



The Nova Scotia Grape Industry: After the 2023 Polar Vortex

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The Nova Scotia Industry

- Background and cultivars
- Economic impact
- Tidal Bay Wines
- Growing regions
- Weather impacts
- The Vortex Impact
- 2023 Activities and Data
- The future

Sauvignon





Halls Harbour
Bay of Fundy



Sauvignon Blanc



Lunenburg



Peggy's Cove



Sauv





Nova Scotia Grape and Wine Industry

- 1611 – Louis Hebert , A French settler plants a small vineyard near Bear River NS
- 1980 – First commercial vintage Roger Dial at Grand Pre
- 1982 – Grape Growers Association of Nova Scotia (GGANS) formed
- 1999 – 3 commercial wineries in NS – Jost, Grand Pre and Sainte Famille
- 2002 – Winery Association of Nova Scotia (WANS) established – changes to Wine Growers of Nova Scotia in 2020 (WGNS)

Nova Scotia Grape and Wine Industry

- 2005 – 125 acres of vineyards and 9 wineries
- 2012 – Tidal Bay officially launches as NS signature white wine
- 2015 – 94 grape growers, 17 wineries and 650+ acres of vineyards
- 2022 – 1,500 acres of vineyards and 23 wineries
- 2022 – Hurricane Fiona hits late September
- 2023 - Polar Vortex hits February 03/04 2023
- 2023 – Abnormal growing season !!!!!!!

| Cultivar | Vinifera (Acres) | Cultivar | Hybrids (Acres) |
|----------------------|------------------|----------------------|-----------------|
| Chardonnay | 156 | L'Acadie Blanc | 284 |
| Riesling | 67 | New York Muscat | 119 |
| Pinot Noir | 66 | Marechal Foch | 83 |
| Ortega | 22 | Leon Millot | 71 |
| Cabernet Franc | 16 | Seyval Blanc | 62 |
| Sauvignon Blanc | 14 | Geisenheim 318 | 53 |
| Pinot Meunier | 13 | Lucie Kuhlmann | 48 |
| Siegerrebe | 6 | Marquette | 44 |
| Siegfried | 6 | Vidal Blanc | 44 |
| Gamay | 5 | Frontenac Blanc | 38 |
| Scheurebe | 5 | Baco Noir | 37 |
| Other | 26 | Petite Milo | 26 |
| | | Osceola Muscat | 24 |
| | | Other | 171 |
| TOTAL acreage | 402 | TOTAL acreage | 1104 |

Nova Scotia Wine: Economic Impact

- \$245 Million total economic impact
 - \$ 163 Million business revenue
 - \$ 32 Million tax revenue
 - \$ 50 Million wages
- Broader Effects
 - \$ 32.6 Million indirect revenues
 - \$ 26.9 Million direct revenues
 - 1,100 FTE jobs through economic impact
- Nova Scotia Wine Industry attracts 150,000 visitors each year

What is Tidal Bay ?

- This wine was developed from a concept of using cultivars in Nova Scotia to create a signature wine
- All grapes used must be grown in Nova Scotia
- Over 20 cultivars may be used
- Maximum alcohol 11%
- Every bottle, in a blind tasting, is evaluated by independent panel

Approved Tidal Bay Grape Varieties



A minimum of 51% (combined) of the final blend must be made up of the primary grape varieties:

51%

**L'Acadie Blanc
Seyval Blanc
Vidal
Geisenheim 318**

The following secondary grape varieties are optional, but may be included up to a (combined) total of 49% of the blend:

49%

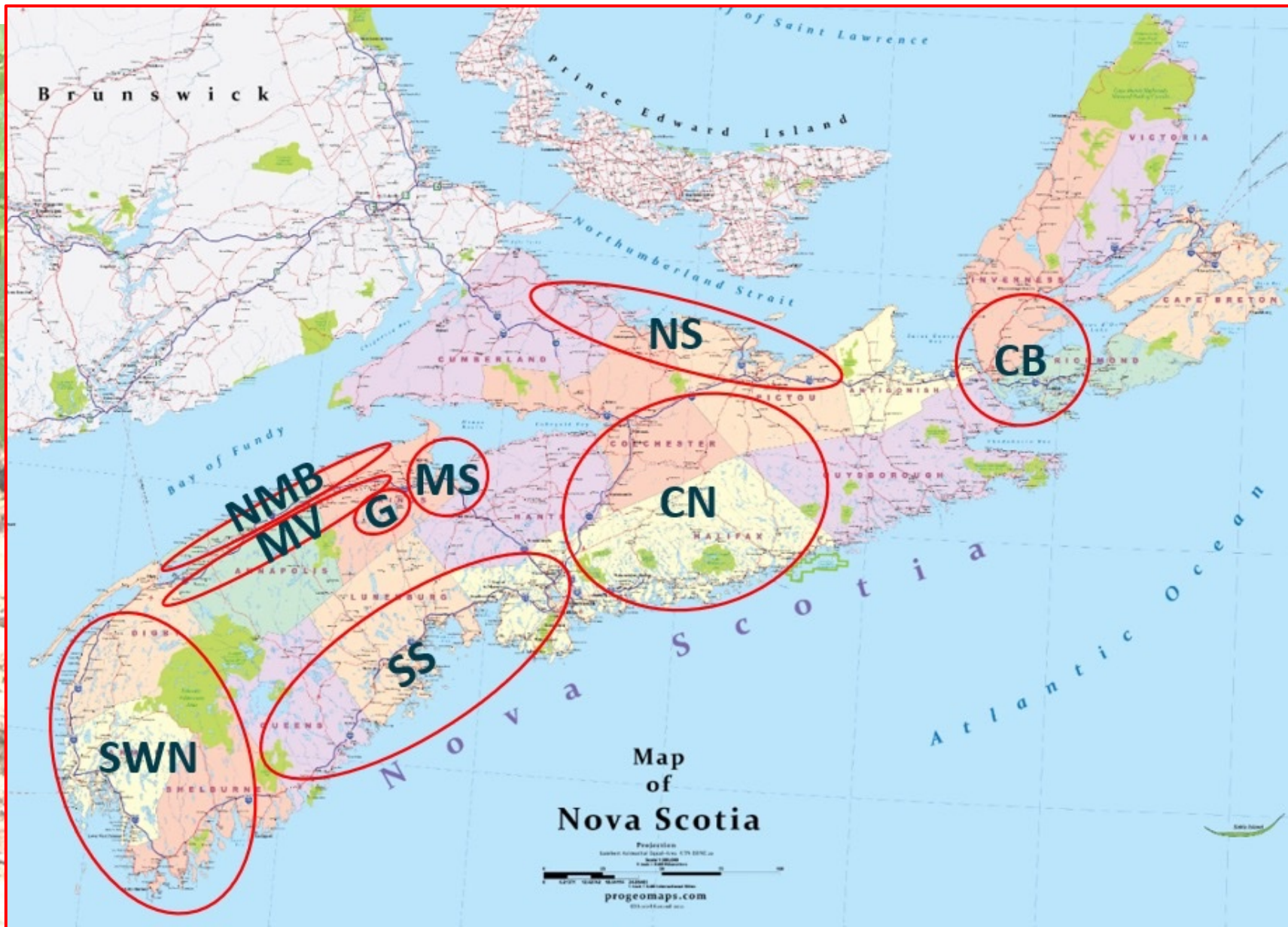
**Riesling
Chardonnay
Pinot Gris
Chasselas
Ortega
Siegfried**

**Osceola Muscat
Frontenac Gris
Frontenac Blanc
Petit Milo
Cayuga**

Other grapes grown in Nova Scotia are permitted to be included in limited amounts (up to 15% of the blend).

From WGNS

Primary Grape Growing Regions in Nova Scotia



LEGEND

NMB = North Mountain Bench

MV = Mid Valley

G = Gaspereau

MS = Minas Shore

NS = North Shore

SS = South Shore

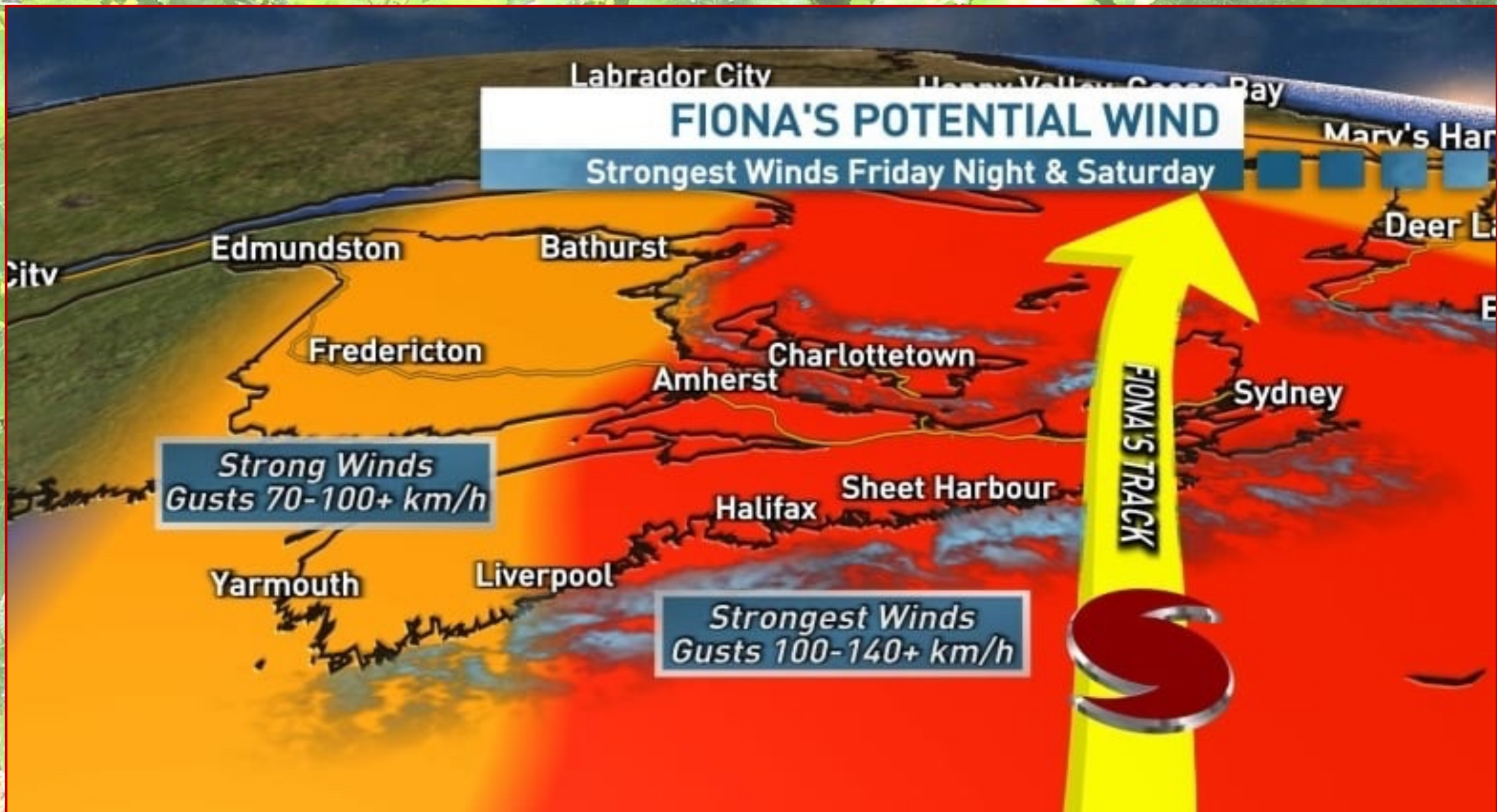
CN = Central Nova

SWN = South-West Nova

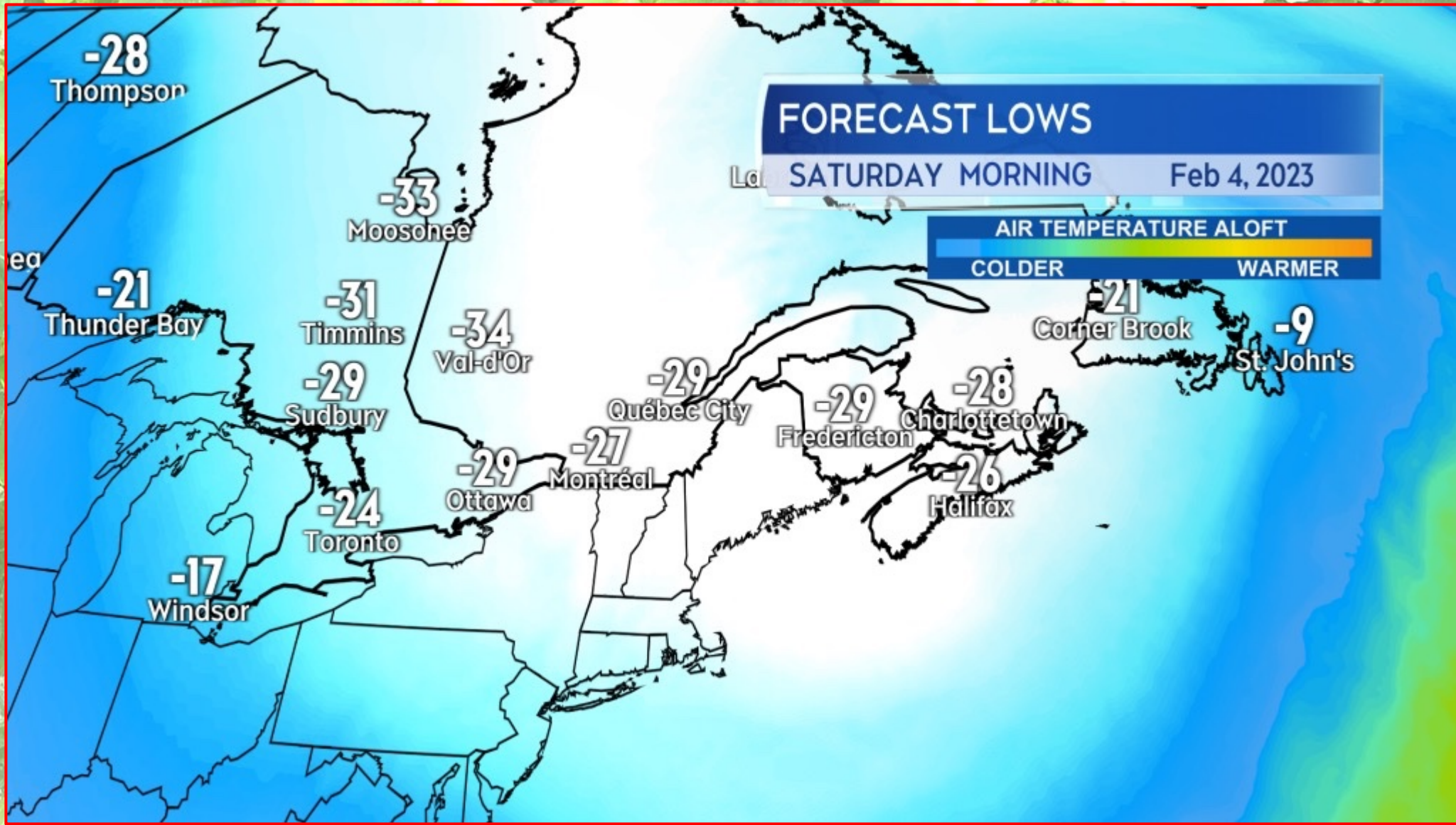
CB = Cape Breton

Weather Influences

- **Hurricane Fiona September 2022**
- **Record Breaking Events!!**
- **Above average early winter temperatures**
- **Polar Vortex February 3-4, 2023**
- **Near drought-like early spring conditions to mid June 2023**
- **Repeat spring frost events**
- **Excessive and frequent summer rain (53 out of 92 days from June through August)**
- **Hurricane Lee (Tropical Storm Lee)**



September 2023 Graphic from CBC News Online retrieved 05 Feb 2024



February 2023 Graphic from CTV News Atlantic



June 2023 Graphic FREEMAP

THE CANADIAN PRESS

Courtesy Canadian Press retrieved January 5, 2024

SUMMER RAINFALL

Totals from June 1st through August 31st

~400-500+ mm

~500-600+ mm

~600-800+ mm

~800-900+ mm

June 1st - August 31st
1981-2010 Average
250-300+ mm

Stats via: ECCC, CoCoRaHS, Wunderground & Cape Breton Mesonet

Edmundston

Miramichi

Charlottetown

Sydney

Fredericton

Moncton

Antigonish

Truro

St. Stephen

Saint John

Kentville

Halifax

Digby

Bridgewater

Shelburne

STORM RAINFALL TOTALS

As of 10am Sunday Morning



Halifax Area

Lower Sackville: 258 mm

Hammonds Plains: 254 mm

Bedford Range: 251 mm

Hublely: 237 mm

Waverley: 217 mm

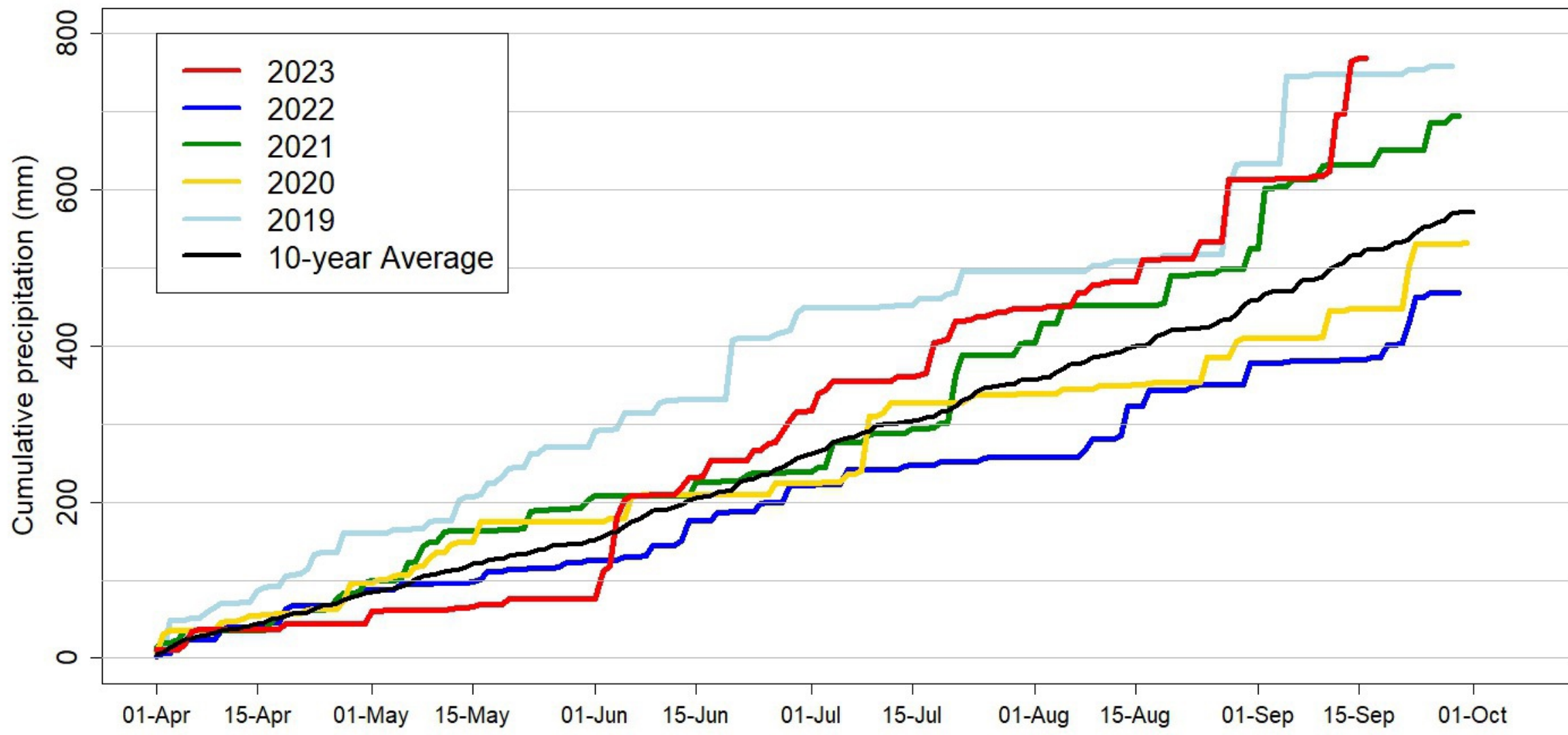
Peninsula: 103-149 mm

Dartmouth: 109-139 mm

Lake Echo: 91 mm

Eastern Passage: 42 mm

From CBC News online July 22/23 2023



LEE SUMMARY

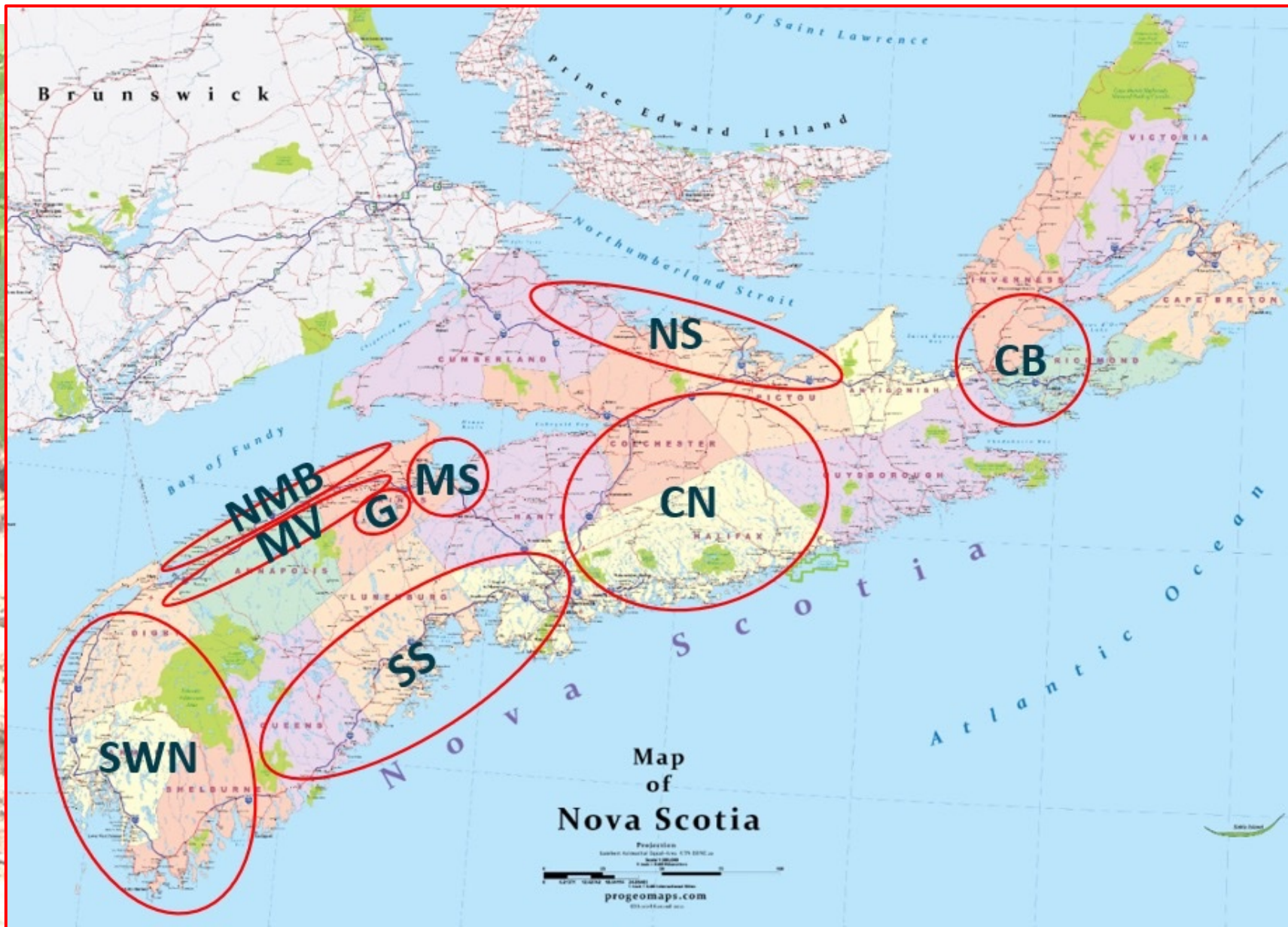
Preliminary Wind Gusts & Rainfall Totals



*Landfall near Long Island, NS
as a Post Tropical Storm*

Graphic from CBC News September 16 2023

Primary Grape Growing Regions in Nova Scotia



LEGEND

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G = Gaspereau

MS = Minas Shore

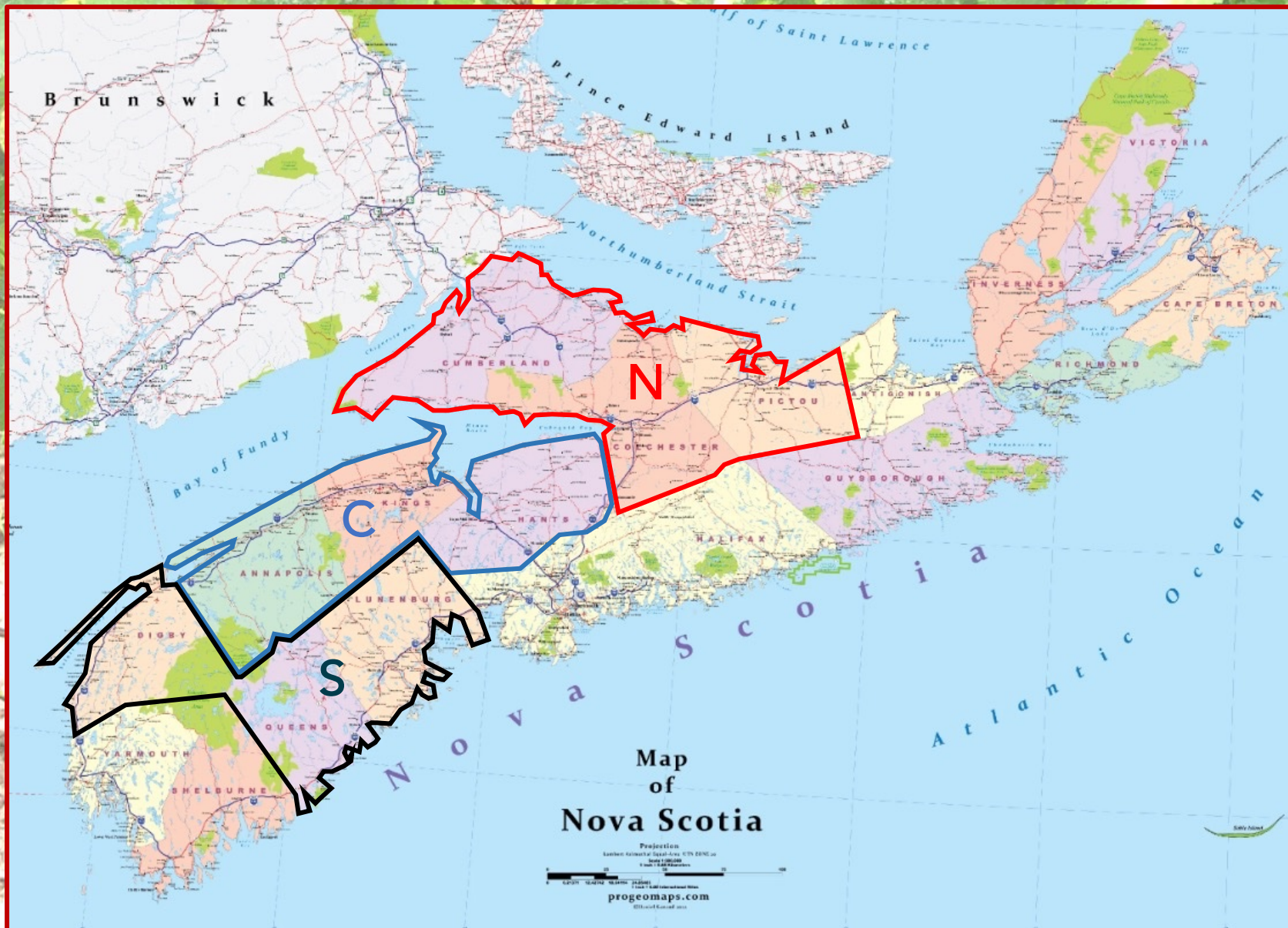
NS = North Shore

SS = South Shore

CN = Central Nova

SWN = South-West Nova

CB = Cape Breton



LEGEND

N = Northern Zone

Cumberland, Colchester
and Pictou Counties

C = Central Zone

Hants, Kings and
Annapolis Counties

S = Southern Zone

Digby, Lunenburg, and
Queens Counties

February 3 – 4, 2023 Minimum temperatures recorded

| Zone | Temperature sensor sites (°C) | Avg min. temp (°C)* |
|---------------------------------|--|---------------------|
| Northern (N of 45° 10') | Caribou (-26.5), Malagash (-26.7), North Shore (-27.6), Wallace Bay (-27.7) | -27.1 |
| Central (44° 35' to 45° 10') | Kentville (-25.5), Greenwood (-25.2), Wolfville (-25.2), Sheffield Mills (-25.2), Windsor (-25.2), Berwick (-25.4), Melvern Square (-25.4), Paradise (-24.9) | -25.2 |
| Southern (S of 44° 35') | Bear River (-24.1), Bridgewater (-23.3), Mahone Bay (-24.0), Martins Point (-23.5) | -23.7 |

from Wright, AH (2023). February 3-4, 2023, Post Freeze Report: Nova Scotia Wine Grape Initial Impact Assessment, Agriculture and Agri-Food Canada / Perennia, Kentville, Nova Scotia

Average LTE50 (50% bud mortality) (°C) values on February 3 in 2023 vs previous 4-year average

| Variety | LTE50 (4-year avg) | LTE50 (2023) | LTE50 diff. |
|-----------------|--------------------|--------------|-------------|
| Vinifera | | | |
| Chardonnay | -24.8 | -23.1 | +1.7 |
| Pinot Noir | -25.4 | -24.7 | +0.7 |
| Riesling | -24.9 | -23.4 | +1.5 |
| Hybrids | | | |
| L'Acadie | -28.8 | -25.4 | +3.4 |
| Marquette | -29.7 | -26.3 | +3.4 |

from Wright, AH (2023), February 3-4, 2023, Post Freeze Report: Nova Scotia Wine Grape Initial Impact Assessment, Agriculture and Agri-Food Canada / Perennia, Kentville, Nova Scotia.

2023 Growing Season

- Highly influenced by fall 2022 and winter 2023 temperatures
 - Much warmer than normal dormant period for grapes
 - Severe weather event on Feb 03/04 2023
 - Substantial work by AAFC and Perennia on bud survival %
- Abnormal weather for whole growing season
- Multiple issues to deal with due to different levels of injury
- Perennia retained viticultural consultant to assist with recovery efforts
- Outreach (surveys)
- Multiple grower in-field days throughout season (4)
- Zoom Q & A sessions (4) and blog posts (11)
- Individual site visits across entire province (50+)

Information Collected

1. 50+ grower/winery replies
2. # of acres of hybrids (estimate) 1100 acres with 690 acres responding - 62%
3. # of acres of vinifera (estimate) 400 acres with 250 acres responding - 63%
4. Vine spacing data
5. Vine mortality numbers
6. Major wineries and their growers cooperated
7. Processing % 2022 versus 2023

Cultivars

Vinifera

• White

- Chardonnay
- Riesling
- Sauvignon Blanc
-

Red

- Pinot Noir
- Pinot Meunier
- Cabernet Franc
- Gamay Noir

Hybrids

White

- L'Acadie Blanc
- New York Muscat
- Seyval Blanc
- Vidal Blanc
- Geisenheim 318
- Frontenac (incl F. Gris, F. Blanc)
- Osceola Muscat

Red

- Marechal Foch
- Marquette
- Leon Millot
- Lucie Kuhlmann
- Baco Noir
- Castel
- Petite Pearl
- Triomphe

Categories of Evaluation

Evaluation of vineyards has been done using visual evaluation to assess vine survival, health and productivity

• **RECOVERY**

- Some crop in 2023

• **RENEWAL**

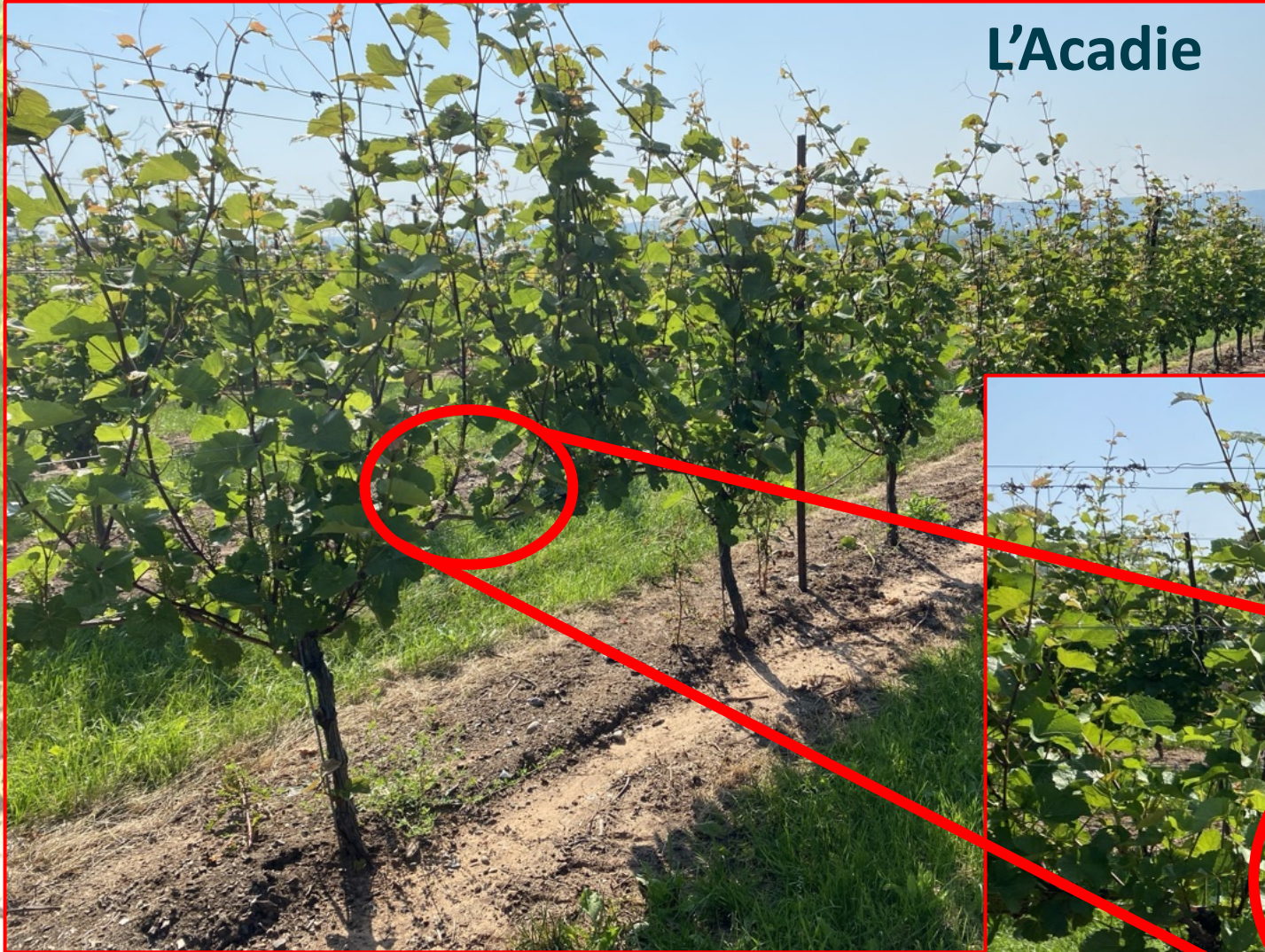
- From the head
- From the base

• **REPLANT**

- Individual vines
- Whole block removal and replant

L'Acadie

Recovery



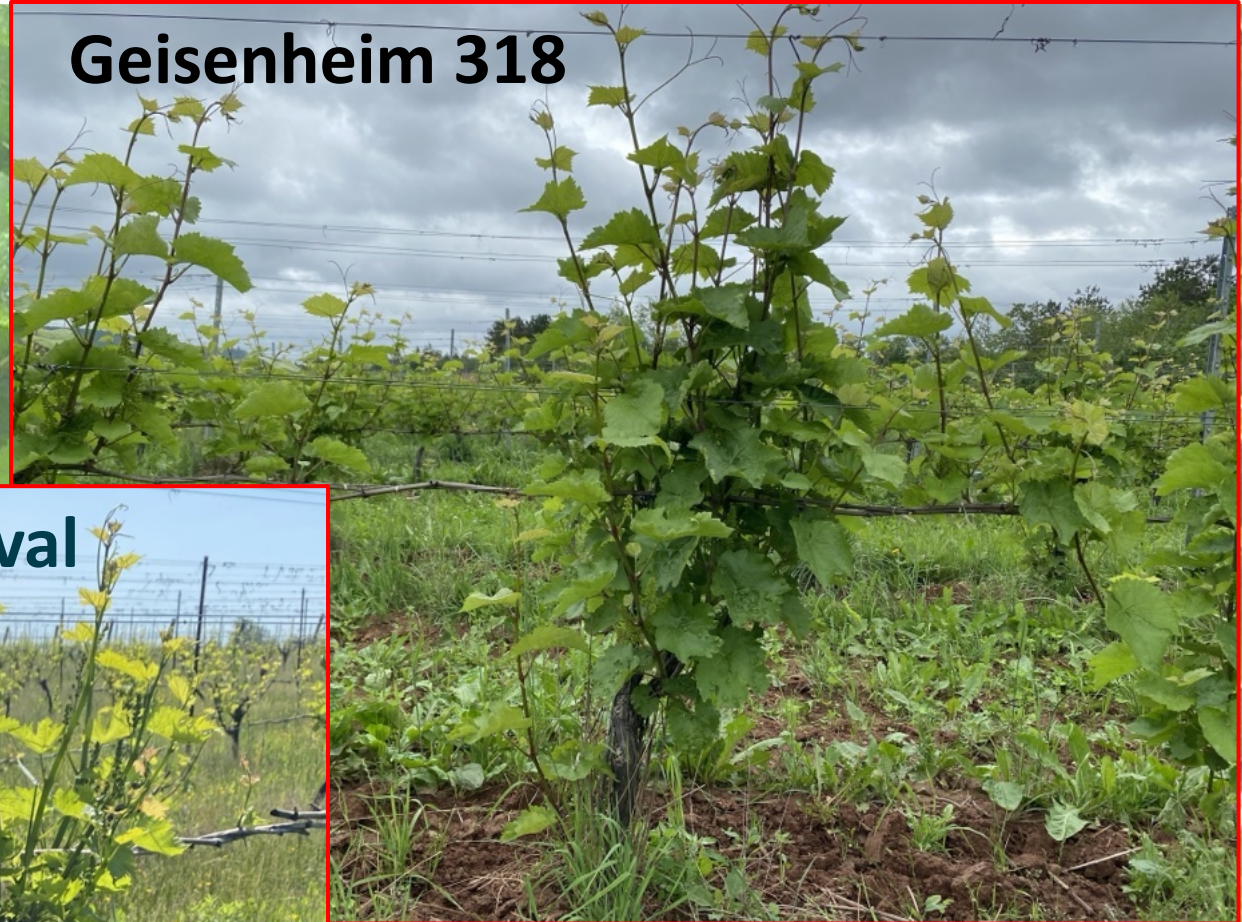
May appear to have a full crop/canopy, but still a low % of primary bud survival.

Renewal – Head Growth

New York Muscat



Geisenheim 318



Seyval



Renewal – Sucker Growth

Early Season

New York Muscat



L'Acadie



Late Season

Vidal



Replant – Some Vine Death



Sauvignon Bl

Replant – Full (> 60% vine death in 2023)

Riesling



Chardonnay



Pinot Noir



Sauvignon Blanc



Vine Spacing

There is no standard vineyard plant spacing - for purposes of the calculations we used in our summary report vine density of:

Hybrids (9 feet by 4.5 feet spacing) – 1, 075 vines per acre

Vinifera (8 feet by 3 feet spacing) - 1,815 vines per acre

Vine Death

| | Vinifera | Hybrids |
|--|---|---|
| Average % vine death | 45% (range of 6.5% to 100%) Est.326,700 dead vines | 6% (range of 2% to 63%) Est. 70,950 dead vines |
| Average % suckers (for renewal) | 36.4% (range of 0% to 90%) | 14.2% (range of 0% to 85%) |
| Average % low crop | 0% (no crop harvested in 2023) | 100% of hybrid acreage had reduced crop with average production at 51.3% (30% to 60%) |
| Average % yield | 0% | 33% to 56% |

Processing % 2022 versus 2023

Multiple wineries were approached and responded with preliminary processing tonnages

- There were no vinifera grapes harvested in 2023 (1 tonne)
- Hybrid processing ranged from 33% to 56% (2023 versus 2022) based on processor
- Using the sum of hybrids processed the median average was 46% (2023 versus 2022)

Challenges - Pruning

Long spurs



Basal buds



Few canes



No pruning

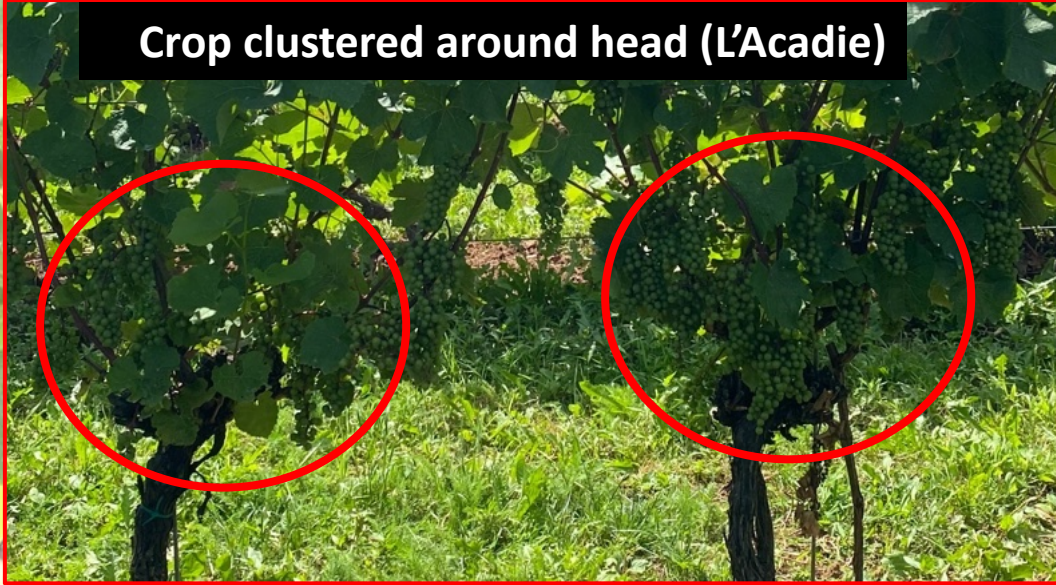


Multiple canes, extra long, overlapping



Challenges – Uneven Crop

Crop clustered around head (L'Acadie)



Frontenac Blanc



Osceola Muscat



Challenges – No Crop

Vinifera

Hybrids

No crop (Chardonnay)

No crop (New York Muscat)

Crop (L'Acadie)

Versus



Challenges – Weed Control



Weather Challenges in 2023

| | Tatamagouche (North Shore) | | Kentville (Mid Valley) | | Liverpool (South Shore) | |
|------------------|------------------------------------|--------------------------------------|------------------------------------|--------------------------------------|------------------------------------|--------------------------------------|
| | Number of days with ppt (mm) | Number of days with ppt ≥25 mm | Number of days with ppt (mm) | Number of days with ppt ≥25 mm | Number of days with ppt (mm) | Number of days with ppt ≥25 mm |
| April | 12 | 0 | 10 | 0 | 10 | 0 |
| May | 9 | 0 | 10 | 0 | 6 | 1 |
| June | 16 | 1 | 19 | 2 | 16 | 3 |
| July | 16 | 3 | 24 | 1 | 13 | 2 |
| August | 12 | 4 | 10 | 2 | 13 | 4 |
| September | 11 | 1 | 14 | 2 | 9 | 0 |
| October | 14 | 0 | 12 | 1 | 10 | 2 |
| Total | 90 | 9 | 99 | 8 | 77 | 12 |

Of particular note in June, July and August at Kentville there were 53 out of 92 with measurable precipitation!

Challenges – Pest Control



Ants (L'Acadie)



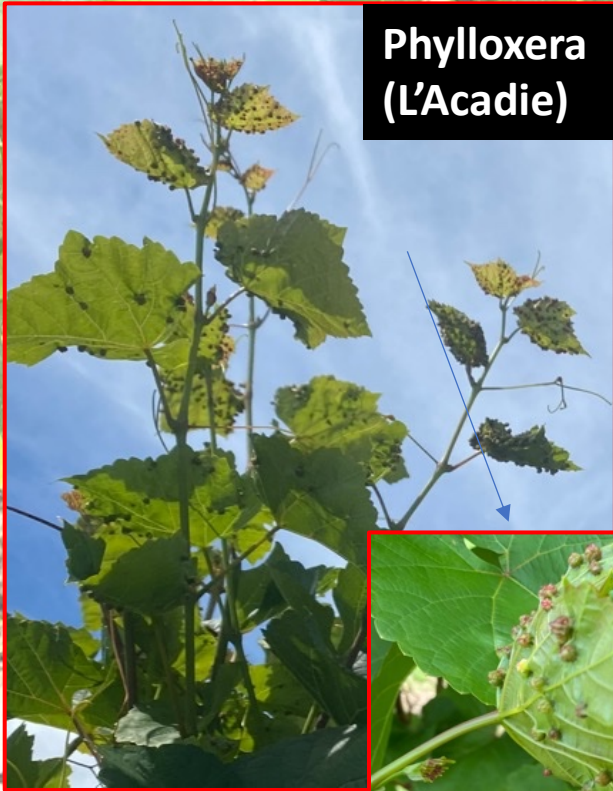
Crown Gall (Riesling)



**Japanese Beetle
(Marechal Foch)**

Challenges – Pest Control

**Phylloxera
(L'Acadie)**



**Erineum Mites
(Geisenheim 318)**



Challenges – Pest Control

Downy Mildew

RAIN!!!



Chardonnay

Chardonnay



Chardonnay



Riesling



Challenges – Pest Control



Black Rot

Challenges – Strange things

New growth late in season



Aerial roots



Salt damage

Extreme Challenges



Current Concerns



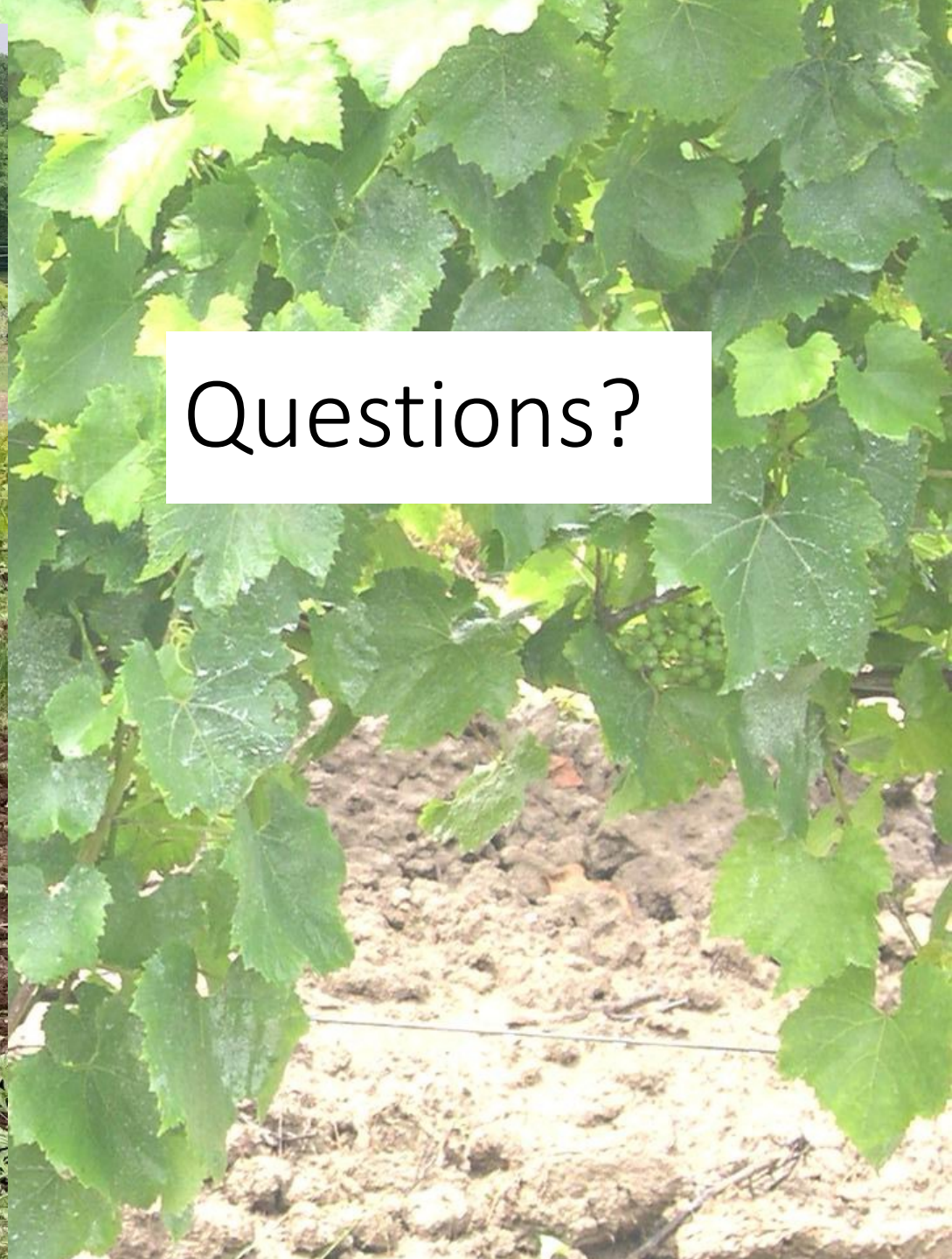
1. Total # of Vine collapse in 2023 and spring 2024
2. Total # of Vine death in 2023 and winter 2023/ 2024
3. Potential for overcropping in 2024
4. Weed and disease control issues in 2023 – weather impeded ability to apply protective fungicides
5. Sourcing vines for replant in 2024 (*limited number of virus certified – especially hybrids*)
6. Changes in vine cultivars being replanted – risk management for future

Big thank you to my Nova Scotia colleagues, growers, wineries, friends, former students and industry for making this more than just a project !

- Jennifer Haverstock and Lisa Harkness of Perennia
- Nova Scotia Department of Agriculture
- Steve Ells and the growers of Grape Growers Association of Nova Scotia (GGANS) for hosting information days and support
- Harrison Wright and Deb Moreau of AAFC Kentville
- Winery Growers of Nova Scotia (WGNS) staff and members
- Grand Pre (Jurg Stutz), Jost/Devonian Coast (Gina Haverstock, Becca Griffin, Sven and Yvonne), Lightfoot and Wolfville (Josh Horton et al.) and many more wineries that helped organize sessions



Questions?



Final Thoughts

1. Risk – Cultivar choices – Winery needs versus wants
2. Self propagation (own root hybrids) – Virus testing in NS
3. Realistically re-evaluate site potential
4. Vine density/spacing and Spare Parts Viticulture
5. Site preparation and corrections if needed to reduce risk
6. Labour, Skill sets and Equipment to do what is needed in time
7. Economics of production – reestablishment and over life of the vineyard
8. And the optimism for the future.....



Sauvi

JUN/25/2019