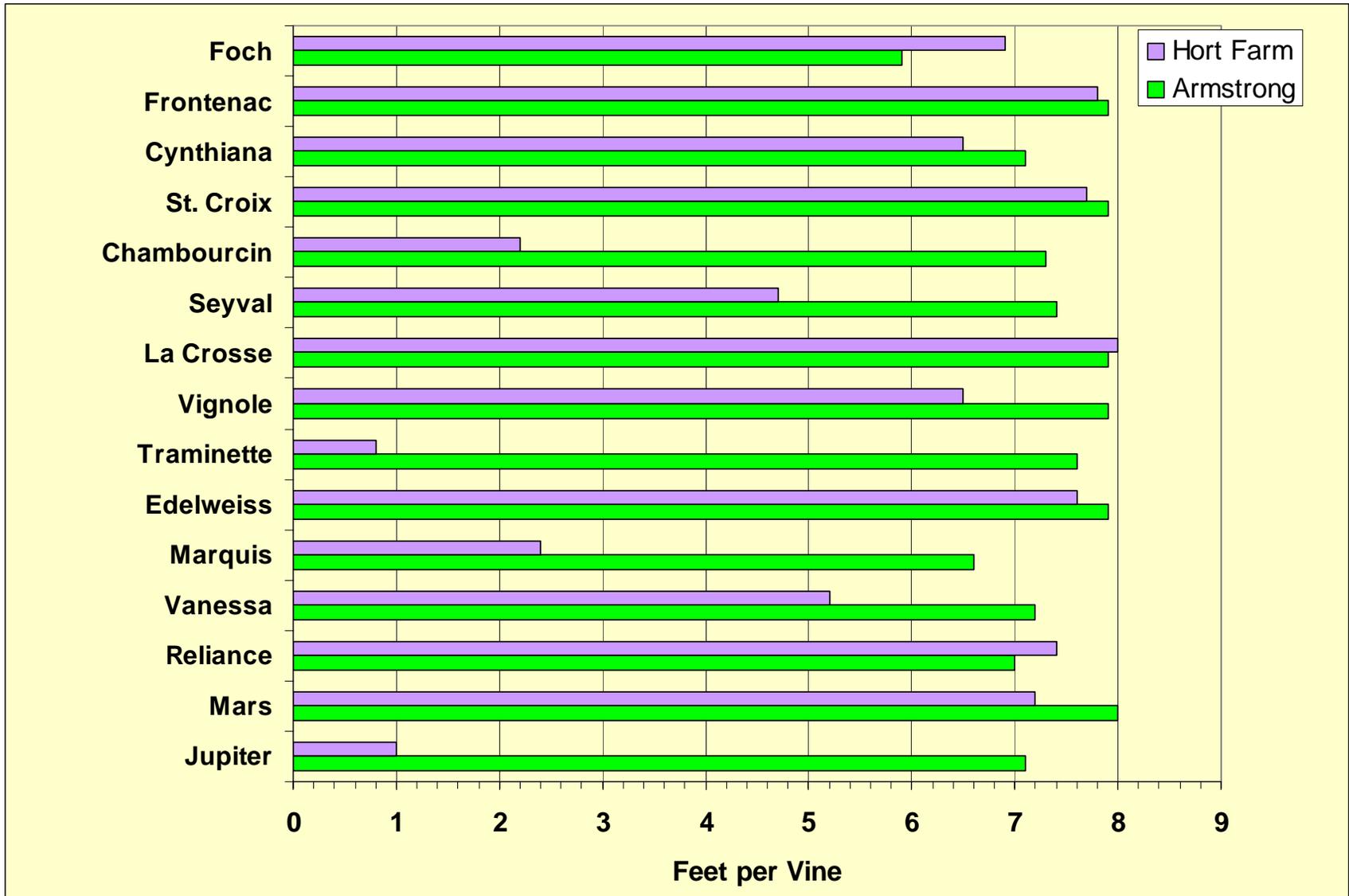
* **CT** = cold tender (-5° F); **MH** = moderately hardy (-10° F);
H = hardy (-15° F); **VH** = very hardy (-20° F)

2003 Wine Grape Cultivar Trial

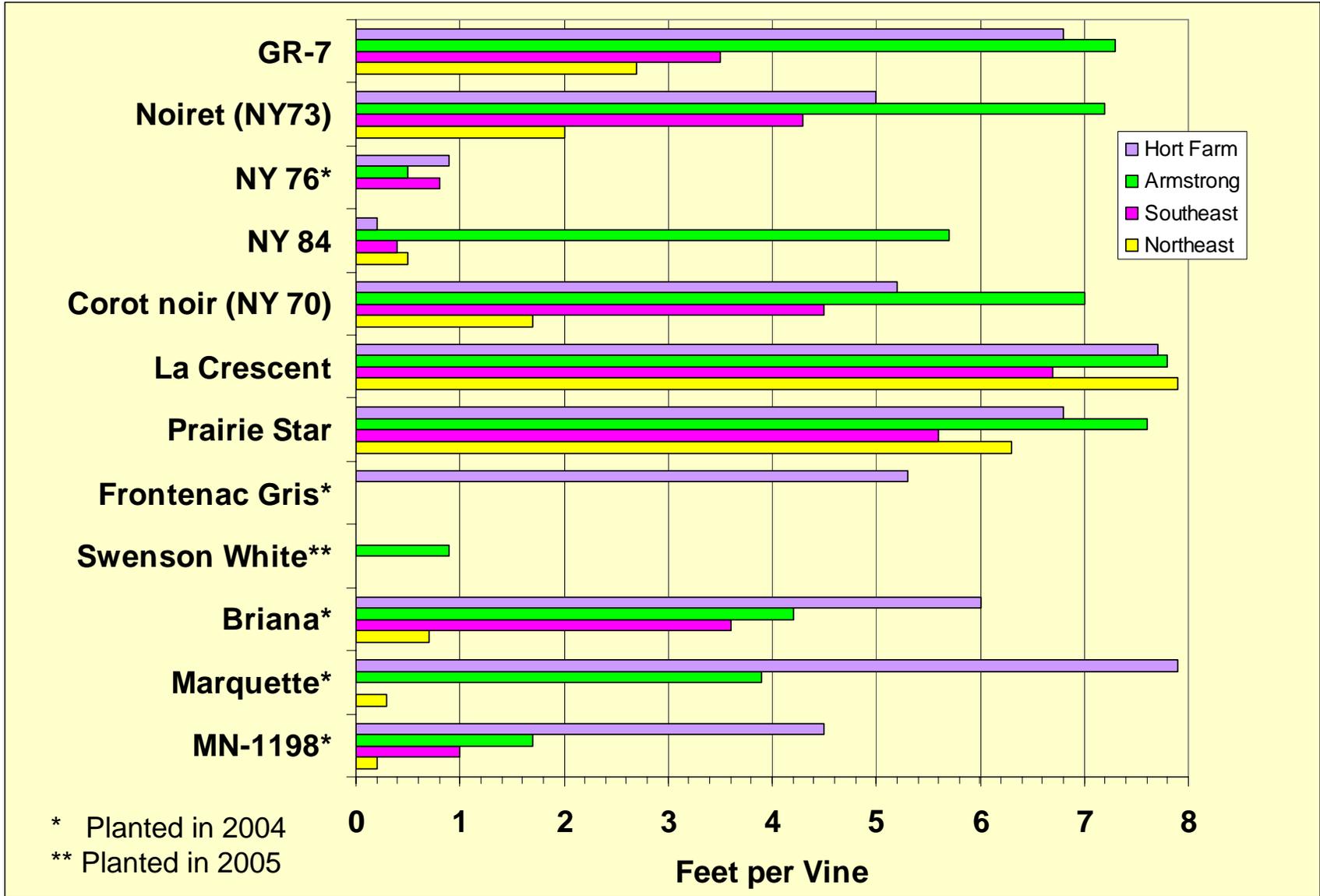
New York	Minn. / Wis.	Cultivars not in 2002 planting
<p>GR-7 (VH) Noiret (MH) NY76.0844.24 (MH?) NY84.0101.04 (MH?) Corot noir (MH)</p>	<p>La Crescent (VH) Prairie Star (VH) Esprit (H) Frontenac Gris (VH) Swensen White (VH) Brianna (VH) Marquette (VH) MN-1198 (VH)</p>	<p>Cayuga White (MH) Chancellor (MH) De Chaunac (MH) Landot 4511 (MH) Leon Millot (H) St. Vincent (MH) Vidal Blanc (MH)</p>

* CT = cold tender (-5° F); MH = moderately hardy (-10° F);
 H = hardy (-15° F); VH = very hardy (-20° F)

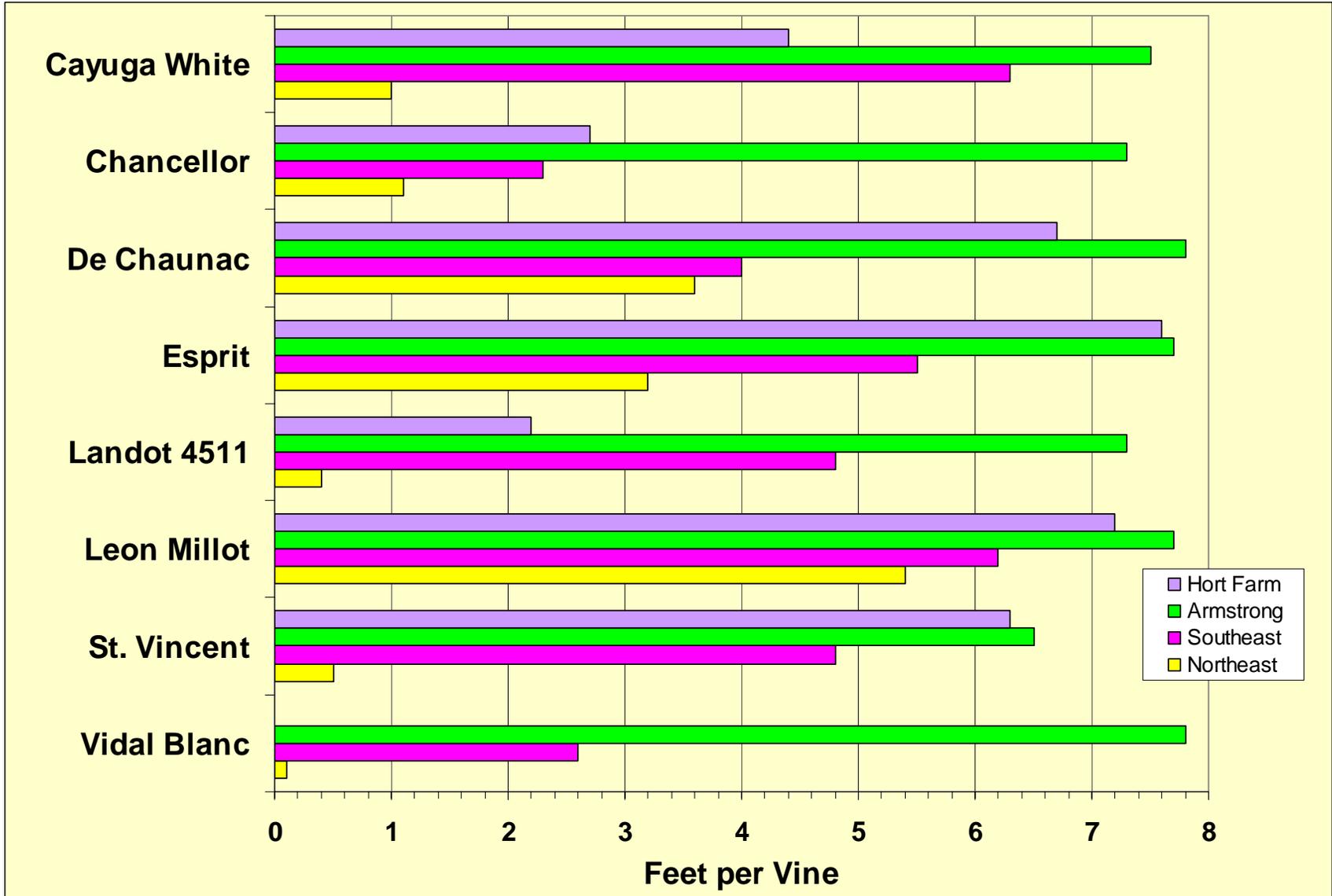
Cordon Establishment after 5 years



Cordon Establishment after 4 years



Cordon Establishment after 4 years

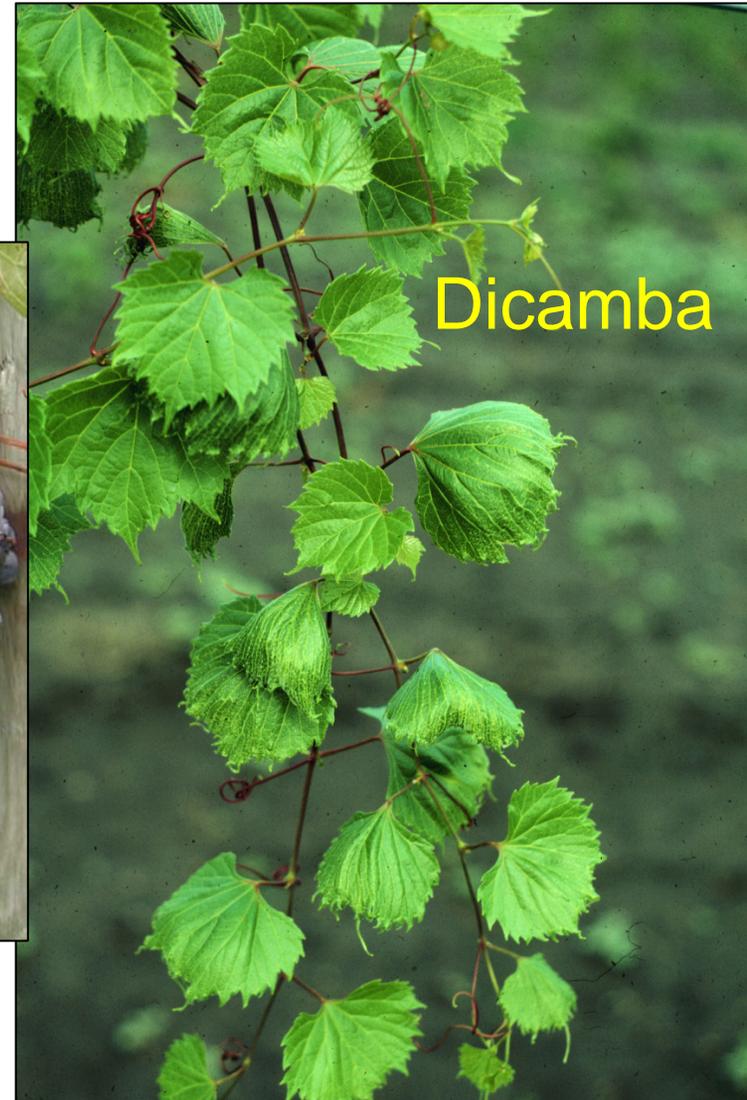


Herbicide Drift Injury

2,4-D injury



Dicamba



Date of Bud Break in 2006*

April						
17	18 Marquette Foch La Crescent	19 GR-7 De Chaunac	20 MN 1198 Edelweiss	21	22 Brianna	23 Frontenac Gris Chancellor Esprit La Crosse
24 Frontenac	25 NY 76 Prairie Star Leon Millot St. Croix Jupiter	26	27 Swenson White Mars	28	29 Seyval Traminette	30 Reliance
May						
1 Noiret Marquis	2 Vanessa	3 Corot noir St. Vincent Cynthiana	4 Vignole	5 NY 84 Cayuga White	6	7
8	9 Chambourcin	10	11	12 Landot 4511	13	14

Date of Harvest in 2006

Week of	Armstrong Farm	Horticulture Station
Aug 13-19	Edelweiss, Reliance	Edelweiss, Reliance
Aug 20-26	Brianna, Jupiter, La Crescent, Landot 4511, Leon Millot, Marquette, MN 1198, Prairie Star, St. Croix, Swenson White, Vanessa	Brianna, Jupiter, Leon Millot, Marechal Foch, Vanessa
Aug 27-Sept 2	Cayuga White, Corot noir, Marechal Foch, Mars, NY 76, NY 84, Seyval blanc,	Marquette, Prairie Star, St. Croix, Seyval blanc
Sept 3-9	Esprit, Frontenac, GR 7	La Crescent
Sept 10-16	Marquis, Traminette	Esprit, Frontenac Gris, GR 7, La Crosse, Mars
Sept 17-23	De Chaunac	Cayuga White, Corot noir, Frontenac, Landot 4511, MN 1198, Vignole
Sept 24-30	Vidal blanc, Vignole	Marquis, Traminette
Oct 1-7	Chancellor, Noiret	Chambourcin, Chancellor, De Chaunac, Noiret, St. Vincent
Oct 8-14	Chambourcin, Cynthiana, St. Vincent	Cynthiana

‘Maréchal Foch’



1920 French release.

- Season: early
- Vine vigor: moderately vigorous, but variable.
- Hardiness: “hardy”
- Bud break: very early – frost prone.
- Moderately productive on 2^o buds.
- Moderately susceptible to black rot & powdery mildew.
- Sensitive to sulfur fungicides.
- Moderately susceptible to 2,4-D; susceptible to dicamba.
- Requires basal shoot thinning.
- Clusters are small & tight
- With early ripening, birds can be a problem.
- Does not produce high yields.
- Can be made into a wide range of wines.
- *Probably being over produced in Iowa.*

'Léon Millot'



Sister seedling of 'Maréchal Foch'.

- Season: early (5-7 days earlier than Foch)
- Vine vigor: Very vigorous
- Hardiness: "hardy"
- Bud break: mid-season.
- Highly susceptible to powdery mildew; moderately susceptible to downy mildew.
- Requires lateral shoot thinning.
- Susceptible to crown gall.
- Susceptible to 2,4-D and dicamba.
- Produces small, tight clusters.
- Productive on 2^o buds.
- Vines are more productive than 'Foch'.
- Wines are similar to 'Foch', with distinct berry aromas, but not as popular.

'St. Croix'



1981 Elmer Swenson release.

- Season: early
- Vine vigor: very vigorous
- Hardiness: “very hardy”
- Bud break: mid-season
- Prone to multiple bud break on spurs; requires shoot thinning and removing lateral shoots.
- Moderately susceptible to downy & powdery mildew, & *Botrytis* bunch rot.
- Slightly susceptible to 2,4-D; moderately susceptible to dicamba.
- Produces medium-sized, tight clusters.
- Moderately productive on 2° buds.
- Berry set can be light.
- Berries are very thin skinned and subject to leaking.
- Wine tends to be bland & neutral in character; suitable for blending.
 - One Iowa winery is making an award winning varietal wine.

'Frontenac'



1996 Univ. of Minnesota release.

- Season: mid-season
- Vine vigor: very vigorous
- Hardiness: “very hardy”
- Bud break: early mid-season.
- Semi-trailing growth habit.
- Requires some shoot thinning.
- Requires some cluster thinning.
- Moderately susceptible to black rot, powdery mildew & *Botrytis* bunch rot.
- Canopy opens up well w/ shoot positioning.
- Leaves are relatively tolerant of 2,4-D, but berries are susceptible; susceptible to dicamba.
- Leaves are susceptible to grape phylloxera.
- Clusters are loose; berry set can be light.
- Fruit quality is excellent, but high acidity at harvest is common.
 - Port
 - Rosé

'GR-7'



2003 Cornell University release.

- Season: Mid-season
- Vine vigor: very vigorous
- Hardiness: “very hardy”
- Semi-trailing growth habit.
- Bud break: very early - frost prone.
- Moderately productive on 2° buds.
- Good tolerance to 2,4-D; susceptible to dicamba.
- Requires basal shoot thinning and removing lateral shoots.
- Susceptible to crown gall.
- Grapes are relatively low in acids; wines are rated good to very good.
- For more information:

<http://www.nysaes.cornell.edu/hort/faculty/reisch/GR7.pdf>

'Marquette'



2006 University of Minnesota release (tested as MN 1211).

- Season: early
- Hardiness: “very hardy”
- Bud break: very early – frost prone.
- Semi-trailing growth habit.
- Moderately productive on 2^o buds.
- Moderately susceptible to 2,4-D and dicamba.
- Clusters are small.
- Berry set can be light.
- Have observed a variation in vine vigor between ISU research plots.

‘Corot noir’

“kor-oh nwahr”



2006 Cornell University release (tested as NY 70).

- Season: late mid-season.
- Hardiness: “moderately hardy”
- Semi-trailing growth habit
- Bud break: late season.
- Moderately productive on 2° buds.
- Good tolerance to 2,4-D and dicamba.
- Susceptible to downy mildew
- Susceptible to crown gall
- Low acid cultivar.
- For trial only in northern parts of Iowa.
- For more information:

http://www.nysaes.cornell.edu/hort/faculty/reisch/bulletin/Corot_noir.pdf

'Noiret'

"nwahr-ay"



2006 Cornell University release (tested as NY 73).

- Season: late season.
- Hardiness: "moderately hardy"
- Semi-trailing growth habit.
- Bud break: late season.
- Somewhat productive on 2° buds.
- Good tolerance to 2,4-D and dicamba.
- Moderately resistant to powdery mildew and bunch rot.
- Low acid cultivar w/ notes of black pepper.
- For trial only in northern parts of Iowa; late maturity makes it questionable for most of Iowa.
- Wine has a distinctive black pepper flavor.
- For more information:

<http://www.nysaes.cornell.edu/hort/faculty/reisch/bulletin/Noiret.pdf>

'Edelweiss'



1978 Elmer Swenson / Univ. of Minnesota release.

- Considered a seeded table grape, but suitable for juice and wine.
- Season: early
- Vine vigor: vigorous
- Hardiness: “hardy”
- Trailing growth habit.
- Bud break: very early– frost prone.
- Not productive on 2^o buds.
- Moderately susceptible to powdery mildew & *Botrytis* bunch rot.
- Moderately susceptible to 2,4-D.
- Large loose clusters, w/ medium to small berries.
- Young shoots are very sensitive to “blow-out”.
- Develops a strong *labrusca* flavor when fully mature.
 - Often harvested between 14 – 16 °Brix.
- Wines are fruity.

'La Crosse'



1983 Elmer Swenson release.

- Season: early
- Vine vigor: VERY vigorous
- Hardiness: “hardy”
- Semi-upright growth habit w/ few tendrils; tends to lay down in a VSP system.
- Bud break: mid-season.
- Requires extensive basal shoot & lateral shoot thinning.
- Good tolerance to 2,4-D; susceptible to dicamba
- Productive on 2^o buds.
- Medium-small, tight clusters w/ thin-skinned berries, subject to leaking.
- Highly susceptible to black rot & *Botrytis* bunch rot; moderately susceptible to downy & powdery mildew.
- Excellent wine with a fruity character, slightly “foxy” if fully ripe.

'Esprit'



1984 Elmer Swenson release.

- Season: mid-season
- Vine vigor: Vigorous
- Hardiness: "hardy"
- Semi-trailing growth habit w/ few tendrils; easy to shoot position.
- Bud break: mid-season.
- Moderately susceptible to 2,4-D and dicamba.
- Moderately productive on 2° buds.
- Large, moderately tight clusters w/ large berries.
- Highly susceptible to powdery mildew; moderately susceptible to downy mildew & *Botrytis* bunch rot.
- Suitable for wine and fresh.
 - Wine can be somewhat cloudy.

'Swenson White'



1994 Elmer Swenson release.

- Season: Mid-season?
- Vine vigor: Vigorous
- Hardiness: "very hardy"
- Semi-trailing growth habit.
- Bud break: mid-season.
- Very susceptible to 2,4-D & dicamba.
- Low productivity on 2^o buds.
- Medium sized(?), moderately tight clusters w/ large berries.
- Moderately susceptible to downy & powdery mildew
- Fruit have a pronounced floral aroma.

'Prairie Star'



2001 Elmer Swenson release.

- Season: early
- Vine vigor: vigorous
- Hardiness: “very hardy”
- Semi-upright growth habit, suitable for VSP training.
- Bud break: mid-season
- Good disease tolerance; somewhat susceptible to anthracnose
- Moderately susceptible to 2,4-D and dicamba.
- Young shoots have been reported sensitive to “blow out”.
- Moderately productive on 2^o buds.
- Medium-small, tight clusters w/ thick-skinned berries.
- Excellent body & S/A balance.

'Brianna'



2002 Elmer Swenson release.

(promoted by Ed Swanson, Cuthills Vineyard, Pierce NE)

- Season: Early mid-season
- Vine vigor: vigorous
- Hardiness: "very hardy"
- Trailing growth habit.
- Bud break: early mid-season.
- Somewhat susceptible to 2,4-D; moderately susceptible to dicamba.
- Endosulfan sensitive.
- Productive on 2° buds.
- Medium-small, tight clusters w/ medium-large, thick-skinned berries.
- Produces a well balanced wine with a pineapple aroma & flavor.
- Promising as a seeded table cultivar.

'La Crescent'



2002 University of Minnesota release.

- Season: early
- Vine vigor: vigorous.
- Hardiness: “very hardy”.
- Bud break: very early with Maréchal Foch – frost prone.
- Semi-trailing growth habit.
- Susceptible to black rot, downy mildew, and crown gall.
- Somewhat susceptible to 2,4-D; very susceptible to dicamba.
- Young shoots are sensitive to “blow out”.
- Moderately productive on 2° buds.
- Very loose clusters, berry set can be an issue.
- Very promising cold hardy white cultivar.
 - Have tasted some very good wines.

'Frontenac Gris'



2003 University of Minnesota release.

- Color mutation of Frontenac that can be made into a very high quality white wine.
- Bud break: mid-season with Frontenac.
- Vine characteristics are like Frontenac.
- Appears to mature just ahead of Frontenac.
- Slightly lower acids than Frontenac.
- Produces a clean, crisp white or salmon-tinged white wine w/ an apricot or peach flavor.

'Mars'



University of Arkansas American-type seedless table grape. Released in 1986.

- Season: mid-season
- Vine vigor: vigorous
- Hardiness: “**moderately hardy**, hardier than ‘Reliance’.
- Trailing growth habit.
- Bud break: mid-season.
- Very good disease tolerance.
- Moderately susceptible to 2,4-D and dicamba.
- Large berries borne in medium sized clusters.
- Productive on 2^o buds.
- Berries are slipskin w/ a mild *labusca* flavor.
- Requires cluster thinning.
- Can be extremely productive.

'Vignole'



1949 French release.

- Season: mid-season
- Vine vigor: moderately vigorous.
- Hardiness: “Moderately hardy”.
- Upright growth habit.
- Bud break: late season.
- Susceptible to powdery mildew, *Botrytis* bunch rot; moderately susceptible to downy mildew.
- Good tolerance to 2,4-D and dicamba.
- Periderm formation occurs very early.
- Moderately productive on 2° buds.
- Very tight, small clusters, with thick skinned berries.
- Berries can develop high sugars while retaining high acidity.
- Only moderately productive in Iowa trials.

'Traminette'



1996 New York release.

- Season: late mid-season
- Vine vigor: moderately vigorous.
- Hardiness: "Moderately hardy".
- Semi-upright growth habit.
- Bud break: mid-season.
- Moderately susceptible to downy mildew.
- Moderately susceptible to 2,4-D; susceptible to dicamba.
- Periderm formation occurs very late, **not adapted to shorter growing seasons.**
- Winter trunk injury can be a problem.
- Not very productive on 2° buds.

'Cayuga White'



1972 New York release.

- Season: mid-season
- Vine vigor: vigorous.
- Hardiness: "Moderately hardy".
- Semi-trailing growth habit.
- Bud break: late season.
- Moderately susceptible to downy mildew.
- Somewhat susceptible to 2,4-D and dicamba.
- Not productive on 2^o buds.
- **Not adapted to colder, shorter growing season sites.**

Cold Hardy Hybrid Wine Cultivars

Not being tested at ISU

White

Elvira (VH)

Horizon (H)

Kay Gray (VH)

Louise Swenson (VH)

Petite Amie (?)

St. Pepin (H)

Swenson Red (H)

Ventura (VH)

Red

Beta (VH)

Bluebell (VH)

Sabrevois (VH)

Valiant (VH)

For More Information

ISU Viticulture Home Page

<http://viticulture.hort.iastate.edu/>

“ISU Research”

- 2002 Leopold Center Grape Cultivar by Management System Trial (*Annual progress reports*)
- 2003 Wine Grape Cultivar Trial (*Annual progress reports*)

Midwest Grape and Wine Institute

<http://www.extension.iastate.edu/Wine/>