EXECUTIVE SUMMARY – SECOND YEAR

Terroir Analysis for the Nova Scotia Wine Growing Region 2017 - 2018

The project

Having completed the second year of the *Terroir* Analysis, the aim is to support the Nova Scotia wine industry to improve the vine grape growing conditions in the vineyard and, consequently, to ameliorate the wine quality for the local and international consumer market. For this reason, a three year wine growing improvement project has been put in place since April 2017.

In order to handle specific technical recommendations for local vine growers and wineries, it is necessary to get a yearly and in-depth insight of:

- The local climate and soil conditions
- The actual conditions of local vineyards planted with hybrid and vinifera varieties
- The commonly used cultural practices and their influence in vine growing
- The wine quality related to the previous mentioned factors

In this meaning, the French word *terroir* stands for the combination of the principal wine growing factors: the climate, the soil properties, the choice of grape cultivar and the human factor (for the applied vine cultural practices).

The results of the second-year *terroir* analysis, the comparison of 2018 results with those obtained in 2017 and the respective technical recommendations have been consolidated in this executive summary.

2018 Results and Comparison to 2017

Continuing the same experimental set-up for the terroir analysis started in 2017, data measurements have been collected during the complete growing period of 2018 for vinifera and hybrid varieties that are today's most representative varieties within four wine growing areas of the Nova Scotia region and compared to the previous year. Based on these results, a detailed and integrated research study has been completed.

The collected data and respective analysis enables the establishment of overall key factors that can be adopted by vine growers in the current year 2019 with the aim to improve the quality of vine grapes.

Following the 2017 vineyard analysis and establishment of first overall key factors to be adopted in 2018, there have been several additional vineyard measurements that all of the wineries included in this project have considered in some of their plots for commercial production. At the same time, new plantations have been established taking into account the technical recommendations that were given in the last year's executive summary.

For the current year 2019, the present executive summary includes the analysis of collected data from the years 2017 and 2018 together with vineyard management recommendations for the present year. Additionally, first results that were obtained after the adoption of the 2018 technical recommendations are also described in the present document.

The overall observations and recommendations are:

1. Climate conditions in 2018 compared to other years

Unfortunately, and after many years, there was a frost episode on June 4th, 2018 with recorded temperatures of -1.8 °C in the regions of Gaspereau and Avonport, and -0.8°C in Wolfville. The vines were already in a phenological stage of 5 separated leaves. The frost caused vine damage of different magnitude in many areas of Nova Scotia, with a significant loss in production.

After the frost, the vines reacted by bursting of the secondary buds after several days without growth. In some cases, the bud was not completely destroyed and a green part remained at the base, but inflorescences were destroyed.

> *In this case, the rest of the shoot can be removed to promote the correct development of a new shoot from the secondary bud and hence provide pruning wood for the following winter. When the shoot tips were destroyed, but inflorescences remained mostly intact, the secondary shoots will serve as pruning wood for the 2019 season.*

In the frost affected areas the Frost-Free Period was significantly shortened, meaning that the time was too short to achieve good quality pruning wood and mature grapes, as vines can only restart growing from secondary buds.

Climatic data obtained from the Wolfville, Avonport and Gaspereau areas confirmed that these three zones correspond to Cold Climate according to the Winkler index. According to the Huglin index Wolfville and Gaspereau correspond to a Cool Climate Zone and Avonport to a Very Cool Climate Zone. The climate data of the last six years confirms the above mentioned classification and also defines all three areas as Very Cool Nights (CNI) classification.

The year 2018 was colder and much rainier than 2017. Temperatures at the end of the season were colder beginning the last week of November, while in 2017 negative temperatures were achieved by the end of December. This Free Frost Period lasted from 192-202 days in 2017 to 111-135 days in 2018.

The 2018 vintage showed a colder Average Growing Season Temperature than 2017, with a drop of 0.5-0.6 °C for Wolfville and Avonport and a drop of 0.7 °C for Gaspereau. In addition, the nights during the grape ripening period were much colder than the previous year, with a significant decrease of 2.6 °C and a CNI around 7 °C (compared to a range of 9.2 to 9.8 °C in 2017). Days with temperatures above 30 °C were observed: a total of 13 days in Wolfville, 14 days in Gaspereau and 10 days in Avonport. The hottest day for all zones was July 5th. The coldest temperature of the year was January 7th, reaching a minimum between -16.8°C and -

17.6°C, depending on zone, which meant a slight damage risk to buds for vinifera varieties. The rainiest days were August 4th for Wolfville, with 61 mm in 24 hours; September 11th for Avonport with 39 mm in 24 hours and August 5th for Gaspereau with 51 mm in 24 hours respectively. Regarding the total rainfall, this vintage was definitely much rainier than the previous year, with an increase of 31% for Wolfville (898 mm); an increase of 73% for Avonport (1103 mm) and finally an increase of 19% for Gaspereau (852 mm). Taking into account the rains during the growing season, officially from April to October, rainfall during this period was the highest in the last 5 years, around 600 mm for Wolfville and Gaspereau, compared to 450 mm in 2017, and 729 mm for Avonport, compared to 357 mm in 2017, meaning an increase of 104% for the last region.

The **Wolfville** area is constantly the area with highest temperatures and lowest rainfall. Its Free Frost Days Period average is 177 days for the last 6 years, being the longest period for the three zones; as well as the zone with the highest temperature during grape ripening at night, with an average of 8.7 °C for this period.

The **Gaspereau** region is slightly colder than Wolfville, with a 100 mm higher and more constant average rainfall. Its nights during the ripening period are colder (8°C) and the Frost Free Days Period reaches 161 days as a last 4-years-average.

Definitely, the **Avonport** area is the coldest and rainiest, with a colder Average Growing Season Temperature and a Frost Free Days Period of 160 days for the last 4 years. Also, it has the highest rainfall, 60 mm higher than Gaspereau and 166 mm higher than Wolfville.

> *From the climate point of view, Wolfville is the most favorable zone for the production of red wine varieties; Gaspereau region has the potential for both, white and red still wines (when considering the slope factor) and the Avonport area is better adapted for producing white varieties or sparkling wine varieties.*

2. Frost damaged study plots in 2018

Due to the major frost event early morning of June 4th, the majority of the study plots were frozen and shoots were significantly damaged. Nevertheless, all of the seven damaged plots were able to undergo a second bud break but they were not able to bloom and set fruit, thus there are no blooming, *veraison* and harvest dates for these plots. However, plots of L'A 2 and L'A 3 were damaged, but they underwent a second bud break and they were able to bloom, to set fruit and to ripen grapes.

The five plots that due to their location were not affected by the frost (four viniferas and one hybrid) had no need to start a second bud break. These are the only plots that could really be compared to the year 2017 for the vegetative growing.

3. Phenological stages

There is a quite constant advantage of 3 days when observing mean phenology dates of hybrids compared to vinifera. This is valid for green showing, 50 % first budburst, full blooming and *veraison*. Instead, a different behavior occurs for the second budburst, as the mean date for vinifera happens to be two days before that of hybrids. Still, the main part of hybrids and vinifera broke buds around June 24 and 25th, which is 18 to 19 days after the big frost.

The difference in full bloom dates goes up to 10 days between the earliest hybrid L'A 1 and the latest vinifera RI 2 and PN 1. *Veraison* dates are, on the contrary, much closer for both groups, except for L'A 1 that colored 5 to 6 days before the rest.

> *Interesting to note is that L'A 2 and L'A 3 (that underwent frost damage) showed 50 % blooming only two days after the other L'A plot that was not affected by frost. This fact reveals the high recovery potential of the L'Acadie hybrid to grow and bloom after frost damage.*

Comparing phenology stages of 2018 to 2017, the dates of all plots for green showing and 50 % of first bud break are very similar with only one day of difference and are actually the only stages that are complete for both years and can be compared as a whole.

For the five plots that did not suffer from frost damage (CH1, RI1, RI2, PN1, L'A1), dates for bloom and *veraison* 2017/2018 can be compared. Full bloom does not show a trend in relation to precocity between years.

Otherwise, a very interesting fact when comparing time span between the phenological stages of blooming and *veraison* is that three vinifera plots (RI 1, RI 2 and PN 1) were 11 to 14 days shorter in 2018 compared to 2017, which shows a very high precocity for 2018. The CH 1 study plot registered a gain of only 2 days for this period. As for the hybrid varieties, the 3 L'A study plots show a similar tendency, but their precocity was not that pronounced, with 2 to 7 days shorter time span between bloom and *veraison.*

In searching for the cause of this important precocity in 2018, it was noted that results for shoot length measurements done on September 26th 2017 and September 25th 2018 show longer shoot growth in 2018, between 50 to 80 % higher for the four vinifera study plots.

On the other hand, looking at the yield per plant results, a big difference can be observed, as 2018 yields are considerably lower than those of 2017 for RI 1, RI 2 and PN1, but not for CH 1 which reveals 10 % higher yield per plant in 2018. For this last study plot, a bloom to *veraison* time shortening of 2 days can probably be explained by not having had this notable decrease in yield per plant. Unfortunately, this year`s production of L'Acadie plots was attacked by animals (L'A1) and by birds (L'A2 and L'A3), decreasing significantly the production of grapes.

Taking both of these factors into account, meaning the longer shoot growth and the lower yield per plant, the effect on the ratio between exposed foliar surface and yield per plant is very important; permitting the plants with proportionally more leaf surface and lower yield to accelerate the maturation process of grapes.

> *The decrease in yield per plant, on its own, has an important impact in the duration of the time span between bloom and veraison. If additionally, the exposed leaf surface (related to the shoot growth) is significantly higher, there will be a double effect on the precocity between the phenological stages of bloom and veraison.*
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> *For this reason, it is very important to increase the sun exposed canopy together with a well-balanced production in order to shorten the grape maturation period and hence to obtain grapes of high quality.*

An interesting example of this is the study plot of Pinot Noir, where vines could shorten their seasonal growing period by 11 days.

Considering the average vine growing cycle (from bud break to harvest), general results suggest a tendency of vinifera varieties to accomplish a 155-day average growing cycle in 2018 compared to 158 days in 2017. For the hybrid varieties, instead, the same time spread had an average duration of 145 days for 2018 compared to 148 days in 2017.

> *In both 2017 and 2018 the mean vegetative cycle of hybrid varieties was 10 days shorter than that of vinifera varieties. In 2018 the vegetative cycle of both hybrids and vinifera varieties was three days shorter than the previous season.*

4. Vegetative Growth

2018 budburst started in vinifera and hybrid plots prior to the frost damage of June 4th. The first vinifera plot to burst was CH 1 on May 18th and the last plots were RI 2, SB and PN 1 on May 24th. Within hybrid plots, there was a more homogeneous budburst as all plots burst between May 18th and May 20th.

> *When comparing the two groups, both vinifera and hybrids reveal plots with high and low bud numbers per plant. These numbers suggest that this imbalance is principally due to cultural practices and the intent to produce a particular wine style (still or sparkling) rather than terroir conditions or factors related to vinifera or hybrid varieties.*

Regarding the shoot length average of hybrids and compared to vinifera varieties, there is a significant higher shoot growth to be seen in the latter with 145 % (100 cm vs. 245 cm) longer shoots on average for 2018 (but only 58 % for 2017). Two main causes would explain this big difference: firstly, nine of 14 study plots were damaged by frost in 2018, meaning

that vines had to restart growth a few weeks later and therefore had less time to regain this shoot length gap. Secondly, the only non-frozen plot L'A 1, showed in 2018 a shoot growth 42 % lower than 2017. Causes for this fact could be unobserved frost damage to shoots, which produced unusual decrease in the shoot growth rate, and also shoot damage caused by the workers during the season, impeding good tracking of the measurements.

L'A 2 and L'A 3 underwent an intensive weed and grass removal, by cutting and tilling them away, especially underneath the vine rows, which could have impacted shoot growing and longer shoot length for 2018 compared to 2017, improving the resources availability for these vines.

In most of the frozen study plots, the shoot length heterogeneity was almost doubled. This fact could be interpreted as probable irregular but non-visible frost damage to shoots, and because of the shoot damage caused by the workers.

> *Comparing to shoot growth of 2017, this year's curves show a steady and low slope, resulting in a shorter shoot length at the same date (end of September). The values for CH 2 and SB reveal the final shoot length (130 and 120 cm respectively), as their curves arrive to a "plateau" or growth end. As mentioned in the 2017 report, the other 5 vinifera varieties did not arrive to a growth end at the same date.*

Measurements regarding the shoot growth end dates reveal for 2018 that all study plots could finish their shoot growth before harvest time. Within the non-frozen study plots vinifera varieties finished growing between September 20th and 25th; on the other hand, the L'A 1 plot finished its vegetative growth by August 27th, almost one month before the vinifera varieties.

> *As vegetative growth finished by the end of August for some hybrid varieties, a proper lignification process and good reserves absorption to trunk and roots could be achieved, showing that their growing pattern is more adapted to local climate and soil.*

5. Vigor maps (NDVI)

The NDVI measurements show that some plots have a totally different vegetative development than in 2017. Some areas that previously had a low vigor increased considerably this year. On the other hand, some plots show less vigor than 2017, likely caused by water accumulation in the soil profile that disturbs the root development. And in other cases, plots continued with low vigor, even if this vintage was rainier.

The 2018 recommendations for specific cultural management focused on the characteristics of every plot, showed results during the last growing season, especially when recommendations were adapted not only to study plots, but to the whole plot.

> *In the case of low vigor plots, recommendations focused on an adequate fertilization*

program, specific cultural practices and soil work, showed notable improvement in vigor and hence fruit quality this year, even if these plots were totally frozen on June 4th.

Regarding plots that have a lower vigor in 2018 compared to 2017, a significant water accumulation caused by a rainier season is probably producing root asphyxiation with the consequences of lower development.

It would be recommended to dig pedological pits in these low vigor areas in order to evaluate soil conditions that interfere with the flow of water excesses in the soil and that being the case, to install a long-term efficient drainage system.

6. Water Status of Vines

As 2017, this year was not favorable for creating water stress conditions in the vines, a fact that was confirmed through the measuring of Stem Water Potential and Delta ^{C13}. The only difference from last year is that measurements were more homogeneous (with a lower standard deviation), probably caused by the higher water presence in all kind of soils. These conditions reduce flavor and aroma concentration in the berries, especially for red still wines.

Considering that Nova Scotia is thought to be at the limit for the production of still wine with vinifera varieties, even with the effects of global warming, the short growing season (Frost Free Period) with cold, cloudy, rainy weather creates a big challenge to produce grapes and wines of high quality. Therefore, it is crucial to execute efficient vineyard management, beginning from the selection of the plantation site until harvest.

7. Nutritional Status of Vines

Tissue analysis reveals a nitrogen increase in all plots compared to 2017 (vinifera varieties 9 % and hybrids 24 % in average). Together with a higher water availability, this would be the explanation of a generalized higher vine vigor.

A potassium content improvement was observed thanks to the 2018 recommendations. Same for phosphorus content, which increased in the vine tissues very similarly in all vinifera and hybrid varieties compared to 2017.

No magnesium deficiencies were observed throughout the season, confirming its good availability and similar assimilation by vinifera and hybrid varieties and, as recommended, avoiding amendments during liming. In general, there are very good levels of zinc and boron in all plots, with levels up when compared to last year. This confirms what was also observed in the soil analysis and the wood pruning analysis.

Nevertheless, and despite last year`s recommendations of iron foliar applications, most plots continue to show a significant iron deficiency throughout the season; a reason to continue regularly with foliar applications. On the other hand, there is a significant

manganese excess in some plots, to the point that there could be a toxicity risk for the vines.

> *Following last year`s recommendations to undertake soil work in plots with excessive manganese content, some plots already showed lower amounts of this element in 2018. The soil work helps to reduce soil compaction and hence to improve the soil's oxygenation. It is crucial to continue with this cultural practice together with soil liming to increase the pH.*

According to the wood pruning analysis, starch content is generally low and some plots reveal a medium level of soluble sugars. This can be explained by an abrupt onset of winter; indeed, the cold weather triggers the hydrolysis of starch into soluble sugars. The nitrogen reserve is good in some plots and in others it remains relatively low. The phosphorus storage values for plots are good or very good and suitable for good root development. In spite of an adequate potassium uptake in autumn, this element becomes scarce during the vegetative growing cycle, as mentioned, and therefore requires foliar applications. There is good iron content, which is positive for its fast availability at the beginning of the season to promote photosynthesis, but which is not the case during the growing season, as shown by the tissue analyses. Manganese values are confirmed to be very high on some plots. The boron and zinc contents are very satisfactory and do not require any particular correction.

8. C ultural practices in the vineyard

8.1 New plantations

Analyzing the collected data regarding plantation density shows a low photosynthetic canopy surface to soil surface. This can be measured as the "Canopy height / Row Spacing" (C/R) index. Values are low or very low, as rates between 0.32 and 0.58 are the norm (only one study plot has an adequate C/R index of 0.68). These low C/R rates correspond to warm growing regions.

> *Considering the above-mentioned climate conditions and the short growing period, sunlight use by the foliar surface of vines (canopy volume) should be very high which is the case with a C/R rate between 0.6 and 0.8.*

As for plantation density in cool climates, a minimal plantation density of 4,500 plants per hectare would be recommended to decrease the "fruit yield per plant rate" and to optimize the "Fruit kg / Foliar Surface" rate.

> *A minimal plantation density of 4,500 plants per hectare can be achieved with a row spacing of 2 m and a plant spacing of 1.1 m in the row. The corresponding canopy height should be at an optimal height of 1.8 m.*

As the nutritional status shows a generalized low potassium availability for the vine, the selection of a « potassium pumping » rootstock would be recommended, but actually, the main rootstock used in vinifera plantations is the rootstock 3309 C.

In cases where soil analysis confirms low potassium availability for the vines, it would be reasonable to plant vinifera varieties on a rootstock that shows better potassium uptake in order to avoid low potassium levels in the long term. An interesting rootstock in this case is 101-14 Mgt.

The generally observed NW – SE (North/West – South/East) row orientation is appropriate for this wine growing region as it permits good sun exposure in the morning hours, but an even better exposure during the after-midday hours. This fact improves consequently photosynthesis activity of the vines.

Accordingly, new vine plantings should consider a NW – SE row orientation, which should only be avoided in the case of a steep slope.

Regarding the slope exposures, it is recommended to plant vinifera varieties, if possible, on South (especially South West) orientated (south-facing) slopes, as these varieties are less adapted to cool climate conditions. Flatlands, instead, should be used to plant hybrid varieties.

Each soil has specific physical, chemical and biological characteristics that need to be studied before the planting decision in order to optimize vine behavior and yield in the long term. It is crucial to make good decisions regarding liming necessity, soil aeration, mineral deficiencies or toxicities, soil water table and other factors for every studied soil unit before planting. Also, the drainage system properties will depend on the soil study as mentioned below.

In order to assure good vine development and crop production of the vineyard in the long term and, additionally, to optimize the soil's wine-making potential, it is recommended to carry out a complete and in-depth soil study in order to have appropriate tools to make optimal planting decisions.

A predominance of winter water supply given mostly by snow that melts in springtime, together with low water evaporation rates, results in excess water draining through the soil profile and to the groundwater. These conditions, in addition to a low subsoil permeability, make the already installed drain systems work very slowly. The result is soils that remain water saturated for quite a long time, significantly affecting the vine root development, the soil microflora and soil mineralization.

Considering the above mentioned issues, it is highly recommended to plan and install a long-term efficient drainage system with the aim to remove the surplus soil water content and to deepen the height of the water table within the soil profile. This is crucial

for all varieties, and especially for the elaboration of fine red wines.

A good and efficient drainage system that works correctly after many years is adapted to the specific soil characteristics of the parcel and needs to be based on a previous soil study.

8.2 Existing plantations

An interesting way to optimize the « canopy height/row spacing » index in already existing plantations is to plant new vine rows in-between the existing vine rows. This is especially recommended when planting density is very low and the existing row distance is at least 3 m. The trimming of the canopy can consequently be adapted to a lower canopy height and still obtain the same C/R ratio.

In order to optimize the C/R index in existing plantations, it is highly recommended to plant new rows between the existing ones when row spacing is at least 3 m and when the necessary machinery is available for narrow row spacing.

Regarding the bud numbers left after pruning, several study plots show a notable difference in bud numbers while comparing 2018 to 2017. This means that the plot wine style target is not consistent over time, leading to different bud pruning strategies yearly: one year high bud load for sparkling wines and another year low bud load for still wines. Vine plants need to follow a similar growing pattern year after year, for being able to maintain similar vigor conditions and a nutrition balance in the long term.

The pruning strategy of a given plot should be consistent over time and according to the specific wine style desired. This means that if it is decided that a plot will be used for sparkling wine, a higher bud number is preferable; when the plot's target is to obtain still wine, a lower bud number would be recommended, year after year.

Missing plants in several plots: one study plot shows very high missing plant percentages (up to 48 %), several plots have a plant loss in the range of 20 to 30 %.

In cases of high to very high missing plant percentages, a new plantation would be recommended, but only after having determined the reasons for vine loss reasons and rectifying the problems.

The commonly observed vine training system is vertical shoot positioning (VSP) which is one of the recommended training systems to make good use of sunlight and foliar exposure to light; the pruning system is mainly one or double cane with or without spurs (*guyot simple* or *guyot double*); some double trunks were also observed.

It is recommended to review the cover crop strategy in relation to nutrient absorption capacity. It's possible that the cover crop is competing with the

vines for the available nutrients. In many study plots an important cover crop root density was observed, that literally invades first soil horizons. A regular cutting of the cover crop should be considered in order to lower disease development, for example downy mildew.

9. Grape growing

Regarding the results for 2018, an important increase in bunch number per plant can be seen at first sight for all study plots when comparing with 2017. Highest fertility can be observed in the L'A 1 plot with 33 bunches and in the CH 1 plot with 30 bunches per plant. These results are consistent with the high yield per plant: L'A 1 with 3.5 kg/plant and CH 1 with 3.3 kg/plant.

Together with the increase of the cluster per plant rate for 2018, also the heterogeneity increased in a significant way for all study plots. This could probably be in response on some level to frost damage that wasn't obvious but still can produce bunch losses that differ from one plant to the other.

The frost damage, even if it was very slight and not obvious, could probably be the explanation of a higher degree of heterogeneity in the number of bunches that was produced by each plant.

For 2018, the highest bunch weight can be observed in the CH 1 plot (175 g/bunch being a little too heavy), followed by RI 1 and RI 2, and confirming results of last year. Pinot Noir being the lightest bunch with 96 g/bunch in average is still in a normal range for the variety. L'A 1 with 128 g/bunch shows a good balanced bunch weight.

When comparing 2018 bunch weights with the same plots last year, there is a very consistent and slight drop in all five study plots, as these plots, even if they were not frozen, underwent low temperatures during the beginning of their vegetative growing. During this time, the differentiated flower bunches that existed already in the growing bud, probably developed less flowers per flower bunch, which results in less berries per bunch. In consequence, bunch weights were lighter.

The influence of very cold weather conditions during the beginning of the vegetative growing period, even if temperatures do not fall below 0 degrees, can have a negative impact on the quantity of flowers developed per flower bunch, that can result in a lower yield.

Except for one study plot, the results of 2018 for yield per plant were lower compared to 2017. Another reason for these results, despite the low temperatures, is the fruit thinning that was accomplished in the study plots.

> *These drops in yield per plant helped to optimize the "leaf surface / yield" ratio for these study plots, resulting in a much shorter bloom-veraison period as there was sufficient canopy or leaf surface to permit a faster accomplishment of the veraison stage.*

The plot CH 1 reveals the highest yield per plant and per hectare (9 000 kg/ha) of the vinifera varieties during 2018. This yield would be more appropriate for a sparkling wine, considering the observed climate conditions and short growing season. For the plots of RI 1, RI 2 and PN 1, where yields range between 4 500 and 6 000 kg per hectare; the production objectives are more oriented to still fine wine.

10. Grape composition

Higher alcohol levels were achieved by non-frozen plots, meaning that the 2018 vintage would have been of higher alcohol percentages for Nova Scotia without the frost event, as frozen plots could generally produce only low alcohol wines.

This year's malic acid content increased in all plots compared to 2017. In the vinifera varieties this increase was around 47 %. The non-frozen plot of L'Acadie, in contrast, had an increase of 11 %. This confirms that 2018 was a later vintage than 2017, which was already pointed out in the climate chapter.

The YAN content increase is remarkable in all plots; vinifera varieties increased its content by 31% to an average of 180 mg/l. Hybrids, instead, increased by 58% obtaining an average YAN content of 190 mg/l, values that ensure a good yeast fermentation.

> *Despite the weather characteristics of 2018 (weather events, temperature conditions and rainfall) there was only a fair level of green-nuance molecules observed in the wines. This can mainly be explained by the recommended cultural practices of this year, which is very promising for the future.*

Interesting to point out is the fact that the hybrid variety L'Acadie proved to be capable of producing grapes with an adequate degree of alcohol for sparkling wines, despite having suffered significant frost damage. This confirms its high adaptability to the weather conditions of this cool climate region and its potential to be planted in areas that historically have a greater frost risk.