

# Grape Breeding in Northern Wisconsin, USA

## 20 Years of Grape Breeding at Mt. Ashwabay Vineyard & Orchard

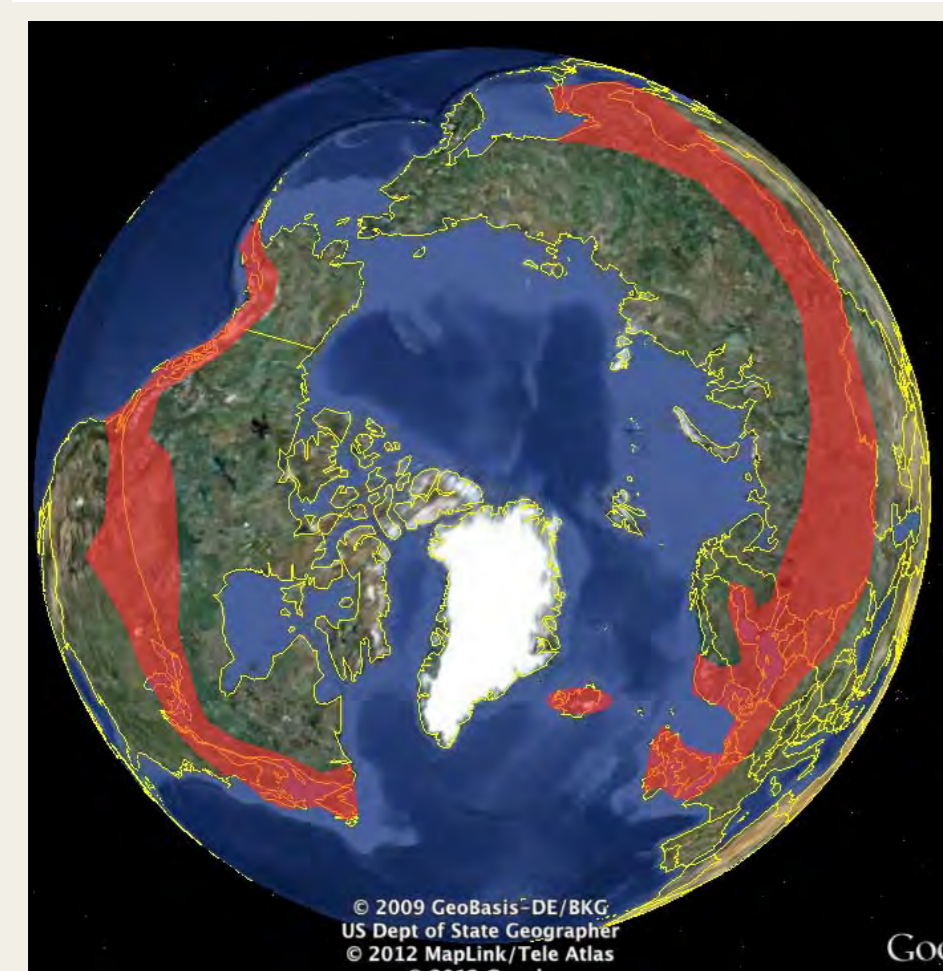
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### Abstract

The MAVO breeding program has been in progress for 20 years trying to develop early-ripening, cold-hardy, disease-resistant wine grapes that make high quality commercial wines. More recently, breeding has also been started to address the same objectives in table grapes. Fruit quality is primarily from *Vitis vinifera*, and resistance traits from *Vitis riparia*. Considerable progress has been achieved, but further testing at multiple sites is required before the best selections can be named and released.

### Breeding Location

- Town of Bayfield in northern Wisconsin (USA), 46.8N, 90.9W
- 1850 GDD 50F (1025 10C), 1600-2300 range (890-1270C)
- Mean last frost 3 May, mean first frost 5 Oct = 155 frost free days
- 5 acres of vineyard, half of that seedling vineyards



The polar map (left) shows the approximate range where varieties developed in the MAVO are expected to be potentially suitable.

This region lies to the north, with some overlap, of the regions covered by most other grape breeding programs.

### Breeding Objectives

- Early Ripening (=Marquette/Marechal Foch or earlier)
- Reliably hardy to -34C (-30F)
- No more the 2 disease control sprays in moderate eastern North American disease pressure.
- Non-labrusca flavored wines
- Clusters >60g (100g target)
- Yield > 4 tons/acre
- Table grapes: seedless

### Breeding History

- First crosses (5) in 1993, in west-central Minnesota.
- In 1995 & 1996, dug up vineyard (≈800 vines), moved to virgin site in northern Wisconsin.
- No crosses in 1996 & 1997.
- 1998 - 2004, 20-30 crosses/year, ≈ 1400 seeds
- 2005 step up effort and added table grape breeding
- Currently 120-150 crosses, 3700 -6200 seeds

### Methods



- Traditional field vineyard crosses, with pollen from MAVO vineyards or from colleagues around the world..
- 3-season greenhouse recently added to facilitate better 1<sup>st</sup> year growth and survival.
- Mature seedling vines evaluated in outdoor vineyard, 6-7 year cycle.
- Initiating tests with marker assisted selection to evaluate suitability of existing markers for increasing efficiency.

### Progress

- 4000-6000 seeds/year
- ≈2100 Seedlings
- ≈1500 Seedlings to vineyard
- 2-4 Second test selections/year
- 35% table grape effort last 5 years

Multiple advanced MAVO selections are currently being tested in vineyards worldwide - USA, Canada, Norway, Denmark, Poland, Lithuania, Latvia, and Czech Republic.

Consistently high wine quality is the last objective evaluated, and needs further testing.



### Parent Selection

#### Resistance Parents

- Most hardy parents are from University of Minnesota or Elmer Swenson
  - Frontenac (all colors) (Minnesota *Vitis riparia* x Landot 4511)
  - La Crescent (St. Pepin x ES 6-8-25)
  - Marquette (Ravat 262 x MN 1094)
  - MN 1045 (*riparia* x Carmine = ([Carigane x Cab Sauv] x Merlot))
  - MN 1094 ([Mandan x Landot 4511] x [*riparia* x Carmine])
  - MN 1095 (*riparia* x Veeblanc)
  - MN 1200 ([*riparia* x SV 18-283] x Landot 4511)
  - ES 6-8-25 (*riparia* x Muscat Hamburg)
  - ES 5-8-17 (*riparia* x Siegerrebe)
  - ES 5-8-10 (*riparia* x Primativo)
  - ES 8-2-24 (*riparia* x SV 23-657)
  - St. Pepin (ES 114 x Seyval Blanc)
  - MAVO 01.20.01 (MN 1094 x Golubok)
  - MAVO 00.22.02 ([St. Pepin x Siegerrebe] x Aris)
  - MAVO 00.33.01 (Frontenac x [Mandan x Landot 4511])



#### Quality Parents

- Mostly tender material
- MAVO tender block = 950 varieties
- External pollen sources: repositories & other breeders (global)
  - Seyval
  - Solaris
  - Siegerrebe
  - Ravat Noir
  - Regent
  - Rondo
  - Zweigelt
  - Titan/Turan
  - Perlette
  - Flame Seedless
  - Beauty Seedless



### The Future...

The MAVO breeding program will continue to produce additional generations of promising grapes by building on prior MAVO breeding and continuing to incorporate new promising quality and resistance material from other breeding programs. At least a couple wine grape releases should be possible in the next few years if additional wine quality evaluations can be conducted at testing locations coming into production. Progress is being made towards hardy seedless table grapes that come close to consumer quality expectations for a locally produced fruit product.