

The 2022 Grape Growing Season in the Northeast

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This article details: a) our 2022 grape growing season in the Mid-Hudson Valley, and how that relates to those farming in Massachusetts, Upstate New York, and New Jersey, and b) how our changing climate may impose more hardships on our future fruit farming operations. For many of us in the Northeast, 2022 was a very difficult year. This article analyzes the weather patterns of the 2022 growing season using data from the National Weather Service (NWS) regions of Albany, New York (Mid and Upper Hudson and Mohawk Valleys and Berkshire Mountains) and Boston (Eastern and Central Massachusetts, Rhode Island, and Northern Connecticut). This is a valuable way to see how last year's wide variation in temperatures and rain fall impacted our grape and other fruit crops. There were notable differences in how weather patterns affected the Boston NWS region as compared to the Albany NWS region.

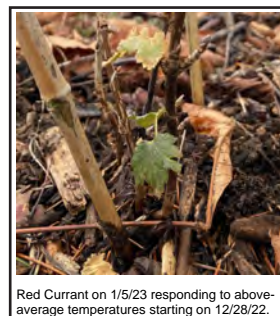
I start with the Mid-Hudson Valley (Albany NWS region), since this bears directly on my observations: January 2022, was 4.7 degrees cooler than average, with 50% less rain than "normal". Both February and March were a bit warmer with slightly more rain than normal. In April 2022, while our temperatures were average, we had 60% more rain. This was followed by May, June, July, and the first two weeks of August, where we witnessed daily temperatures that were on average three to four degrees above average, with 50 to 60 % less rain. This combination of hotter days with no rain lead to our summer drought conditions.

The drought ended abruptly in Mid-August and September, the start of our much earlier harvest season, when we received almost 50% more rain in this time period than normal. In November, when cooler Fall weather should have arrived so that our vines could harden off for the winter, we were almost 4 degrees warmer than normal. This trend continued for most of December. Hence, while our vines had nominally

hardened off, they were not optimally hardened off. The warm weather continued until December 23rd, when the Christmas Eve Massacre bomb cyclone hit, with air temperature plunging from 53 to 9 degrees F in just 14 hours. These fridge temperatures lasted for three days, then for the rest of December and the first part of January, temperatures were again much higher than normal with bouts of rain.

Except for a few notable deviations, a similar weather pattern occurred in the Boston NWS region as was the case in the Albany NWS region. That is, a January with cooler temperatures and less rain, followed by a relatively "normal" February and March. However, April was different in the Albany NWS region when compared to the Boston NWS region in that instead of having an average temperature with 60% more rain than normal, it was warmer, but the region received 36% less rain. This means that going into the summer months, the Boston NWS region already had a rain deficit that heightened its summer drought conditions. Hence, the Massachusetts drought started in April, not May and lasted for the entire summer including August and September. After September, the Boston NWS region got some rain, but still much below its normal levels. The Christmas Eve Massacre bomb cyclone in the Boston NWS region was slightly more moderate than that which occurred in the Albany NWS region.

It is during these difficult growing seasons, which with climate change may occur more frequently, that we can learn much about the fruits that we grow and their capacity to sustain punishing heat, drought, floods, fungal diseases, and insect pressure and still produce an economically viable crop in a sustainable manner.



The 2022 Growing Season

Here is how some of our grape varieties reacted to this year's summer drought, September floods, warm Fall that hindered the hardening off of grape wood, only to experience a Christmas Arctic blast. At my farm in Athens, New York, we evaluate over 100 different varieties of French-American and Native American inter-specific hybrids, many that were developed in the 19th century in the Hudson Valley and Eastern Massachusetts. For more information on these grape varieties, click [HERE](#).

Overall, our grapes were harvested 7 to 10 days earlier than normal with higher sugar levels. This "normal" harvest date, over time, has been gradually occurring earlier and earlier each year. This year, our harvest dates were historically much earlier. Our production was about 30% less because the grape berries, for most varieties, were smaller. With the summer drought, bird and other wildlife damage was extremely high as the wildlife needed moisture obtained from such fruits to combat very high temperatures and lack of water.

There were variations in ripening times, berry size, and production levels depending on the genetic heritage of each hybrid grape variety. The genetic heritage of most of my French-American and Heritage Native-American hybrid vines comes from the grape species *Vitis aestivalis*, *V. cinerea*, *V. labrusca*, *V. riparia*, *V. rupestris*, and *V. vinifera*. Each of these grape species have their own growth attributes.

Vitis riparia heritage varieties such as Baco Noir and Bacchus came in at least 10 days earlier than normal with deep berry skin color and higher sugar levels. Our Baco Noir was picked on August 29th, about 11 days earlier than normal, however, the birds did not seem to attack it as they normally do. While our Foch, was harvested on September 2nd, about seven days earlier, we harvested earlier because of severe bird damage that was being sustained. Historically, about 40 years ago, Baco Noir was harvested in the third week of September, while Foch was harvested in the second week of September. It seems that the change in climate and weather patterns has led Baco Noir to be harvested three weeks earlier than it had been, while Foch is harvested only one week earlier than it had historically been harvested. Hence, we now harvest Baco Noir at least 10 days before Foch.

The *Vitis aestivalis* and *rupestris* heritage varieties Burdin 6055, Chelois and Pallmer, which historically have been harvested in the third and fourth week of September were harvested about 7 days earlier. These varieties were not adversely affected by the excessive summer heat, drought, or subsequent wet conditions we experienced this September. This may be because Chelois, Burdin 6055, and Pallmer have in their ancestry *Vitis aestivalis*, which is drought resistant and *Vitis rupestris*, which tends to have a tap root that reaches deep in the earth for water. The production levels of Burdin 6055, Chelois, and Pallmer were not substantially reduced by 2022 growing standards, compared to my other grape varieties.

However, many of our *Vitis labrusca* varieties such as Concord, Delaware, Iona, and Jefferson, in reaction to the excessive heat and lack of water, pretty much shut down this summer to preserve water. These varieties did not dry up or advance in their ripening, they simply stopped growing and ripening until the rains came back in September. Hence, our Concord, Delaware, Iona, and Jefferson harvest occurred only about four to five days earlier than in previous years, with similar or lower sugar levels, which bucked the 2022 trend of varieties being harvested 7 to 10 days earlier than normal. We had to pick the *labrusca* varieties earlier than we would have liked to with lower sugar levels, because of the massive bird damage that they were sustaining.

The drought also affected berry size of different grape varieties in different ways. While *Vitis riparia* varieties such as Baco Noir and Bacchus had berries that remained small, they continued to ripen, even at an accelerated pace. While *Vitis aestivalis* and *rupestris* varieties such as Chelois, Burdin 6055, and Pallmer berries were of normal size and not affected by the lack of water. I was not able to ascertain the effect that the significant rains had on berry splitting, as by the time the September rains came, the wildlife was aggressively having a field day stripping the vine of much of its fruit. However, it looks like that Chelois, Burdin 6055, and Pallmer would not have experienced any berry splitting.

Here is a summary of how the 2022 growing season weather affected other commonly-grown grape varieties in New England, Upstate New York, and New Jersey. Chambourcin was harvested on September 17th, about 7 days earlier with lower sugar levels of 18 brix. Leon Millot (Wagner clone) was picked 8 days earlier on

August 29, with sugar levels at 18 brix. Here again, with the massive bird pressure on a black variety like Leon Millot, we were forced to pick this variety earlier than we would have liked to. Noiret was picked on September 6th, 9 days before normal, with sugars above average at 18 brix. Agawam, the E. S. Rogers hybrid of Salem, MA, was picked on September 6th, about 5 days early, with sugar levels at 17 brix. Baco Blanc, a grape used in France to make brandy, came in 10 to 17 days early on September 11th, with slightly fewer sugars at 14 brix.

While there are many Minnesota hybrids grown in New England and Upstate New York, I do not grow any, so it is hard for me to comment on them. My understanding is that Minnesota red varieties such as Frontenac and Marquette which ripen by late mid-season, predictably were harvested about 7 to 10 days earlier than normal this year with very high sugars. The Minnesota white hybrids tend to ripen earlier than the Minnesota red varieties, hence they too came in much earlier with very high sugars.

From these observations, it is clear that our very warm and bone-dry summer affected the harvest dates of most of our French-American and Hudson Valley & New England Heritage grape varieties, but in different ways depending on their genetic ancestry.

Wildlife Damage to the Vineyard

The effects of our summer drought on our wildlife populations, nesting patterns, and migration patterns was significant. The drought severely reduced food sources for most bird and wildlife populations. Further, the increased heat increased the demand for water. This meant that bird populations were very aggressive in eating our grapes. Even two sets of bird nets, while it hindered bird damage, did not stop it. Further, for late ripening varieties, such as Verdelet, Diana, or Goethe, I did not even get to net them because the sugars were too low, so I thought, to attract birds for a feast. However, while these grapes were unripe with few sugars, the birds ate anything they could find as they were so hungry and thirsty.

Each year has its own mix of wildlife populations that can threaten a vineyard. These populations rise and fall based on communal diseases that each species faces and climatic conditions which leads to a natural ebb and flow of such populations. Because of the scarcity of food and browse caused by the drought, for the first time, we

had a bear on our property, who was looking for food.

Due to climate change, especially this year, it was very hard to predict which grapes the birds and wildlife would attack first. This was because many grape varieties ripened in a sequence that was out of order due to drought conditions and wildlife hunger that made it unpredictable which grape varieties would be attacked first.

Conclusions

The lessons that growers need to take away from the 2022 growing season:

1. Growers need to be very aware of our changing climate and weather patterns and how that affects wildlife populations, migration patterns, and what and when they feed. These wildlife factors will influence how to manage and preserve your crop.
2. With our changing climate, growers need to be more flexible and willing to alter how and when they prune, spray, harvest, and manage their vineyards so that they can produce an economically viable crop.
3. Look at your current mix of grape and other fruit cultivars and accept the fact that this mix of grape varieties and other fruits that you grow will need to be continuously monitored and changed.
4. The stress that our changing weather patterns is putting on our vineyards and fruit farms is also putting additional personal stress on our growers and their families as well. Growers should have a solid mental health support network to cope with our more stressful lives.

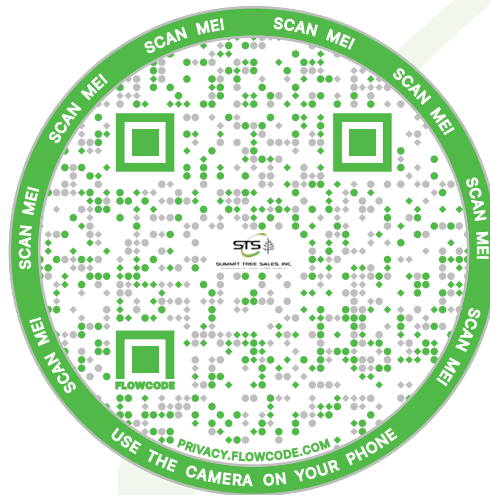
With our changing climate, many changes will need to be considered so that profitable fruit farming in the Northeast can continue in the future. While we have challenges ahead, I am quite confident that we are up to this challenge.

This article is based on field studies, observations, measurements, and recordings taken on my farm Cedar Cliff Vineyards, Athens, New York from the years 2010 to the present. During this time period, I recorded the grape bud break dates, flowering dates, and harvest dates, including sugar levels for over 100 different varieties of French-American and Native-American hybrids, including 19th century Heritage grape varieties bred in the Hudson Valley and Eastern Massachusetts.



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