The Long Island grape variety trial has been in existence for over half of the 40-year history of this new industry. Established in 1993, the trial at Cornell’s Long Island Horticultural Research and Extension Center in Riverhead has evaluated over 50 Chardonnay, Merlot, and Cabernet Sauvignon clonal selections and 46 novel grape varieties for their vineyard performance and wine quality under unique local climatic and soil conditions of Eastern Long Island. Managed in close collaboration with an industry advisory group, the trial has identified superior Chardonnay and Merlot clones and eight novel varieties that are now grown commercially on Long Island. The grape industry has grown from a single planting in 1973 to 2,000 acres of premium wine grapes.

**KEY CONCEPTS**

- The Long Island wine grape clone and variety trial was established in 1993 at the Long Island Horticultural Research Center in Riverhead, New York.
- Clonal evaluation has focused on selections of Chardonnay and Merlot.
- 47 additional varieties have been screened since 1993.
- ‘Dijon clones’ are now an important part of the Chardonnay acreage.
- Eight novel varieties originally in the trial have since been commercially planted.
- The ‘mix’ of varieties changes from year to year, with input and advice from an industry advisory group.
- Ninety percent of growers surveyed in 2010 reported they used information from the trial in making planting decisions.
Introduction. Since the first premium *vinifera* wine grapes were planted in the 1970s, finding the right varieties and clones for Long Island’s unique environment has been an industry priority. In a 1991 survey Long Island winegrowers indicated that locally generated information on varieties and clones was their top research priority. As a fine wine industry, growers have long recognized the importance of producing ripe, high quality fruit from varieties suited to Long Island terroir. In response to this need, the Cornell Cooperative Extension of Suffolk County grape research program started a clone and variety trial at the Long Island Horticultural Research and Extension Center, Riverhead, in 1993. To date, 49 varieties have been evaluated for their adaptation to the island’s unique microclimate and terroir.

The Long Island Industry. Grape production on Long Island is concentrated on the North Fork, a narrow strip of land 2-5 miles wide and 25 miles long, bounded by the Long Island Sound and Peconic Bay, with additional plantings near Bridgehampton on the South Fork. Its maritime climate and sandy soils provide an environment uniquely suited to premium *vinifera* grapes. Long Island Sound and the Atlantic Ocean moderate both summer and winter temperatures, and provide a frost-free growing season that often extends into November. The industry is comprised of 2000 acres of grapes, roughly equivalent in size to the Finger Lakes (2200 acres of *vinifera*), Ohio (2200 acres) and slightly smaller than Virginia (2900 acres). Its 48 wineries produce 600,000 cases of wine (1.4 million gallons) annually which are well-received by local, regional and national consumers and wine critics.

Trial Evaluations. The original planting focused on clonal selections of the three most commercially important varieties: Chardonnay, Merlot and Cabernet Sauvignon. All clones were replicated on C3309 and MG101-14 rootstocks and as own-rooted vines. The inclusion of own-rooted vines came at the behest of the late Robert M. Pool, professor emeritus of viticulture at Cornell. Since then, a series of other white and red varieties have been planted to help define which varieties thrive with Long Island’s maritime climate and sandy soils. Each season, a written report and yield component data are compiled and shared with Long Island grape industry members. (Research data from 2005 to 2014 is available on the Research Page at the CCE Suffolk Grape Program web site). Wines are produced from selected cultivars, providing an opportunity for sensory evaluation.

The trial is located in a 1.5 acre block at the Long Island Horticultural Research and Extension Center. Vines are trained to a midwire cordon with vertical shoot positioning. Canopy management practices reflect commercial practice including shoot thinning to 4-5 shoots/ft. row cluster zone leaf removal, crop adjustment and 2-3 canopy hedgings.

Vineyard renovation continues annually. Varieties with mediocre to poor vineyard performance or of little interest to industry members are removed, and new selections are
planted with input from the advisory group and industry. As the industry evolves, so does the mix of varieties under evaluation.

**Chardonnay clones.** Chardonnay, the most widely-grown white wine variety in the world, has perhaps the most diverse selection of clones. Different clones exhibit wide variation in cluster architecture, time of ripening and flavors. The first blocks of chardonnay planted on Long Island were clones from California such as the ‘Martini clone’ (Table 1) that had large, tight clusters (prone to botrytis fruit rots) and ripened late, producing less distinctive wines in Long Island’s climate. Our trial of 15 Chardonnay clones included the so-called ‘Dijon clones’ introduced in the 1990’s – and profoundly changed Chardonnay plantings on Long Island. As a group, these clones were different from their high acid, later ripening California cousins. They ripened sooner and displayed moderate acids and more nuanced, mineral, nutty flavors. Clones 76 and 96 (Table 1) have been particularly popular. These clones proved to be better adapted to Long Island’s cooler climate, and made it possible for Long Island wineries to produce more distinctive and unique Chardonnay wines.

For a detailed discussion on Chardonnay clones, see **Chardonnay History and Selections at EPS**, and a comprehensive list of Chardonnay clones at the **UC Davis National Grape Registry**.

**Merlot clones.** Merlot is considered the ‘signature wine’ for Long Island’s climate. Our trials have included eight Merlot clones. In contrast to the large clonal differences we saw with Chardonnay, differences in Merlot clones have been more subtle. Merlot clones 1, 3 and 181 have shown consistent production as well as rich, ripe flavors and tannins. Those three clones comprise the majority of plantings on Long Island. Merlot clone 8 has rich ripe flavors but more rustic tannins. In addition poor fruit set is sometimes an issue. Fruit quality has been variable for clones 6, 9, and 314. Strictly based on production, clone 6 is a workhorse. It annually requires cluster thinning. Newer clones of Merlot would be worthy of further evaluation.

**Cabernet Sauvignon clones.** Eight clones of Cabernet Sauvignon clones were planted in the mid-1990s. Clone 6 was removed due to unsustainable yields. Clones 10 & 341 were infected by leaf roll virus. In this vineyard, late ripening Cabernet Sauvignon has been a challenge because the vineyard sits amid hundreds of acres of vegetables. This renders the fruit highly susceptible to wildlife depredation and exacerbates losses due to tropical storms. Consequently, Cabernet Sauvignon data has been inconsistent and for this reason Cabernet Sauvignon is no longer a focus in the research vineyard.

**Other varieties.** Since 1995, 46 varieties have been screened. It has been enlightening to see vine growth habit, taste fruit (and sometimes wine) and examine data from uncommon varieties traditionally not found on Long Island. Commercial plantings of Albariño, Barbera, Dornfelder, Lemberger, Malvasia Bianca, Muscat Ottonel, Pinot Gris, and Sangiovese have resulted. The newest varieties in the trial are Auxerrois, Petit Manseng, Verdejo, Grüner Veltliner, and Zweigelt. In recent evaluation of small-lot wines, the first three varieties were praised by growers as “perfumey” and “floral,” with peach and honey flavors. The aromatic whites Arneis, Moscato Giallo and Vermentino were planted in 2014. The hardy red Saperavi is our new addition, planted in 2015.

As a direct result of our trials, growers have established commercial plantings of six novel varieties: Dornfelder, Muscat Ottonel, Lemberger, Malvasia Bianca, Albariño and Barbera, expanding the range of unique varietal wines and blends produced by Long Island Wineries. Read more about these varieties at: [http://ccesuffolk.org/agriculture/grape-program/grape-research#sthash.L5sIHFHX.dpuf](http://ccesuffolk.org/agriculture/grape-program/grape-research#sthash.L5sIHFHX.dpuf).

**Interspecific Hybrids.** In the mid-2000’s, we planted the first hybrids in a dedicated section of our variety trial. This work started because, over the long run, hybrids may offer unique characteristics of value to the industry. The ongoing goal of this work is to document fruit quality and the degree of disease tolerance. Viticulturally, the results have

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**Table 1.** Sampling of Chardonnay clones in LIHREC research vineyard, Riverhead, NY.

<table>
<thead>
<tr>
<th>Clone No.</th>
<th>Origin</th>
<th>Clust. wt. -lbs.</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>5</td>
<td>Martini Vyd, Carneros, CA</td>
<td>0.50</td>
<td>Late ripening, high acid, tight clustered</td>
</tr>
<tr>
<td>15</td>
<td>Prosser, WA</td>
<td>0.35</td>
<td>Looser than cl.5, typical, balanced</td>
</tr>
<tr>
<td>17</td>
<td>Alexander Valley, CA</td>
<td>0.34</td>
<td>Robert Young clone, pear</td>
</tr>
<tr>
<td>20</td>
<td>Italy</td>
<td>0.30</td>
<td>Sparkling wine clone, lemon, simple</td>
</tr>
<tr>
<td>25</td>
<td>Geisenheim, Germany</td>
<td>0.43</td>
<td>Bright, green apple, late ripening</td>
</tr>
<tr>
<td>76</td>
<td>Dijon, France</td>
<td>0.35</td>
<td>Aromatic, fine, almond, balanced</td>
</tr>
<tr>
<td>96</td>
<td>Dijon, France</td>
<td>0.40</td>
<td>Aromatic, elegant, sharp, productive</td>
</tr>
<tr>
<td>806</td>
<td>Saône-et-Loire, France</td>
<td>0.26</td>
<td>Orange peel flavor, muscat aroma</td>
</tr>
</tbody>
</table>

been variable (see Table 2 for a list and comments) though several of the more recently planted varieties (Petite Pearl and especially NY 81, Cayuga White x Riesling) hold some promise. Interestingly, the hybrids have been a grape berry moth magnet. This characteristic – the elevated susceptibility of hybrids to grape berry moth in a mixed planting – has been verified by grape entomologists. Though there are a few small-scale hybrid plantings in the industry and some hybrids have proven dependable, growers still view hybrids as a curiosity. This is due to uncertainty about financial feasibility as well as market acceptance.

Industry Impacts. In a 2010 survey (A.Wise, unpublished data), 90% of growers indicated that variety and clonal trial results have influenced their plant material decisions. However, the benefits extend beyond these trial results. Over the years, the vineyard has been a microcosm of industry patterns and processes. For example, Leaf roll and red blotch virus have been diagnosed in both certified and non-certified material. After virtually no crown gall for 20 years, 50% of the 2-year-old aromatic whites currently have symptoms. Additionally, in the early years, deer control was unnecessary as populations were in check. Yet in response to increased deer populations, an 8 ft steel mesh fence now encompasses the entire research farm facilities. An airblast sprayer was also replaced with a Lipco recycling sprayer to reduce drift, focus deposition and economize on sprays. Over the row ¾” mesh bird netting has given way to more efficient fine mesh (4 x 5 mm) side netting. These ongoing equipment modifications in response to changing growing conditions are challenges every vineyard must face.

Grape trials also support sustainable agricultural practices. Nitrogen fertilization started with ammonium nitrate, progressed to calcium nitrate, and now is largely accomplished with peanut meal and compost. In place of pre- and post-emergence herbicides, the area under the trellis is now mowed 3-5 times/season. While not a formal member, our management practices conform to the guidelines set forth by the newly minted Long Island Sustainable Winegrowing, a program that supports sustainable viticulture practices and local economies.

Variety and clonal evaluation play a crucial role in the evolution of fine wine industries. This is because it is imperative to explore new possibilities to meet the demands and market changes as the Long Island wine industry continues to grow. The continuing effort to evaluate clones and varieties of interest, in partnership with growers and winemakers, has helped growers and wineries make informed decisions about what to plant, resulting in higher quality finished wines.

“Growing the range of varieties that Alice has done over the years has given growers the confidence to try new things,” said Larry Perrine, CEO of Channing Daughter Vineyards. “And don’t forget that trying out varieties that were found unsuitable is equally important, because it helped growers avoid making mistakes.”

<table>
<thead>
<tr>
<th>Parentage</th>
<th>Performance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Norton</td>
<td>V.aestivalis, first released in 1830</td>
</tr>
<tr>
<td>Marquette</td>
<td>V.vinifera (including Pinot Noir), other Vitis species</td>
</tr>
<tr>
<td>Arandell</td>
<td>Other hybrids, V.cinerea, V.rupestris</td>
</tr>
<tr>
<td>Aromella</td>
<td>Includes Ravat, Traminette and Gewürztraminer</td>
</tr>
<tr>
<td>Petite Pearl</td>
<td>Cold-hardy hybrid released by private breeder T. Plocher</td>
</tr>
</tbody>
</table>

Varieties currently planted:


Varieties removed due to lack of interest or viticultural flaw:


Yield component data and project reports can be found on the Cornell Cooperative Extension of Suffolk County grape program website: http://ccesuffolk.org/grape-program.
Given that it costs as much as $20,000/acre to establish a vineyard, planting unsuitable varieties can be a costly mistake. Information gleaned from 22 years of variety trials on Long Island has played a key role in Long Island’s rise to prominence as a wine region, with a reputation for exceptional quality and unique wines.

For More Information

CCE-Suffolk Grape Program. This website hosts information about grape production on Long Island, and Alice Wise’s program.

Evaluation of Wine Grape Cultivars and Clones – 2013 report. This report summarizes the most recent data from the Long Island wine grape variety trial.

The National Grape Registry, hosted by University of California, Davis, has a comprehensive list of grape varieties and clones available through nurseries and at Foundation Plant Services.

Acknowledgements

The following people and organizations have made important contributions to this trial:

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- Industry members who have lent their time, equipment, supplies and crews to the project.
- Ben Sisson for patiently enduring years of questions.
- Rich Olsen-Harbich for patiently providing winemaking advice.
- Companies that have donated product.
- Program assistants, notably Tom Gallagher, 1994-1998, and Libby Tarleton, 2002-2015, as well as summer and fall vineyard workers.
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