# Focus Areas For The University of Nebraska Viticulture Program

***University Of Nebraska Viticulture Program***
http.//agronomy.unl.edu/viticulture

# Focus Areas For The University of Nebraska Viticulture Program

- Cultivar/Genotype Evaluation
- Cold Tolerance
  - Winter
  - Spring
  - Fall
- Vineyard Establishment

# Focus Areas For The University of Nebraska Viticulture Program

- Disease Management
- Insect Monitoring
- Bud Physiology
  - Bud Break Timing
  - Bud Break Delay

# Focus Areas For The University of Nebraska Viticulture Program

- Reduced Input/Organic
- Trellis Systems
- Weed Management
  - Mulch Studies
  - Cover Crops
  - Phenoxy Herbicide Tolerance

# Focus Areas For The University of Nebraska Viticulture Program

- Rootstocks & Winter Protection
- Propagation
- Harvest Parameters
- Wine & Juice Composition, Fruit Wines

Funding:
Richard and Lurine Kimmel Charitable Foundation,
The Nebraska Grape and Wine Board
and the University of Nebraska Institute of Agriculture and Natural Resources

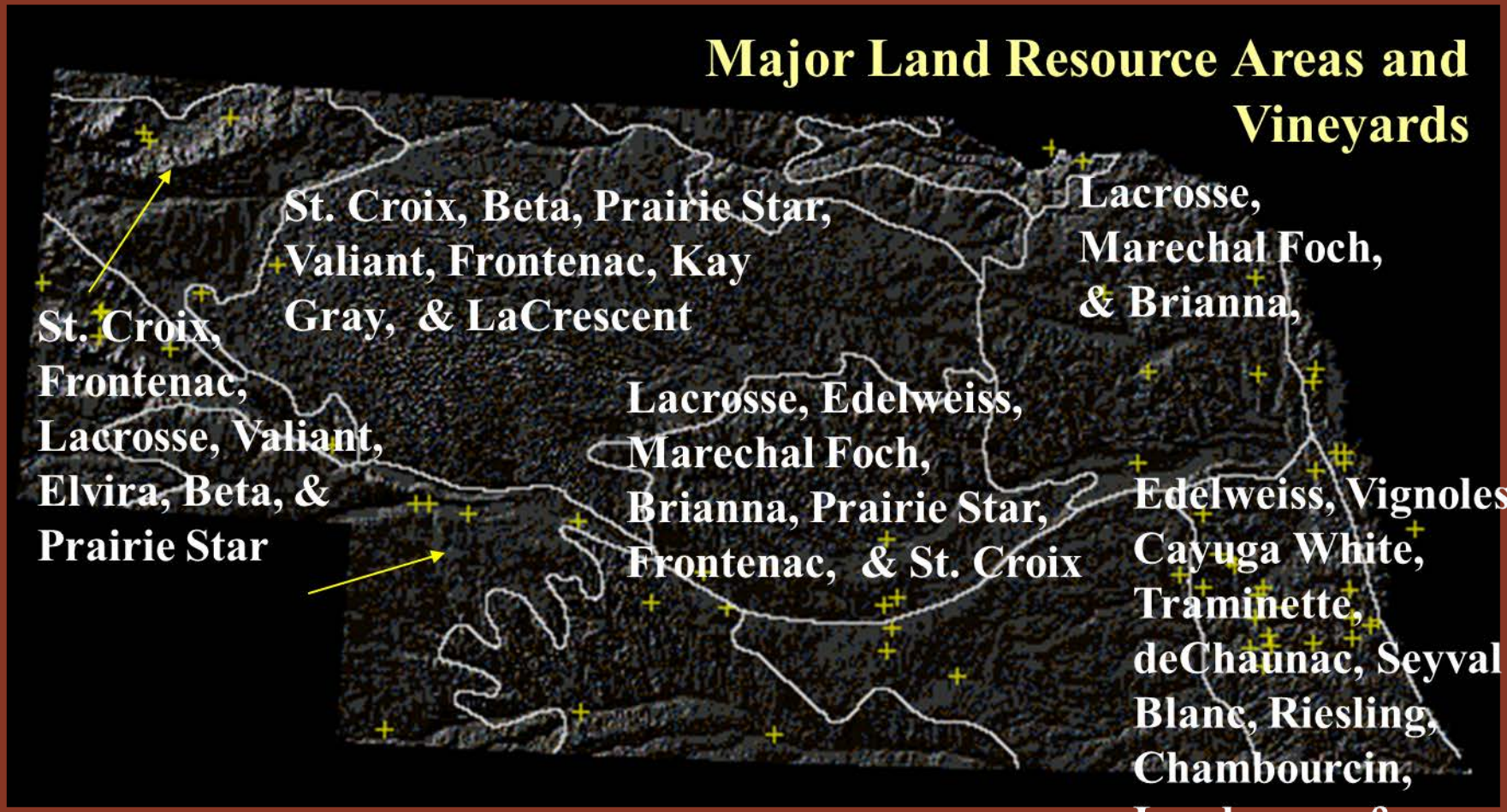
# Focus Areas For The University of Nebraska Viticulture Program

- Vineyard Locations
  - Nemaha
  - Peru
  - Nebraska City
  - Pawnee City
  - Scottsbluff

# Focus Areas For The University of Nebraska Viticulture Program

1971 to 2000 Normals

| Weather Station | FFP (28°F) | Days <-10°F | Tmin Extreme | Abs Tmin | GDD (50°F) |
|---|---|---|---|---|---|
| Cuthills Vineyard Osmond | 166 | 8.4 | -21.0 | -28 | 3249 |
| Geo. Spencer Kearney 4 NE | 177 | 3.8 | -14.4 | -30 | 3325 |
| James Arthur Vineyard Lincoln AP | 183 | 4.0 | -15.2 | -22 | 3605 |
| Blue Valley Vineyard Crete | 190 | 2.8 | -14.5 | -25 | 3714 |
| Lovers Leap Vineyard Crawford | 153 | 4.3 | -17.5 | -33 | 2742 |
| Geneva Research Farm Geneva, NY | 198 | 0.5 | -7.2 | -16 | 2485 |


Major Land Resource Areas and Vineyards
St. Croix, Beta, Prairie Star, Valiant, Frontenac, Kay Gray, & LaCrescent
Lacrosse, Marechal Foch, & Brianna,
St. Croix, Frontenac, Lacrosse, Valiant, Elvira, Beta, & Prairie Star
Lacrosse, Edelweiss, Marechal Foch, Brianna, Prairie Star, Frontenac, & St. Croix
Edelweiss, Vignoles, Cayuga White, Traminette, deChaunac, Seyval Blanc, Riesling, Chambourcin, Lemberger & Norton/Cynthiana

# Bill Waltman

**Table 1. Mean Hardiness Rating and Spring Bud Break for Cultivars Exhibiting Reliability**

| Cultivar | Mean Hardiness Rating[z] | Mean Bud Break Rating[y] | Remarks |
|---|---|---|---|
| Chambourcin, O.R. | 6.47 | 2.15 | |
| Chambourcin/3309C | 6.19 | 1.65 | |
| deChaunac | 8.28 | 5.80 | Late frost susceptible but fruits well on secondaries |
| Delaware | 8.30 | 3.70 | |
| Edelweiss | 8.43 | 4.10 | Sometimes hurt by late frost |
| Frontenac | 8.66 | 2.80 | |
| Lacrosse | 8.33 | 3.60 | |
| Marechal Foch | 6.98 | 5.90 | Late frost susceptible |
| Saint Croix | 8.71 | 3.95 | |
| Vignoles | 8.11 | 3.70 | |

[Z] Ratings: 1 to 9, with 1`= dead and 9 = all buds alive and breaking. Averaged over four locations and three years.

[Y] Ratings: 1 to 6, with 1 = tight buds, 6 = buds opened and shoots elongating.

**Table 2. Mean Hardiness Rating for Cultivars to Consider on a Trial Basis in Nebraska**

| Cultivar | Mean Hardiness Rating[z] | Remarks |
|---|---|---|
| Bianca/3309C | 5.18 | Variable vigor |
| Catawba | 5.30 | Not good on heavy soils |
| Cayuga White | 5.85 | Very productive once established |
| Chardonel | 6.20 | Slow starter |
| Cynthiana/Norton | 7.30 | Small bunches, productive |
| Esprit | 6.65 | |
| Lemberger/3309C | 6.34 | Must be grafted, large clusters |
| Leon Millot | 7.30 | Similar to M. Foch, early bud break |
| Niagara | 5.82 | |
| Riesling/3309C | 6.68 | Must be grafted |
| Seyval Blanc | 7.05 | Attractive large clusters, overcropping may be a problem |
| Traminette | 6.50 | Beautiful clusters, lovely spicy wine |
| Trollhaugen | 6.80 | |
| Vidal Blanc | 5.16 | Slow starter |

[z] Ratings: 1 to 9, with 1 = dead and 9 = all buds alive and breaking. Averaged over four locations and three years.

**Table 3. Mean Hardiness Rating for Experimental Grape Genotypes in Nebraska**

| Genotype (Code #) | Mean Hardiness Rating[z] | Remarks |
|---|---|---|
| ES 2-1-9 | 5.20 | Named 'Sabrevois' in Quebec; |
| ES 3-24-7 | 6.70 | 'Prairie Star'; fruity white wines |
| ES 5-4-29 | 6.55 | 'Lorelei' |
| ES 6-1-43 | 4.95 | 'Swenson White' |
| ES 10-18-30 | 6.45 | |
| ES 7-4-76 | 9.00 | 'Brianna'; white wines bursting with tropical fruit |
| MN 1131 | 6.95 | |
| MN 1166 | 7.95 | 'LaCrescent'; excellent fruity white wines |
| MN 1197 | 7.50 | |
| MN 1200 | 7.60 | |
| MN 1211 | 7.60 | Released as 'Marquette' |
| NY GR7 | 7.45 | good vigor on lean soils |
| NY 70.809.1 | 7.05 | Corot Noir |
| NY 62.122.1 | 5.25 | Valvin Muscat |
| NY 73.0136.17 | 6.60 | Noiret |

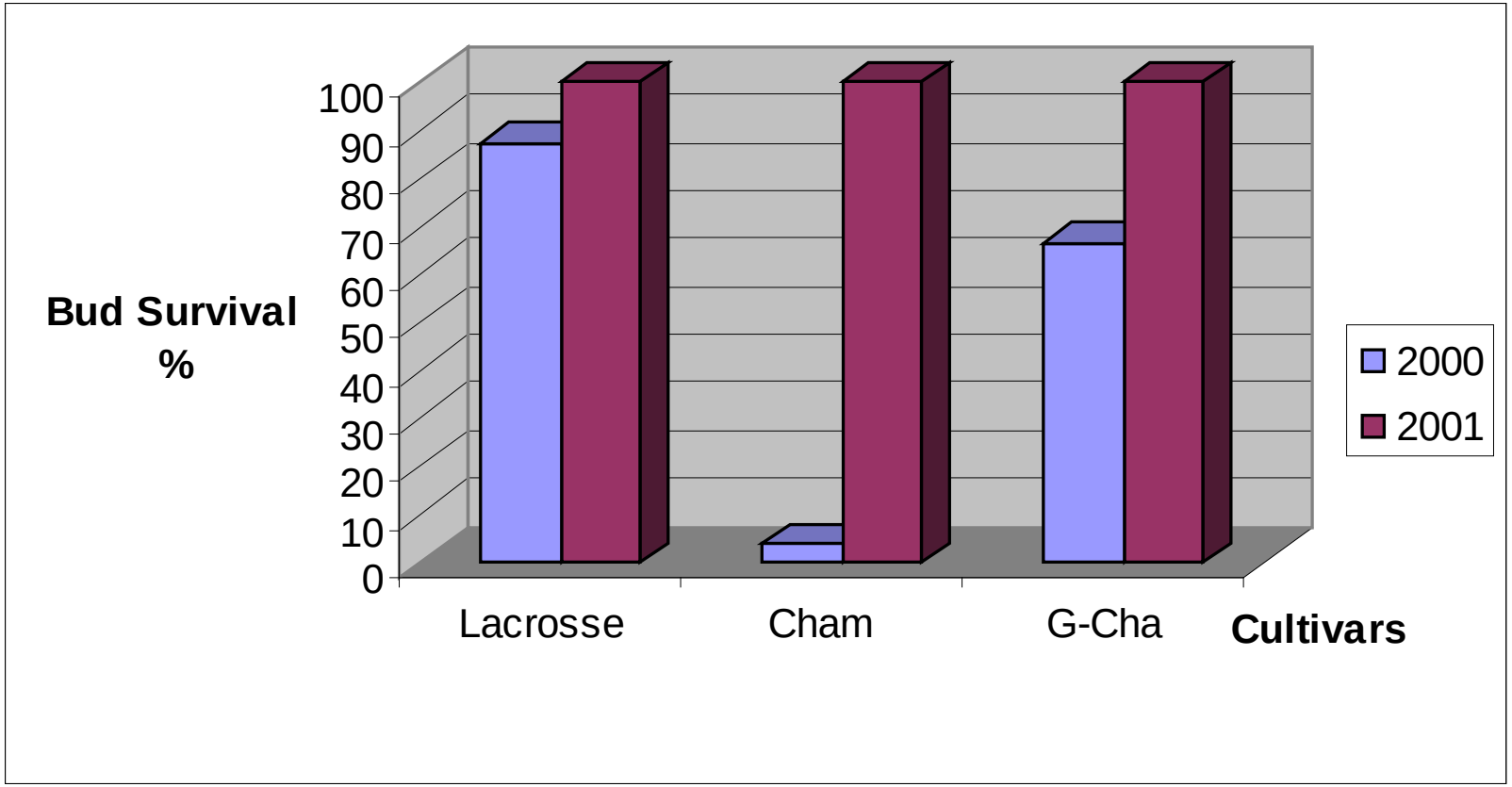
[z] Ratings: 1 to 9, with 1 = dead and 9 = all buds alive and breaking.

# Cynthiana (Norton)

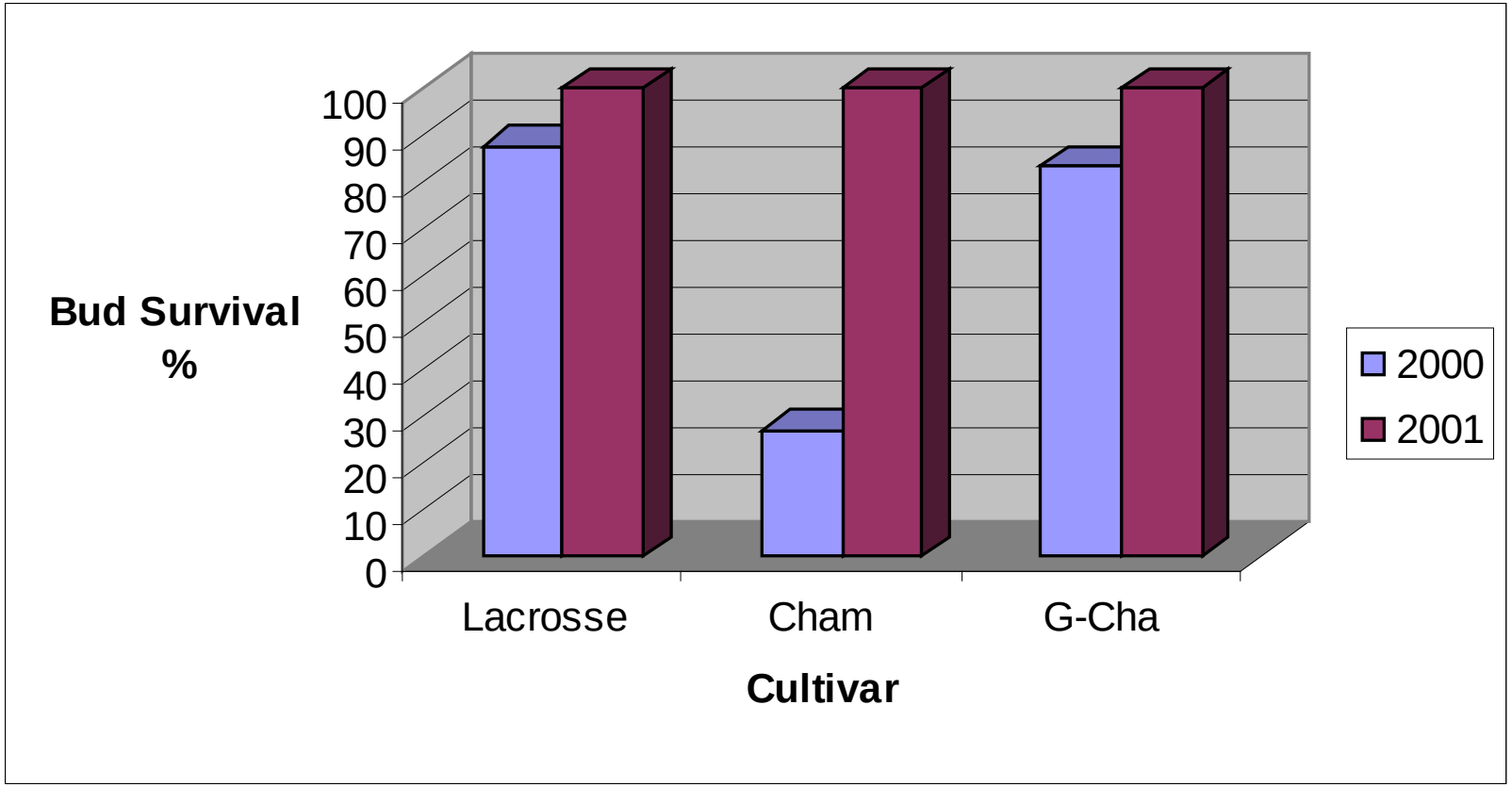
# Delaware

# Vidal Blanc

# Primary Bud Survival, February



# Secondary Bud Survival, February



# Dr. Sanjun Gu

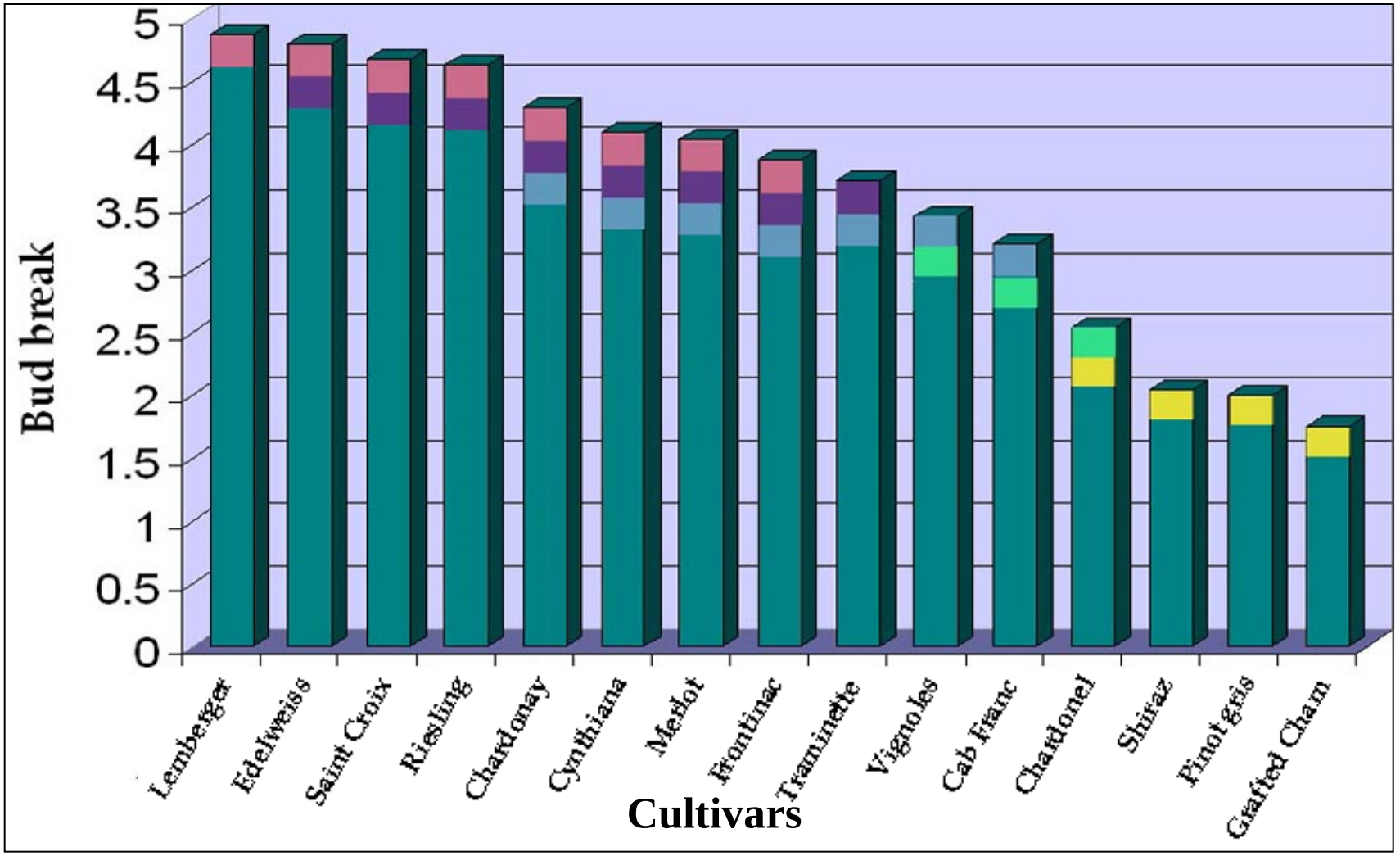



**Figure 1. Using a 1 to 6 rating scale, where 1 represents tightly closed buds and 6 means buds have broken completely and shoots have begun to elongate. Based on observations of 12 plants for each cultivar (two 6-plant replications), April 18, 2002.**

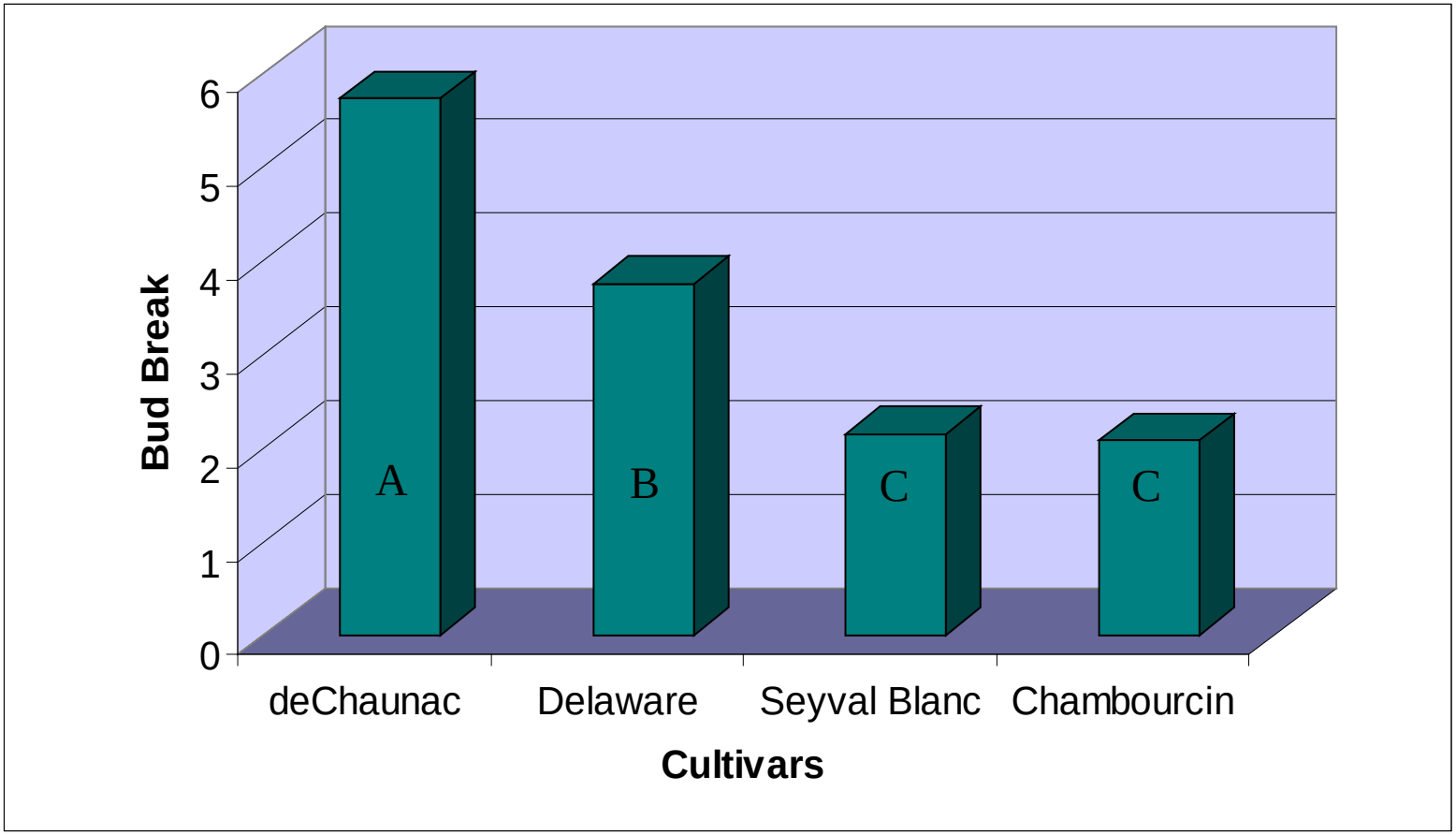



**Figure 2. Comparison of bud break timing for four cultivars, using a 1 to 6 rating scale (see Fig.1). Based on observations of 24 plants for each cultivar (four 6-plant replications), April 18, 2002.**

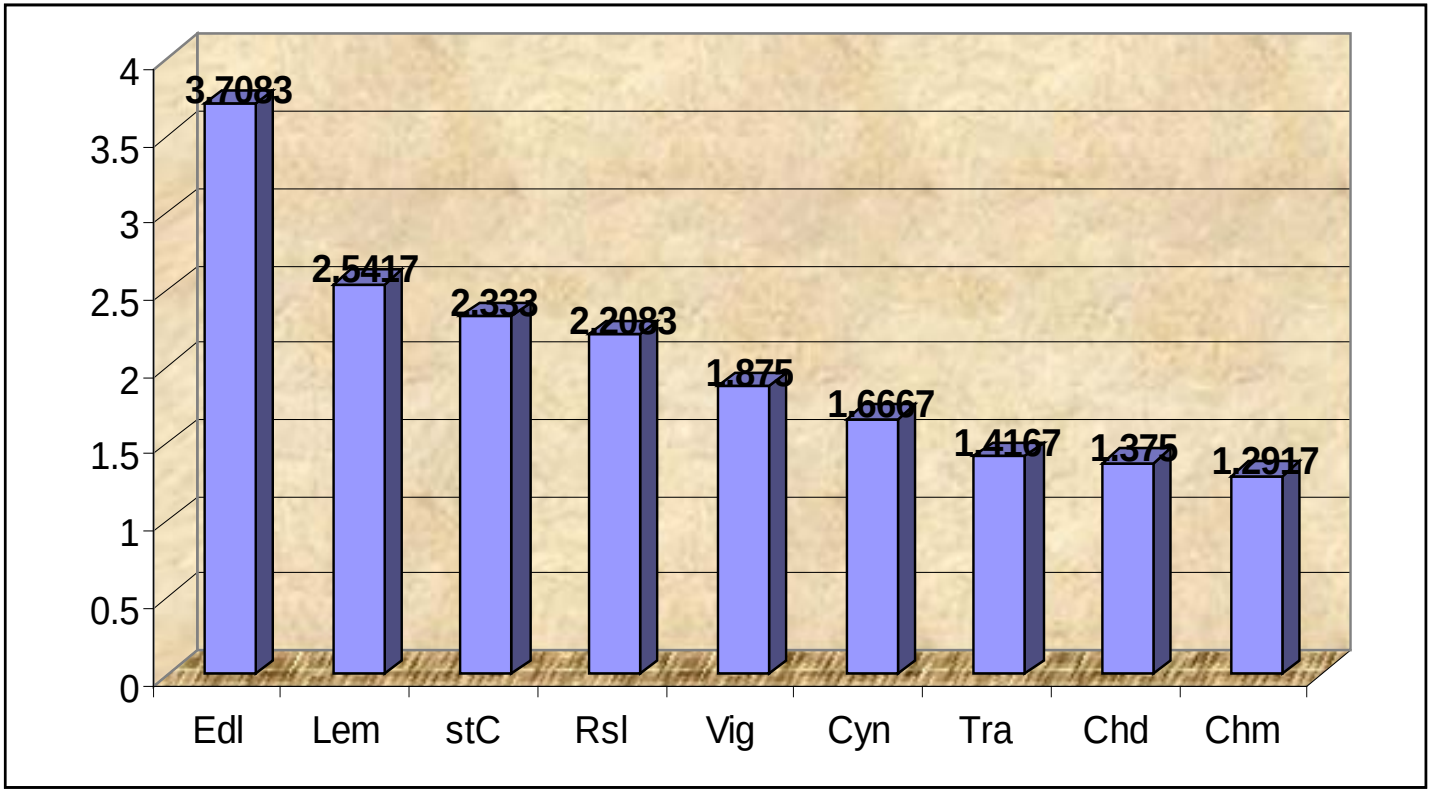



**Figure 3. Using a 1 to 6 rating scale, where 1 represents tightly closed buds and 6 means buds have broken completely and shoots have begun to elongate. Cultivars compared are Edelweiss (Edl), Lemberger (Lem), Saint Croix, (StC), Riesling (Rsl), Vignoles (Vig), Cynthiana/Norton (Cyn), Traminette (Tra), Chardonel (Chd) and Chambourcin (Chm) on 3309C. Based on observations of 12 plants for each cultivar (two 6-plant replications), April 12, 2006.**

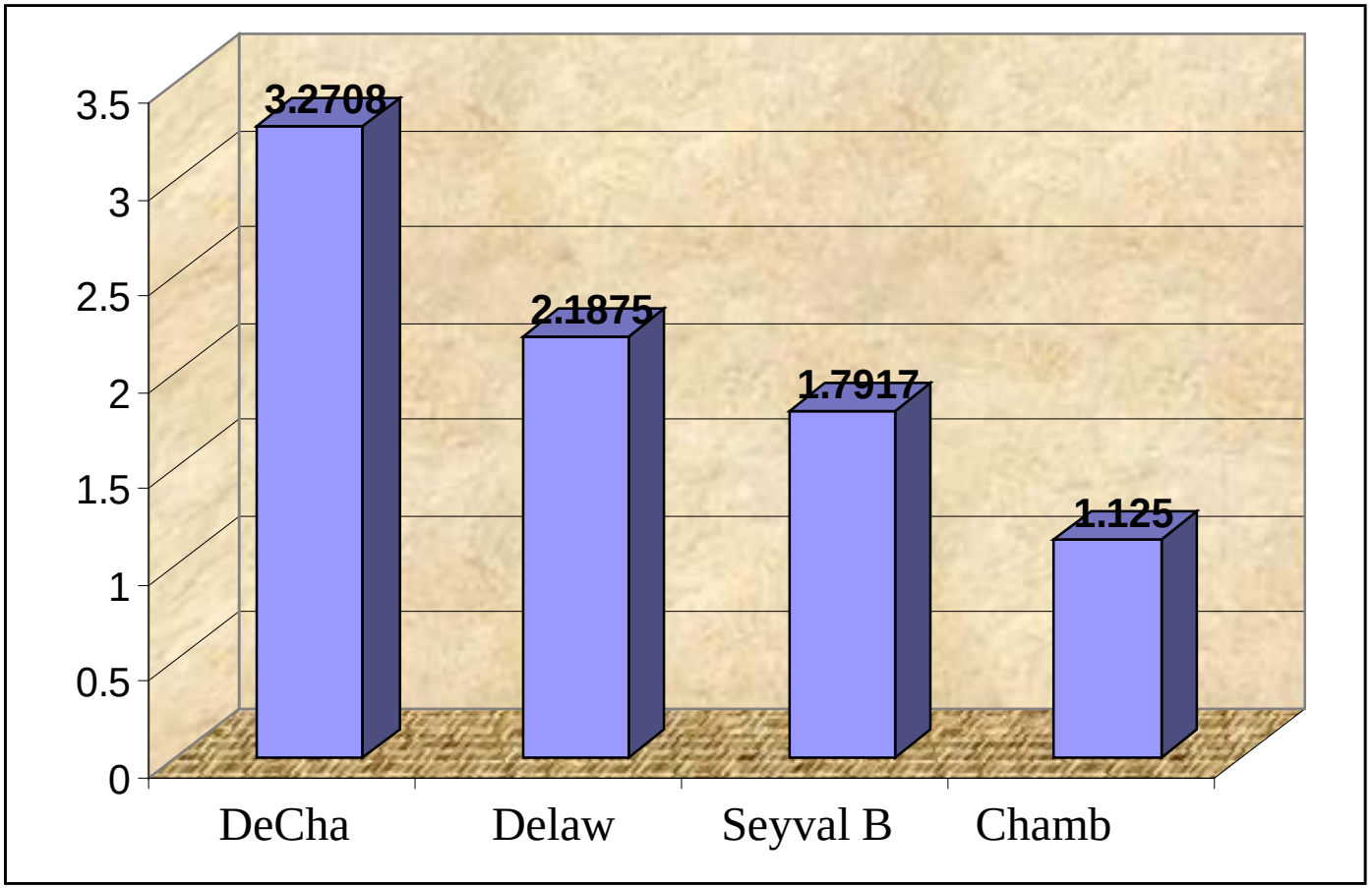



**Figure 4. Comparison of bud break timing for four cultivars, using a 1 to 6 rating scale (see Fig.1) DeCha = deChaunac, Delaw = Delaware, Seyval B = Seyval Blanc and Chamb = Chambourcin (own rooted). Based on observations of 24 plants for each cultivar (four 6-plant replications), April 12, 2006.**

# 2003 Thru 2009 Grape Yield in Pounds per Plant

| Variety | Cultivar | 2003 | 2004 | 2005 | 2006 | 2007 | 2008 | 2009 | Average/ Variety |
|---|---|---|---|---|---|---|---|---|---|
| 1 | Frontenac | 6.2 | 7.8 | 0.7 | 28.8 | 29 | 18.7 | 29 | 17.2 |
| 2 | deChaunac | 5.1 | 5.1 | 2.5 | 22.7 | 16 | 0 | 24.6 | 10.9 |
| 3 | St. Croix | 2.5 | 0 | 0 | 5.8 | 0 | 0 | 6.3 | 2.1 |
| 4 | Valiant | 9.3 | 6.2 | 9.3 | 24.2 | 22.6 | 22 | 24.2 | 16.8 |
| 6 | Leon Millot | 4.3 | 9.4 | 3.3 | 32.1 | 22.2 | 16 | 28.3 | 16.5 |
| 7 | Seyval | 2.1 | 4.1 | 5.5 | 10.6 | 0 | 0 | 8.4 | 4.4 |
| 8 | Lacrosse | 1 | 3.5 | 0.5 | 8.3 | 0 | 0 | 9 | 3.2 |
| 9 | Edelweiss | 2.2 | 2.9 | 0 | 2.3 | 5 | 0 | 4.5 | 2.4 |
| 10 | Niagara | 1.6 | 0.7 | 1.1 | 1.6 | 5.5 | 0 | 2 | 1.8 |
| 11 | Chardonel | 0 | 1.4 | 1.3 | 5.8 | 0 | 0 | 5.3 | 2.0 |
| 12 | Cayuga White | 4.4 | 3.6 | 0 | 5.5 | 0 | 0 | 6.2 | 2.8 |
| 13 | Concord | 3.6 | 5.2 | 0 | 1.5 | 0 | 0 | 3 | 1.9 |
| 14 | Marechal Foch | 2.1 | 9 | 3.4 | 19.5 | 20.3 | 14 | 20.7 | 12.7 |
| 15 | Elvira | 3.1 | 1.3 | 1.1 | 21.2 | 8 | 21 | 24.3 | 11.4 |
| Average/ Year | | 3.4 | 4.3 | 2.1 | 13.6 | 9.2 | 6.6 | 14.0 | 7.6 |

# Effects of Training System on Sunlight Penetration, Yield and Fruit Quality of ‘Frontenac’ (*Vitis* spp.)

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This study investigated the effects of 5 trellis styles on the fruit-zone light environment, fruit chemical composition, and yield of ‘Frontenac’ grapes grown on a fertile site near Crete, Nebraska over 2 growing seasons. Photosynthetically active radiation (PAR) was measured above the canopy and within the fruiting zone at berry set, veraison, and harvest. Point quadrat canopy analysis was performed at veraison. Fruit was collected at harvest for chemical analysis (pH, per cent soluble solids, titratable acidity). At all sampling dates in 2008, vines grown on Geneva Double Curtain (GDC) and High Cordon (HC) trellises had significantly higher mid-day transmittances than vines grown on Smart Dyson (SD) and Vertical Shoot Positioned (VSP) training systems. In 2009, transmittance relationships between trellises were similar. In both years, leaf layer number was lower for GDC and HC than for SD and VSP. In 2008, GDC vines had higher fruit yield than VSP, SD, HC, and Scott Henry. In 2009, GDC yielded significantly more than VSP and HC. In 2008, trellises with higher transmittances produced higher quality fruit: GDC had higher pH and Brix than other trellises; titratable acidity (TA) was lower in GDC and HC than in SD and VSP. In 2009 fruit quality results were not related to transmittance. GDC and HC canopies had the highest transmittances on most sampling dates, but GDC vines had significantly higher yield and may produce better quality fruit. These results suggest GDC is the best training system for ‘Frontenac’ on high vigor sites in southeastern Nebraska.

# Effects of Training System on Sunlight Penetration, Yield and Fruit Quality of 'Frontenac'

- Light transmittance highest for GDC and HC
- LLN lower for GDC and HC
- GDC had higher yield than HC, VSP, SD & SH
- Higher light transmittance (GDC) = higher quality fruit
  - ↑°Brix
  - ↑pH
  - ↓TA

# Bud Break Research

- NAA (1000 ppm) & Amigo Oil significantly delayed bud break 2-6 days.
- ‘Edelweiss’ yield was not affected.
- Harvest parameters were not affected.
- Bud position 5 was significantly delayed by applying NAA at 1000 ppm only in Jan.
- Treatments had no effect on shoot length.

Eastern Nebraska Grape Disease Severity – 2011

| Cultivar | Black Rot | Downy Mildew | Powdery Mildew |
|---|---|---|---|
| Frontenac | X | O | O |
| St. Croix | X | O | X |
| Valiant | XX | X | X |
| Prairie Star | X | X | X |
| Marechal Foch | X | XX | X |
| Lacrosse | XX | XX | X |

Rating Scale: XX = severe; X = moderate; 0 = absent or of no commercial concern.
Phomopsis (*Phomopsis viticola*) was not a problem in the 2011 growing season.

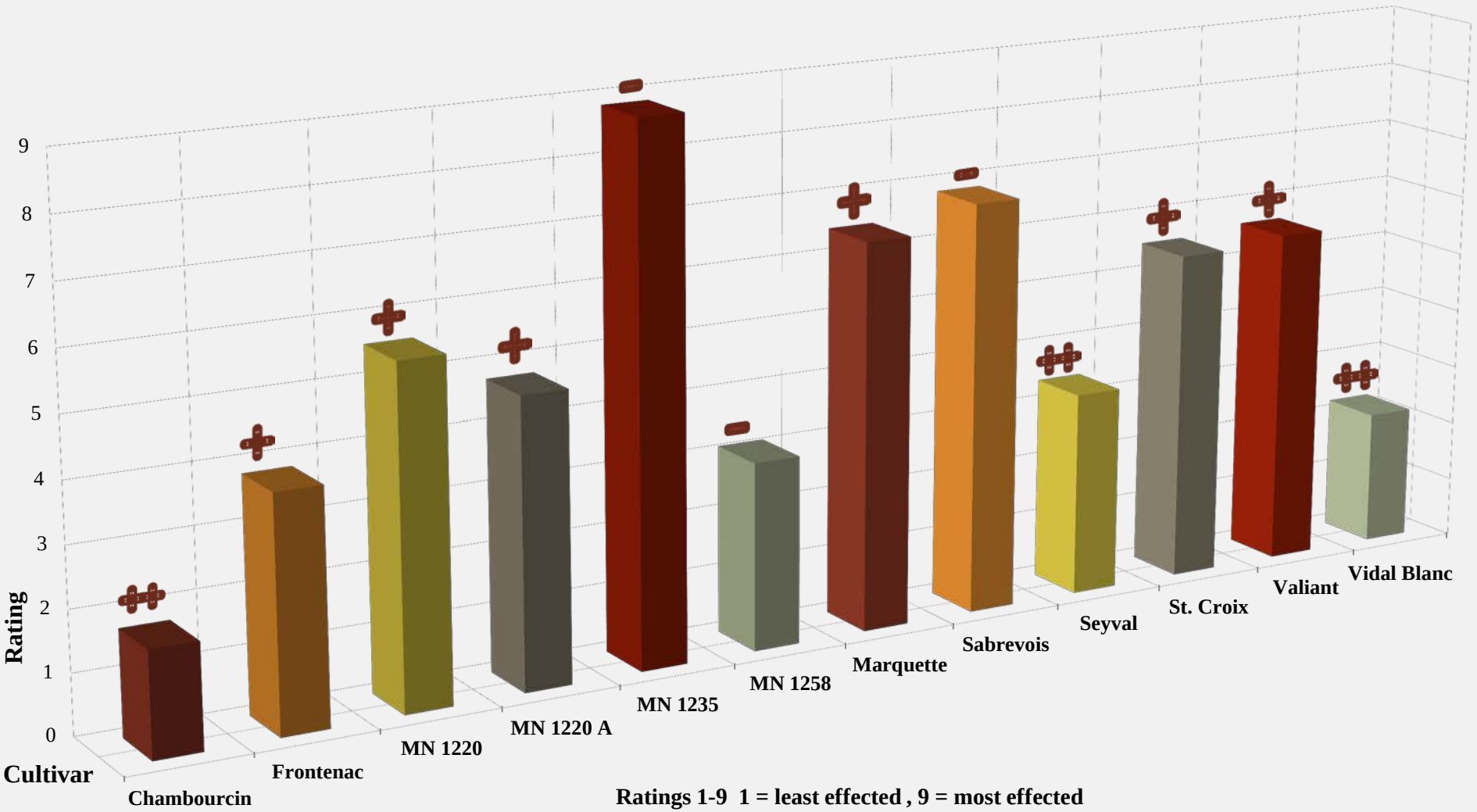
## 2,4-D damage on MN 1235

- **Experienced complete fruit loss**

## Sabrevois

- **Experienced complete fruit loss**

# Mean Visual 2,4-D Damage




**Ratings 1-9 1 = least effected , 9 = most effected**
**++ close to normal crop + below normal crop –no or close to no crop**

# Thank You