

## SUBMISSION GUIDE FOR NUCLEAR STOCK AUDIT TESTING OF NUCLEAR STOCK CLASS SEED POTATOES

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This is a summarized version of the general requirements for Nuclear Stock class seed potato testing; for the full version please see [CFIA D-memo D- 97-08: Production, Maintenance, Multiplication and Certification of Nuclear Stock Class Seed Potatoes.](#)

### **Phases of Nuclear Stock Class Seed Potato Production and Testing Requirements:**

Three phases are recognized in the production of Nuclear Stock class seed potatoes:

- **Initiation:** where pathogen-tested potato propagules are established in an aseptic environment through in vitro micro-propagation (i.e., tissue culture)
- **Maintenance:** where pathogen-tested potato propagules are maintained in an aseptic environment
- **Multiplication:** where pathogen-tested potato propagules are increased through vegetative propagation in an aseptic environment and/or in a protected environment (e.g., greenhouse, screenhouse, growth chamber, etc.)

Each crop under production must have valid disease testing results at all times during the multiplication process, with the exception of micro-tuber production, where valid disease testing results are required at the initiation of the micro-tuber production cycle.

All disease tests must have been carried out by a [laboratory approved by the CFIA](#) and they are valid for a period of 12 months commencing on the date that the sample was received for testing to the approved laboratory.

Each crop must have been found free from the following organisms:

- Viruses: PVA, PVS, PVM, PVY, PVX, PLRV, PMTV and PotLV
- Viroid: PSTVd
- Bacteria: *Clavibacter michiganensis* subsp. *sepedonicus*, the causal pathogen for bacterial ring rot (BRR).

**\*Information current as of September 2017 with diagrams and information referenced from:  
CFIA D-97-08 & CFIA D-97-11**

<http://www.inspection.gc.ca/plants/plant-pests-invasive-species/directives/potatoes/d-97-08/eng/1313337803460/1313337874471>

<http://www.inspection.gc.ca/plants/plant-pests-invasive-species/directives/potatoes/d-97-11/eng/1323886418103/1323886500636>

**Sample Submission Requirements by Phase:**

**Initiation:** Disease testing of plantlets in an aseptic environment must be carried out on a minimum of **two** plantlets for each variety/clone and each variety/clone must be found free from the diseases identified above. Any potato material (i.e., any potato plant part, including stems and tubers) is acceptable for initiation into culture.

**Maintenance:** There are no requirements for specific disease testing during the maintenance of Nuclear Stock class seed potatoes in an aseptic environment other than, where maintenance takes place in a facility other than the initiating facility, the material must be certified as Nuclear Stock class seed potatoes prior to maintenance and possess disease testing results as described above.

**Multiplication:** For Nuclear Stock class seed potatoes in an aseptic environment the level of testing for each variety/clone under active multiplication will be 1% or a minimum of 5 plantlets to a maximum of 50 plantlets per clone.

The crop must be grown from Nuclear Stock class plantlets or micro-tubers which were produced in aseptic conditions, or from first generation Nuclear Stock class mini-tubers produced in the grower's own protected environment facility, or from stem cuttings produced in the grower's own protected environment facility that have been disease tested.

If first generation mini-tubers and/or stem cuttings are used to produce a second generation, a CFIA inspector shall not certify the second generation unless material from the first generation or the second generation have been tested by a laboratory approved by the CFIA and found to be free from the pathogens listed above.

When additional pathogen testing is required on a crop producing mini-tubers, samples for virus and viroid testing should be collected at budding/flowering time (approximately 40 -70 days after planting) and for *Clavibacter michiganensis* subsp. *Sepedonicus*, causal pathogen for bacterial ring rot (BRR) as outlined in the BRR submission guide.

Testing must be done on a representative sample consisting of 1% of the plants/tubers with a minimum of 5 and a maximum of 50 plants/tubers sampled per lot. All plants and when applicable, at least one tuber per plant, must be tested if the total number of plants of the clone is less than 5. All samples taken for required pathogen testing must be collected by or under the supervision of a CFIA inspector.

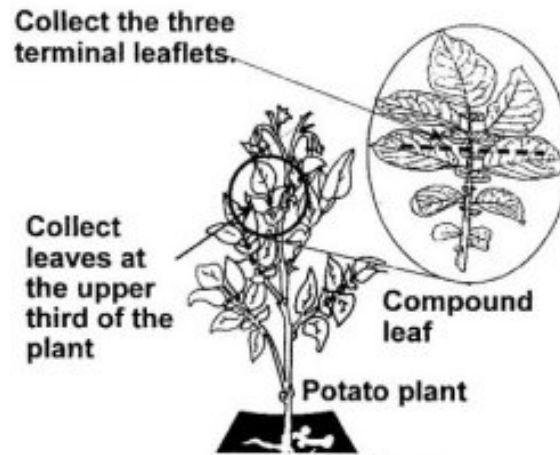
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<http://www.inspection.gc.ca/plants/plant-pests-invasive-species/directives/potatoes/d-97-08/eng/1313337803460/1313337874471>

<http://www.inspection.gc.ca/plants/plant-pests-invasive-species/directives/potatoes/d-97-11/eng/1323886418103/1323886500636>

**How to Sample Leaves for Virus Testing:**



**Appendix I: Summary Table of General Requirements for the Production of Nuclear Stock Class Seed Potatoes:**

| Criteria  | Initiation (aseptic)  | Maintenance (aseptic)   | Multiplication (in an aseptic environment)   | Multiplication (in a protected environment)  | Comments   |
|---|---|---|--|--|--|
| <b>Audit Inspection Requirements</b>  | If applicable, at least once a year as part of the overall multiplication facility audit process.<br><br>Recorded on <b>CFIA/ACIA 529 2 (2.2.1.1)</b>   | If applicable, at least once a year as part of the overall multiplication facility audit process.<br><br>Recorded on <b>CFIA/ACIA 5292 (2.2.1.1)</b>  | <b>Audited at least once</b> during active production.<br><br>Recorded on <b>CFIA/ACIA 5292 (2.2.1.1)</b>  | <b>At least once</b> , at or about budding / flowering time (40-70 days after planting) <b>(2.3.2)</b><br><b>Plus</b> , an optional pre-planting inspection <b>(2.3.13)</b><br><br>Recorded on <b>CFIA/ACIA 5293</b>   | If the facility does not meet program requirement, use form <b>CFIA/ACIA 5294</b> to request corrective action.  |
| <b>Lab Testing Requirements</b><br><br><b>Free of Virus</b><br><b>Viroid</b><br><b>Bacteria</b> | Minimum of 2 plantlets per variety.<br><b>Viruses:</b> PVA, PVS, PVM, PVY, PVX, PLRV, <b>PotLV, PMTV.</b><br><b>Viroid:</b> PSTVd<br><b>Bacteria:</b> BRR A<br>positive test will result in the disposal of at least that clone and all its progeny | Where maintenance takes place in a facility other than the Initiating facility, the material must be certified as Nuclear Stock class seed potatoes prior to maintenance.<br><b>Note:</b> There are no requirements for specific disease testing during the maintenance phase. <b>(2.2.3.2)</b> | Minimum of 2 plantlets per variety (valid for one year, must have <b>valid testing results at all times during multiplication process</b> )<br><b>Viruses:</b> PVA, PVS, PVM, PVY, PVX, PLRV<br><b>Viroid:</b> PSTVd<br><b>Bacteria:</b> BRR<br><b>Exception:</b> Micro-tuber production - testing results are required prior to initiation of the production cycle. | <b>Must have valid testing results at the time of planting</b> for the following:<br><b>Viruses:</b> PVA, PVS, PVM, PVY, PVX, PLRV<br><b>Viroid:</b> PSTVd<br><b>Bacteria:</b> BRR<br><b>Exception:</b> Planting first generation mini-tubers and plant cuttings <b>(2.3.11</b> and <b>2.3.12)</b> | For clarification on determining the validity period, the recognized twelve month period will commence on the date that the samples were received to a CFIA approved laboratory. PMTV & PotLV testing are required only at the initiation phase. |

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