

Clean Vines - Frequently Asked Questions

1. What does the term “virus-free” grapevines really mean?

The term “virus-free” is not an accurate description of clean grapevine material. A more accurate way to describe this grapevine material is “**certified clean**” or sourced from “**virus tested**” mother blocks. We want to avoid using the word “free” because the clean material is not tested against ALL viruses to exist, but rather only tested against the viruses that the specific certification program has deemed economically important. For example, according to CGCN-RCCV’s “[Certified Plus](#)” and “[Certified](#)” programs, material is tested against at least 25 viruses and other pathogens of concern (details in Appendix 5 of each program). But this isn’t consistent across all grapevine certification systems. The viruses that a certification system is testing against will vary based on the viruses and other pathogens that are deemed economically important in that region. This is why it’s so important to ask your nursery what viruses they are testing for!

2. What questions should you be asking your nursery when looking to buy clean vines, and what answers should you be looking for?

Please note the following questions and answers before placing your next nursery order:

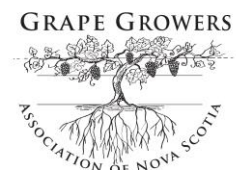
a) Are these vines certified? If so, by what organization and/or program?

Within Canada, you want to ensure your vines are labelled as either “*Certified Plus*” or “*Certified*” by CGCN-RCCV, as these are the two highest tiers of certification and the only domestic certification system that exists. Material produced according to CGCN-RCCV’s lowest tier certification called the Verification Program, and labelled “*Verified*”, is also acceptable until July 31st, 2029.

It is not enough to know that your nursery is a participant in CGCN-RCCV’s programs because many nurseries produce both certified and non-certified grapevines. Make it clear that the specific varieties you want to purchase are produced according to CGCN-RCCV protocols. When in doubt, check CGCN-RCCV’s website for lists of participating nurseries in [Certification](#) and [Verification](#) programming, and contact the nursery directly about your desired varieties.

b) What viruses are these vines certified against?

As stated in question #1, the list of viruses that a certification system tests for will vary depending on the region. In a domestic sense, CGCN-RCCV’s two certification programs certify against at least 25 viruses and other pathogens. These include but are not limited to economically important viruses such as **grapevine red blotch virus**, **grapevine leafroll-associated virus-3**, **grapevine pinot gris virus**, **grapevine fanleaf virus** and all **other quarantine pests** listed in the [CFIA’s Plant Protection Act](#), such as phytoplasmas. CGCN-RCCV explains symptoms, how it spreads and vineyard management options for common and economically important viruses at www.cgcen-rccv.ca/site/grapevine-viruses. Please note that CGCN-RCCV’s Verification program tests for grapevine red blotch virus, grapevine leafroll-associated virus-1 & -3, and tomato ringspot virus.



When available, it is recommended to purchase CGCN-RCCV “*Certified Plus*”, or “*Certified*” vines over “*Verified*” vines.

Furthermore, it is recommended to always source your clean grapevines from within Canada first, if available. If your desired varieties are not available domestically, at the very least, confirm that your imported vines are certified against the economically important viruses and CFIA quarantine pests listed above.

c) What diagnostic method(s) is used to test the certified propagation blocks?

Detection methods in order of most informative to least:

- i) High Throughput Sequencing (HTS): highly sensitive and one test for all viruses (known and unknown).
- ii) Quantitative PCR or qRT-PCR: virus/pathogen specific and provides information on how much virus is detected in the sample.
- iii) Polymerase Chain Reaction (PCR) or Real Time-PCR: virus/pathogen specific and provides a yes or no result.
- iv) ELISA (enzyme-linked immunoassay) test: Less sensitive than PCR tests and the availability of antibodies is limited to certain species of viruses.

3. Is it common for grapevine certification programs to certify against Crown Gall?

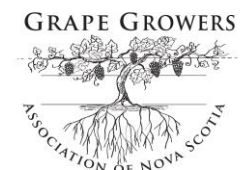
No. However, according to CGCN-RCCV’s “*Certified Plus*” program, grapevines produced and propagated according to the conditions as described within this set of protocols regarding *Allorhizobium vitis* (crown gall) may distinguish their material as sourced from Crown Gall tested plants. But no certification for Crown Gall is provided on the final product.

4. How come vines can never be fully guaranteed clean?

No grapevine certification programs that exist to date, domestically or internationally, can guarantee that the vines are clean from viruses or pathogens. Some viruses and virus-like pathogens are known to be present in grapevines as dormant without showing any symptoms or negative effects on vine growth or fruit quality. Additionally, these new viruses or virus strains may evolve in natural conditions, out of the control of human intervention.

5. What is the importance of the concept of starting clean, and staying clean? How do I protect my clean vines after they are planted?

“**Starting Clean**” means purchasing CGCN-RCCV vines from a participating nursery, or if purchasing internationally, vines that are produced according to a CGCN-RCCV recognized certification system. Although domestic Canadian sources of clean grapevine material are always encouraged and promoted over international sources, CGCN-RCCV understands that current demand exceeds the capacity of domestic sources.



“Staying Clean” means implementing precautionary processes at the vineyard level. After planting clean grapevines, it is important to do everything within your control to keep the vines from getting infected with viruses and/or other pathogens by managing populations of insects capable of spreading certain viruses and other pathogens (such as mealybugs, soft-scale insects and treehoppers). There are a few precautionary processes you can implement at the vineyard level such as field inspections, equipment cleaning, and vector control and applying insecticides as needed. CGCN-RCCV recommends the following:

- ❖ **Field inspections:** Monitor the clean plantings for symptoms of viruses and other diseases, especially during the growing season.
- ❖ **Equipment cleaning:** Ensure you are thoroughly cleaning your equipment by removing soil from machines with water and sanitizing handheld items if working in a non-certified block and moving to a “certified clean” block. Alternatively, consider working on clean blocks first and non-certified blocks last.
- ❖ **Vector control:** Regular treatment schedules, or other pest management strategies, must comply with provincial recommendations and treatments must be applied to control potential virus vectors. Follow integrated pest management practices for your province: [British Columbia](#), Ontario (1. [sprays](#), 2. [information resources](#)), [Quebec](#), [Nova Scotia](#).

If vines are showing common signs of infection, regardless of if the block is “certified clean” or not, TEST THEM and consider removing the positives. The earlier the infection is detected, the better your chances of reducing the spread of virus. And when replanting the areas of removed vines, ALWAYS PLANT “CERTIFIED CLEAN” GRAPEVINES. There is no cure once vines are infected. The only way to remove infection is to destroy the vines to manage further spread.

6. What are the benefits of planting certified clean vines?

First and foremost, planting clean vines is the first line of defense against virus-associated economic loss for Canadian grape growers & wineries! Healthy grapevines produce quality fruit for premium Canadian wines. Data from California shows potential annual benefit of approximately USD\$90 million associated with testing for grapevine leafroll-associated virus-3¹. Additionally, Cornell University estimates a benefits-to-cost ratio of 117:1 from using pathogen-tested vines in California and New York².

¹ Cheon, J. Y., Fenton, M., Gjerdsseth, E., Wang, Q., Gao, S., Krovetz, H., Lu, L., Shim, L., Williams, N., & Lybbert, T. J. (2020, July 1). Heterogeneous benefits of virus screening for grapevines in California. American Journal of Enology and Viticulture. <https://www.ajevonline.org/content/71/3/231.abstract>.

² Troendle, J. A. (2017, May 30). ECONOMIC IMPACTS OF USING VIRUS-TESTED GRAPEVINES. Cornell University Library. <https://doi.org/10.7298/X4R49NXV>.

