

Evaluation of Winegrape Cultivars and Clones on Long Island

A progress report to the NY Wine & Grape Foundation

Continuing Project

Principal Investigator

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**A Research and Extension project
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Summary: In 2019, 35 winegrape varieties were evaluated at the Long Island Horticultural Research and Extension Center. Mencía, a Spanish red, and Rkatsiteli, a Georgian white, were planted in May. Among newer selections, we harvested crops from Vermentino, Arneis, Itasca, Moscato Giallo, Saperavi, NY 81 and Regent. NY81, Regent and Itasca are disease resistant hybrids. Due to warm, dry weather in late summer, ripening conditions were ideal in 2019. Fruit from 10 varieties was provided to local winemakers for small lot winemaking.

Objectives

1. Vineyard evaluation of the core varieties – Evaluation of 9 Chardonnay clones and 6 Merlot clones.
2. Evaluate new vinifera cultivars and clones – Explore new and less common varieties.
3. Screen disease resistant hybrids - Evaluate degree of disease resistance and fruit quality.

Materials and Methods: This 1.5-acre vineyard is located at LIHREC, Riverhead on a well-drained sandy loam soil. Vines are spaced 8x6 with VSP training and drip irrigation. Canopy management practices include shoot thinning to 4-5 shoots/ft. row, cluster zone leaf removal, crop adjustment and canopy hedging. The area under vines was maintained with a tractor-mounted mower; young vines were hand weeded. Each vine was harvested individually to determine cluster number, crop weight per vine and average cluster weight. From each variety/clone, 100 berries were randomly sampled to obtain average berry weight, Brix, titratable acidity and pH.

Results and Discussion

Weather – Rainfall was above average in the early season, average mid-summer then sunny, warm and dry in August and September. Temperatures were overall cooler than 2018; however, 2019 was much sunnier than 2018. There were 3458 GDD, similar to other seasons over the last 10 years.

Pest management – Downy mildew was a season-long challenge despite the dry weather. Leafroll virus manifested in previously asymptomatic vines which was very frustrating. *Botrytis* bunch rot (BBR) was almost non-existent. Sour rot was a concern only in Pinot Noir. Sauvignon Blanc, often plagued by sour rot, was clean. Later ripening reds had minor sour rot.

Harvest – Cluster rot was minimal due to dry, sunny weather in late summer. This allowed harvest based on ripeness rather than advancing cluster rot or impending bad weather. Sugars were high, acids were low to moderate, fruit was clean, yields were average to above average. 2019 may be one of the best harvests in the history the Long Island industry.

Varieties removed in 2019

*Marquette – Marquette is a reliable, high quality red hybrid with good resistance to powdery and downy mildew. Vines were managed with >50% fewer fungicides vs. vinifera. Fruit ripened around Labor Day. Initially planted on VSP, yields gradually declined over 6 years to unsustainable levels. Yields rebounded after conversion to high wire. Vines were removed to make room for new hybrid selections.

*Petite Pearl – These vines struggled to fill the (high wire) trellis despite extra water and nitrogen. Yields were low due to low berries/cluster as well as low cluster number/vine. Fruit was extremely susceptible to sour rot/fruit flies even in dry seasons. These vines had aerial phylloxera in 2018.

Planting, 2019: Two new vinifera varieties were planted, Mencía, a well-regarded Spanish red vinifera known for a range of wine styles, and Rkatsiteli, an aromatic white vinifera from Georgia (Europe).

Chardonnay: Yields were up in 2019 due to higher berries/cluster and in some cases larger berries. Clone 5 clusters were particularly large. Fruit was free from cluster rot at harvest.

Table 1. Yield components of Chardonnay clones by rootstock, LIHREC vineyard, 2019

Clone	Harvest Date	Clusters/vine			Crop weight, lbs./vine ³			Cluster wt., lbs./cluster			
		3309	101-14	Own	3309	101-14	Own	3309 2018	3309 2019	101-14 2019	Own 2019
5	10-2	15.1	14.9	14.8	9.1	9.4	8.6	0.50	0.60	0.64	0.59
15	"	21.4	21.2	22.1	7.5	7.1	6.9	0.32	0.36	0.34	0.31
17	"	22.5	20.4	21.9	7.8	7.5	6.9	0.30	0.35	0.37	0.32
75	"	19.5	▪	19.5	7.2	▪	7.7	0.32	0.37	▪	0.40
76	"	21.3	▪	▪	7.2	▪	▪	0.26	0.34	▪	▪
78	"	20.4	▪	22.3	7.5	▪	7.2	0.27	0.37	▪	0.33
95	"	22.1	▪	23.3	7.5	▪	7.7	0.32	0.34	▪	0.33
95-RB ¹	"	16.5	▪	▪	4.6	▪	▪	0.22	0.26	▪	▪
96	"	18.3	▪	21.3	7.5	▪	9.3	0.33	0.41	▪	0.44
GS ²	"	▪	21.5	▪	▪	6.6	▪	0.24	▪	0.31	▪

1 – Confirmed red blotch infected vines. 2 – GS (grower selection) vines are replicated on 101-14 rootstock only.
 3 - 7 lbs/vine is equivalent to ~ 3.2 tons/acre. ▪ Indicates vines not replicated on that rootstock.

Table 2. Yield components of Chardonnay clones by rootstock, LIHREC vineyard, 2019

Clone	Berries/cluster				Berry weight – grams			
	2018	2019			2018	2019		
	3309	3309	101-14	own	3309	3309	101-14	own
5	146.7	170.2	174.0	162.6	1.87	1.93	1.92	1.88
15	94.9	130.0	114.5	103.0	1.64	1.59	1.56	1.57
17	103.5	117.5	117.3	102.5	1.68	1.82	1.84	1.74
75	124.7	146.8	▪	130.8	1.55	1.63	▪	1.70
76	86.3	119.7	▪	▪	1.63	1.75	▪	▪
78	99.9	133.9	▪	112.7	1.57	1.71	▪	1.67
95	95.8	109.2	▪	118.7	1.74	1.83	▪	1.73
95-RB ¹	67.6	80.8	▪	▪	1.69	1.85	▪	▪
96	104.7	135.5	▪	129.7	1.67	1.86	▪	1.79
GS ²	93.0	▪	123.7	▪	1.57	▪	1.69	▪

1 – confirmed red blotch infected vines. 2 – GS vines are replicated on 101-14 rootstock only.
 ▪ Indicates vines not replicated on that rootstock.

Table 3. Fruit ripening, Chardonnay clones /3309, LIHREC vineyard, 2019

Clone	°Brix		TA, g/l		pH	
	2018	2019	2018	2019	2018	2019
5	19.2	22.6	7.8	8.9	3.29	3.26
15	19.9	22.3	6.8	5.6	3.34	3.44
17	19.1	21.6	6.4	5.4	3.39	3.38
75	20.1	23.1	6.0	6.9	3.29	3.37
76	19.6	22.3	7.2	7.4	3.32	3.39
78	19.4	22.3	6.0	7.5	3.30	3.32
95	19.6	22.6	6.2	7.2	3.22	3.35
96	19.8	21.4	6.0	7.5	3.39	3.38
GS ¹	19.8	22.4	5.0	7.4	3.33	3.41

1 – GS vines are grafted onto 101-14 rootstock only.

White varieties other than Chardonnay: During field tours, growers were most impressed with flavors of Verdejo, Vermentino and Albariño. Four of 28 Verdejo vines again showed a distinctive berry scarring and stippling of leaves. Virus tests thus far have been negative. At harvest, little or no field cleaning was necessary for all these varieties as cluster rot was minimal. As with Chardonnay, clusters were larger in 2019 vs. 2018 due primarily to a higher number of berries/cluster. The newest variety is Itasca, a cold hardy hybrid from MN with mildew and phylloxera resistance. It is intended for dry, white wines, has pear, floral and mineral notes. These vines were sprayed for phomopsis and black rot until fruit set (late June). After that, they received only 3 applications of Lifegard (*Bacillus mycooides* isolate J, Certis, USA). Vines were completely free from fungal disease at harvest.

Table 4. Performance of white winegrape varieties, LIHREC vineyard, 2019

Variety	Harvest date	Clust. no./vine	Crop wt. lbs./vine	Cluster wt. lbs./cluster	Berries/cluster	Berry wt.- g.	°Brix	TA, g/l	pH
Albariño/14 ¹	9-30	21.5	5.8	0.27	108.3	1.40	22.3	9.2	3.20
Aligoté 1/09	"	18.8	9.4	0.50	127.0	2.06	19.6	8.4	3.24
Arneis/14	"	12.4	6.6	0.54	158.0	1.66	23.8	7.5	3.36
Auxerrois 45/14	9-25	21.5	9.5	0.44	127.8	1.99	21.3	5.4	3.44
Gewürztraminer 1/09	9-30	26.8	6.6	0.25	92.9	1.86	23.2	5.0	3.80
Gewürztraminer 3/09	"	17.3	3.7	0.21	72.4	1.96	23.2	4.8	3.75
Grüner Veltliner/14	9-30	12.8	9.6	0.75	211.3	1.94	23.1	5.3	3.53
Itasca/own (2 yrs old)	8-27	•	•	0.10	50.7	1.27	25.5	6.6	3.14
Malvasia Bianca/09	9-23	8.0	5.6	0.70	133.9	2.75	20.5	7.2	3.29
Moscato Giallo/09	9-30	12.9	6.4	0.50	103.5	2.63	20.8	6.3	3.39
Muscat Ottonel 1/09	9-17	23.8	6.9	0.29	74.0	2.42	19.8	5.4	3.35
NY 81 /09 ²	9-23	14.1	5.4	0.38	110.0	1.66	23.2	7.5	3.22
Petit Manseng/14	10-22	16.4	5.5	0.34	142.0	1.12	27.1	12.6	2.85
Pinot Gris 146/09	9-23	17.0	5.7	0.34	118.2	1.48	21.5	5.4	3.42
Pinot Gris 152/09	"	22.0	7.4	0.34	127.1	1.50	21.5	7.4	3.49
Sauv.Blanc 1/09	"	22.9	8.6	0.37	124.3	1.68	23.9	8.1	3.20
Sauv.Blanc 376/14	9-24	23.6	8.6	0.37	119.6	1.78	23.5	6.6	3.36
Sauv.Blanc 530/14	"	23.8	7.4	0.31	121.3	1.50	23.8	5.4	3.33
Semillon 2/09	9-30	15.3	6.4	0.42	122.1	1.64	22.2	8.9	3.26
Semillon 3/09	"	15.8	6.3	0.40	107.4	2.12	22.2	6.6	3.23
Tocai Friulano 1/14	9-23	18.3	4.6	0.25	107.5	1.44	20.9	6.6	3.46
Verdejo/09	9-19	16.7	7.5	0.45	112.6	2.40	21.2	6.8	3.41
Vermentino/5BB	9-19	13.6	7.9	0.59	114.4	3.47	21.0	6.9	3.29

1–Leaf roll infected vines. 2 - Riesling x Cayuga White hybrid; • Indicates data not collected. 7 lbs/vine is equivalent to ~3.2 tons/a.

Merlot: Berries/cluster were higher in 2019 vs. 2018; berry size was higher in UCD but not French clones. Clones 1 & 3 are widely planted and are consistently good performers in yield and quality. Clone 6 consistently requires heavy cluster thinning. If high production is the goal, clone 6 is a good choice. Many growers like the fruit quality of clone 181. Clones 181 and 314 have large clusters and require careful thinning. Detailed yield component and ripening data may be found in the Appendix or by contacting the Principal Investigator.

Red varieties other than Merlot: Clusters were generally larger in 2019 due to higher berries/ cluster and in some cases higher berry weights. Pinot Noir and Zweigelt had moderate sour rot at harvest, as is the case every year. Otherwise, the red viniferas had little or no cluster rot, even larger clustered varieties such as Sangiovese. Due to the sunny, dry weather, it was a very good year for ripening red vinifera. Detailed yield component and ripening data may be found in the Appendix or by contacting the Principal Investigator.

Recently planted reds include Regent and Saperavi. Regent, planted in 2017, is a red hybrid with Chambourcin, Müller-Thurgau and Silvaner parentage. It is widely planted in Germany. In 2019, vines were sprayed for black rot and phomopsis through fruit set. After that, only 2 sprays of Lifegard (*Bacillus mycooides* isolate J, Certis, USA) were applied. At harvest, vines had no powdery mildew and just a few minor lesions of downy in the upper canopy. Regent is purportedly winter-sensitive. Thus far, there has been no winter injury in this planting. Saperavi vines, planted in 2015, continue to struggle with trellis fill. Some of the vines also annually develop pronounced leaf reddening post-veraison. Virus tests have been negative.

Winemakers and winemaking: There has been a definite uptick in interest from local winemakers in the last several years. Tours of the vineyard were held in July and September. Several winemakers on the tour had never seen the vineyard. The fruit of 10 varieties was provided to three local winemakers for small lot winemaking. This proved to be enormously popular as it enables winemakers to gain experience with unusual varieties. Together with industry members, we hope to evaluate the results in late winter. Varieties: Arneis, Auxerrois, Grüner Veltliner, Moscato Giallo, NY 81, Petit Manseng, Regent, Saperavi, Vermentino, Zweigelt.

Conclusion: Evaluation of winegrape varieties and clones has been a long-term project on Long Island. With steep planting costs for vineyards, >\$20,000/acre, it is essential to choose varieties carefully. The goals of this work are to determine fruit quality potential, disease susceptibility and economic viability. Traditional varieties such as Chardonnay and Merlot continue to play an important role due to their reliability and versatility in the winery. However, growers are also interested in diversifying their wine portfolio so that continued exploration of uncommon varieties is important. Inclusion of disease resistant hybrids in this planting furthers the industry goals of improving environmental stewardship. For this reason, hybrids may play a larger role in future industry plantings.

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Appendix

Evaluation of Winegrape Cultivars and Clones on Long Island Progress Report, Jan., 2020

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Impact Statement – The installation of one acre of winegrapes ranges from \$20-30,000; consequently, a poorly performing variety can be a costly mistake. In a grower survey, 90% of respondents indicated they had used information from this vineyard in their planting decisions; in 2019 this included Auxerrois and Verdejo. Disease resistant hybrids were successfully managed with <50% reduction in fungicide use.

Publications and presentations – Local growers toured the vineyard during Plant Science Day, July 31 (22 growers) and on September 4 (15 growers). During the latter meeting, we had a ‘fruit tasting’ – clusters from 20 varieties were available for a comparative tasting (photo in Veraison to Harvest newsletter, Sept. 6, 2019). Three presentations on this trial will be given in 2020 in Hershey, PA (January), Charlottesville, VA (February) and Long Island (April). Observations and data from this vineyard appeared or will appear in the following:

- Long Island Fruit & Vegetable Update newsletter (circ.218, weekly)
- Suffolk County Ag News (circ.330, monthly) – Feb.19, Dec.19 and Feb.20.
- Veraison to Harvest weekly newsletters (circ.800+)
- Long Island Vineyard Manager List Serv (104 members)
- LIHREC Annual Report, due to be posted spring, 2020 at <http://cuaes.cals.cornell.edu/farms/lihrec>.
- CCE grape program website (>2400 website hits, 2019) – includes an article on Alternative White Winegrape Varieties and Alternative Red Winegrape Varieties. An article on the trial was posted to Appellation Cornell (circ.1200) April, 2015; reprinted June 2015 in Wines and Vines trade magazine (circ. 9193). <http://grapesandwine.cals.cornell.edu/sites/grapesandwine.cals.cornell.edu/files/shared/Research%20Focus%202015-2.pdf>.

Tables and Graphs (continued from Progress report)

Table 5. Yield components of Merlot clones by rootstock, LIHREC vineyard, 2019

Clone	Harvest date	Clusters/vine			Crop weight, lbs./vine			Cluster wt., lbs./cluster			
		3309	101-14	Own	3309	101-14	Own	3309 2018	3309 2019	101-14 2019	Own 2019
1	10-21	17.3	16.2	18.0	8.0	7.0	6.7	0.30	0.46	0.44	0.38
3	“	16.4	15.8	18.3	7.2	7.3	6.6	0.29	0.44	0.47	0.37
6	“	15.9	▪	▪	7.0	▪	▪	0.34	0.45	▪	▪
8	10-22	19.6	20.6	21.0	7.1	6.6	6.2	0.25	0.37	0.33	0.29
181	10-21	12.5	▪	▪	6.9	▪	▪	0.41	0.56	▪	▪
314	“	11.6	▪	▪	6.4	▪	▪	0.36	0.56	▪	▪

▪ Indicates vines not replicated on that rootstock. 7 lbs/vine is equivalent to about 3.2 tons/acre.

Table 6. Yield components of Merlot clones by rootstock, LIHREC vineyard, 2019

Clone	Berries/cluster				Berry weight – grams			
	2018	2019	2019	2019	2018	2019	2019	2019
	3309	3309	101-14	own	3309	3309	101-14	own
1	95.0	117.0	147.7 ¹	100.2	1.77	2.01	1.92	2.07
3	99.9	118.9	119.9	97.0	1.68	1.86	1.88	2.05
6	109.6	120.3	▪	▪	1.68	1.96	▪	▪
8	78.0	98.3	99.7	87.0	1.69	2.14	1.90	2.10
181	123.1	170.4	▪	▪	1.80	1.79	▪	▪
314	128.2	159.4	▪	▪	1.79	1.80	▪	▪

▪ Indicates vines not replicated on that rootstock. 7 lbs/vine is equivalent to about 3.2 tons/acre.

1 – several M.1/101-14 vines had very large clusters.

Table 7. Fruit ripening, Merlot clones/C3309, LIHREC vineyard, 2019

Clone	°Brix		TA, g/l		pH	
	2018	2019	2018	2019	2018	2019
1	19.1	23.1	5.4	5.3	3.49	3.50
3	19.7	23.4	5.0	5.4	3.58	3.52
6	19.4	22.3	5.4	5.0	3.38	3.55
8	19.3	23.3	7.0	5.1	3.54	3.53
181	19.4	23.8	5.6	5.3	3.42	3.52
314	19.4	23.4	6.2	5.1	3.38	3.47

Table 8. Performance of red winegrape varieties, LIHREC vineyard, 2019

Variety/clone	Harvest date	Clusters/vine	Crop wt. lbs./vine	Cluster wt. lbs./cluster	Berries/cluster	Berry wt.-g.	°Brix	TA, g/l	pH
Barbera 2/09	10-24	17.2	8.5	0.49	71.7	3.61	24.4	11.3	3.13
Cab.Franc 1/09	10-22	17.6	6.6	0.38	112.7	1.91	23.8	5.3	3.50
Cab.Franc 332/09	“	12.9	5.4	0.42	141.2	1.72	24.0	5.1	3.55
Cab.Sauv.7/09	10-24	18.8	5.6	0.30	111.5	1.50	22.2	8.3	3.18
Cab.Sauv.8/14	“	18.3	5.7	0.32	120.7	1.52	22.6	8.1	3.32
Cab.Sauv.11/09	“	20.3	6.1	0.30	131.6	1.50	22.6	9.2	3.22
Cab.Sauv.21/09	“	23.8	6.4	0.28	106.4	1.52	22.8	7.8	3.27
Dornfelder/09	9-17	12.3	7.7	0.62	105.2	2.71	19.2	6.0	3.38
Lemberger/09	10-8	13.3	6.4	0.49	117.2	2.35	21.0	7.5	3.20
Malbec 4/09	“	20.5	6.6	0.33	79.2	2.40	22.3	7.4	3.22
Malbec 6/09	“	21.3	5.4	0.25	58.2	2.36	21.8	7.2	3.29
Petit Verdot 2/09	10-24	21.5	6.0	0.28	135.1	1.09	24.6	10.2	3.15
Pinot Noir 4/09	9-17	17.4	7.2	0.41	161.8	1.62	20.5	8.3	3.32
Regent/14	9-23	20.1	5.7	0.29	77.7	2.21	23.1	7.5	3.36
Sangiovese2/09	10-15	12.3	10.7	0.87	174.8	2.49	23.5	6.6	3.11
Saperavi/09	9-25	11.3	6.5	0.57	174.0	2.01	23.1	8.6	3.41
Syrah 1/09	10-15	15.9	6.9	0.44	121.8	1.98	21.3	5.7	3.31
Syrah 3/09	“	15.3	7.1	0.46	111.2	2.00	21.1	6.8	3.26
Zweigelt/14	9-18	14.6	9.0	0.62	180.2	2.05	19.0	5.1	3.16

7 lbs/vine is equivalent to 3.2 tons/acre. ▪ Indicates data not collected