

NE-1020 Coordinated Variety Trials: The view from 40,000 feet

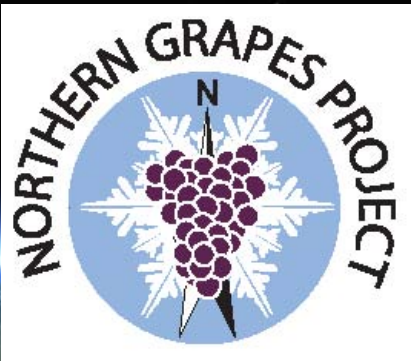
Tim Martinson
*Sr Extension Associate
Cornell University*



The Northern Grapes Project is funded by the USDA's Specialty Crops Research Initiative Program of the National Institute for Food and Agriculture, Project #2011-51181-30850

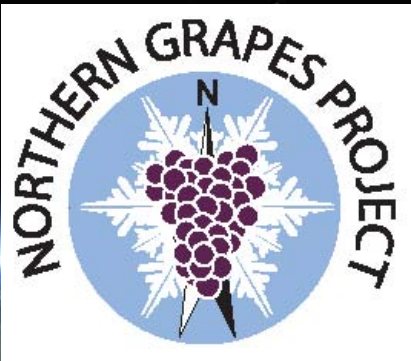
US Dept of State Geographer
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Data SIO, NOAA, U.S. Navy, NGA, GEBCO

Google Earth



NE-1020 Coordinated Variety Trials: The view from 40,000 feet

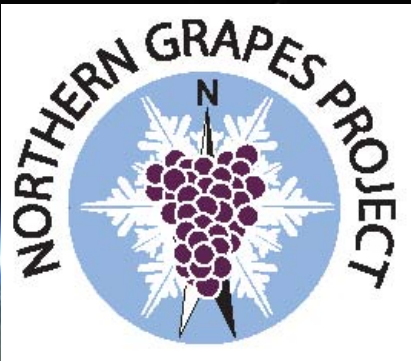




NE-1020 Coordinated Variety Trials: The view from 40,000 feet



Vine Performance at 11 Locations over 5 years



NE-1020 Coordinated Variety Trials: The view from 40,000 feet

Outline:

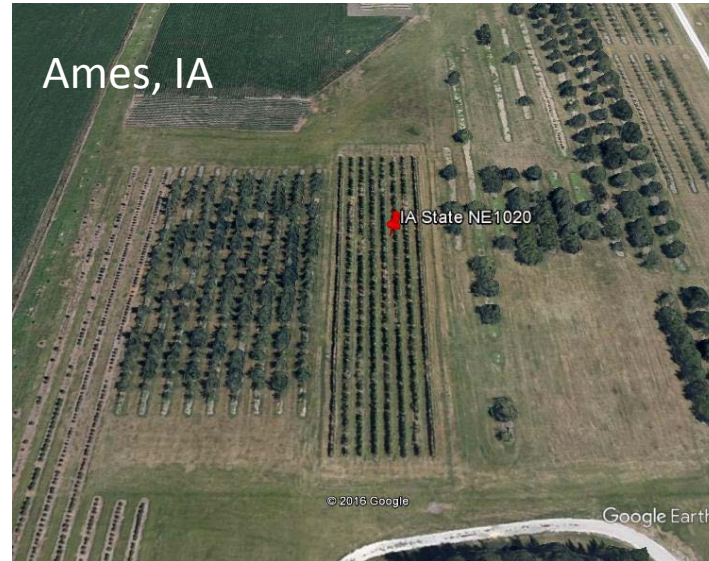
- Yield and Quality
- Timing (Phenology)
- Vine Balance metrics
- Impact of Winter Injury

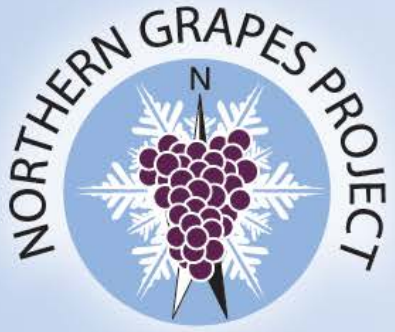
ND- NE1020
SD - NE1020
IA
NE-1 NE1020

VT - NE1020 NY - Willsboro Trial
NY- Geneva NE1020
CT-2-NE1020
CT-1 NE1020

Vine Performance at 11 Locations over 5 years

The Plantings via Google Earth (6 of 11)



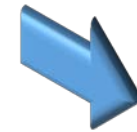
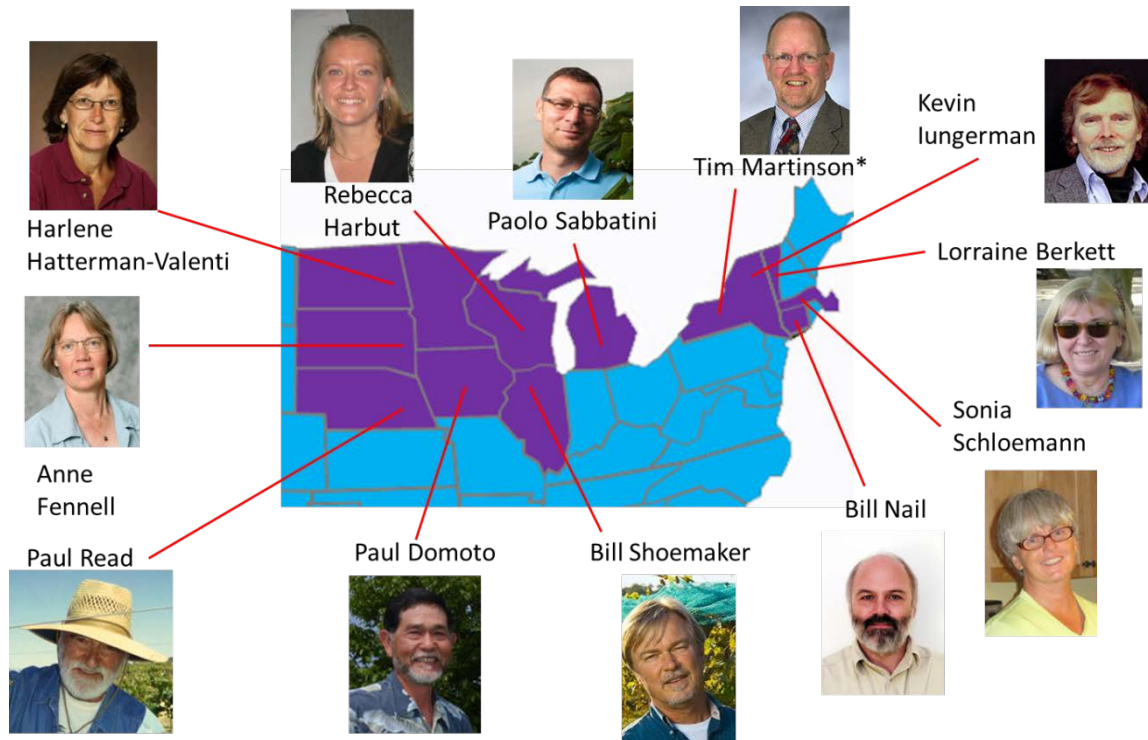


NE-1020 Coordinated Variety Trials



How does environment affect yield & quality?

Climate and standard maturity indices



Vine performance and climate

- Eval: Yield and quality vs. climate indices
- Data from 3-9 sites/variety

NE-1020 Data Protocol

Adopted in 2010

NE 1020/Viticulture Consortium
Coordinated variety trials
Viticultural Data Collection Protocol.

1. vine growth
 - nodes retained
 - grown pruning weight
 - live shoots per retained node
 - live shoots per vine
2. Acclimation and cold hardiness (if winter injury suspected)
 - bud injury (% dead primary buds)
 - trunk injury (comment, incidence)
 - crown gall
3. In-season crop adjustment
 - shoot thinning: post-thinning shoot counts
 - cluster thinning: -prethinning cluster counts
 - cluster thinning: -post-thinning cluster counts
4. Phenology
 - 50% budburst
 - 50% bloom
 - 50% veraison
 - harvest date
5. Meteorology
 - temperature (hourly)
 - rainfall (daily)
 - continue in winter for min/max
6. crop yield (and yield components)
 - crop weight per vine
 - clusters per vine
 - berry weight
 - berries per cluster
7. juice chemistry (harvest)
 - Brix
 - pH
 - TA
8. Pest tolerance
 - relative disease ratings (if present)
 - comments on insect issues.
 - Spray records

NE-1020 Data Protocol

Adopted in 2010

Specific Data Needed	Procedure	Measurement units
Dormant & Early Growing Season		
Grown Pruning weight	bundle and weigh 1st year canes from individual vines.	G/vine
Cordon Length/vine	Measure length of cordon	M
Retained nodes	Count number of buds remaining after pruning; excluding renewal spurs.	nodes per vine
Nodes with live buds	Count number of retained spur or cane buds that have produced live shoots at 4-8 in shoot growth.	No. of 'count' buds with live shoots
Shoots per vine	Count all live shoots, excluding renewals - includes 2ndaries that push.	Number/vine
Derived values:		
Bud survival	Nodes with live buds/retained nodes	Percentage
Crop/pruning weight ratio (Ravaz Index)	Divide Yield (g/vine) by Pruning weight(g)	Ratio
Shoots/meter of row	Shoots per vine / in-row vine spacing (M)	
Shoots per retained node	Total Shoots per vine/ No. retained nodes	

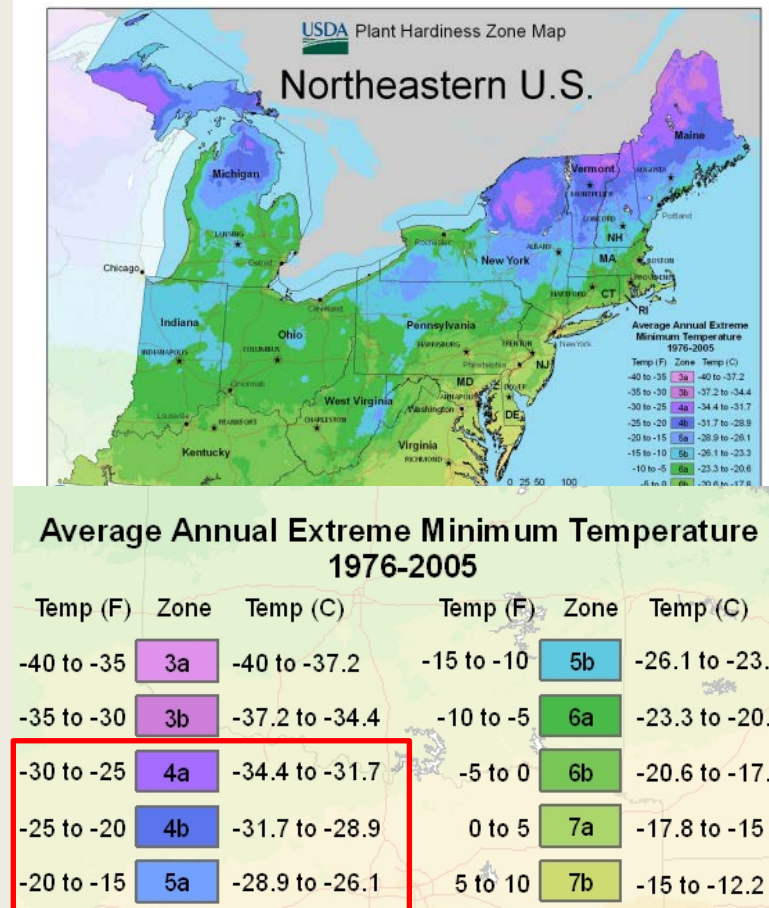
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Cultivar Performance

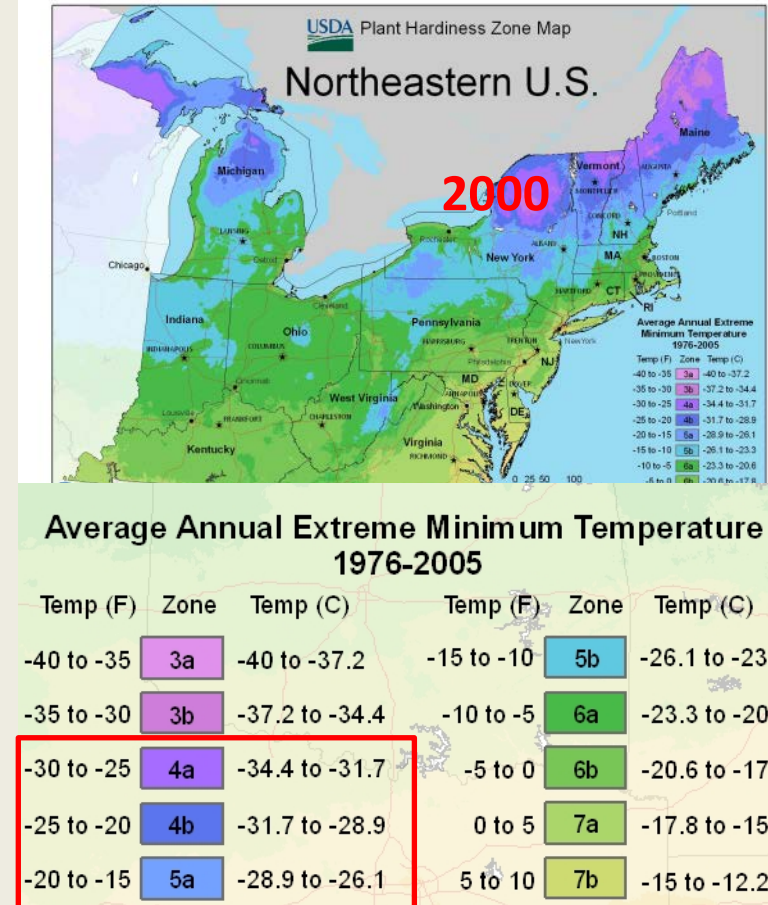
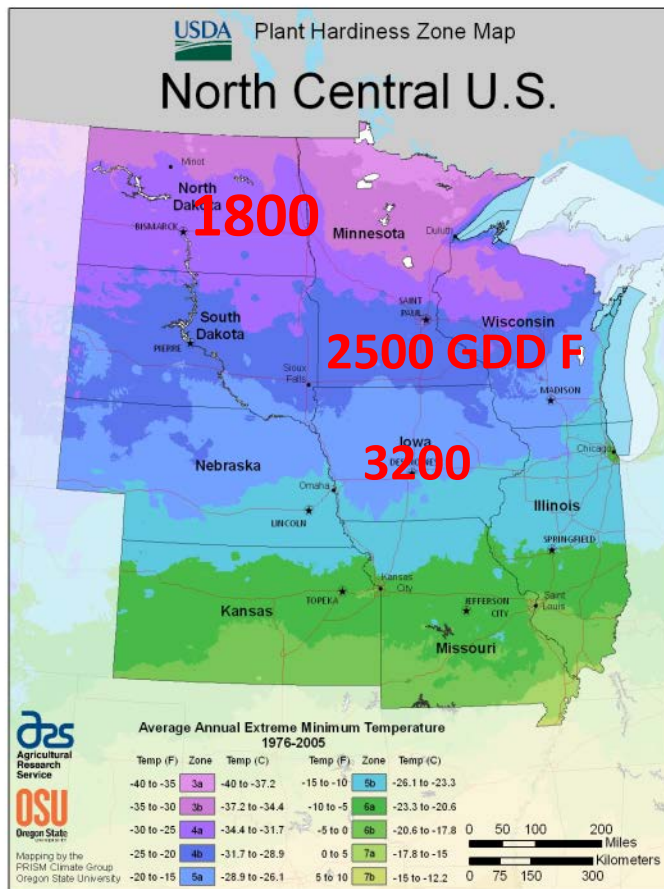
winter lows, heat units, early budburst





Cultivar Performance

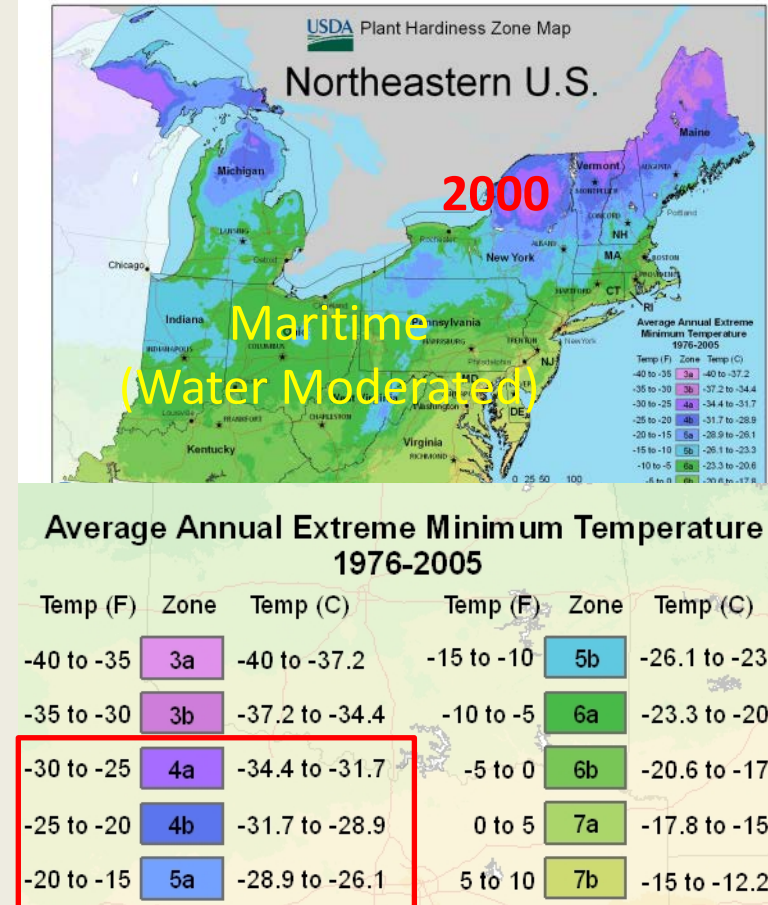
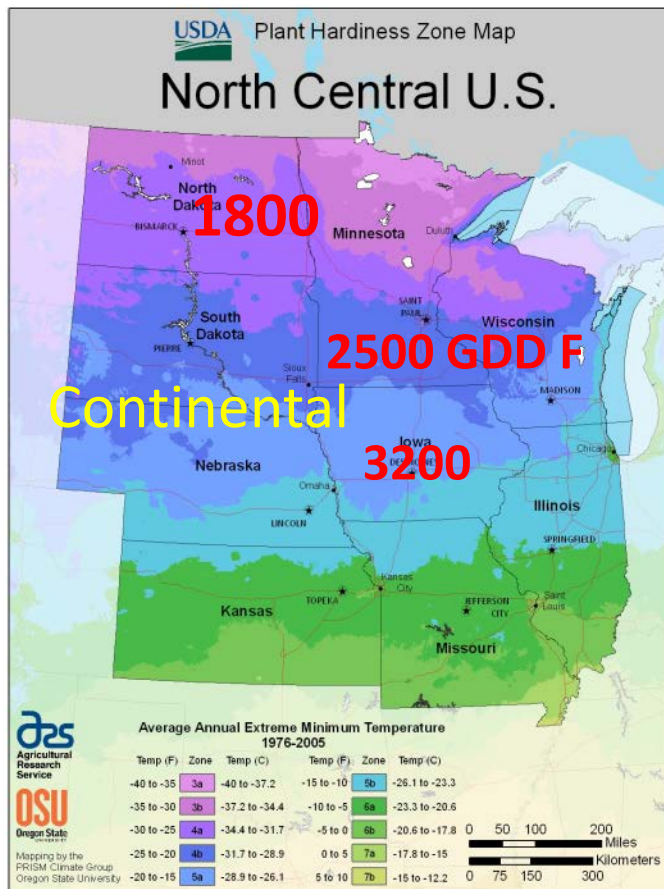
winter lows, heat units, early budburst

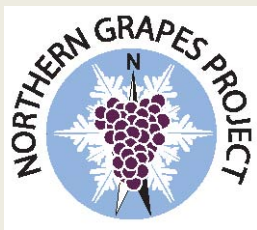




Cultivar Performance

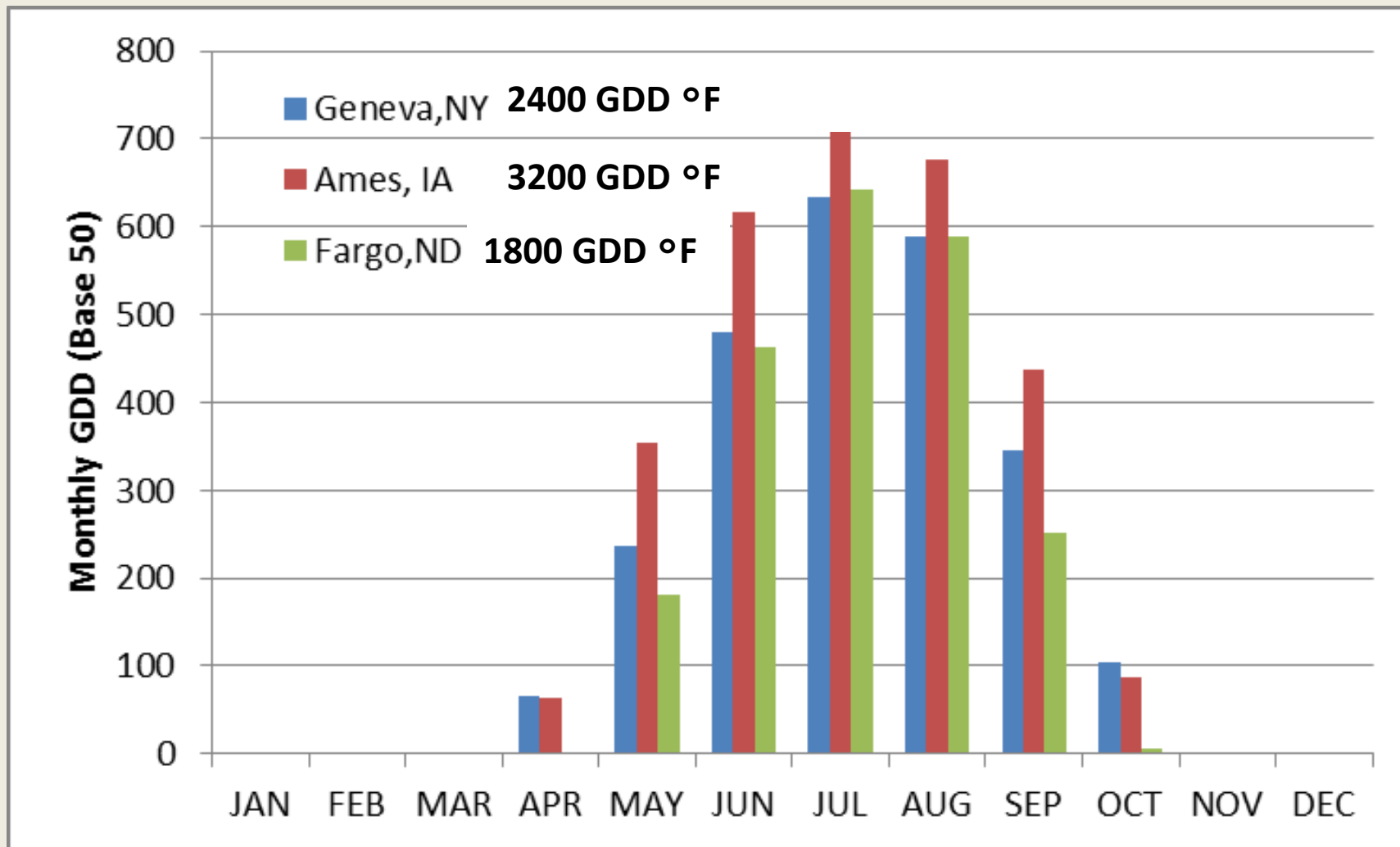
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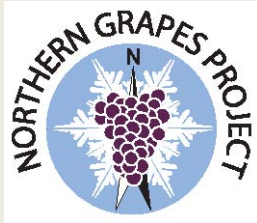




Weather and Growing Degree Days

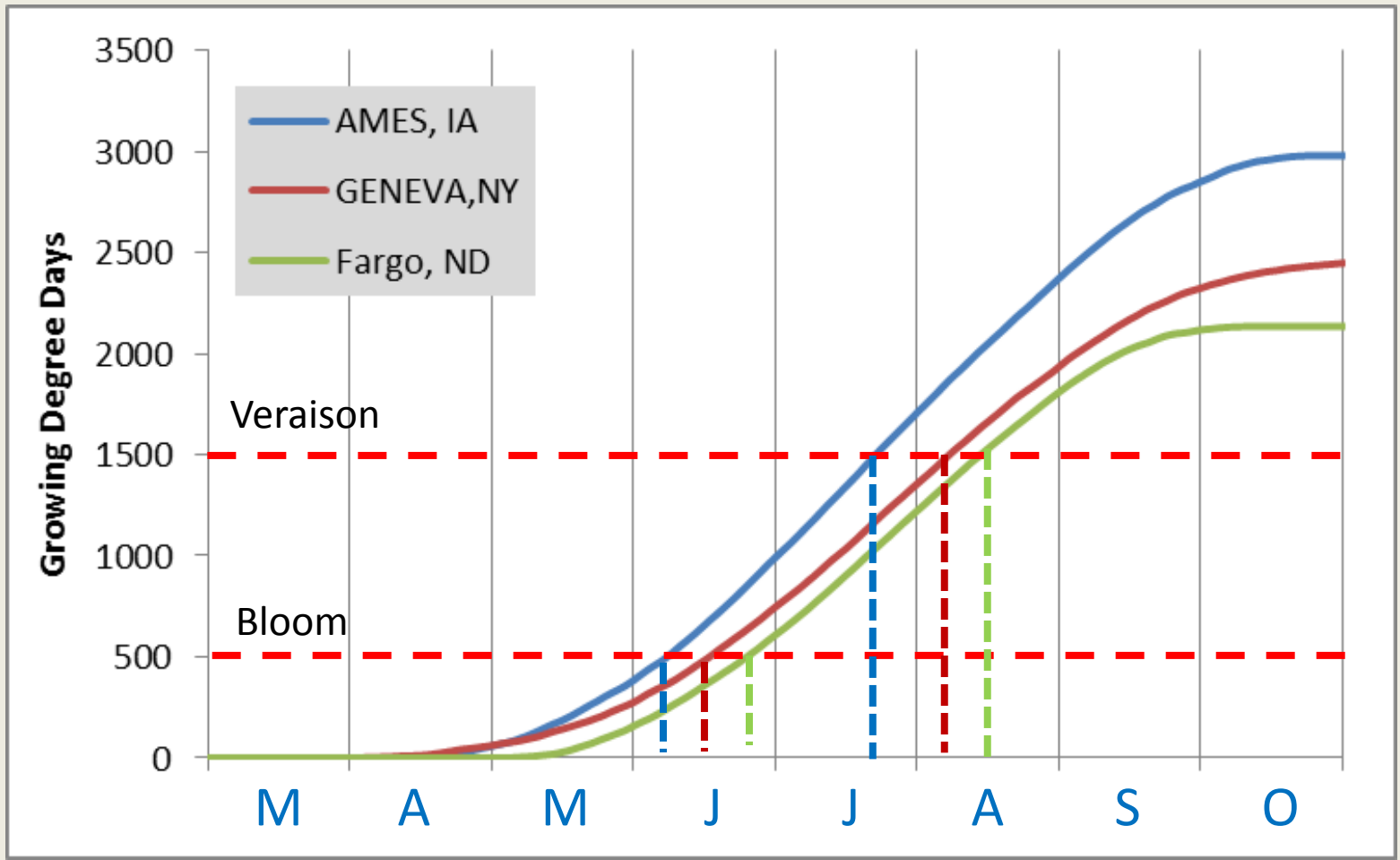
30 year average 1980-2010





Heat Unit Accumulations

30 Yr Average Growing Degree Days



NE-1020 Blocks

With Northern Cultivars

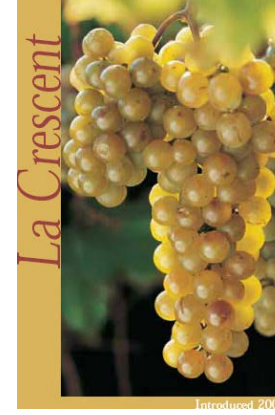
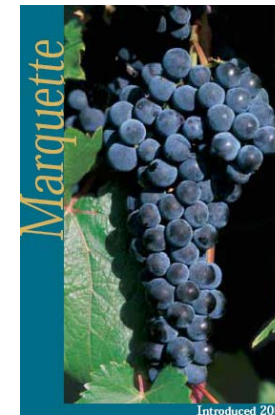
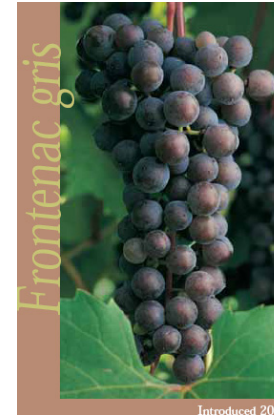


Table 1. List of cold-climate cultivars planted in NE-1020 project *Multi-state Evaluation of Winegrape Cultivars and Clones* and two additional project blocks in Illinois and New York.

State	Cultivars under Evaluation (No. vines)													
	Edelweiss	Frontenac	Frontenac gris	La Crescent	La-crosse	Marquette	MN 1258	MN 1189	MN 1200	MN 1220	MN 1235	Petit Amie	Prairie Star	St. Croix
<i>NE 1020 Coordinated Variety Trials</i>														
Connecticut		50	25			50		25	50		25			50
Iowa		50		50		50	50	50	50	50	50	50	50	50
Michigan		25		25										25
Nebraska	18	36	36	36	36	36	36	36	36	36	36		36	36
NY-Geneva				25		25								25
Pennsylvania				25		25		25			25			
South Dakota		36	36	36		36	25	25	25	36	25	25	25	36
North Dakota		24	24	24		24			24	24	24	24	24	24
Vermont		24		24		24							24	24
Massachusetts		24		24		24								24
<i>Additional Cultivar Trials</i>														
NY-Champlain	12	12	12	12	12	12			12			12	12	12
Illinois		24	24	24		24						24	24	24

NE 1020 blocks were planted in 2008; NY Champlain in 2005; and Illinois in 2008

NE-1020 Blocks

With Northern Cultivars

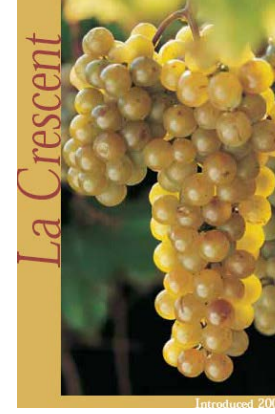
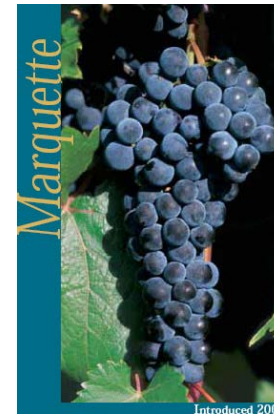
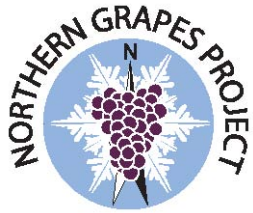
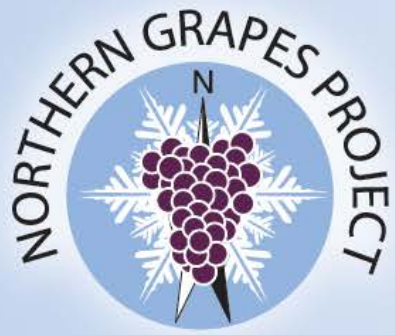


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Iowa		50		50		50	50	50	50	50	50	50	50	50
Michigan		25		25		25								25
Nebraska	18	36	36	36	36	36	36	36	36	36			36	36
NY-Geneva				25		25								25
Pennsylvania				25		25		25		25				25
South Dakota		36	36	36		36	25	25	25	36	25	25	25	36
North Dakota		24	24	24		24			24	24	24	24	24	24
Vermont		24		24		24							24	24
Massachusetts		24		24		24								24
<i>Additional Cultivar Trials</i>														
NY-Champlain	12	12	12	12	12	12				12		12	12	12
Illinois		24	24	24		24						24	24	24

NE 1020 blocks were planted in 2008; NY Champlain in 2005; and Illinois in 2008



What Can We Learn from Cultivar Evaluations?



Can variety X be grown profitably in environment Y?

- How often can we expect winter injury?
- Is there enough heat to ripen them consistently?
- What fruit composition is typical for region?





What Can We Learn from Cultivar Evaluations?



Can variety X be grown profitably in environment Y?

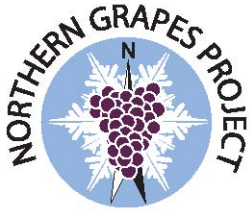
- How often can we expect winter injury?
- Is there enough heat to ripen them consistently?
- What fruit composition is typical for region?

Benchmarks:

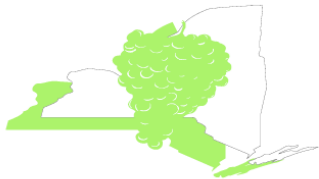
- ~ 4 T/acre of fruit, 5 yr average.
- Low frequency winter injury
- Budburst and spring frosts
- Acids, sugars and pH in acceptable ranges.



Production Cost Estimates – Miguel Gomez



November 2015 EB 2015-12
COST OF ESTABLISHMENT AND PRODUCTION OF COLD HARDY GRAPES IN THE THOUSAND ISLANDS REGION OF NEW YORK-2015



Dayea Oh, Sogol Kananizadeh, Miguel I. Gómez, Tim Martinson

Charles H. Dyson School of Applied Economics and Management
 College of Agriculture and Life Sciences
 Cornell University, Ithaca, New York 14853-7801

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Attribute	Lake Erie Bulk Producers 13 acres of 200 acre vineyard		1000 Islands Startup Vineyard 20 Acres	
	Frontenac	Marquette	Frontenac	Marquette
Yield (T/acre)	5	5	2.25	3
Price/Ton	\$600	\$900	\$1,500	\$1,800
Income/acre	\$3,000	\$4,500	\$3,375	\$5,436
Variable costs	\$1,506	1,506	\$2,051	\$2,154
Total fixed costs	\$1,046	\$1,121	\$2,724	\$2,810
Total costs	\$2,552	\$2,627	\$4,805	\$4,967
Profit or loss	\$448	\$1,873	(\$1,145)	\$469
Breakeven price/T	\$510	\$525	\$1.969	\$1.645
Breakeven Yield (T)	4.2	2.8	3.3	2.7

Oh et al. 2016. **COST OF ESTABLISHMENT AND PRODUCTION OF COLD HARDY GRAPES IN THE CHAUTAUQUA REGION OF NEW YORK-2015**

Oh et al. 2015. **COST OF ESTABLISHMENT AND PRODUCTION OF COLD HARDY GRAPES IN THE THOUSAND ISLANDS REGION OF NEW YORK-2015**

Yields

<http://northerngrapesproject.org>

[Summary yield data \(PDF\)](#)

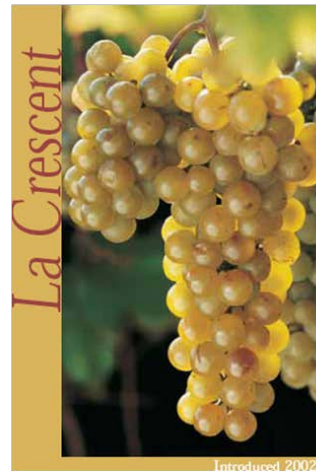
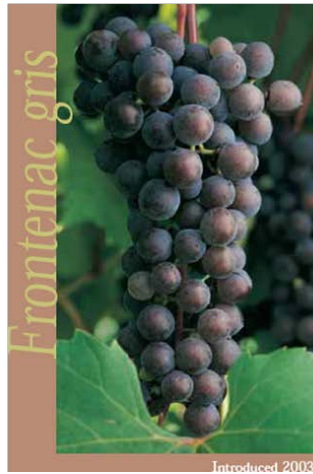
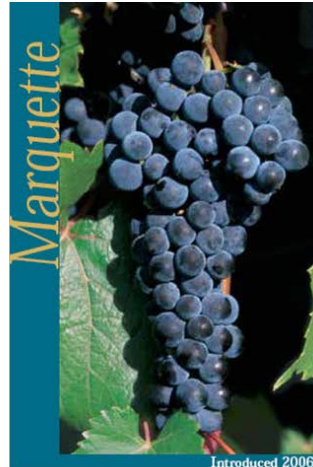


Table 3 Yield in Lb/vine and T/acre of La Crescent at NE1020 Coordinated Variety Trials, 2011-2016

Site	Cultivar	EvalYear	Vine spacing	Lb/vine	T/acre	ph	Brix	Titric Acid
IA1	La Crescent	2012	545	5.0	1.4	3.3	24.8	11.6
IA1	La Crescent	2013	545	7.4	2.0	3.3	25.4	11.4
IA1	La Crescent	2014	545	7.4	2.0	3.3	22.5	10.0
IA1	La Crescent	2015	545	12.8	3.5	3.3	23.3	6.9
IA1	La Crescent	2016	545	13.1	3.6			
Average				9.1	2.5	3.30	24.0	10.0
MA1	La Crescent	2012	622	14.0	3.9		19.1	4.5
MA1	La Crescent	2013	622	13.4	3.7		19.1	4.5
Average				13.7	3.8		19.1	4.5
MI2	La Crescent	2010	691	2.0	0.7	3	22.4	
MI2	La Crescent	2011	691	15.4	5.3	3.2	23.6	
MI2	La Crescent	2012	691	15.4	5.3	3.33	24.7	10.7
MI2	La Crescent	2013	691	16.8	5.8	3.16	22.1	11.6
MI2	La Crescent	2014	691	12.0	4.2	3.02	20.6	11.8
MI2	La Crescent	2015	691	0.0	0.0			
Average				10.3	3.6	3.1	22.7	11.4
MI3	La Crescent	2011	546	17.9	6.2	3.28	21.0	5.6
MI3	La Crescent	2012	546	11.7	4.1	3.26	21.7	9.1
MI3	La Crescent	2012	546	13.4	4.6			
MI3	La Crescent	2013	546	19.8	6.9	3.3	18.0	9.1
MI3	La Crescent	2014	546	0.0	0.0			
MI3	La Crescent	2015	546	0.0	0.0			
Average				10.5	3.6	3.3	20.2	7.9
ND	La Crescent	2012	545	8.4	2.3	3.13	27.1	21.6
ND	La Crescent	2013	545	14.7	4.0	4.37	20.3	17.6
ND	La Crescent	2014	545	1.0	0.3	2.97	22.8	19.5
ND	La Crescent	2015	545	2.2	0.6			
ND	La Crescent	2016	545	5.2	1.4			
Average				6.3	1.7	3.48	23.4	19.6
NY Geneva	La Crescent	2010	810	2.2	0.9	3.4	23.2	8.3
	La Crescent	2011	810	10.9	4.6	3.4	23.1	10.3
	La Crescent	2012	810	17.6	7.4	3.4	26.9	7.6
	La Crescent	2013	810	19.7	8.3			
	La Crescent	2014	810	12.6	5.3	3.3	24.2	11.4
	La Crescent	2015	810	17.9	7.6	3.3	24.2	11.4
Average				13.5	5.7	3.4	24.3	9.8
NY Champ	La Crescent	2008	605	19.6	6.8	3.50	23.0	11.4
	La Crescent	2009	605	25.8	8.9	3.50	22.5	11.4
	La Crescent	2010	605	22.7	7.8	3.30	23.6	12.5
	La Crescent	2011	605	19.5	6.8	3.13	19.6	12.1
	La Crescent	2012	605	22.3	7.7	2.96	24.0	13.9
	La Crescent	2013	605	14.2	4.9	3.05	22.0	15.7
	La Crescent	2014	605	16.6	5.8			
	La Crescent	2015	605	10.9	3.8	3.02	21.3	15.8
Average				18.9	6.6	3.2	22.3	13.3

Yields and Vine spacing

2 measures:

Lb/vine

T/acre

Yields and Vine spacing

2 measures:
Lb/vine
T/acre

3rd Measure:
Yield/ m or foot
of canopy

$$10 \times 8 = 545 \text{ vines/acre}$$

$$10 \times 7 = 622 \text{ vines/acre}$$

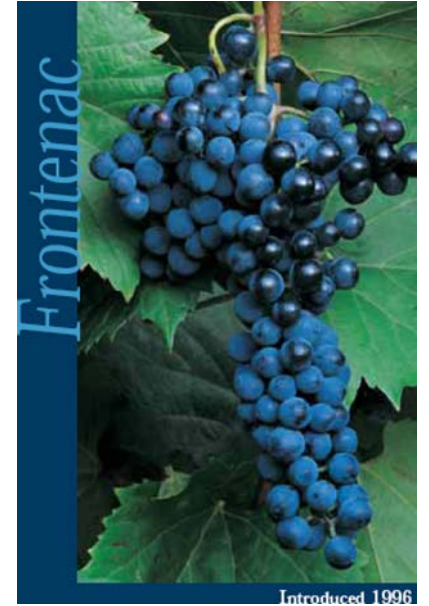
$$10 \times 6 = 726 \text{ vines/acre}$$

$$9 \times 8 = 605 \text{ vines/acre}$$

$$9 \times 7 = 691 \text{ vines/acre}$$

$$9 \times 6 = 807 \text{ vines/acre}$$

Yields: Frontenac

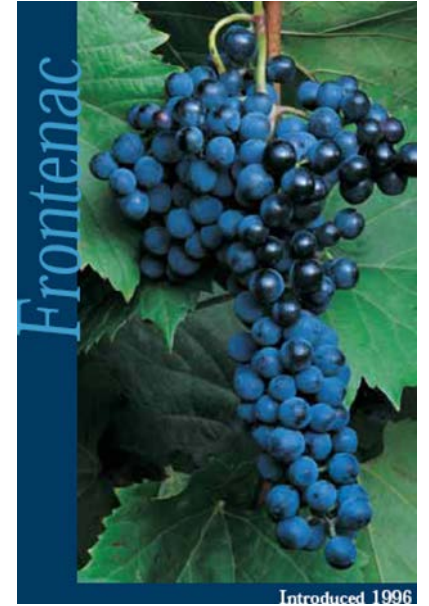


Site	EvalYear	Lb/vine	T/acre	ph	Brix	Titratable Acidity (g/l)
SD	2 yr	5.5	1.7		26.3	12.2
CT Site 1	5 yr	6.7	2.7	3.56	22.1	11.7
IA	5 yr	7.7	2.1	3.35	26.1	10.8
CT Site 2	5 yr	9.4	2.8	3.33	24.9	10.1
ND	5 yr	10.5	2.9	3.10	25.9	18.4
VT	7 Yr	11.0	4.8	3.19	23.2	16.8
MI Site 2	6 yr	12.7	4.4	3.08	21.2	14.0
NY- Willsboro	7 yr	24.4	8.6	2.93	22.4	15.6
MA	2 yr	28.0	7.7		23.5	9.6

Range:

- 5.5-28 lb/vine
- 1.7- 8.6 T/acre
- 21.2-26.3° Brix
- 9.6-18.4 TA (g/l)

Yields: Frontenac

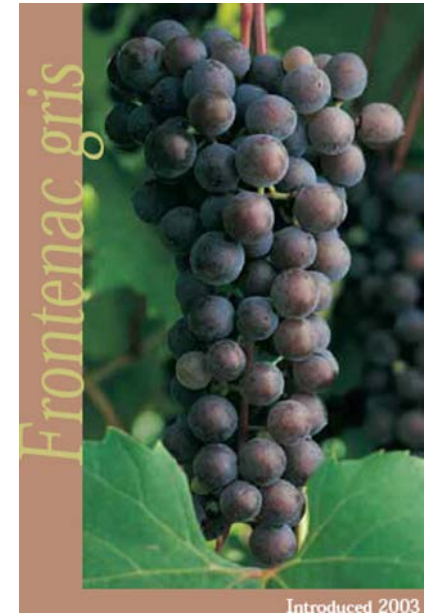


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Range:

- 5.5-28 lb/vine
- 1.7- 8.6 T/acre
- 21.2-26.3° Brix
- 9.6-18.4 TA (g/l)

Yields: Frontenac Gris

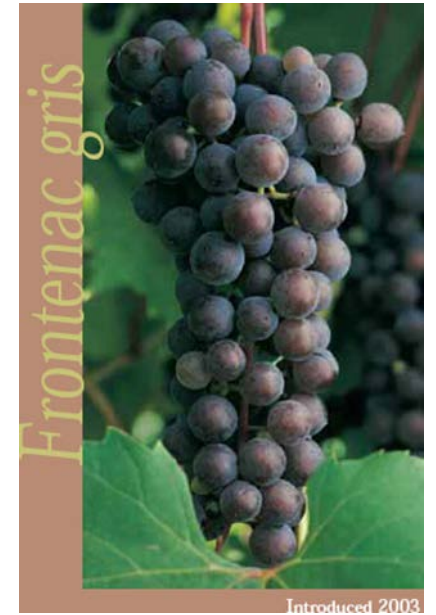


Site	Year	Lb/vine	T/acre	ph	Brix	Titratable Acid (g/l)
ND	5 yr	6.8	1.9	3.15	26.8	13.5
CT-1	4 yr	7.2	2.9	3.5	24.0	8.7
MI-3	5 yr	10.3	3.6	3.1	23.8	10.2
NY- Willsboro	8 yr	24.2	8.0	2.97	22.9	15.0

Range:

- 6.8-24.2 lb/vine
- 1.9- 8.0 T/acre
- 22.9-26.8° Brix
- 8.7-15.0 TA (g/l)

Yields: Frontenac Gris

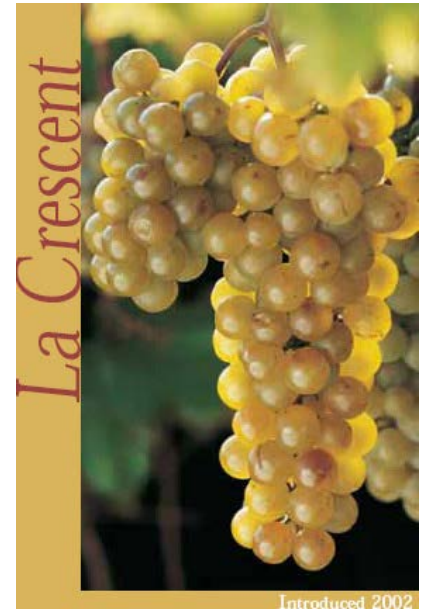


Site	Year	Lb/vine	T/acre	ph	Brix	Titratable Acid (g/l)
ND	5 yr	6.8	1.9	3.15	26.8	13.5
CT-1	4 yr	7.2	2.9	3.5	24.0	8.7
MI-3	5 yr	10.3	3.6	3.1	23.8	10.2
NY- Willsboro	8 yr	24.2	8.0	2.97	22.9	15.0

Range:

- 6.8-24.2 lb/vine
- 1.9- 8.0 T/acre
- 22.9-26.8° Brix
- 8.7-15.0 TA (g/l)

Yields: La Crescent

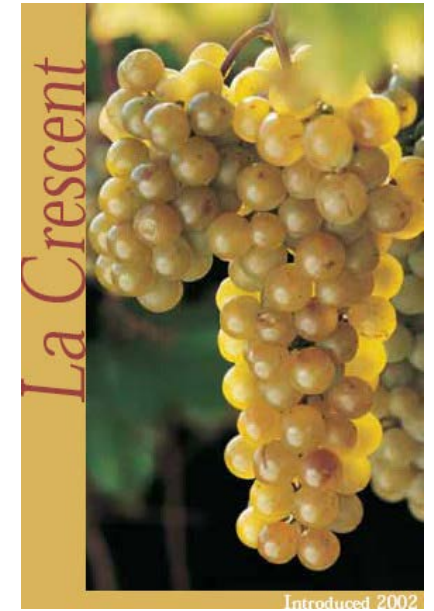


Range:

- 4.7-18.9 lb/vine
- 1.4-6.6 T/acre
- 19.1-27.1° Brix
- 4.5?-19.6 TA (g/l)

Site	Comment	EvalYear	Lb/vine	T/acre	ph	Brix	Titratable Acidity
SD	2 'no crop'	2 yr	4.7	1.4	3.0	27.1	13.9
ND	1 'no crop'		6.3	1.7	3.49	23.4	19.6
IA		5 yr	9.1	2.5	3.30	24.0	10.0
VT		7 yr	9.8	3.6	3.1	21.8	15.5
MI Site 2	2 'no crop'	6 yr	10.3	3.6	3.1	22.7	11.4
MI site 3	2 'no crop'		10.5	3.6	3.3	20.2	7.9
NY- Geneva		6 yr	13.5	5.7	3.4	24.3	9.8
MA		2 yr	13.7	3.8		19.1	4.5
NY-Willsboro		8 yr	18.9	6.6	3.2	22.3	13.3

Yields: La Crescent

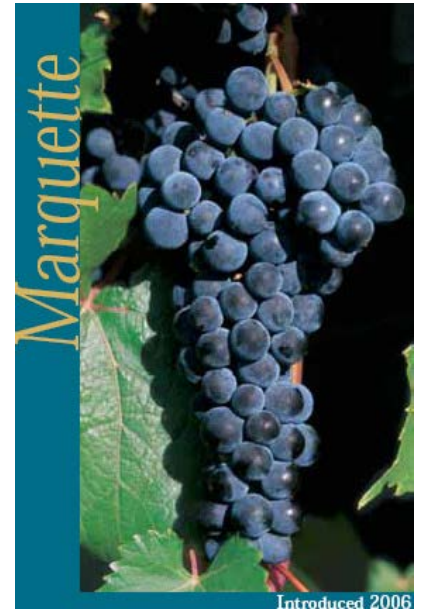


Range:

- 4.7-18.9 lb/vine
- 1.4-6.6 T/acre
- 19.1-27.1° Brix
- 4.5?-19.6 TA (g/l)

Site	Comment	EvalYear	Lb/vine	T/acre	ph	Brix	Titratable Acidity
SD	2 'no crop'	2 yr	4.7	1.4	3.0	27.1	13.9
ND	1 'no crop'		6.3	1.7	3.49	23.4	19.6
IA		5 yr	9.1	2.5	3.30	24.0	10.0
VT		7 yr	9.8	3.6	3.1	21.8	15.5
MI Site 2	2 'no crop'	6 yr	10.3	3.6	3.1	22.7	11.4
MI site 3	2 'no crop'		10.5	3.6	3.3	20.2	7.9
NY- Geneva		6 yr	13.5	5.7	3.4	24.3	9.8
MA		2 yr	13.7	3.8		19.1	4.5
NY-Willsboro		8 yr	18.9	6.6	3.2	22.3	13.3

Yields: Marquette

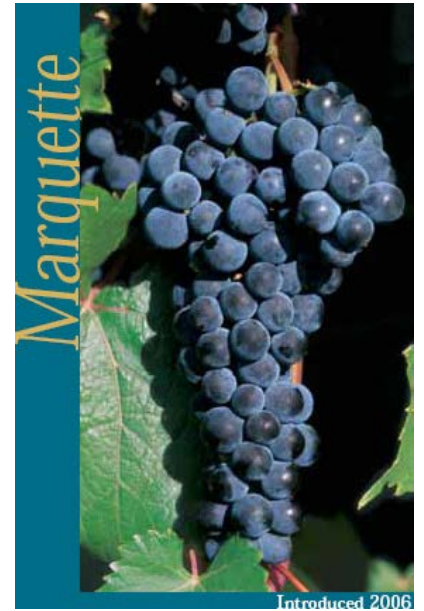


Site	Comment	EvalYear	Lb/vine	T/acre	ph	Brix	Titr Acid
CT Site 1		4 yr	3.1	1.3	3.78	22.3	9.1
ND	1 'no crop'	5 yr	4.0	1.1	3.03	27.4	12.6
CT Site 2		4 yr	5.0	1.5	3.55	25.3	7.2
SD	2 of 4 no crop	2 yr	5.6	1.7	2.98	28.3	8.3
IA		5 yr	9.7	2.6	3.37	25.5	8.8
VT		7 yr	10.9	4.0	3.07	24.5	14.2
MA		2 yr	14.3	4.1		23.3	8.3
MI Site 3			17.0	6.0	3.29	22.2	8.3
NY Willsboro		8 yr	17.6	6.1	3.09	23.4	11.3
MI Site 1	3 'no crop'	6 yr	19.4	7.2	3.45	24.0	7.9

Range:

- 3.1-19.4 lb/vine
- 1.1-6.0 T/acre
- 22.2-27.4° Brix
- 7.9-14.2 TA (g/l)

Yields: Marquette



Site	Comment	EvalYear	Lb/vine	T/acre	ph	Brix	Titr Acid
CT Site 1		4 yr	3.1	1.3	3.78	22.3	9.1
ND	1 'no crop'	5 yr	4.0	1.1	3.03	27.4	12.6
CT Site 2		4 yr	5.0	1.5	3.55	25.3	7.2
SD	2 of 4 no crop	2 yr	5.6	1.7	2.98	28.3	8.3
IA		5 yr	9.7	2.6	3.37	25.5	8.8
VT		7 yr	10.9	4.0	3.07	24.5	14.2
MA		2 yr	14.3	4.1		23.3	8.3
MI Site 3			17.0	6.0	3.29	22.2	8.3
NY Willsboro		8 yr	17.6	6.1	3.09	23.4	11.3
MI Site 1	3 'no crop'	6 yr	19.4	7.2	3.45	24.0	7.9

Range:

- 3.1-19.4 lb/vine
- 1.1-6.0 T/acre
- 22.2-27.4° Brix
- 7.9-14.2 TA (g/l)

Yields: St Croix



Site	Comment	EvalYear	Lb/vine	T/acre	ph	Brix	Titr Acid
CT Site1		4 yr	4.2	1.7	4.06	19.0	5.1
CT Site 2		4 yr	4.9	1.5	3.65	21.4	5.1
ND		5 yr	7.6	2.1	3.18	23.0	9.6
MI – Site 2	1 'no crop'	6 yr	9.7	3.4	3.5	19.8	7.1
SD	2 of 4 no crop	2 yr	10.1	3.1	3.37	14.3	10.9
NY-Geneva		6 yr	10.7	4.5	3.6	20.0	7.3
VT		7 yr	11.6	4.2	3.13	18.7	9.0
MI – Site 3		6 yr	12.7	4.4	3.4	19.3	6.8
IA		5 yr	14.0	3.8	3.52	19.0	6.7
NY-Willsboro		7 yr	17.4	6.0	4.26	18.9	9.9
MA		2 yr	24.2	7.5		20.0	5.9

Range:

- 4.2-24.2 lb/vine
- 1.5-7.5 T/acre
- 14.3-23.0° Brix
- 5.1-10.9 TA (g/l)

Yields: St Croix



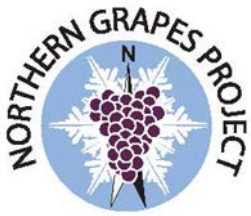
Site	Comment	EvalYear	Lb/vine	T/acre	ph	Brix	Titr Acid
CT Site1		4 yr	4.2	1.7	4.06	19.0	5.1
CT Site 2		4 yr	4.9	1.5	3.65	21.4	5.1
ND		5 yr	7.6	2.1	3.18	23.0	9.6
MI – Site 2	1 'no crop'	6 yr	9.7	3.4	3.5	19.8	7.1
SD	2 of 4 no crop	2 yr	10.1	3.1	3.37	14.3	10.9
NY-Geneva		6 yr	10.7	4.5	3.6	20.0	7.3
VT		7 yr	11.6	4.2	3.13	18.7	9.0
MI – Site 3		6 yr	12.7	4.4	3.4	19.3	6.8
IA		5 yr	14.0	3.8	3.52	19.0	6.7
NY-Willsboro		7 yr	17.4	6.0	4.26	18.9	9.9
MA		2 yr	24.2	7.5		20.0	5.9

Range:

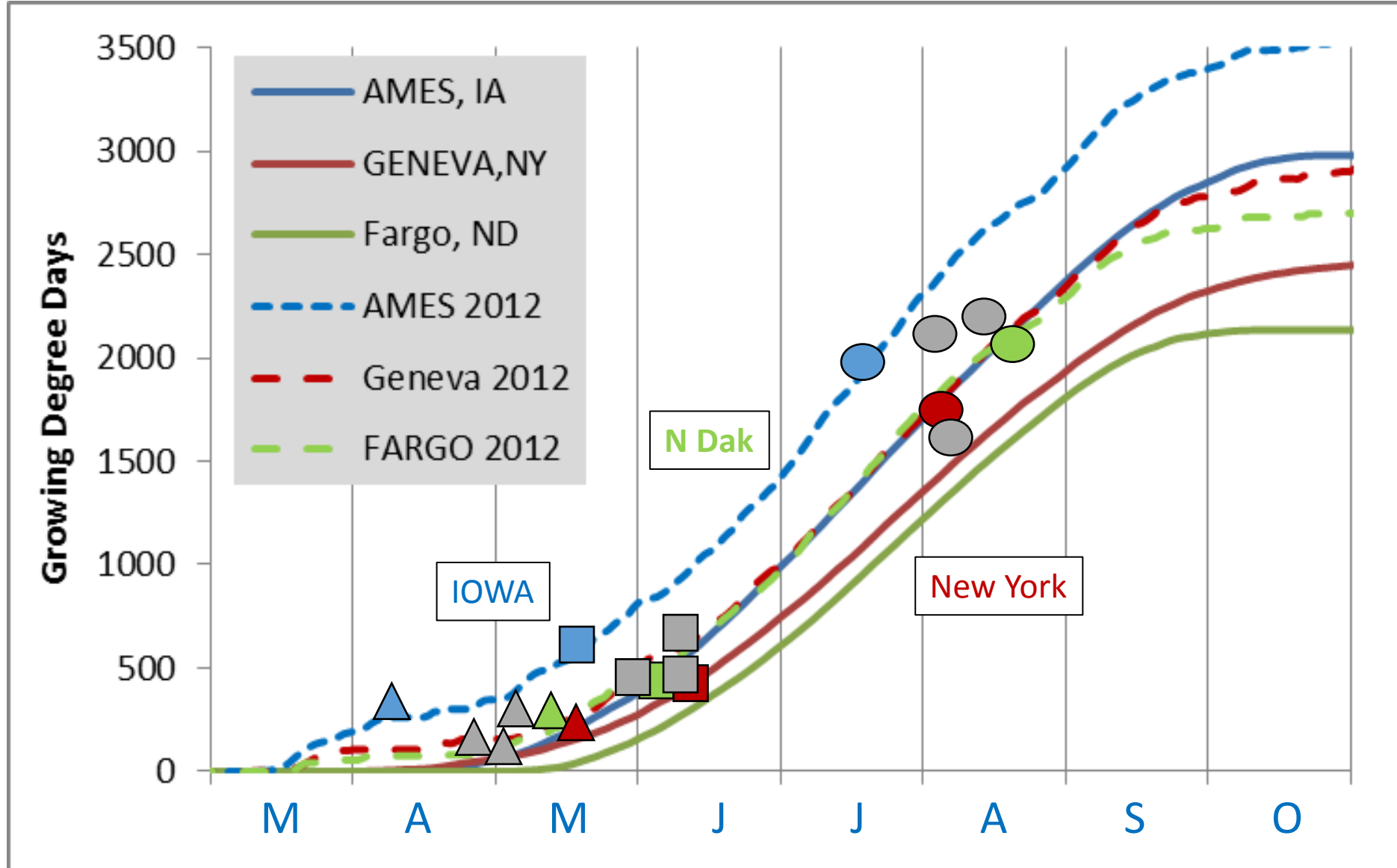
- 4.2-24.2 lb/vine
- 1.5-7.5 T/acre
- 14.3-23.0° Brix
- 5.1-10.9 TA (g/l)

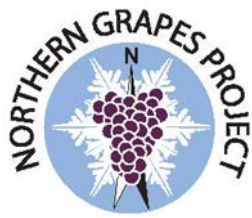
Phenology

- Date and Growing Degree days (base 50) for:
 - Budburst
 - Bloom
 - Veraison
 - Harvest

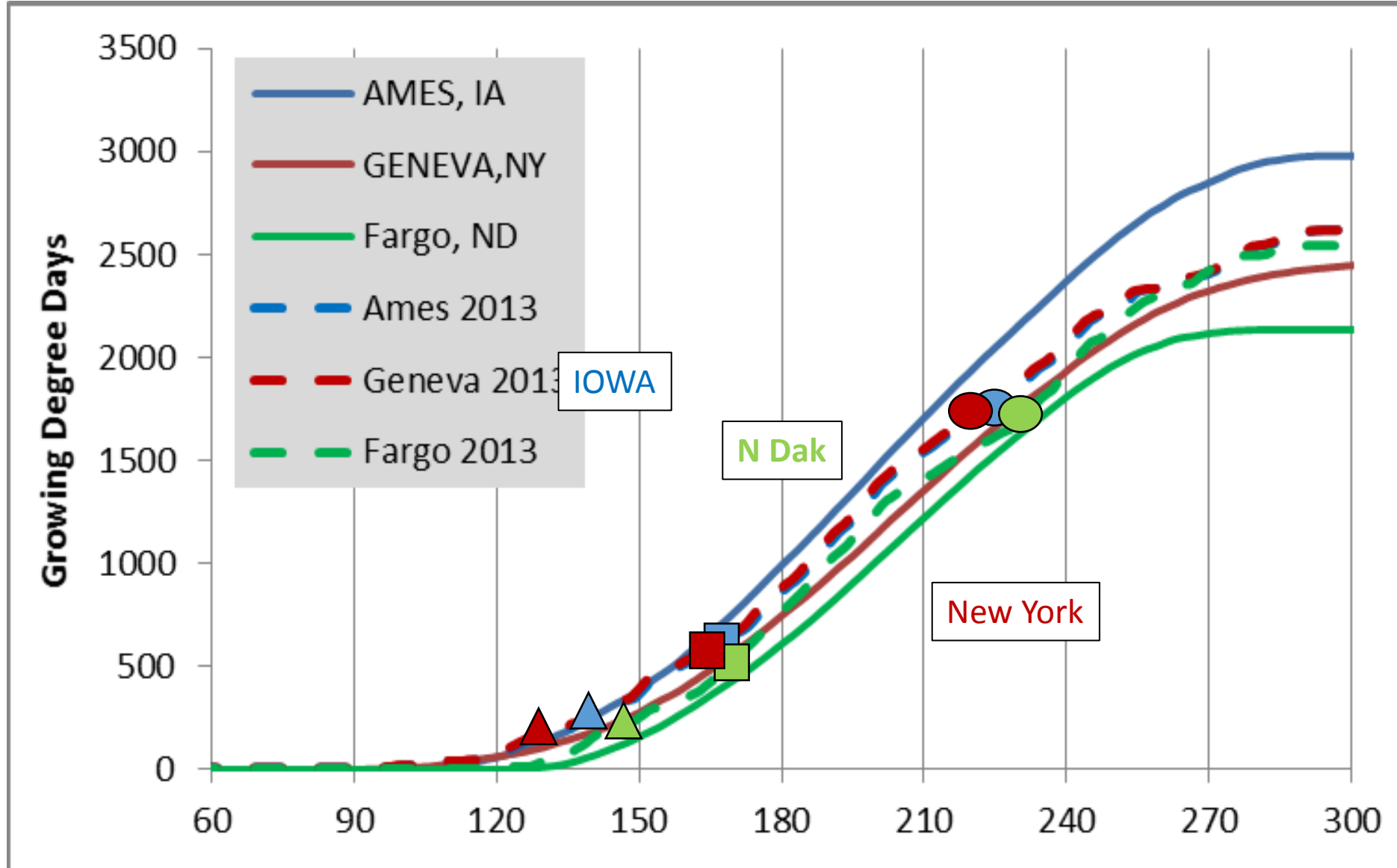


Frontenac Phenology Dates 2012

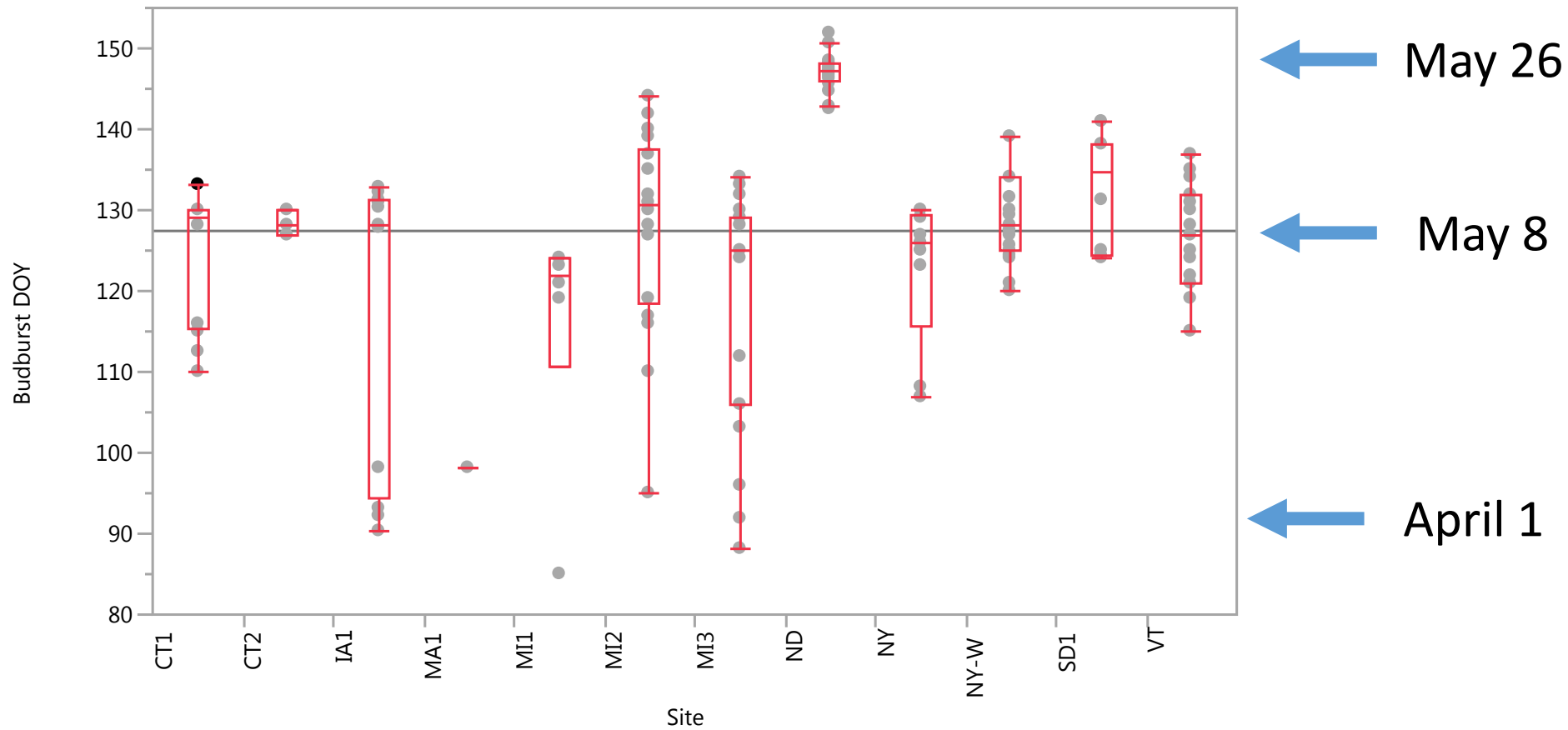




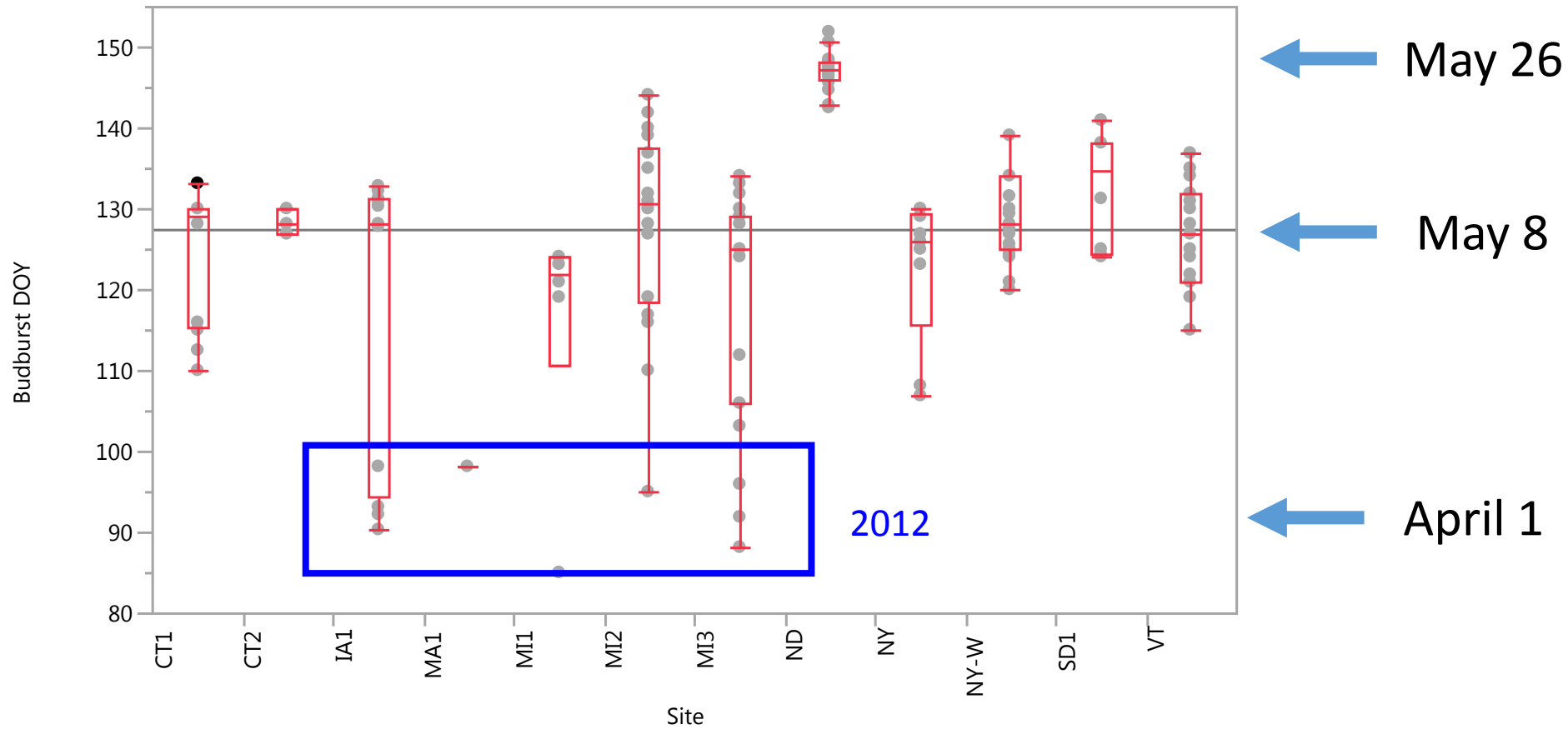
Frontenac Phenology Dates 2013



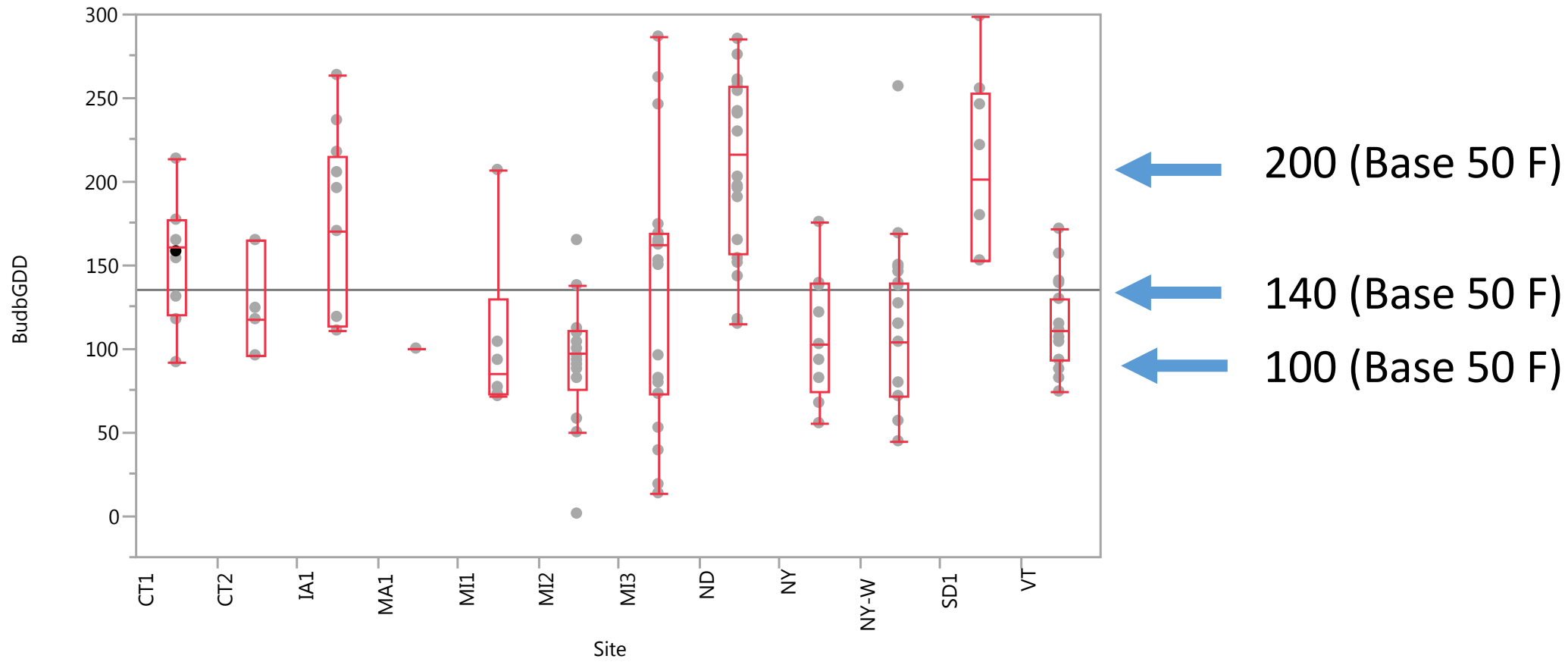
Phenology (by site): Budburst Date



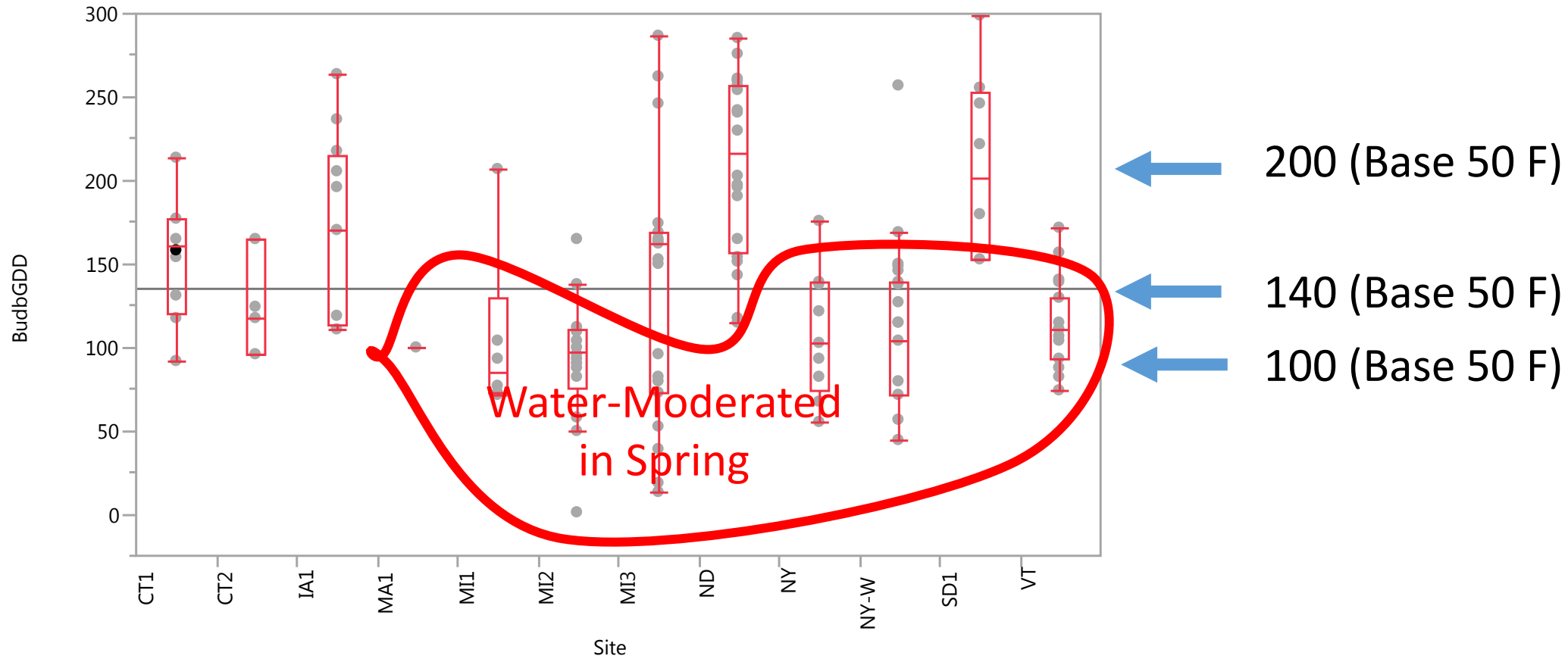
Phenology (by site): Budburst Date



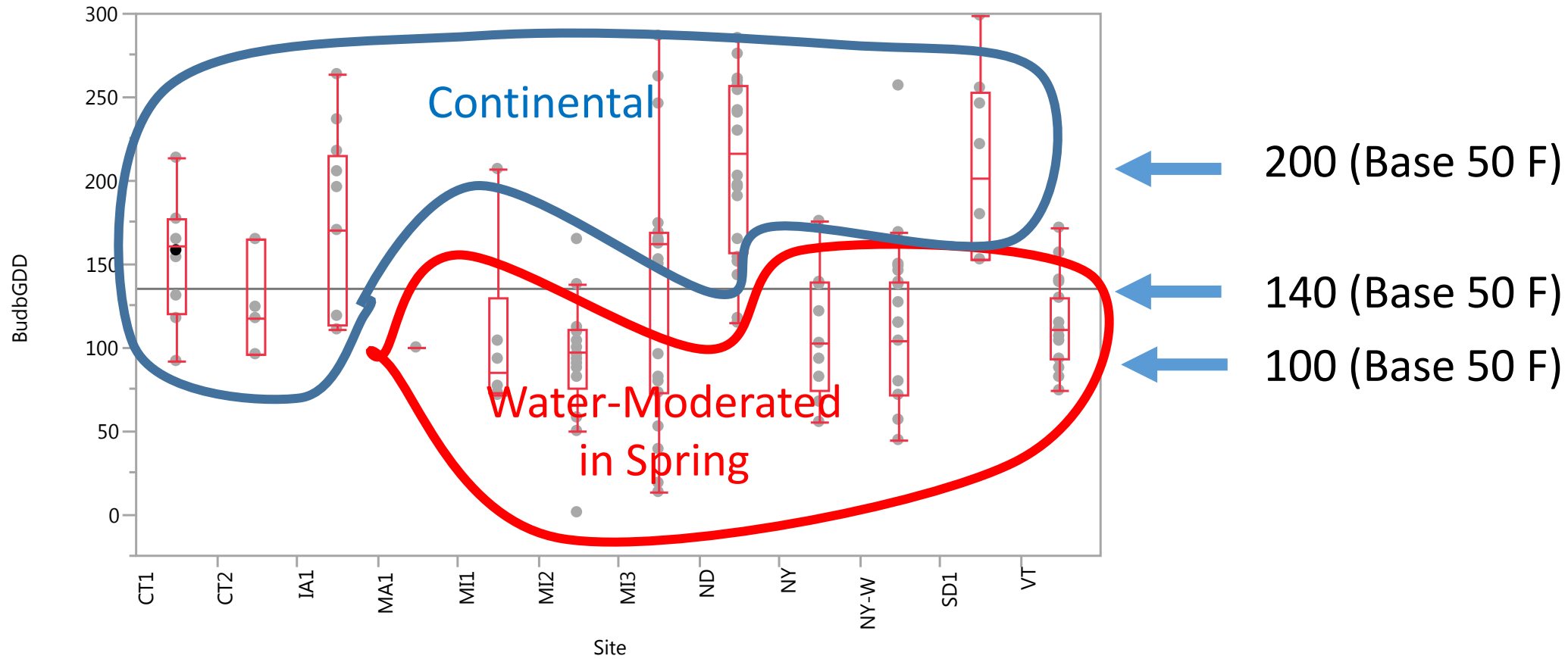
Phenology (by site): Degree Days at Budburst



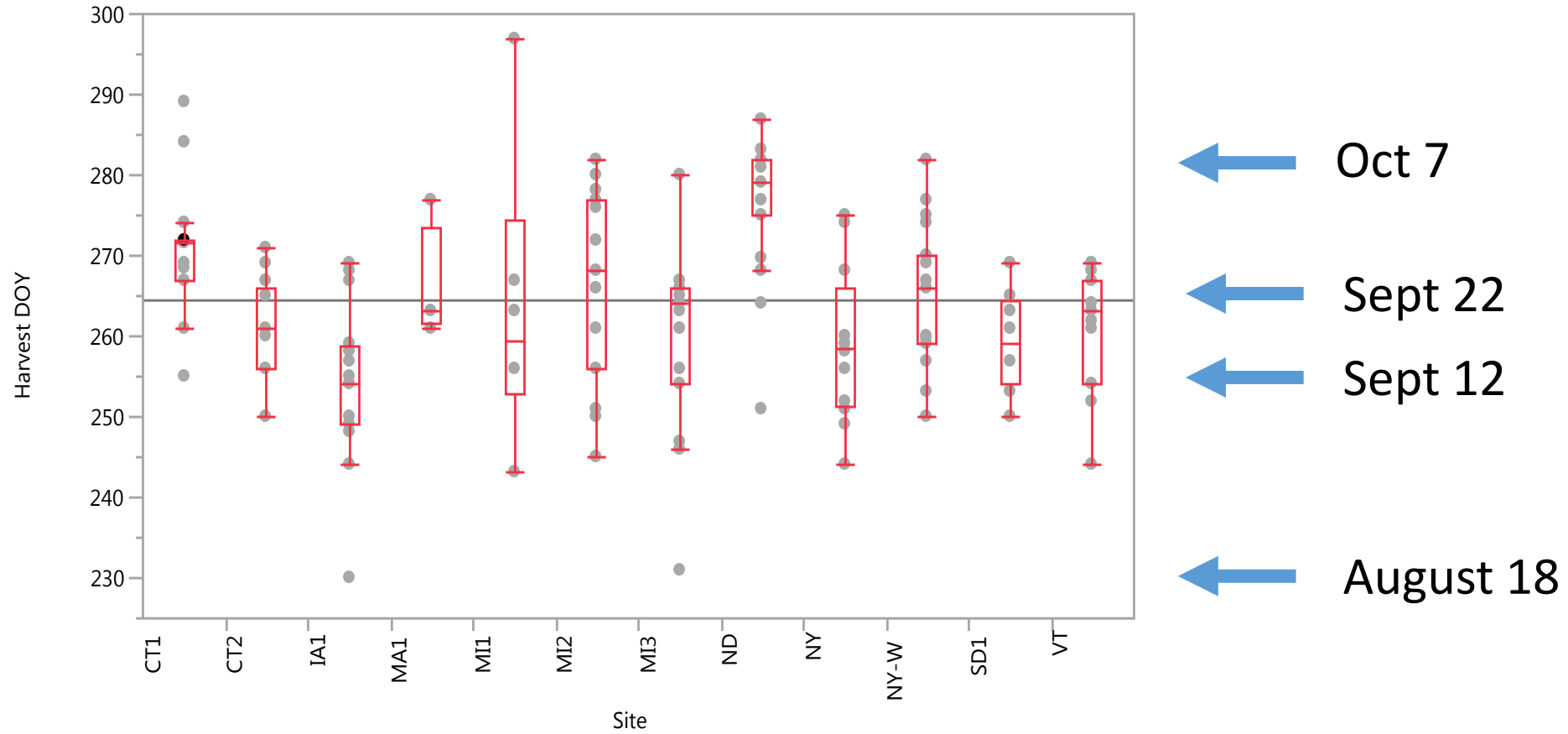
Phenology (by site): Degree Days at Budburst



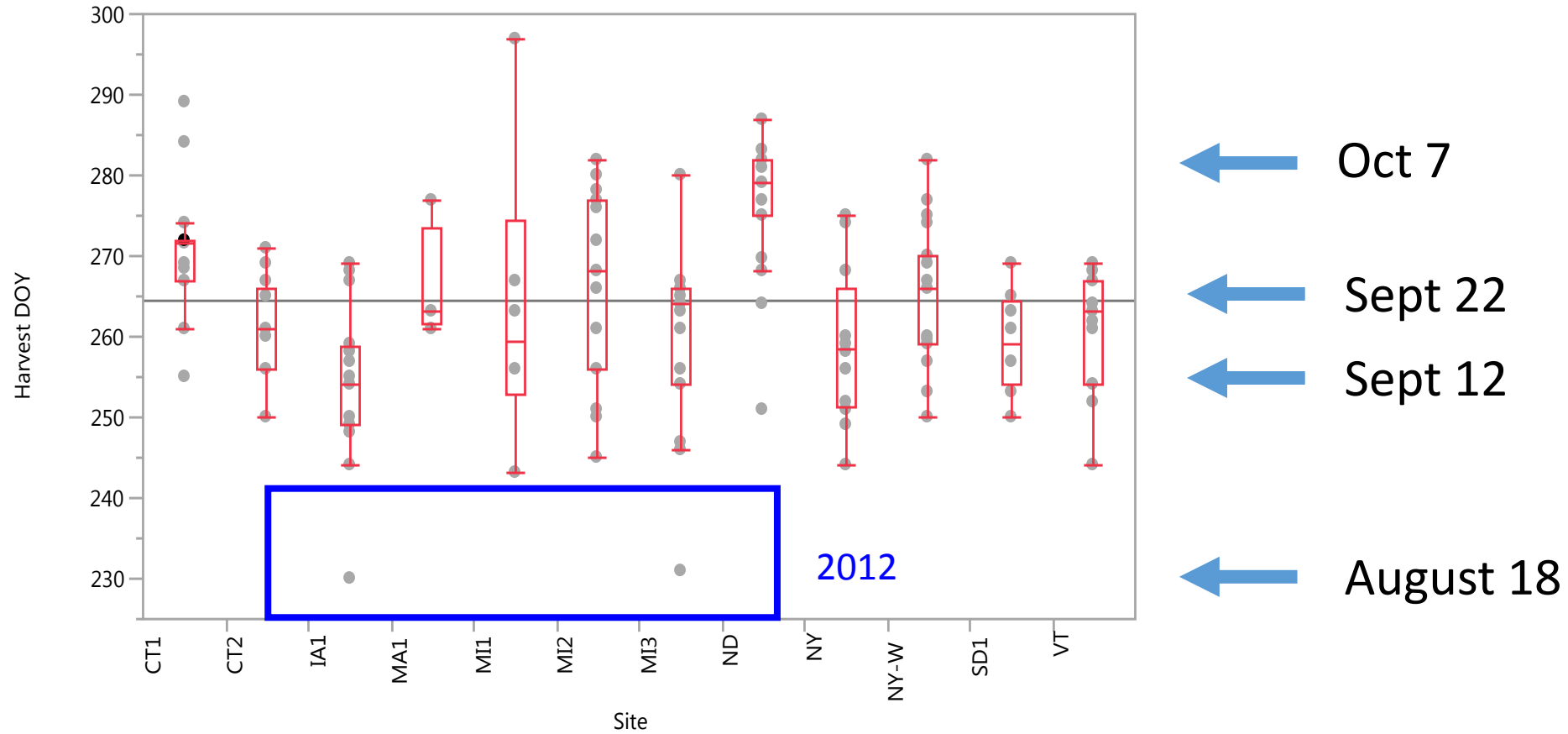
Phenology (by site): Degree Days at Budburst



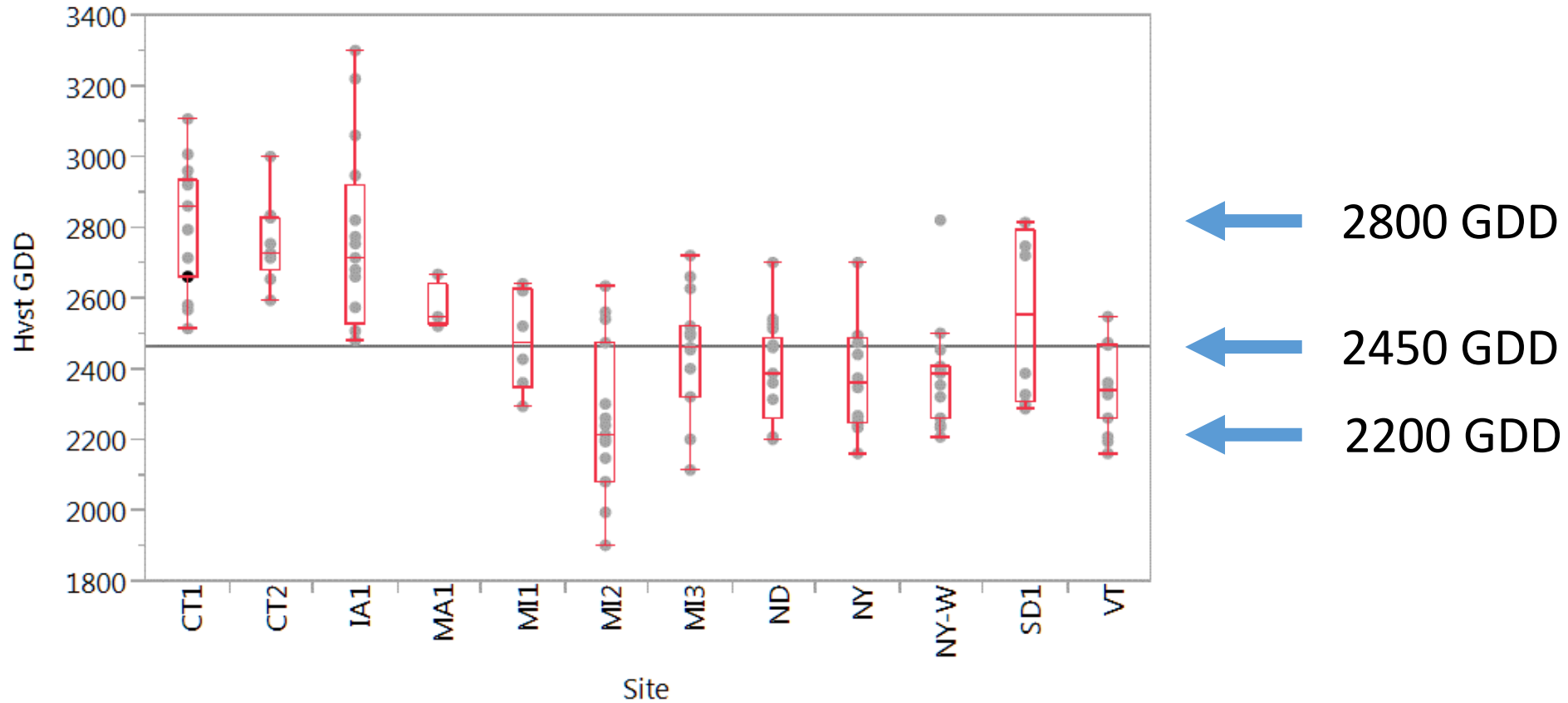
Phenology (by site): Harvest Date



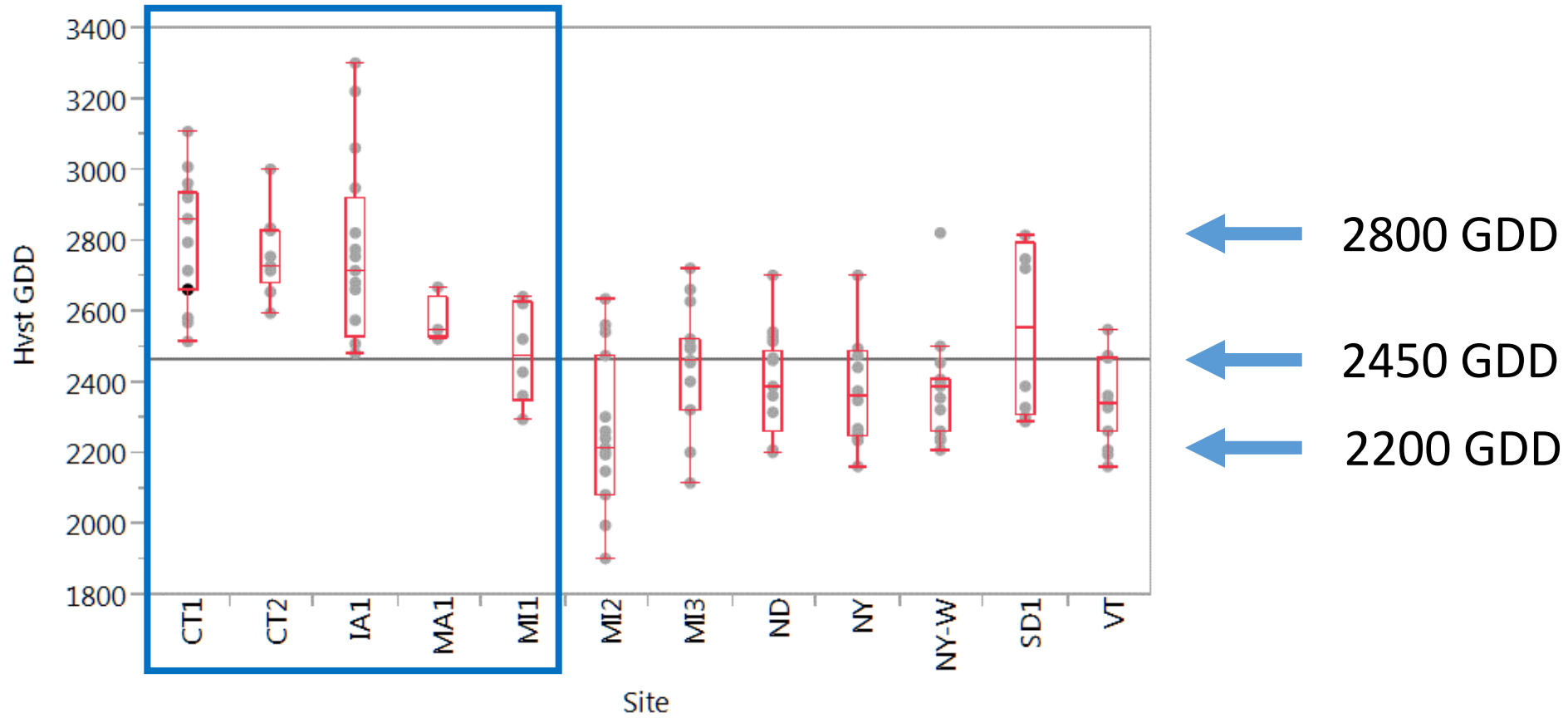
Phenology (by site): Harvest Date



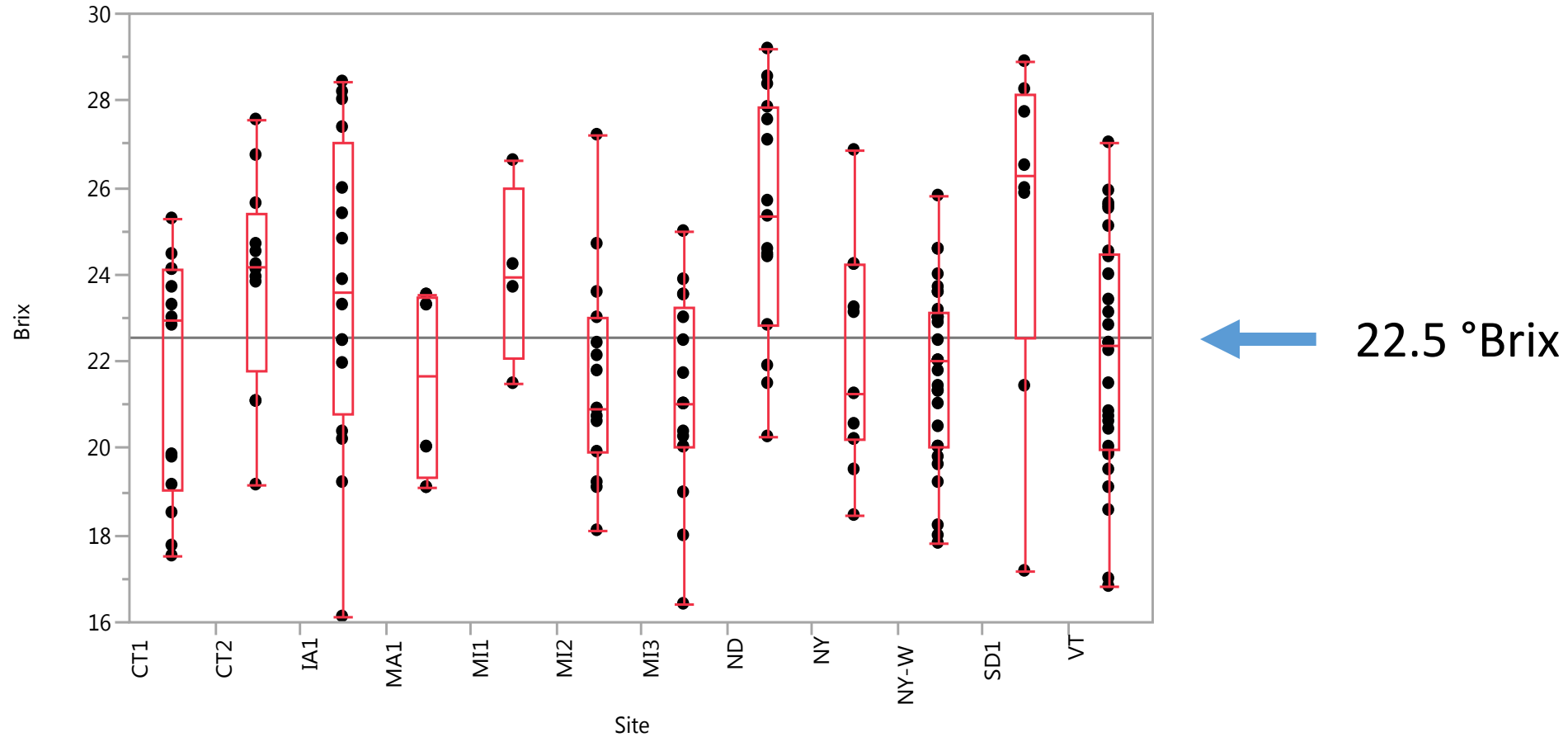
Phenology: Growing Degree Days at Harvest



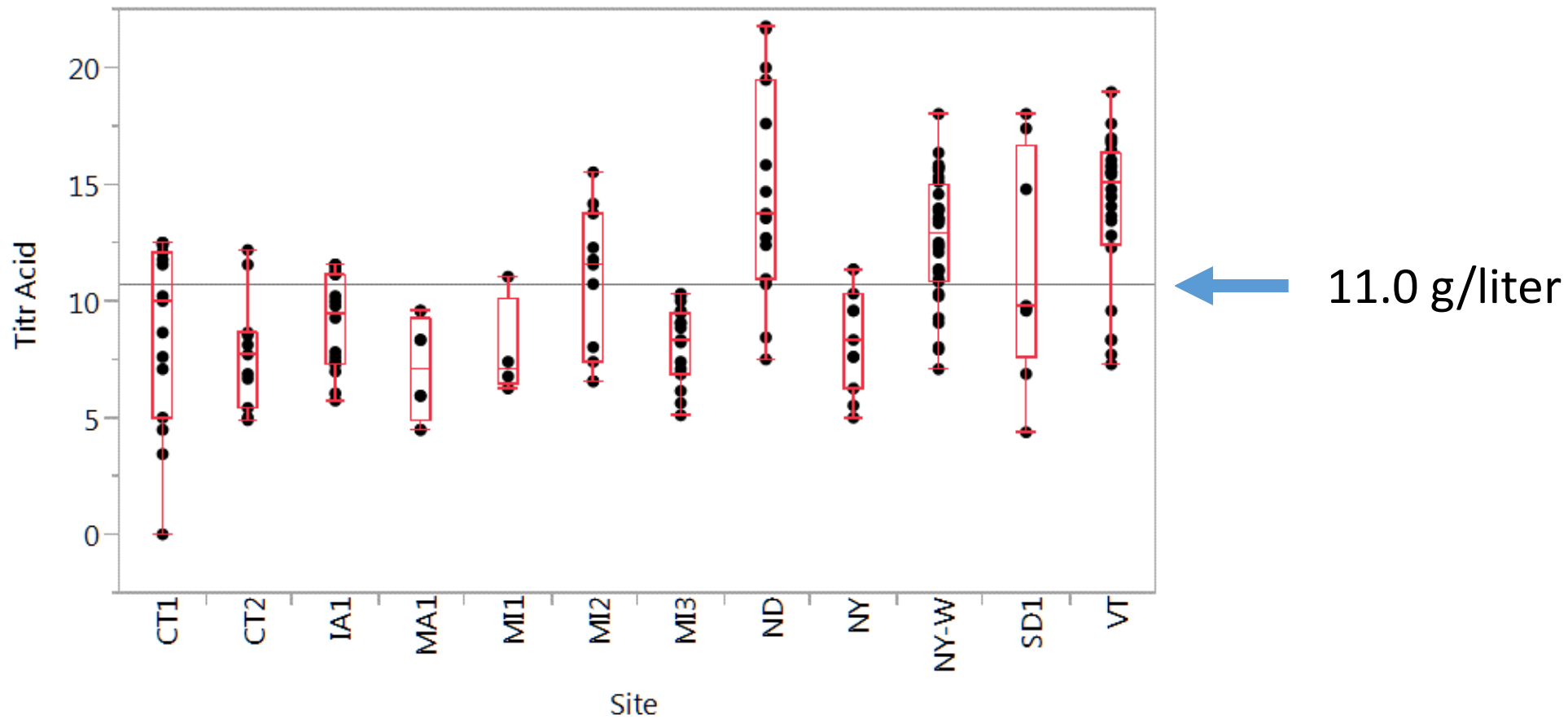
Phenology: Growing Degree Days at Harvest



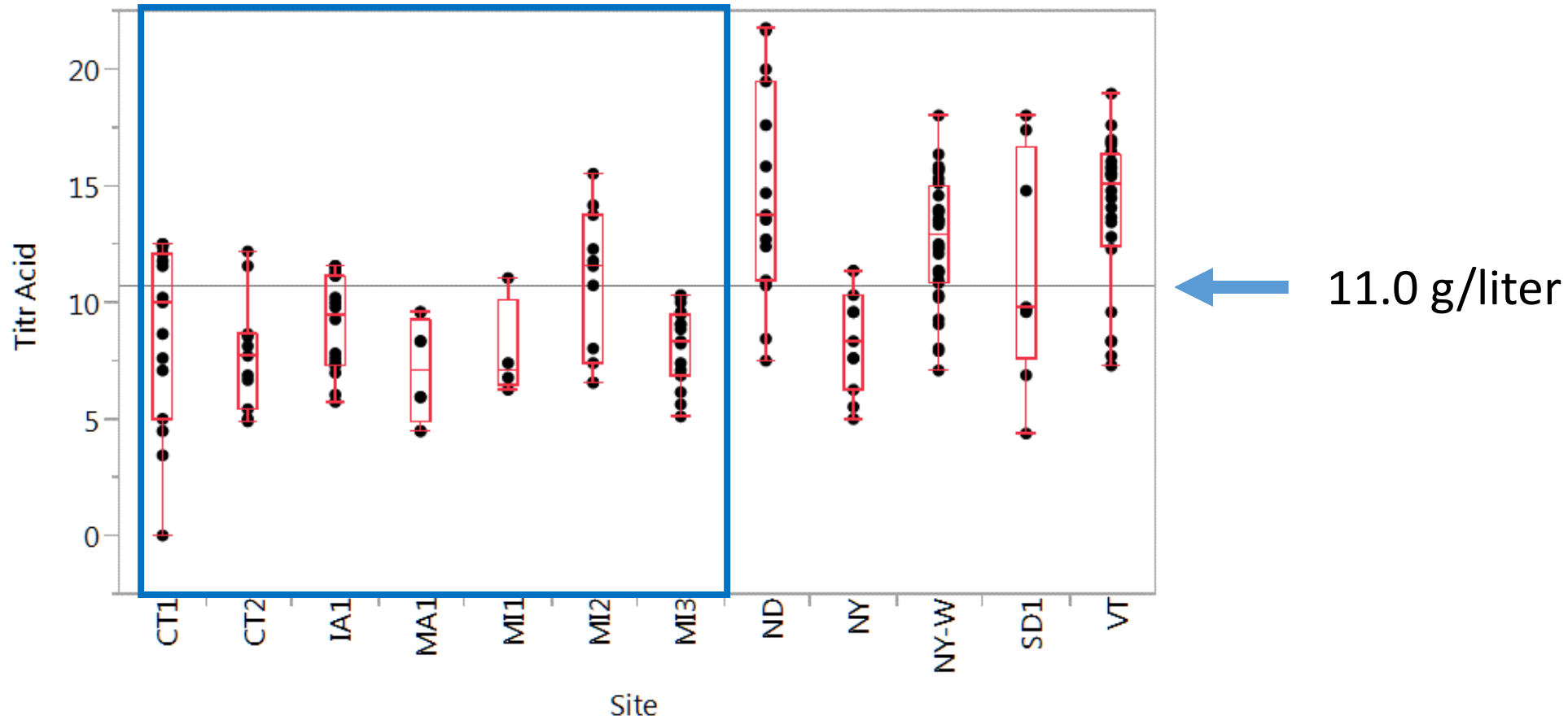
Maturity at Harvest: Soluble Solids ($^{\circ}$ Brix)



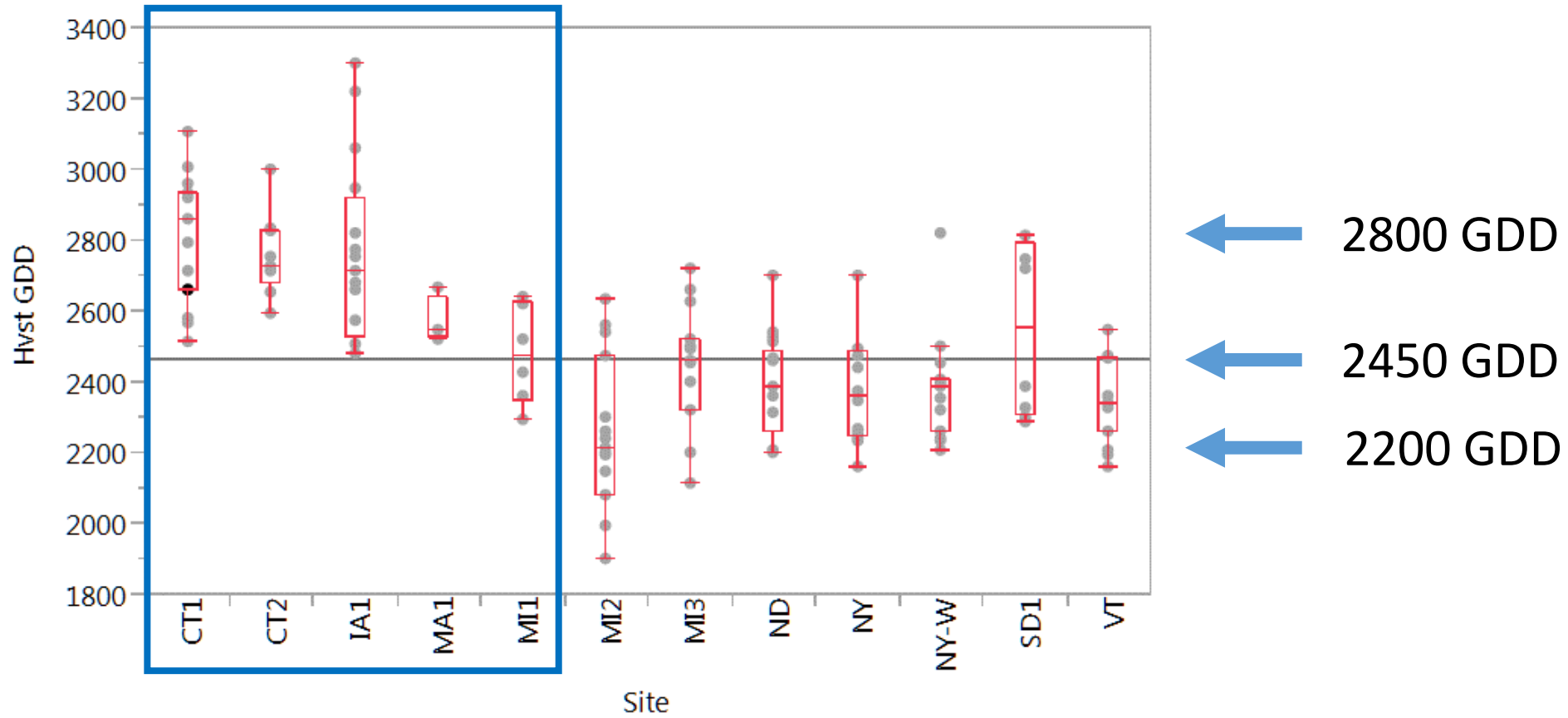
Maturity at Harvest: Titratable Acidity (g/l)



GDD and Maturity: Titratable Acidity (g/l)

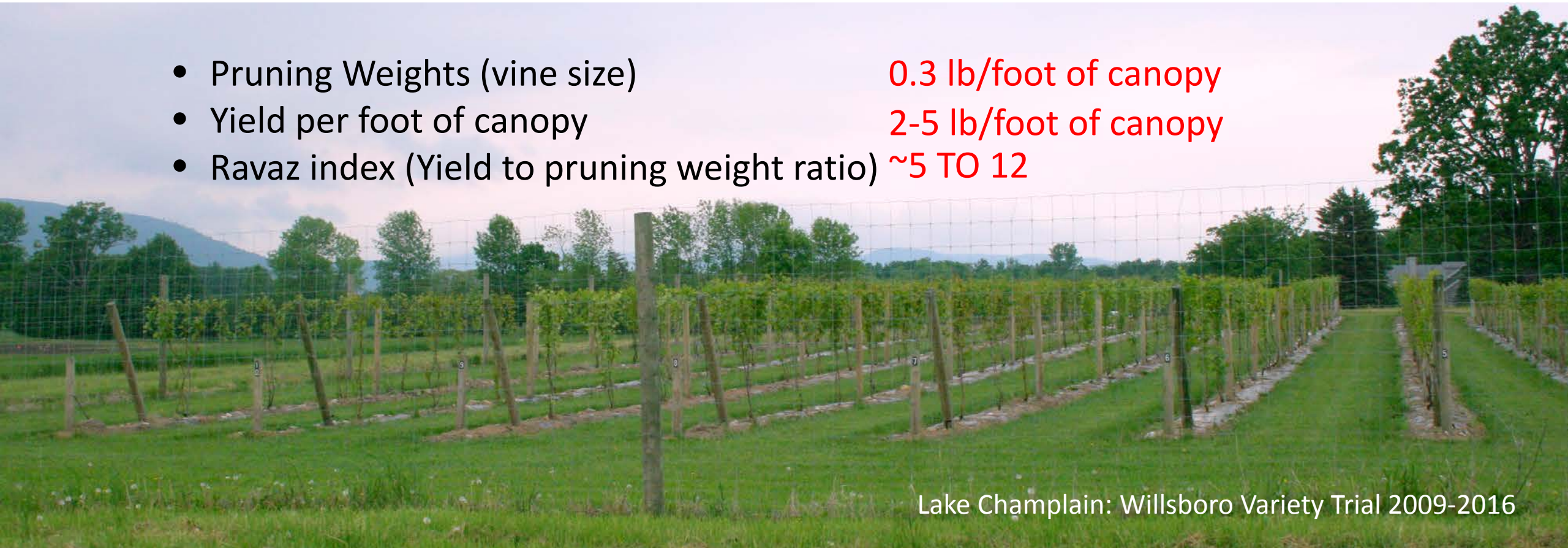


Phenology: Growing Degree Days at Harvest



Are they balanced?

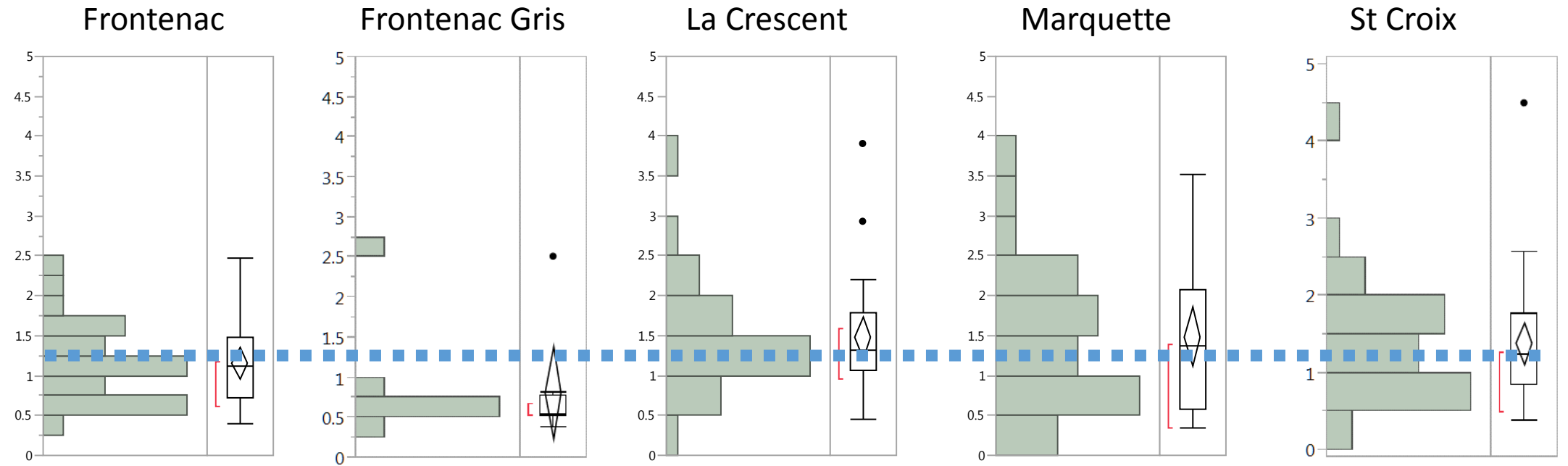
- Pruning Weights (vine size) 0.3 lb/foot of canopy
- Yield per foot of canopy 2-5 lb/foot of canopy
- Ravaz index (Yield to pruning weight ratio) ~5 TO 12



Lake Champlain: Willsboro Variety Trial 2009-2016

Pruning weights in NE1020 Plots

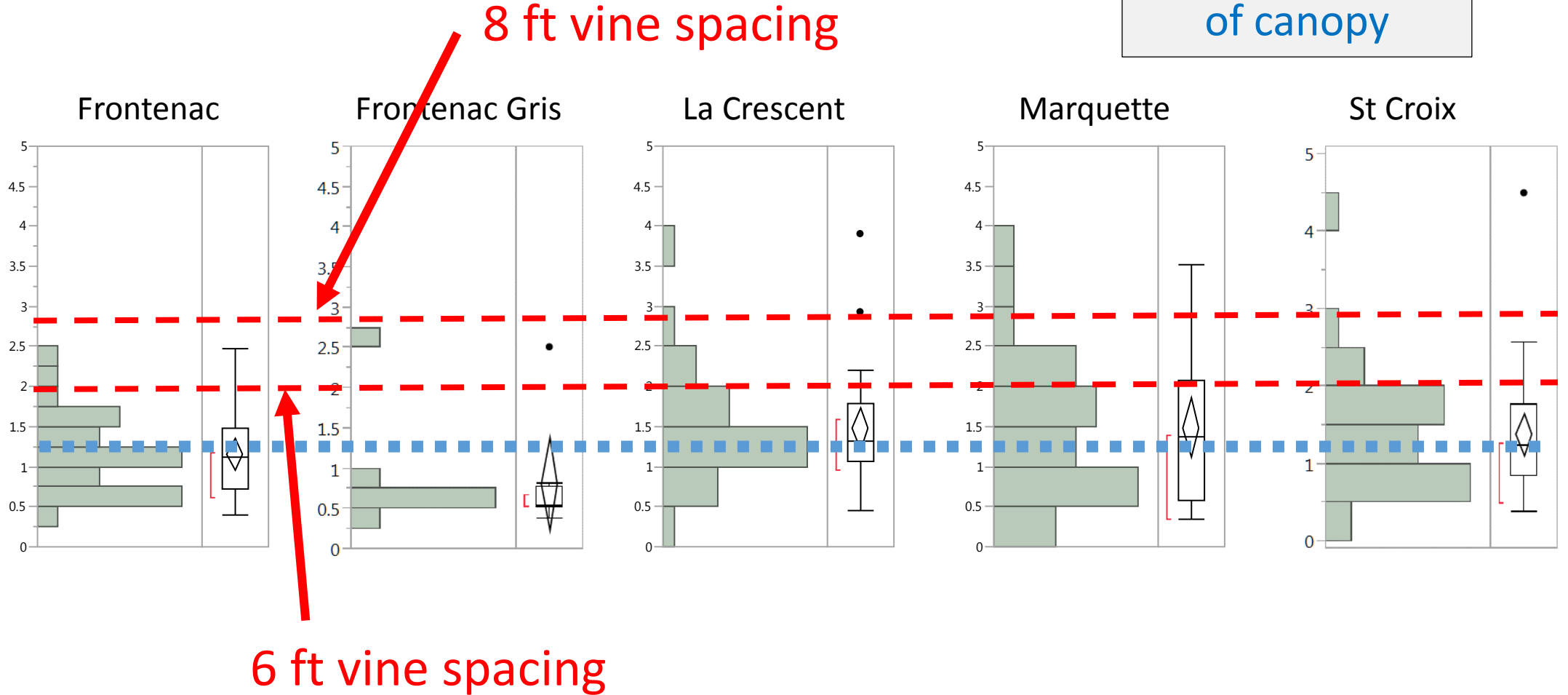
Pruning Weight Lb/vine



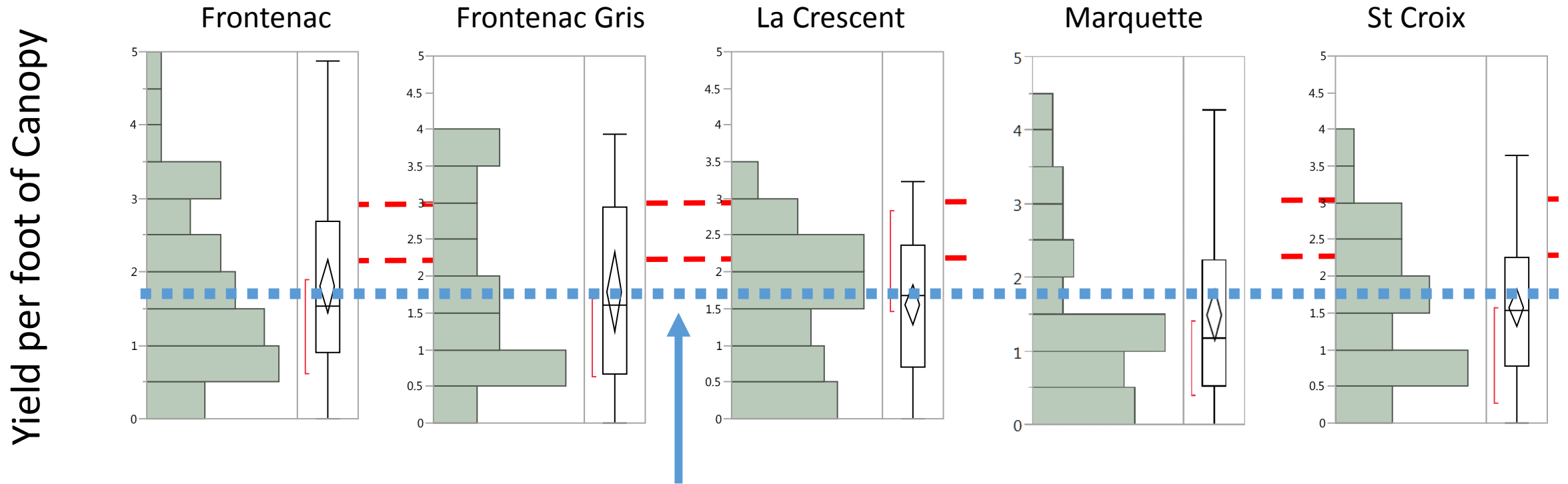
Pruning weights in NE1020 Plots

Optimum:
0.3 lb Pruning
Weight per foot
of canopy

Pruning Weight Lb/vine

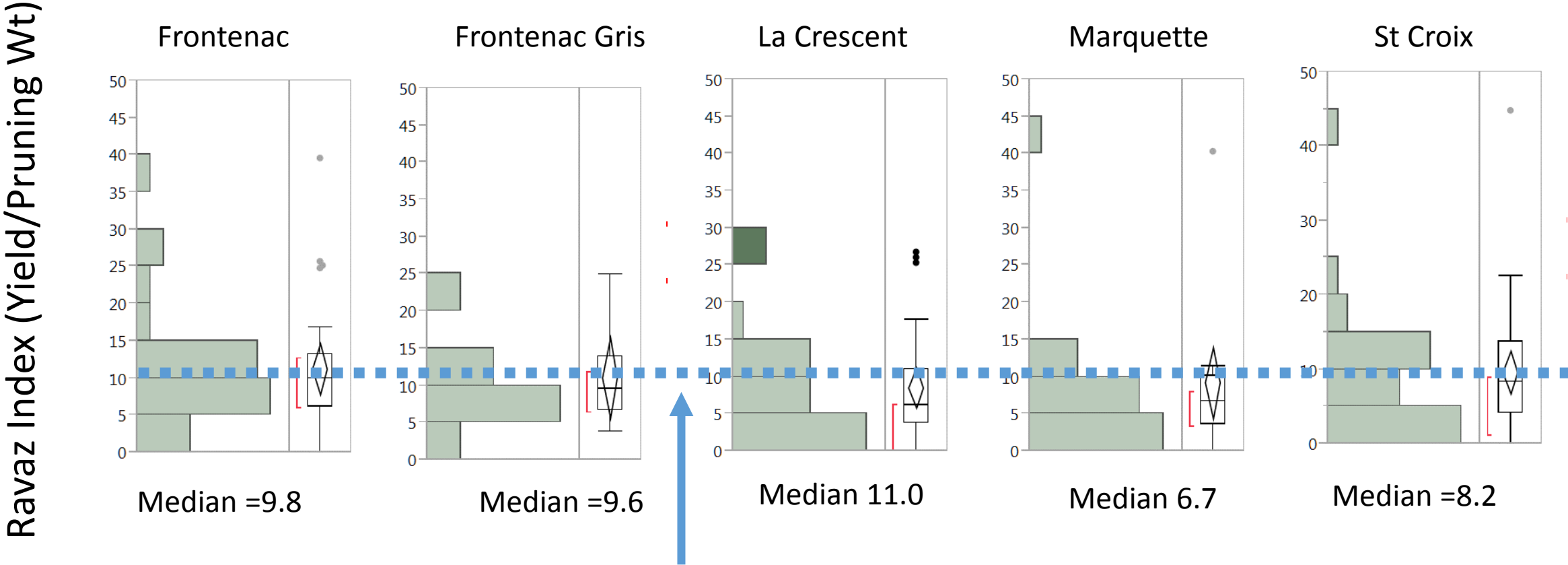


Yield/ft of canopy – NE1020 Blocks



For 9 ft rows, 1.7 lb/foot of canopy = 4 T/acre

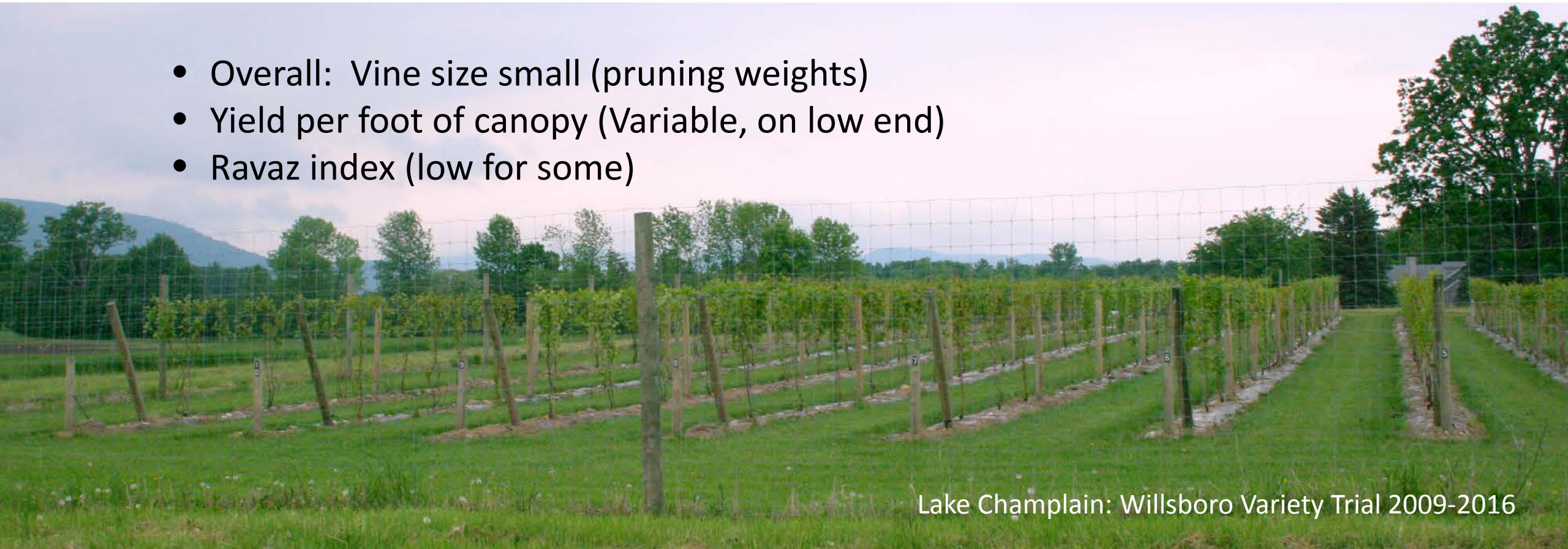
Ravaz Index – NE1020 Blocks



Ratio of Yield: Pruning Weight . Optimal range vinifera= 5-12

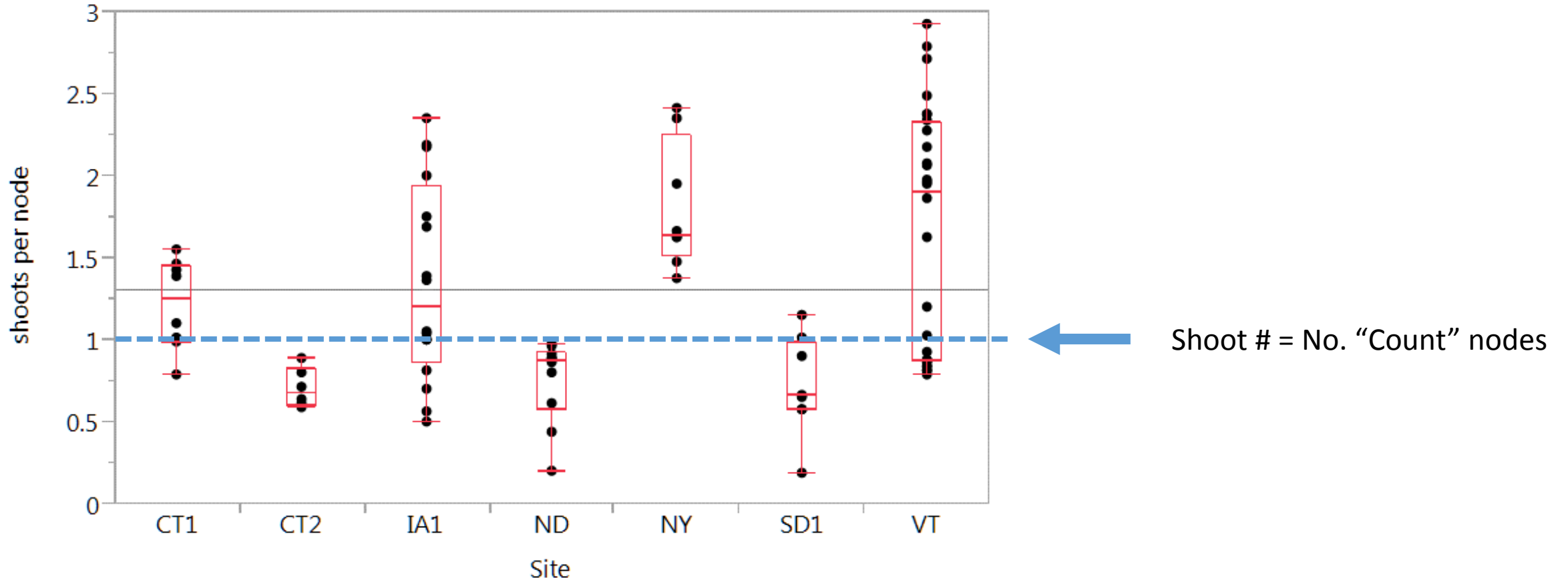
Are they balanced?

- Overall: Vine size small (pruning weights)
- Yield per foot of canopy (Variable, on low end)
- Ravaz index (low for some)

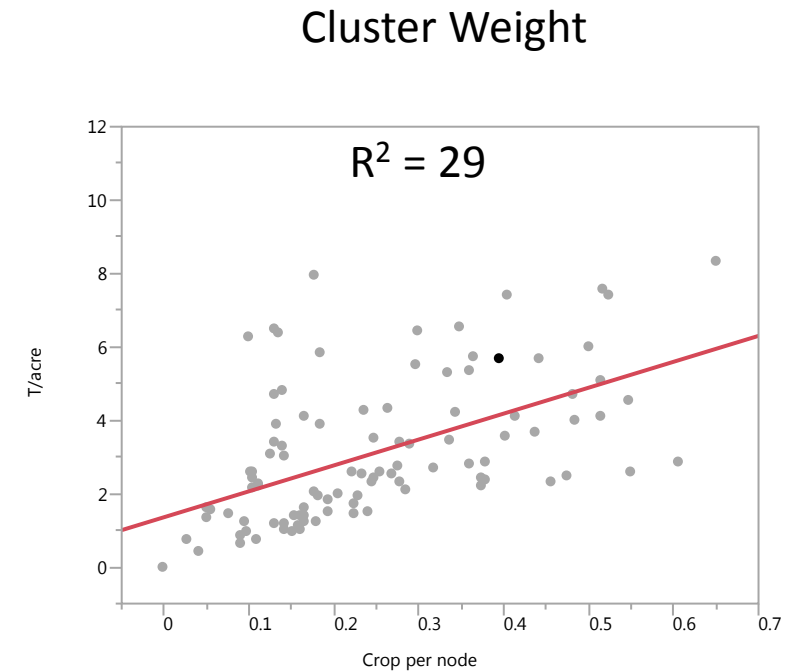
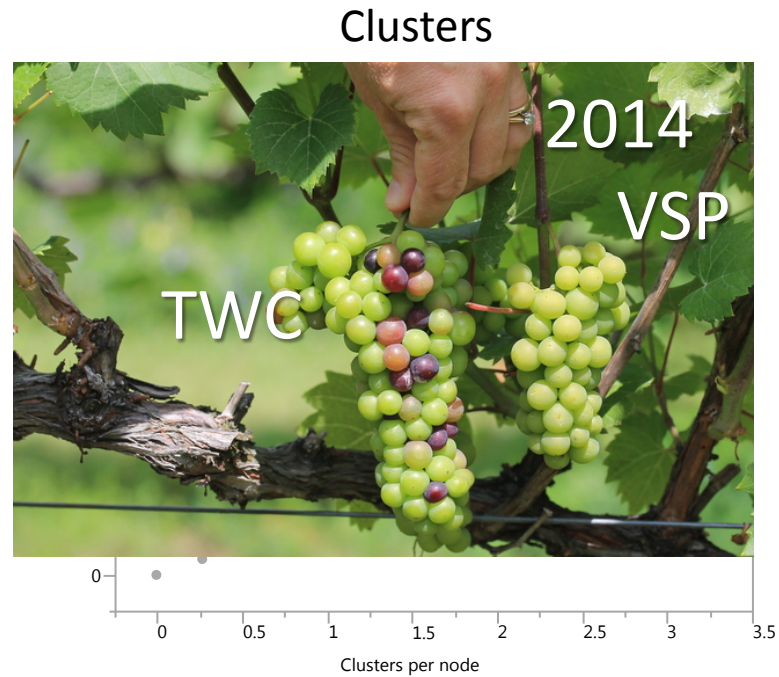
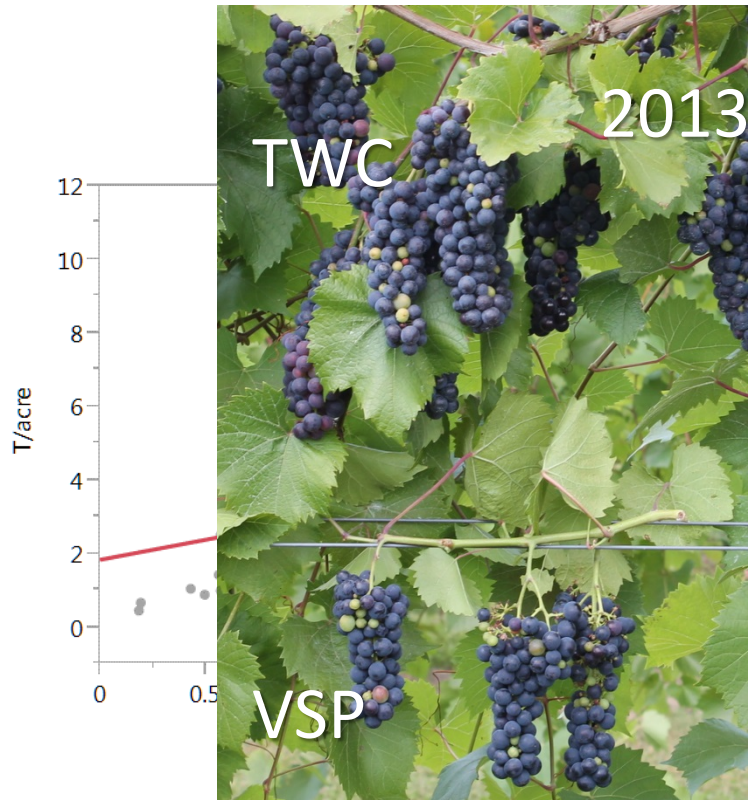


Lake Champlain: Willsboro Variety Trial 2009-2016

Winter Injury Metrics: Shoots per retained node



Yield Predictors: Shoots per node, Clusters per node, Crop per node



More Fruitful Nodes = Higher Crop

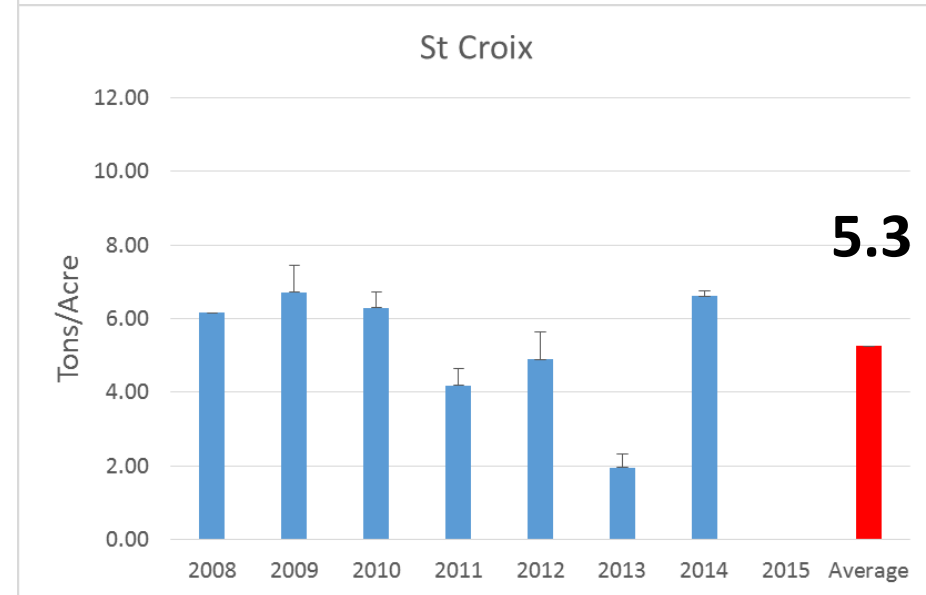
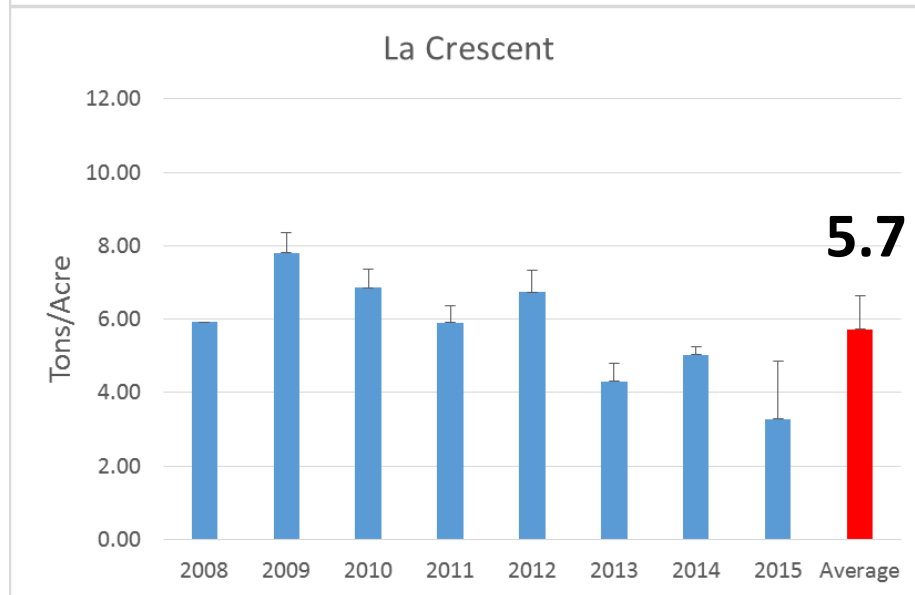
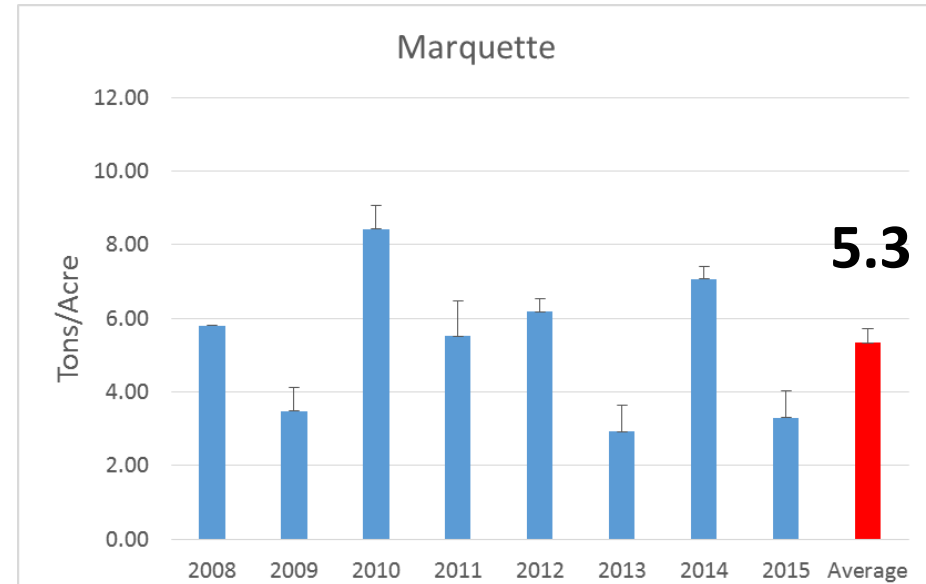
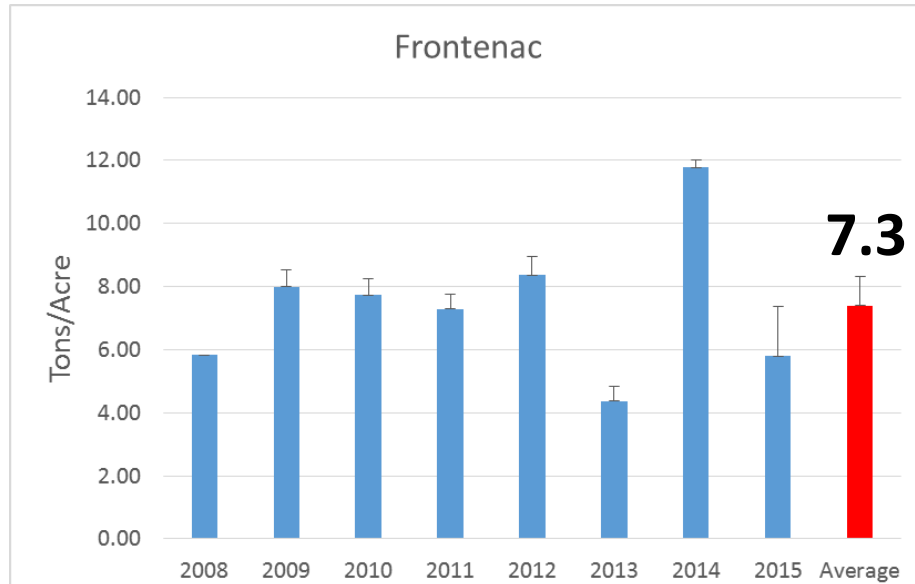
Eight Years of Yield at Willsboro

- Exceptional site
- Good Weed/Floor Management
- 5-6 well-timed fungicides
- High Cordon w/shoot adj.

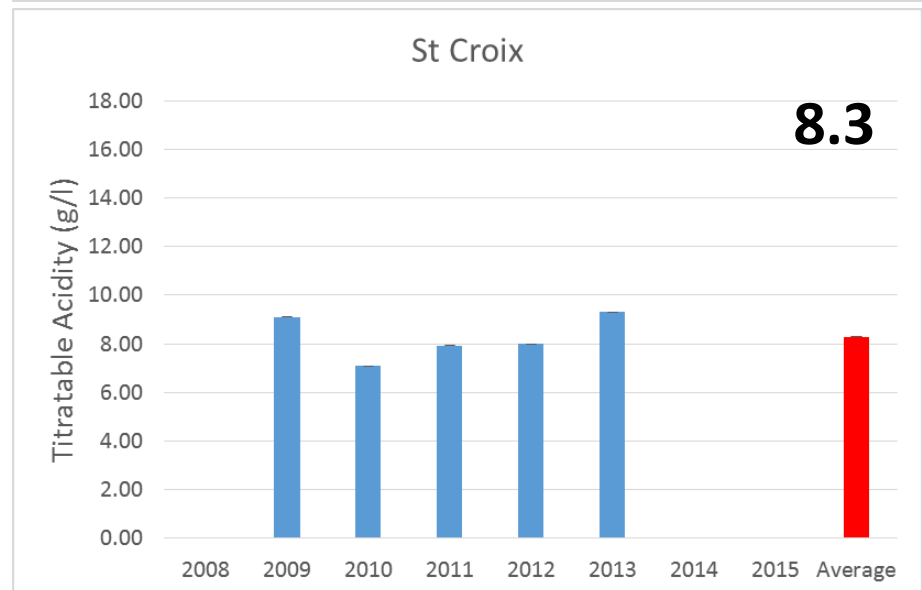
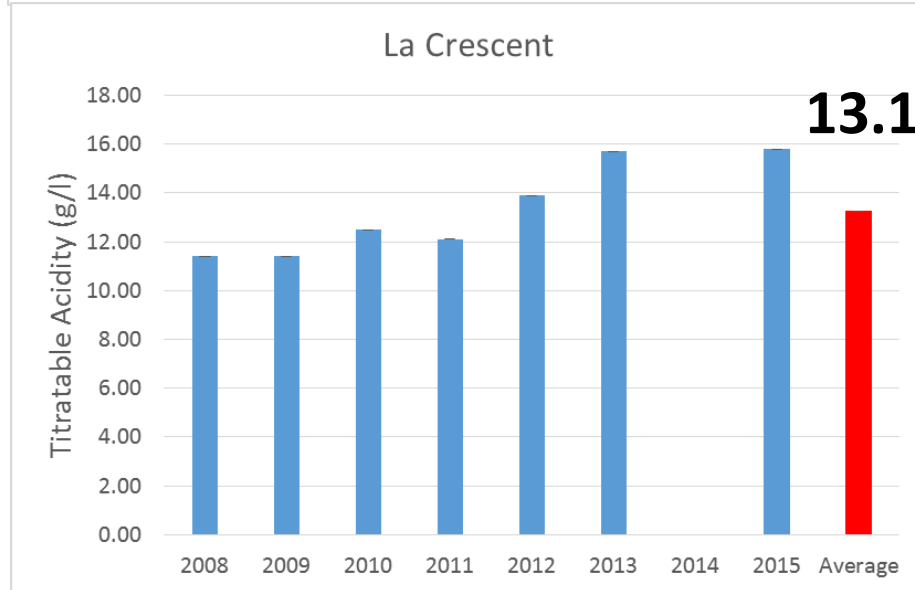
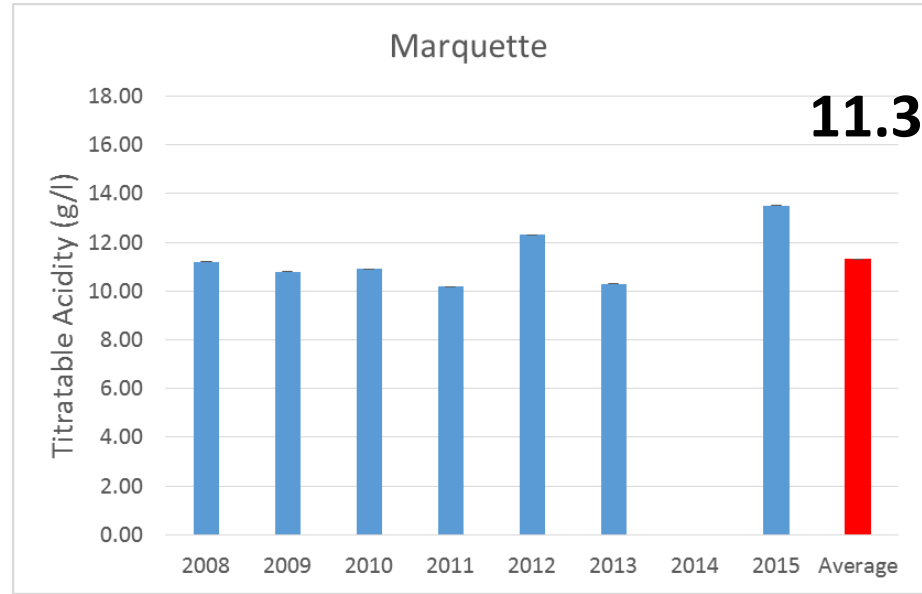
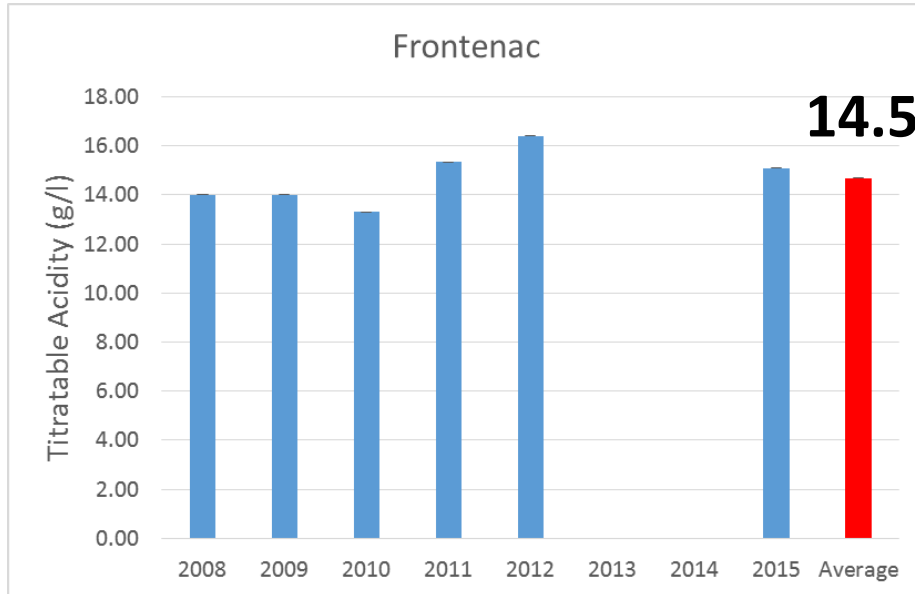


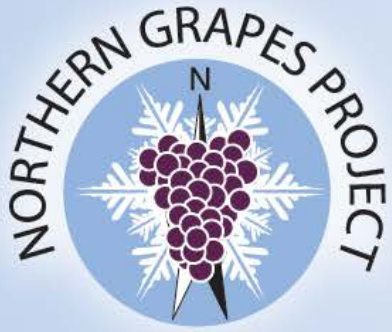
Lake Champlain: Willsboro Variety Trial 2009-2016

Eight Years of Yield at Willsboro



Eight Years of TA at Willsboro





Lessons from NE1020 Trials



- Economic yields (~4T, 10 lb/vine, 1.7 lb/ft of canopy) are achievable
 - VT, Willsboro, Michigan I.
- Vine size small in ~1/2 of sites (<<0.35 lb/ft pruning weights)
- More heat units by harvest= lower titratable acidity
 - Higher TA in Northeastern Sites
- Winter injury metric: Shoots/retained node, Crop/Node predictive of yield
- Data skewed: Polar vortex (2014-2015) – no crop data reported.

Management to improve vine size, Retain more buds as 'hedge' to winter/spring Injury



Acknowledgements



- **Team Members**

- ND: **Harlene Hatterman-Valenti**, North Dakota State University
- SD: **Anne Fennell**, South Dakota State University
- NE: **Paul Read**, University of Nebraska
- IA: **Diana Cochran** and **Paul Domoto**, Iowa State University
- MI: **Paolo Sabbatini**, Michigan State University
- NY: **Anna Wallis**, **Kevin Iungerman**, **Steve Lerch**, **Justine Vanden Heuvel**, Cornell University
- VT: **Terence Bradshaw**, **Lorraine Berkett**, University of Vermont
- CT: **Bill Nail** and **Francis Ferrandino**, Connecticut Agricultural Experiment Station
- MA: **Sonia Schloemann**, University of Massachusetts Cooperative Extension



The Northern Grapes Project is funded by the USDA's Specialty Crops Research Initiative Program of the National Institute for Food and Agriculture, Project #2011-51181-30850

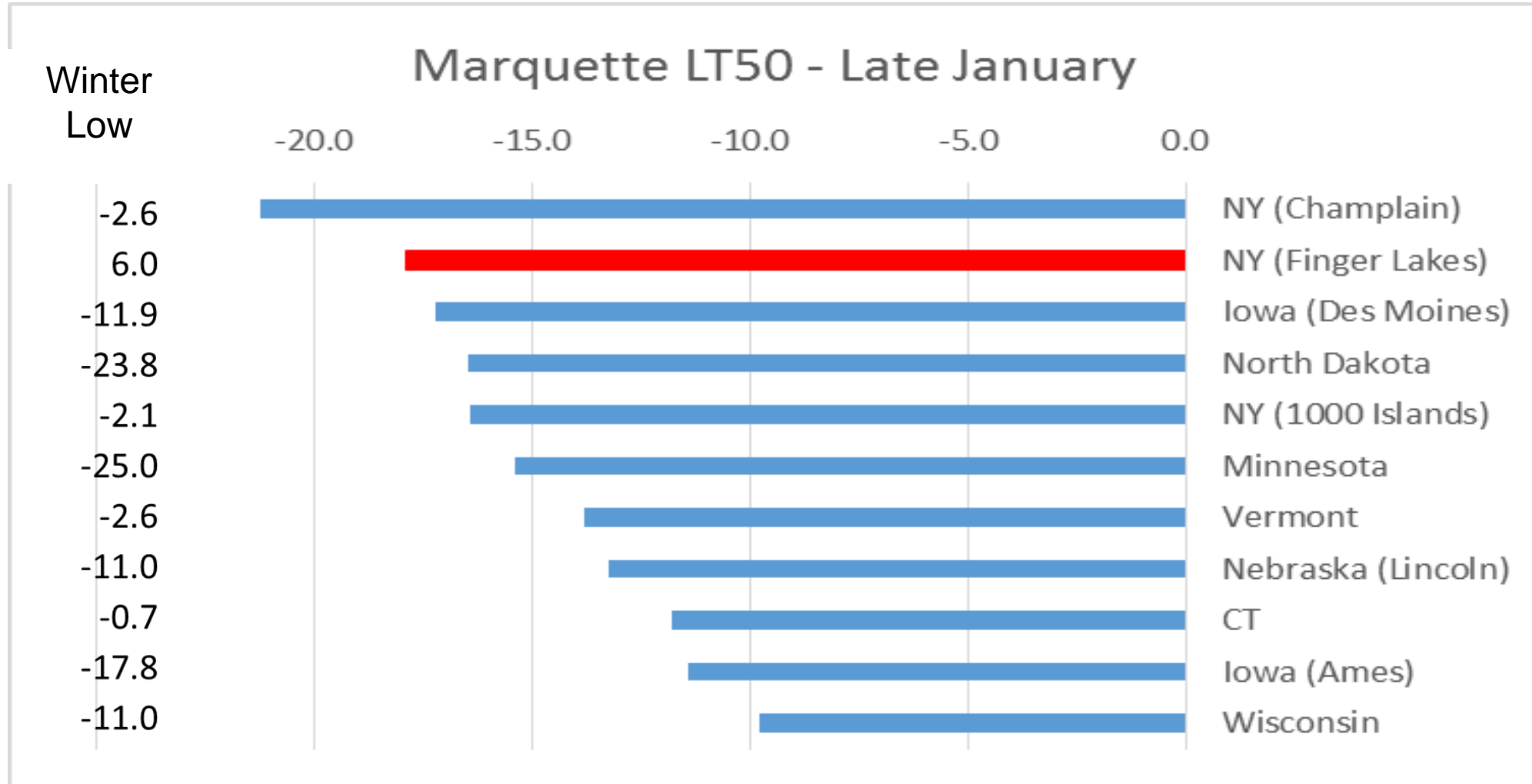
New Data on Northern Grapes

Question: How do midwinter bud freezing temperatures vary for the Cold-Hardy varieties based on winter severity?

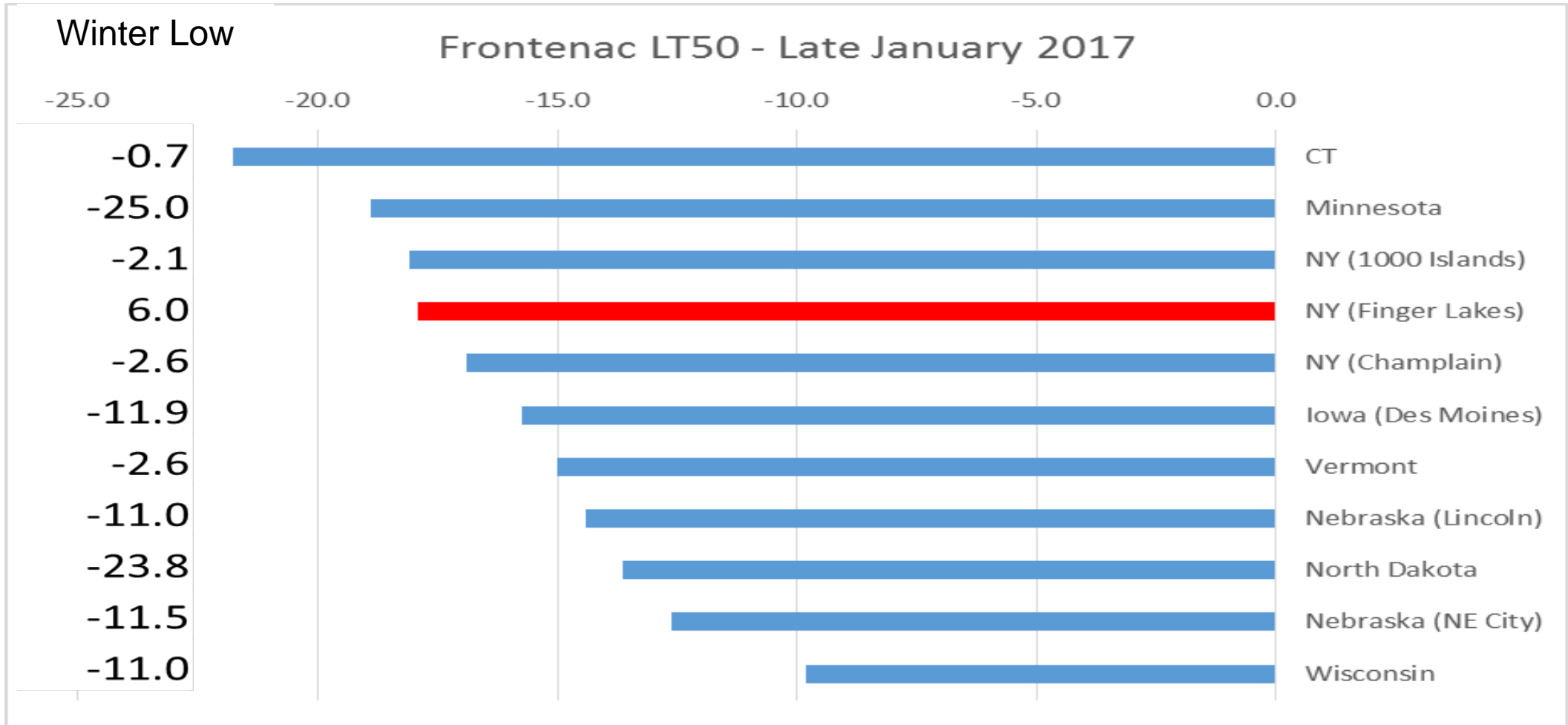
2017 Collection the week of Jan 22-26.

11 Locations

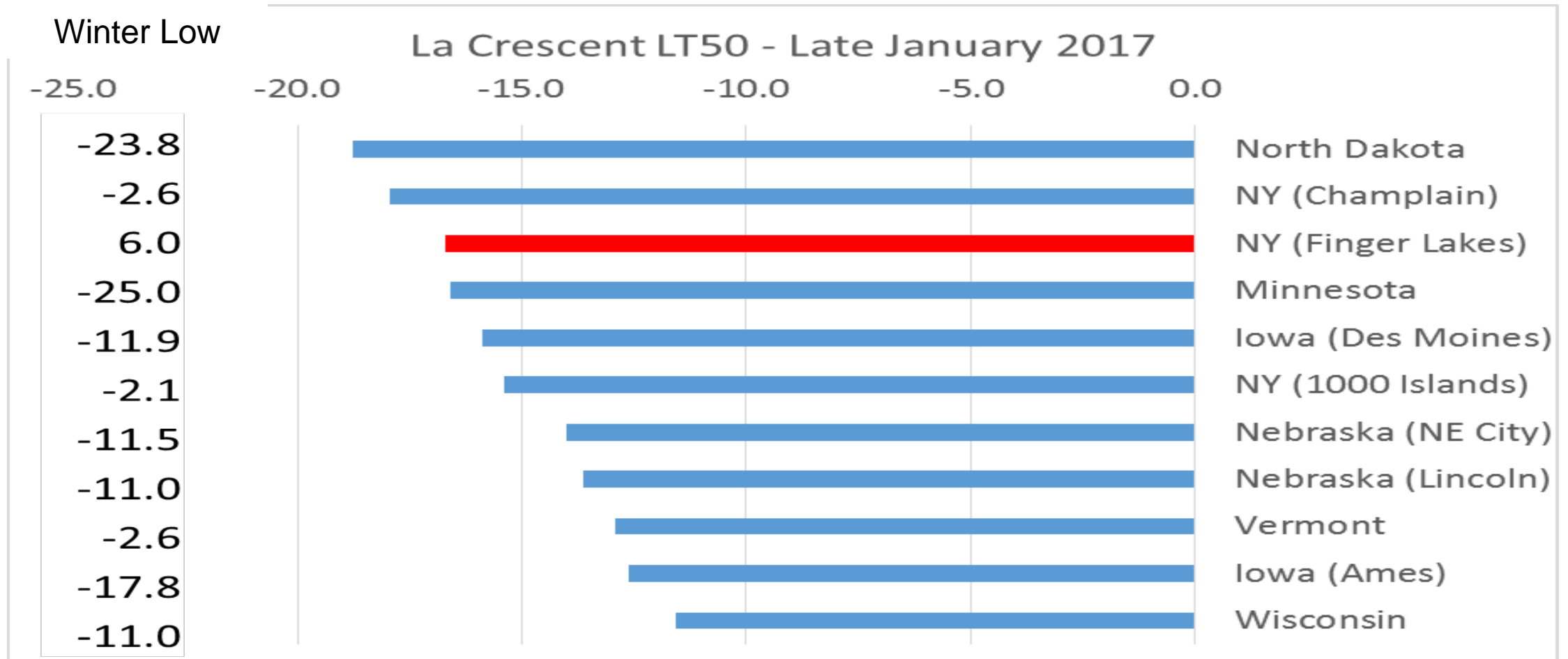
Marquette LT₅₀ Range: -11 to -22° F



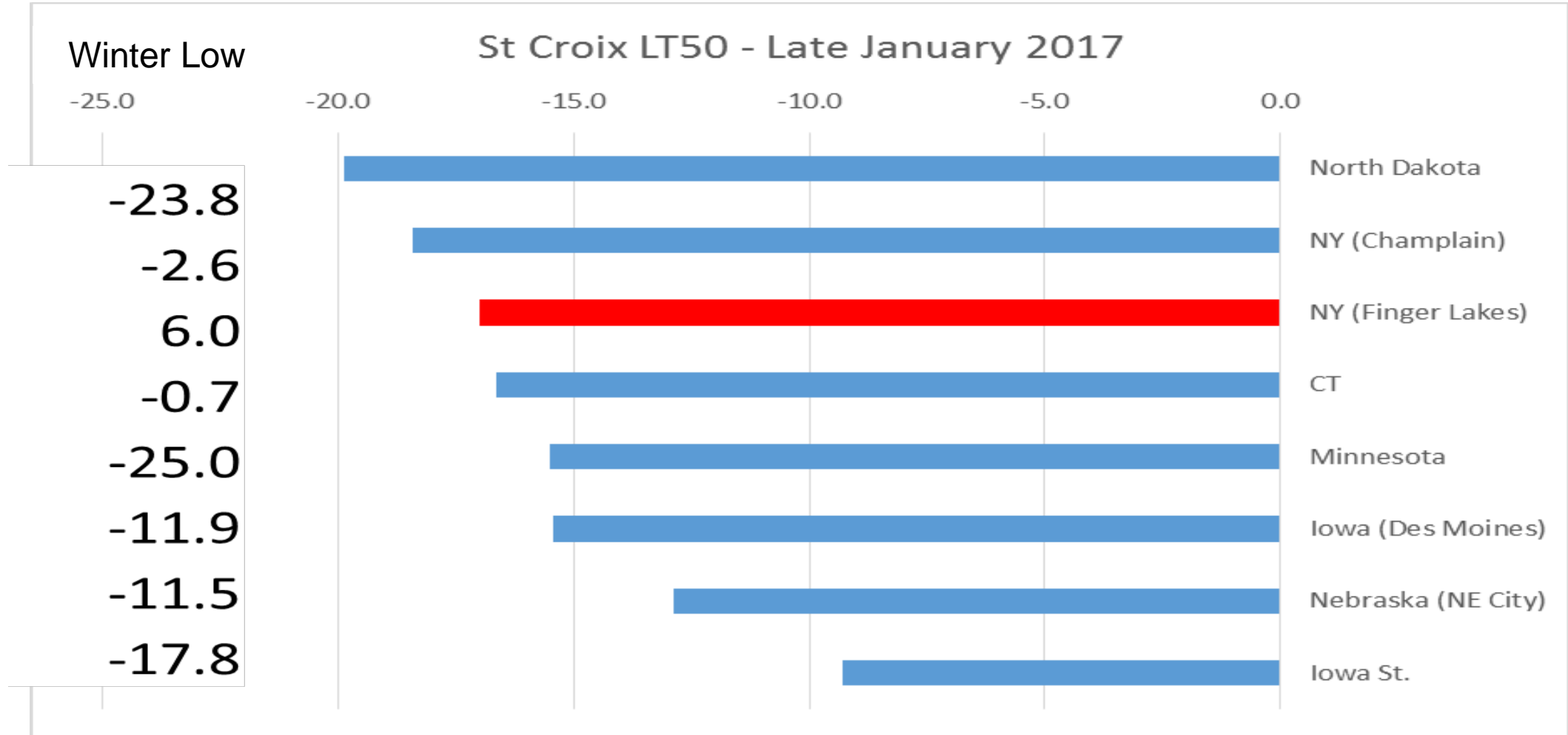
Frontenac LT₅₀ Range: -10° to -22° F



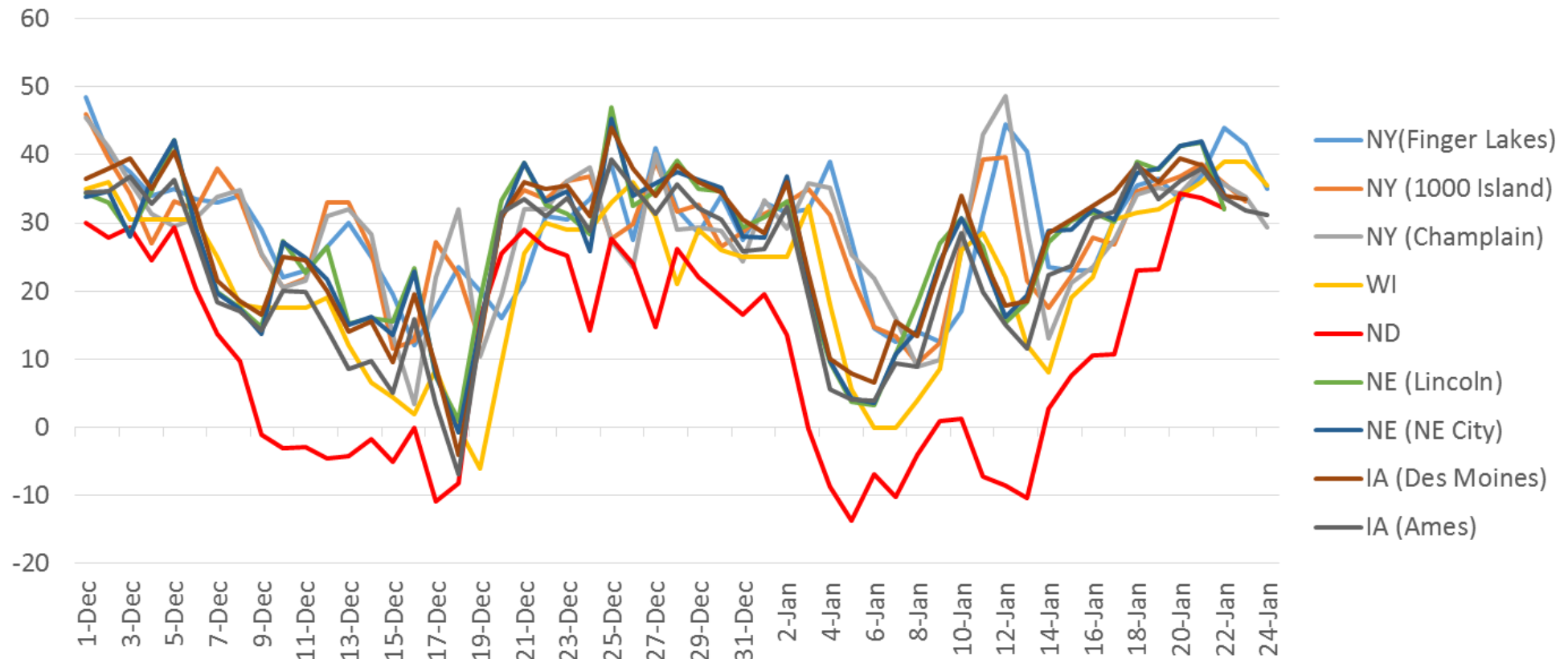
La Crescent LT₅₀ Range: -12° to -18° F



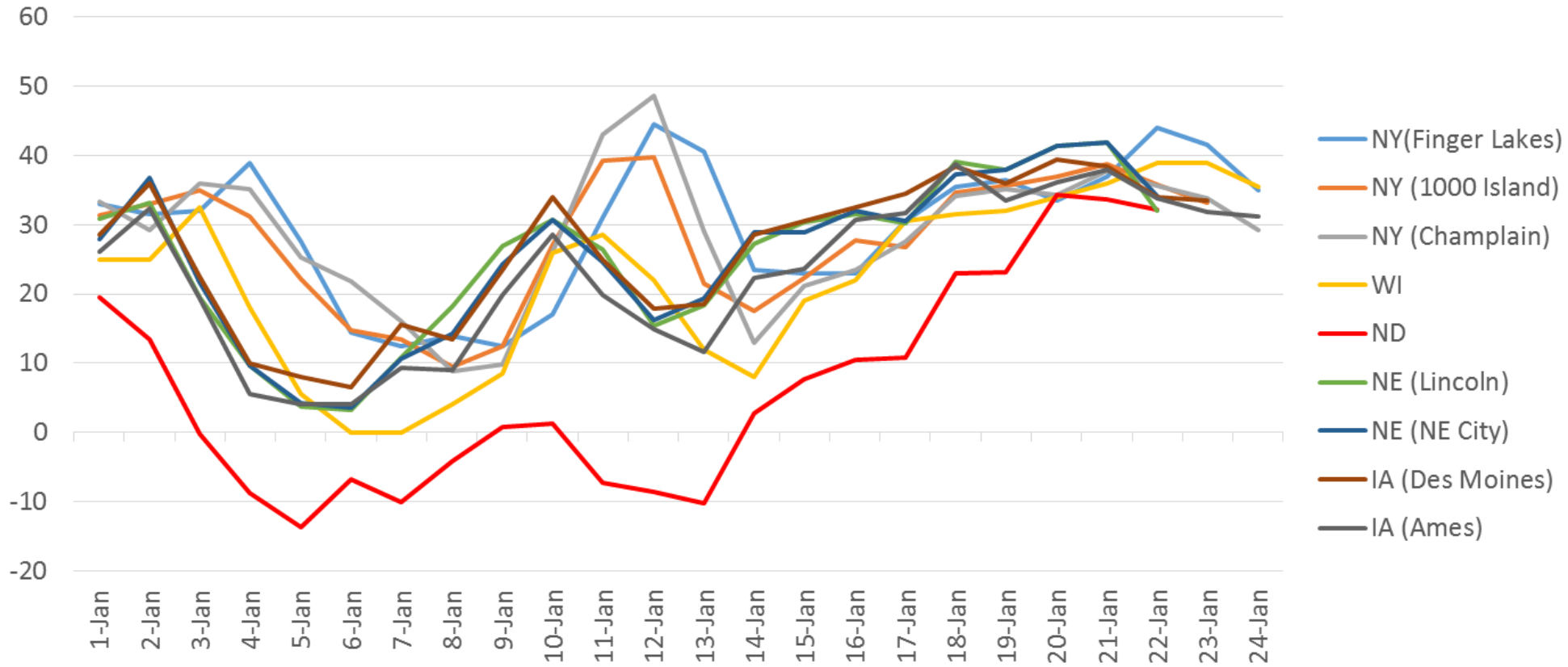
St. Croix LT₅₀ Range: -9° to -20° F



Average Temperatures: December 1 to January 24



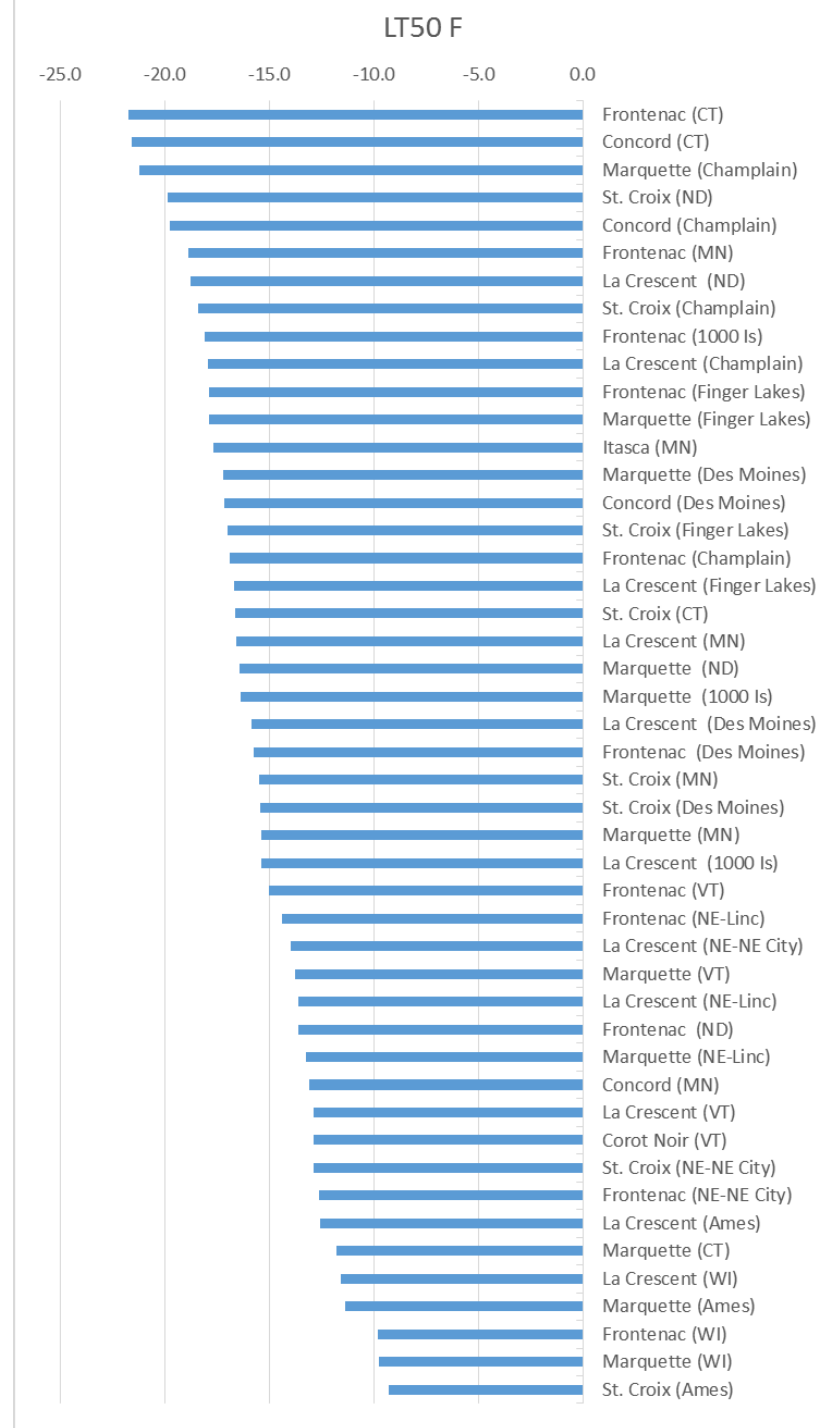
Average Temperatures: January 1 to January 24



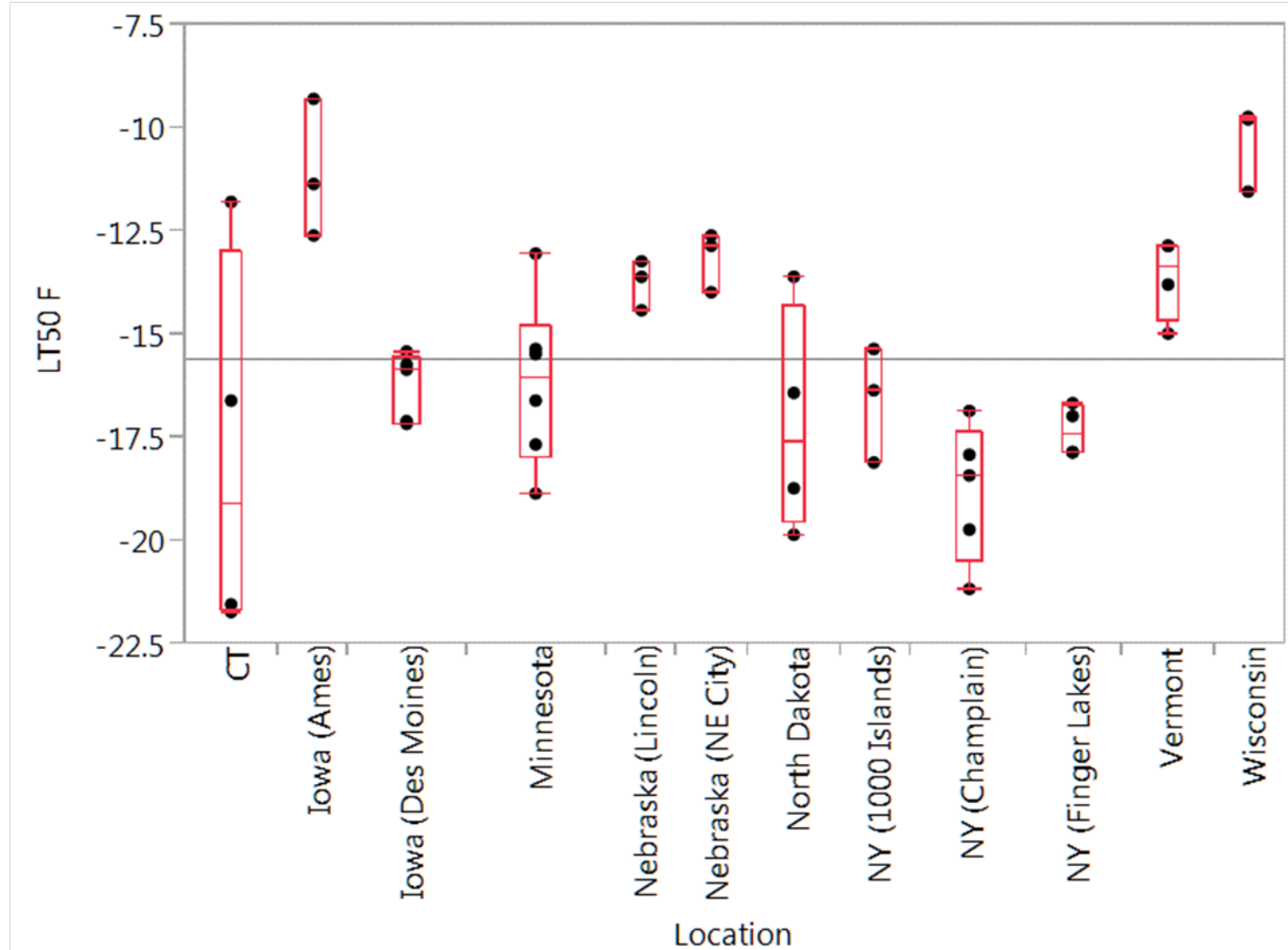
LT50s

48 Samples
Ranked from
Lowest to
Highest

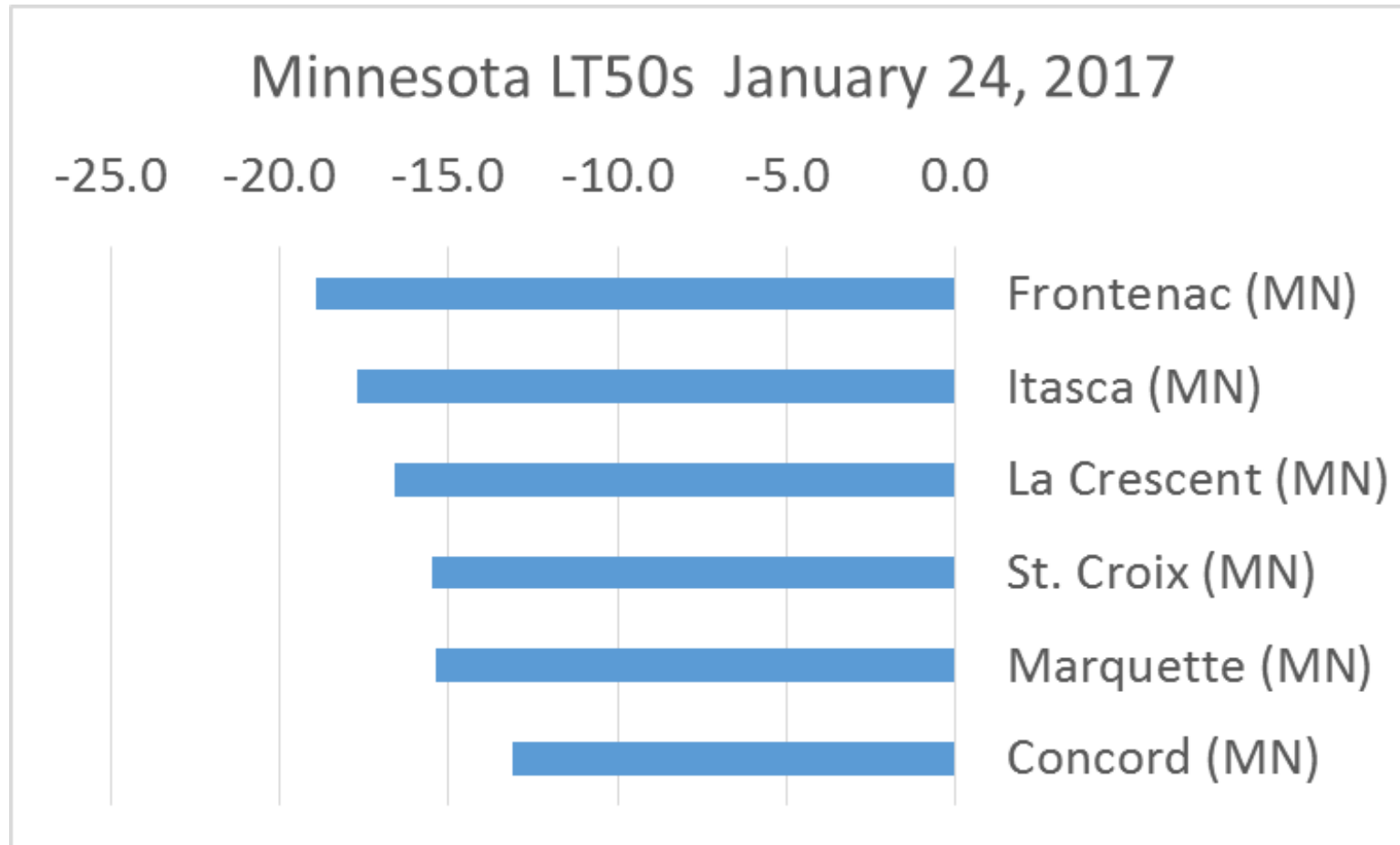
Range:
-9.3 to -21.6° F



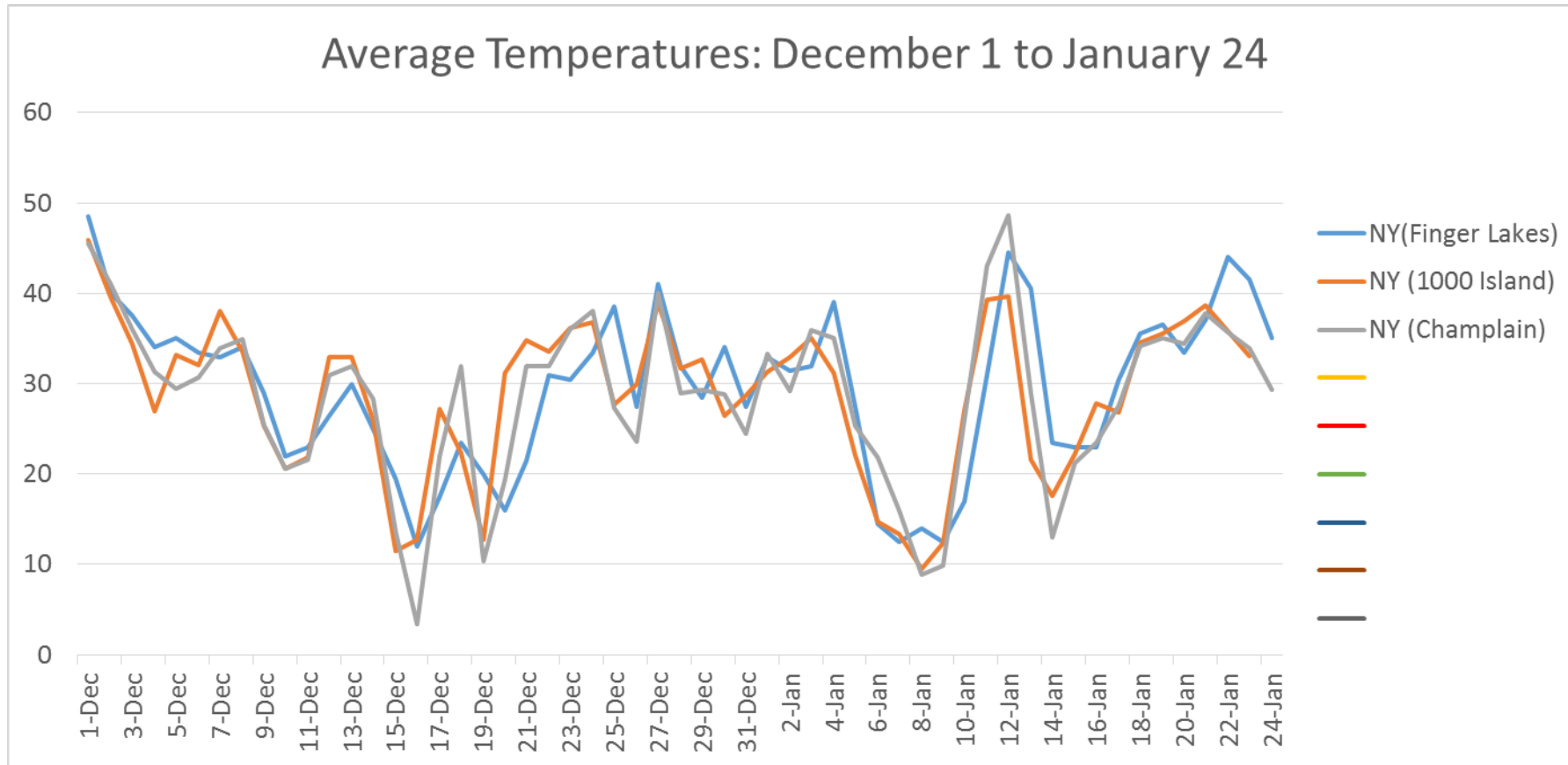
LT50s by Location Across Varieties



Minnesota samples



NY Sites Only



Midwest Only

