

2019 OREGON POTATO SEED CERTIFICATION STANDARDS



**Oregon Seed Certification Service
Oregon State University, Corvallis, Oregon**

Certification in Oregon

Certification in Oregon is authorized by Revised Statutes 633.620 and 630. It is administered by the dean of the College of Agricultural Science of Oregon State University and his appointed representatives. A certification board, appointed by the dean of the College of Agricultural Science, develops and determines policy; accepts, rejects and deletes varieties from the certification program; evolves, modifies and alters standards for certification subject to the approval of the dean. The Certification Program is a service of the School of Agriculture administered through the Oregon State University Extension Service. It is divided into two projects. The Foundation Seed and Plant Materials Project is responsible for making available sufficient improved planting stock to insure a continuous supply of early generation material for later increase by Oregon growers engaged in the certification program. The Certification Project is responsible for maintaining the pedigree of superior varieties under a generation system by appropriate inspection and records to insure that genetically pure varieties are produced under the Oregon Certification Program. County Agricultural Extension Agents are the certification representatives within counties. Application blanks, lists of eligible varieties, and the Oregon standards for seed certification can be obtained at each county Extension office or directly for the Seed Certification office in Corvallis.

A memorandum of agreement was established August 1, 1945, between the Oregon State University Extension Service and the Commodity Inspection Division, Oregon State Department of Agriculture. It states that the Oregon State Department of Agriculture will make all inspections of seed potatoes offered for inspection according to the certified seed potato grades established in the Oregon certification standards, and may reject for certification any lot or lots not grading in accordance with the grade claimed on the certification tags and/or shipping certificate. The memorandum of agreement and working procedures were reconfirmed in 1972.

Purpose of Certification

The purpose shall be to provide a service to the public for the maintenance and increase of quality seed and propagating material of varieties grown and distributed in such a manner as to maintain varietal purity, and meeting tolerances for certain diseases, through the appropriate application of these rules.

Disclaimer of Warranty

Certification does not constitute a warranty of either the Oregon Seed Certification Service or the grower of certified seed potatoes regarding the quality or freedom from disease of the seed potatoes beyond the express representation that the potatoes were produced, inspected, graded, and shipped under the standards of the Oregon Seed Certification Service, and did qualify, prior to shipping, as to freedom from disease and all other requirements of the rules and regulations of the Oregon Seed Certification Service. The reliability of the tests performed on these potatoes is subject to the normal limits of laboratory accuracy. By acceptance of these seed potatoes, buyer expressly agrees that the exclusive remedy for breach of any warranty shall be limited in all events to a return of the purchase price of the seed.

These Seed Potato Certification Standards are a part of the Oregon Seed Certification Handbook. You may obtain a copy of the Certification Handbook by contacting the county Extension office or the Seed Certification office. The 2019 Oregon Seed Potato Standards are effective May 1, 2019.

Cover Photo: Potato planting in Gilliam County - By Bev Day

PR: e1 2-11-19

Oregon Potato Seed Certification Program Changes for 2019

1. Seed lots from states where the Post-Harvest Test (PHT) is solely based on tuber testing (no grow-out) will be accepted in Oregon.

Specific change - XIV. POST-HARVEST TESTING REQUIREMENTS modified (page 18). A new 'Part B' would be inserted after 'Part A' that would read as follows:

B. Acceptance of tuber tested lots: A Post-Harvest Test (PHT) in Oregon is construed to mean a winter grow-out of plants that are then visually evaluated. Lots that have only been subjected to laboratory-based tuber testing as the PHT will only be accepted from states or provinces winter a grow-out is not an option. Tuber tested lots from states or provinces where there is a WGO option will only be accepted as a 'special case' (policy on file).

2. Isolation of early generation lots from non-certified material (Experimental plots) accepted without 300-foot isolation provided special conditions are met.

Background: The current standards require G1 and G2 producing lots be isolated 300 foot from 'commercial' (uncertified fields/lots). There have been several appeals to this requirement where a grower wishes to plant a seed lot near or within an experimental plot of material that had been pathogen-tested and rogued but was not certified.

Specific change Footnote *3 in Table 4 of the Standards (page 14) modified as follows:

"This isolation requirement is waived if adjacent to experimental lines that can be documented as having the same, or higher, testing status as materials of a similar class to those being certified in the block".

WEBSITES: Information at your fingertips

Oregon Potato Seed Certification Standards	http://seedcert.oregonstate.edu/potatoes
Oregon Seed Certification eCertification page (requires a PIN)	https://w3.oscs.orst.edu/online/
Oregon Potato Commission	http://www.oregonspuds.com/
Oregon Department of Agriculture	http://www.oregon.gov/ODA/
Potato Association of America	http://potatoassociation.org/
National Potato Council	http://www.nationalpotatocouncil.org/
PNW <u>Plant Disease</u> Management Handbook	https://pnwhandbooks.org/plantdisease
PNW <u>Insects</u> Management Handbook -Potato	http://insect.pnwhandbooks.org/vegetable/irish-potato
PNW <u>Weed</u> Management Handbook	https://pnwhandbooks.org/weed
US & Canadian Seed <u>Acreage</u>	https://seedcert.oregonstate.edu/potato-certification-national-level
Seed Potato Grades & Export Standards	https://www.ams.usda.gov/grades-standards/seed-potatoes-grades-and-standards
NAPPO APPROVED RSPM 3 ("Requirements for the Importation of Potatoes")	http://www.aphis.usda.gov/import_export/plants/plant_exports/downloads/RSPM3_Revision_03_18_10_e.pdf
UN/ECE Potato Seed Standards	https://www.unece.org/trade/agr/standard/potatoes/pot_e.html

Oregon Potato Seed Certification Standards

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CERTIFICATION STANDARDS

Minimum Requirements for Potato Seed Certification in Oregon

Consider:

	<u>Page</u>	<u>Yes</u>	<u>No</u>
Variety – Eligibility, Owner approval	10, 22	<input type="checkbox"/>	<input type="checkbox"/>
Seed Stock Eligible	13, 27	<input type="checkbox"/>	<input type="checkbox"/>
Crop History	14	<input type="checkbox"/>	<input type="checkbox"/>
Seed Farm Requirement	8	<input type="checkbox"/>	<input type="checkbox"/>
Field, Lab, or Greenhouse Inspection Application	7	<input type="checkbox"/>	<input type="checkbox"/>
Map of Field	7	<input type="checkbox"/>	<input type="checkbox"/>
Latent Virus Testing (PN, N, G1 as Required)	7, 11	<input type="checkbox"/>	<input type="checkbox"/>
Winter Test Sample	17	<input type="checkbox"/>	<input type="checkbox"/>
Fees Paid	7	<input type="checkbox"/>	<input type="checkbox"/>
Map of Storage with Lots Identified	19	<input type="checkbox"/>	<input type="checkbox"/>
Tags or Shipping Certificate Completed	19	<input type="checkbox"/>	<input type="checkbox"/>
Grade Inspection if Necessary	20, 33	<input type="checkbox"/>	<input type="checkbox"/>
Inspection for Necrotic Arcs (Out-of-state shipments)	20	<input type="checkbox"/>	<input type="checkbox"/>

Seed Certification

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 Corvallis, OR 97331-3003

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Potato Inspection Staff

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POTATO CERTIFICATION AND FOUNDATION SEED
AND PLANT MATERIAL ADVISORY COMMITTEE (PC&FS&PMAC)

The Advisory Committee consists of 13 voting members: eight growers of Certified seed potatoes; two commercial potato growers selected by the Oregon Potato Commission; one OSU researcher; one Extension specialist; and one county agent. The Certification Program and Commodity Inspection Division, Oregon Department of Agriculture shall be represented by one ex-officio member each. Other ex-officio members may be appointed as the Dean or the Committee deem necessary. The a listing of the current committee can be found at: <http://seedcert.oregonstate.edu/advcom>.

The purpose of this Advisory Committee is to promote and improve the potato seed industry of Oregon and to assist and cooperate with the Certification and Foundation Seed and Plant Materials Board.

CHAIRMAN	Mike Macy, Culver	(541) 546-6136
VICE-CHAIRMAN	Rob Lane, LaGrande	(541) 786-5263
SECRETARY	Jeff McMorrان, Corvallis	(541) 737-4513

SEED GROWERS - Voting Members

<u>Central Oregon</u>		<u>Northeastern Oregon</u>	
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<u>Klamath Falls:</u>		<u>At Large¹</u>	
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COMMERCIAL GROWERS² - Voting Members

Lon Baley, Merrill	(541) 723-3200
Greg Harris	(541) 481-9274

OREGON STATE UNIVERSITY

Voting Members:

Kenneth Frost, OSU Plant Pathologist (Hermiston)	(541) 567-6337
Vidyasagar R. Sathuvalli, OSU Potato Program (Hermiston)	(541) 737-3539
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Ex-officio:

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OREGON DEPARTMENT OF AGRICULTURE - EX-OFFICIO

Elizabeth A. Savory, Plant Health Program Manager, ODA	(503) 986-4570
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¹ - Considered an ‘at large’ position selected by the Oregon Seed Potato Growers Association.
² - Selected by the Oregon Potato Commission

SIGN-UP SCHEDULE AND DEADLINES

<u>Sign-up Schedule</u>	<u>Deadline</u>
Lab (Micropropagation) or Greenhouse Facility Inspection - While plants present	
Field Inspection Application and map (or within 15 days of planting for those fields planted after May 25, no applications accepted after June 30)	June 1
Survey of uncertified potato fields	July 15
Latent Virus Testing Application (field)	July 30
Latent Virus Testing Field Prior to kill down (2 week notice) Winter Grow-Out Within 4 weeks of sample delivery	
Winter Test Sample (delivery) Note: No sample will be accepted after January 2nd (Notification required by Dec. 15)	November 20

FEES

A. Micropropagation Laboratory/Greenhouse Inspection

1. Mother Plant Testing - lab fees (*in vitro* plants)

Cost for pathology testing *in vitro* “mother plant” material is paid directly by the micropropagation lab to testing lab and is dependent on the current rates charged by testing lab. A listing of laboratories conducting these assays and their current charges is available on request. There is no additional fee for OSCS audits of pathology testing records.

2. Greenhouse Production – inspection & lab fees

- a. \$325 for the first lot (= \$250 facility fee + \$75 lot fee), \$75 for each additional lot for first two inspections or pathology sample collection trips to greenhouse. Minimum fee for each additional inspection/sampling trips: \$90.
- b. Laboratory testing charges to be paid directly by applicant.

B. Certified Seed Field Inspection: Fees are \$30.00 per acre, with a \$60.00 minimum charge per application. Acreage over the minimum may be figured in tenth of an acre. There will be no tagging charge. FFA and 4-H projects, of less than one acre, may be certified without fees. Applications dated or postmarked after midnight June 1st deadline (or 15 days after planting for lots planted after May 25) will be charged an additional fee of \$50.00 per application over the regular acreage fee. **No application will be accepted after June 30.**

1. If acreage is withdrawn before the first inspection the entire fee will be refunded minus a “Special Request Fee” per application as per page V of the OSCS

Handbook.

2. Ten dollars (\$10.00) per acre will be refunded if acreage is rejected at the first inspection or withdrawn before the second inspection. No refunds of less than \$20.00 will be made for each lot.
3. Six dollars (\$6.00) per acre will be refunded if the acreage is rejected at the second inspection. No refunds of less than \$20.00 will be made for each lot.
4. No other refunds will be made.

C. Reinspection Fee: \$40.00 per lot. Fee waived if reinspection occurs while inspectors are still present in the area. For early generation lot it is recommended grower be present to remove any ‘scored’ plants during the inspection.

D. Uncertified field inspection: Survey of uncertified fields on a seed farm to establish Seed Farm eligibility.

1. Fees are \$6.00 per acre, with minimum of \$40.00 per application. After July 15, an additional fee of \$50.00 will be charged per application over the regular acreage fee.
2. The entire fee will be refunded if acreage is withdrawn before inspection.

E. Leaf sampling and latent virus determination.

A. Field samples: See table 1. Final sign-up date is July 30. A \$50.00 late fee will be charged for each application made after July 30.

Billed as “Sampling Fee”. Minimum \$60/application. Maximum of \$196 per lot (based on 400 leaf maximum sampling). **“Laboratory Fee” billed directly to grower by testing lab. See Table 1, Pg. 8.**

B. Winter Grow-Out samples: \$42/lot (400 leaves) if mailing required (i.e. overnight delivery to lab), \$32 if no mailing required (i.e., OSU Seed Lab used). No minimum fee.

F. Winter Grow-out / Post-Harvest Test

For sample received prior to November 21:

1. Fields less than 1 acre:	\$ 60
2. Fields 1-20.9 acres:	\$135
3. Fields 21-40.9 acres:	\$270
4. Fields greater or equal to 41 acres:	\$405

Late Fee: Samples received after **November 20th** will be a late fee of \$60/lot.

No samples accepted after January 2 (notice must be given for any samples arriving after December 15). Growers will be billed for the Winter Test Plot fee. Winter tests results are not reported until fees are received.

Table 1 - Latent Virus Testing Fees

A. Field Sampling

Class	Rate	ELISA		Sampling /mailing fee *4	Approx. Lab fee *5		
		L/H *1	samples/acre *2		1 virus	2 virus	
Nuclear	1/4 *1	L/H *1	*2	\$184 per 0.1 acre	\$195	\$345	
G1	400	L/A *3	80	\$196 per acre	\$208	\$372	*6
G2	50	L/A	10	\$25 per acre	\$26	\$47	*6
G3-5	20	L/A	4	\$10 per acre	\$11	\$20	*6

B. Winter Grow-Out = \$42 sampling and mailing fee (based on 400 leaf sample); All classes. Fee reduced to \$32 per 400-leaf sample if no mailing involved (i.e., sample hand delivered to the OSU Seed Lab).

*1 - Leaves/hill (nuclear) - no maximum rate.

*2 - Dependent on number of hills present, for example: if 0.1 acre had 1,500 hills, 375 leaves would have to be sampled = 75 ELISA samples = sampling fee of \$184; lab fee = 75 ELISA samples @ \$2.60/sample = \$195 (1 virus); \$345 (2 virus)

*3 - Leaves/acre (other classes), MAXIMUM = 400 leaves per lot.

*4 - Maximum of \$208 per lot (based on 400 leaf maximum sampling rate).

*5 - Per unit shown, per 0.1 acre (Nuclear) or per acre (all other classes) based on 2018 OSU Seed Lab fees. Fees vary with number of samples submitted at one time. This fee is **BILLED DIRECTLY TO GROWER BY LAB**.

*6 - Maximum lab fee per lot (based on 400-leaf sample) and is approximately \$208 (1 virus), \$377 (2 virus).

G. Special Request: Special out-of-the-routine request will be subject to a fee.

and where the lowest class planted must have been Certified. All equipment not used exclusively on a seed farm must be thoroughly sanitized prior to use on any seed field.

GENERAL REQUIREMENTS

I. REQUIREMENT

To be eligible for certified seed potato production, all acreage on a Seed Farm (see definition Section II below) must have been planted with the certified seed.

All acreage planted to potatoes, but not entered for re-certification, must be inspected at least once during the growing season for bacterial ring rot, except (1) when a grower plants his own certified seed or (2) when the seed produced is for the producers' own use only and will not be eligible for sale as certified seed.

No bacterial ring rot is permitted in fields not entered for certification. Finding bacterial ring rot in the uncertified fields will cause Certified seed fields to be subject to the bacterial ring rot requirement noted on Page 15 ("C. Bacterial ring rot"). A special application for the inspection of uncertified fields must be completed along with a map showing the location of each field.

II. ADMINISTRATIVE DEFINITIONS

A. Seed Potato: A seed potato refers to the tuber used for reproduction of the potato.

B. Seed Farm: A Seed Farm is a clearly independent operation, managed separately, and includes all land, facilities (storage, etc.) equipment, operational personnel

C. Certification: The act of endorsing a seed lot as meeting the standards or requirements specified in the order or regulations governing the production of seed potatoes. Except as might otherwise be specified, the measurement method or basis for determining compliance with the standards is visual inspection of the growing grounds and crops thereon or harvested there from as described in the order or regulations. "Certification" does not constitute a guarantee or warranty, nor is it a representation that the seed potatoes to which the indicia of certification (certification tags, seals, Certificate of Final Certification, etc.) are attached, or which are otherwise represented as certified, are merchantable or fit for a particular purpose.

D. Tolerance: The permissible allowance for a disease, varietal mixture, or grade defect as specified in the order or regulation governing certification of seed potatoes. Except as might otherwise be specified, the measurement method or basis for determining compliance with the stated tolerance is visual inspection of a sample of the plants or tubers in the field or lot, respectively. Further, except as specified, sample sizes are at the discretion of the certification agency.

Diseases, varietal mixtures, or grade defects may be present at a level in excess of specified tolerances, because diseases and diseased plants, varietal mixtures, and grade defects which cannot readily be observed visually at the time of official inspection may not be detected at such time. Furthermore, even the inspection

of larger samples might not reveal deviations in excess of specified tolerances. Finally, with respect to the "zero" tolerances for such defects as varietal mixture, bacterial ring rot, root-knot nematode, the tolerance is chosen for reasons of convenience and practicality and is not construed to mean that the lot inspected is free of them. It does mean that no varietal mixture, bacterial ring rot, or root-knot nematode was found during the inspection process.

E. Completion of Certification: A lot will not be considered certified until:

1. The farm has met Seed Farm Requirements, (see page.8)
2. Has passed at least two inspections of which one may be a winter greenhouse test (at the discretion of the agency/inspector).
3. A harvest or bin inspection of tubers has been completed, unless this inspection is considered not possible by the Harvest Inspector due to circumstances out of the grower's control. Any lot not so inspected will have the sentence "No harvest/bin inspection conducted on this lot" included on the Final Report. Lots not inspected due to lack of cooperation by the grower, such as failure in communicating harvest dates to the Harvest Inspector, may not be eligible for certification.
4. A map of the storage area must be on file with the Certification Office clearly identifying each seed lot by variety and class.
5. A Winter Grow-Out sample has been submitted (exception is made for lots shipped within 90 days of harvest). NOTE: Early out-of-state shipments are not exempt from an inspection for internal necrotic arcs as specified under the Necrotic Virus Management Plan (see page 20 for details).
6. Proper tags or Certificate of Final Certification has been issued, see page 19.
7. Required out-of-state grade inspections and inspections for 'necrotic arcs' have been fulfilled, see page 20.

III. BASIS FOR REFUSAL TO APPROVE OR INSPECT

- A. Refusal to Inspect:** The certification inspector may refuse to inspect a field if:
1. The location of the field is such that inspection would be unduly expensive.
 2. The grower fails to follow the rules governing certification, including failure to pay for services previously rendered.
 3. Heavy weed infestation, lodging of potatoes, etc., or storm, frost, or other conditions beyond the control of the grower preclude satisfactory inspection.

B. Refusal to Approve: The certification inspector may refuse to approve a field for certification due to unsatisfactory appearance caused by weeds, poor growth, poor stand, disease, insect damage, and/or any conditions that may prevent thorough inspection or may reflect unfavorably upon the certification program. Roguing bacterial ring rot plants is not permitted in a Certified seed field. During inspection no bacterial ring rot is allowed in or out of count.

C. Appeal Procedures: If a grower disagrees with a decision on his crop rendered by a certification staff member, he may appeal this decision. The grower must file a letter of appeal within 15 days^{*1} of receiving the decision notice. The grower must sign the letter of appeal. Involvement with the local county Extension agent, including a letter of support, is encouraged and may strengthen a grower's case. The letter of appeal and any supporting documentation should be forwarded to the Seed Certification office, Crop Science Building, Room 031, Oregon State University, Corvallis, OR 97331-3003. Email letters of appeal are acceptable as long as the sender is clearly identifiable.

The Seed Certification office will contact the grower and/or his agent, and make appeal inspections where warranted insofar as time, weather, and crop conditions permit. If a mutually satisfactory agreement cannot be reached, the Certification office will forward, as promptly as possible, all information to the Director of seed services (Daniel G Curry, 541-737-5094) who will develop an 'Appeals Board' to hear the case and make a ruling. The Board reserves the right to charge the grower or the grower's agent seeking the appeal for expenses incurred related to the appeal when those expenses are deemed to be excessive.

*1 - For appeals of the **second field inspection** or the **winter grow-out** should be made immediately before the field enters advanced die down or the WGO plants are destroyed and samples discarded (as lots are read). An eMail notification of intent to appeal is sufficient.

IV. PUBLISHING DIRECTORY OF CERTIFIED SEED POTATO GROWERS

Seed Potato Growers Lists will be published annually after final field inspection. The report will show the results of all field inspections, including bacterial ring rot. The Directory will include all lots that have completed the field inspection portion of the OSCS program (including the "Do Not Publish" varieties with variety names blacked out). Lots withdrawn prior to completion of field inspection portion of the OSCS program are not included unless Bacterial Ring Rot found during the required inspection for BRR. Fields that normally would be required to have a Winter Test, but final approval cannot be made at last inspection, will have a 'pending' under

classification which means the seed lot is held for Winter Test, or other tests were not completed at the time of publication.

V. VARIETAL ELIGIBILITY REQUIREMENTS FOR CERTIFICATION

Seed stock and propagating material must be approved by the Oregon State University Seed Certification Board to be eligible for certification. Eligibility requirements for certification of publicly and privately developed varieties are the same. In Oregon certification does not imply recommendation. Variety recommendations for the state of Oregon are the responsibility of staff members within the School of Agriculture working in the areas of the crops involved. Recommendations are based on research data and knowledge of the variety under consideration.

A list of potato varieties approved for certification in Oregon is prepared each year (see page 22). Varieties to be considered for certification may be submitted from the following sources:

- A. From the Oregon Agriculture Experiment Station, after being approved by the New Crops Variety Committee of the Oregon Agricultural Experiment Station.
- B. From the Oregon Agricultural Experiment Station in cooperation with other public agencies.
- C. From developments of other state or governmental experiment stations.
- D. From private and commercial plant-breeding programs.

To have a variety considered for entry in the certification program, a grower, breeder, or originator shall submit the appropriate form to the Seed Certification office, Crop Science Bldg., Room 031, Oregon State University, Corvallis, OR 97331-3003. Appropriate forms can be obtained from the Seed Certification office. For newly developed varieties, this request should be submitted one year prior to the time certification is desired. For varieties previously accepted by other certification or regulatory agencies, this request should be submitted prior to time of planting.

Acceptance of a variety for certification by the OSGS shall be based on the following information. (This information shall be considered confidential).

1. A statement by the person or firm requesting certification that the variety has been **adequately tested** to determine its value and probable area of adaptation, that it merits certification and that it is distinguishable from other varieties, as set forth in Article V of the International Code of Nomenclature of Cultivated Plants, which reads as follows:

"The term cultivar (variety) denotes an assemblage of cultivated individuals which are distinguished by any characteristics (morphological, physiological, cytological, chemical or others) significant for purposes of agriculture, forestry, or horticulture, and when reproduced (sexually or asexually) retain their distinguishing feature."

When any stock being presented for certification has been previously released under a different designation, the Certification Board reserves the right to refuse further consideration until the sponsoring breeder or originator files documentary evidence from the USDA Seed Branch indicating that such a stock of seed is free to move in interstate commerce under the proposed new designation.

2. A statement of **origin** and breeding procedure.
3. Description of the **morphological characteristics** (such as tuber skin and flesh color, height, uniformity, leaf, and flower characteristics, etc.), physiological characteristics of value to field inspectors, and such other factors as the breeder or sponsor considers pertinent.
4. Evidence of **performance** including data on yield, insect or disease resistance, and other factors supporting the value of the variety. These performance tests may be conducted by private companies or Agricultural Experiment Stations, and shall include appropriate check varieties that are used extensively in the area of intended usage.
5. A statement giving the **region** of probably adaptation and **purposes** for which the variety will be used. This should include areas within state or countries where the breeder of the variety has tested it and anticipates recommending and merchandising it.
6. Procedure for **maintenance** of stock seed classes shall be described. At the time a variety is accepted for certification, a sample of propagating material, if requested, shall be presented to the certifying agency. The certifying agency can request a sample of stock seed or propagating material at any time while the variety is in the certification program.
7. When varieties are reviewed for acceptance into the Oregon Certification Program, a favorable report from the USDA-ARS Plant Variety Protection office will be considered.
8. Seed will be eligible for certification upon meeting the appropriate certification standards. Information pertaining to the certification of a private variety will be made available only to the specified firm or individual (owner/agent) upon written request to the Seed Certification office.

VI. VARIETIES CERTIFIED

- A. **Varieties Eligible** for Certification in Oregon, see Appendix page 22. The Oregon Certification Board oversees approval of new varieties entered for certification in Oregon. Appropriate forms may be obtained from the Oregon Seed Certification office, Crop Science Building, Room 031, Oregon State University, Corvallis, OR 97331-3003. See Page 10.
- B. **Variety Approval Status:** Four groups of are recognized within the OSCS system:
1. **Public (or “open”)** - released or nationally recognized varieties with no restrictions on production.
 2. **Proprietary Varieties** - Varieties protected by Plant Variety Protection (PVP) in which the growers of must have owner’s permission for production of certified seed potatoes (see more on approval or proprietary variety in part C of this section below).
 3. **Experimental Lines:** The field increase of stock seed to be used for experimental purposes may be examined by Seed Certification personnel provided such a request is made before planting. An appropriate tag will be issued to declare the intended use of the seed for experimental purposes (i.e. a white tag). This tag will not imply that the experimental line has been accepted into the certification program as a released variety. Fees for this service are the same for certification services.
 4. **Heirloom Varieties:** Are generally older varieties which are often widely grown for which OSCS has not been able to identify a living breeder/owner to act as a mediator should slight differences occur among differing sources of the variety. “Heirloom Varieties” must meet a basic variety description on file (color of tuber flesh & skin, tuber shape, flower color, any prominent haulm characteristics, see OSCS Policy Sheet #16 for more detailed information). “Heirloom Varieties” are listed under the ‘Experimental’ category in the OSCS database, but list the Contactor as “Heirloom Variety”. The database automatically bypasses the search of ‘approved growers list’ for these varieties.
- C. **Approval of “Proprietary” Varieties:** All potato material with proprietary status in the United States must have the permission from owner or agent prior to release of inspection reports or issuing final certification. Growers must complete a grower signoff on the application attesting to the fact that they have the owner’s permission to produce the specific proprietary variety. Growers are assumed to be approved to produce a proprietary variety if the variety owners/agents has not responded to a request for ‘grower approval’ within 30 days. For the sake of applying this rule, ‘*proprietary in the United States*’ is defined as a variety that has either a PVP ‘certificate issued’ or ‘pending,’ or is a pre-commercial advanced experimental line of a

university/USDA/private variety development program, requiring MTA for production. Though rare, a potato variety that has been patented would also fall under this category. The status of each accepted variety is listed in the Appendix, Part A (page 22).

VII. MICROPROPAGATION (LAB /GREENHOUSE)

Note: Special testing requirements for material derived from True Potato Seed (TPS) on file.

Note: For information on requirements for material in the Experimental Line Selection Program see page 28

A. Basic Requirements for Plant Material Increases:

1. All micropropagation facilities must be approved by a certification agency.
2. All material must be documented as to source of the variety and must be an approved as noted on page 8 of the General Requirements.
3. All tests required by these standards must be conducted by a third party laboratory approved by the Oregon Seed Certification Service, unless indicated otherwise. See approved protocols on file.
4. Entry level material must be isolated from all other material and limited to 50 *in vitro* propagules per line selection. All plant material to be mass micropropagated must have met the testing protocol of paragraph B on this page.
5. Records - Good records to document movement of plant material through increase is required (see page 12, “I. Required Records”). Records must be available for audit by a seed certification agency
6. Minimum greenhouse and laboratory physical standards must be met. Certification agency inspection of facility is required on a regular basis. Physical and procedural requirements are available on request. Strict sanitation must be maintained during increase of *in vitro* or greenhouse plant material.

B. Testing Requirements for Entry Level

Testing of 100 percent of the mother plants, as outlined in Figure 1, Page 26 of these standards for the following pathogens is required. All mother plants will be screened for bacteria and fungi with Richardson medium and/or nutritional broth. Acceptable protocols are available upon request. Screening with Richardson medium and/or nutrient broth may be done by production lab.

1. *Clavibacter michiganensis* subsp. *sepedonicus* by ELISA or PCR. (See protocol on file defining an acceptable *in vitro* plant determined by these tests, amended as per PCAC January 2015).

2. *Pectobacterium* (f. *Erwinia*) by crystal violet pectate (CVP), with *Pectobacterium* tested for being defined as *Pectobacterium atrosepticum* (f. *Erwinia carotovora* sub species *atroseptica* (Eca)) and *Pectobacterium carotovorum* subsp. *carotovorum* (f. *Erwinia carotovora* subspecies *carotovora* (Ecc)) and *Dickeya* spp. (syn. *E. chrysanthemi*). Greenhouse minitubers are only rejected for Pre-Nuclear Class if found to yield positive tests for *Pectobacterium atrosepticum* or *Dickeya* spp but not for *Pectobacterium carotovorum* subsp. *carotovorum*.
3. Potato viruses X, Y, S, M, A, Leafroll, and PMTV by ELISA, or other approved test.
4. Potato spindle tuber viroid by cDNA, dot hybridization or gel electrophoresis.
5. All plant material to be mass propagated must test negative for the pathogens listed above.
6. Plant material may be requested by the certification office.

C. Testing Requirements for Existing *in vitro* Plant Material

1. To be considered as Existing *In vitro* Plant Material, Entry Level Material must have passed all tests on *in vitro* and grow out plantlets.
2. Source of *in vitro* plant material may be from *in vitro* plantlets, *in vitro* microtubers, Pre-Nuclear plantlet nodal cutting, and Pre-Nuclear sprouts.
3. Yearly testing for Potato virus X,Y,S,M,A, Leafroll, and PMTV by ELISA, or other approved test.
4. Screening for bacteria and fungi with Richardson medium and/or nutrient broth may be done by production lab.
5. *Clavibacter michiganensis* subsp. *sepedonicus* by ELISA or PCR.
6. *Pectobacterium* (as defined in B2 above) by crystal violet pectate (CVP).
7. Potato Spindle Tuber Viroid (PSTVd) need be tested only once at Entry Level stage.

D. Sampling Requirements for Laboratory or Greenhouse Mass Propagated plants and/or Tubers

1. All pathology samples must be taken and laboratory results completed prior to shipping of plantlets or tubers. A minimum of one percent of the plants or tuber population, but no less than 20 samples (or 20% of lots having 100 plants or less), must be tested for *Pectobacterium* (f. *Erwinia*) (as defined in B2 above)* and *Clavibacter michiganensis* subsp. *sepedonicus** bacteria, and Potato viruses X, Y, and Leafroll **.

* Protocol on file specifying what constitutes a confirmation of diagnosis for *Pectobacterium* and

Clavibacter michiganensis subsp. *sepedonicus*. Tests using CVP, bioassay, or other recommended tests for the purpose intended will be limited to 5 bulked plants per test.

** Virus tests limited to ELISA or other approved test. No more than 5 plants or tubers may be bulked when running the ELISA tests.

2. The sampling will be taken under the supervision of Seed Certification Agency. Tests are to be conducted by an independent diagnostic laboratory approved by the Oregon Seed Certification Agency.
3. Pre-Nuclear class stock has a zero tolerance for the above-mentioned pathogens.

E. Inspections: Upon receipt of the application, a certification agency will make at least two inspections of the micropropagation facilities (includes laboratory and/or greenhouse increase). See page 26 for reference material.

F. Test Results: Completed test results described in paragraph C above must accompany the certification Shipping Certificate sent to the Oregon grower. This must include sample designation, type of test, laboratory name, and signature of laboratory representative.

G. Classification of Stock Produced Through These Guidelines:

1. Plantlets, microtubers, or minitubers purchased by the seed grower would be considered Pre-Nuclear stock.
2. The progeny from Pre-Nuclear would be eligible for certification as Nuclear stock. (Nuclear production protocol available upon request).

H. Publishing Seed Sources: The seed source in the seed directories may list private laboratory or greenhouse providing the planting material.

I. Records Required to Retain:

1. Inventory of all plant material on hand and testing results.
2. Individual records for each line being mass increased, showing step-by-step flow through for each increase and the actual number of plants or micro-minitubers on inventory.

VIII. SEED STOCK DOCUMENTATION

Documentary evidence of the seed source used for planting must accompany the application. Certification tags from other states will be accepted when accompanied by a **North American Certified Seed Potato Health Certificate (NAHC)** issued by the state of origin. All seed stock must be winter test-plot approved, except when winter testing is not required based on lot size, or in special cases when approved in advance by the Certification office (see exception for seed lots coming from states that only offer tuber testing for the post-harvest test in Part X1V-B, page 18). Proof of certification of Oregon-grown seed will consist of tags/or sales records, shipping certificates from Oregon and other states will be accepted as proof of certification of planting stock for re-certification if methods of maintaining lot identity meet the approval of the Oregon Seed Certification office. In case of growers planting their own seed for re-certification, greenhouse readings will be accepted. When growers use their own seed, the lot number must be shown on the application. The only exceptions for no lot number are for those seed lots being improved under the Exception class and approved by the Oregon Seed Certification.

IX. SEED ELIGIBLE FOR CERTIFICATION

(See Appendix page 25 for comparison with other states)

Pre-Nuclear, Nuclear, and Generation 1 - Generation 5

Unless otherwise denoted, all seed potatoes certified in Oregon are produced under the Limited Generation Program

All lots entered for re-certification in Oregon must have been subject to a post-harvest Winter Grow-out (see page 17) with the exception of (1) lots of 750 pounds or less; or (2) lots approved based on existing policy (see *Policy Statement #2 - OSCS Policy Regarding Accepting Lots Which Have Not Had A Winter Grow-out*).

Application acceptance cutoff: Applications for recertification of potato lots for class G1 and higher will **not be accepted after June 30th**.

Specific requirement by class:

- A. Pre-Nuclear, must be produced according to page 11 of the Oregon Seed Potato Standards.
- B. Generation Nuclear, 1, 2, 3, and 4 from any source meeting the following requirements:
 1. Originating progeny tuber must have been tested for bacterial ring rot, *Pectobacterium sp.*, and viruses (A, M, LR, S, X, Y, PMTV, and spindle tuber viroid) .
 2. Progeny being planted must not have been increased in the field more years than is acceptable for the generation being produced.
 3. Class being planted must meet disease tolerances for Oregon's limited Generation requirements for the

class.

- C. See pages 10 and 22 (“Varietal Eligibility” & “Varieties Certified”, respectively) for further seed stock requirements.
- D. Seed must be Generation 4 or higher. Generation 5 class of seed shall not be eligible for recertification. The Certification office must decide exceptions for seed stocks not meeting requirements. Any exceptions will be identified by the prefix "EXC". EXC is limited to two increases after initial production of EXC-1. See Appendix, page 27, for special requirements in meeting the EXC class.
- E. Seed Categories

Table 2 – Seed Categories – Class Produced

<u>Seed Planted</u>	<u>Class Produced</u>	<u>Field Year</u> *1
Pre-Nuclear	Nuclear	Greenhouse
Nuclear	Generation 1	FY1
Generation 1	Generation 2	FY2
Generation 2	Generation 3	FY3
Generation 3	Generation 4	FY4
Generation 4	Generation 5	FY5 *2

*1 – maximum, may be less if previous lot down-graded

*2 – may be extended 1 year for seed of varieties in very short supply as ‘special case’ with variety breeder/owner approval.

F. Generations Eligible for Recertification

1. **Pre-Nuclear (PN)** - Plant material produced according to page 11. Seed must be derived from mother plants that have been tested and found free of PVX, PVY, PVM, PVS, PVA, PLRV, PMTV and any other rod shaped viruses, spindle tuber viroid, *Clavibacter michiganense* subsp. *sepedonicus* and *E. carotovora*. Stock must be increased via tissue culture, stem-cutting (SC), techniques or derived from true potato seed (TPS). Lots not qualifying for Pre-Nuclear Class can be downgraded to a class for which standards are met in regard to disease tolerances.
2. **Nuclear (N)** - Must be produced from Pre-Nuclear stock.
3. **Generation 1 (G1)**– Must be planted from Nuclear class or higher seed stock”.
4. **Generation 2 (G2)** - Must be grown from Generation 1 or Nuclear seed stock.
5. **Generation 3 (G3)** - Must be grown from Generation 2 or higher seed stock.
6. **Generation 4 (G4)** - Must be produced from Generation 3 or higher seed stock.

7. **Generation 5 (G5)** - Must be produced from Generation 4 or higher seed stock with a maximum of 2% mosaic in the post-harvest test. This class is not eligible for recertification in Oregon, however may be extended 1 year for seed of varieties in very short supply as ‘special case’ with variety breeder/owner approval (see main Oregon Certification Service Handbook page 3, Item b under “Limitations of Generations”).

G. **Official Sub-class designations:** Sub-class designations are used to specify certain aspects of a class that are not related to its field-year or of having met tolerances for disease/off-type of the class noted. These are indicated by a post-fix label following the class. Current sub-class designations used on Oregon are:

Table 2B - Sub-class used in Oregon

-SC	material derived from “ stem cut ” lines,
-TPS	material derived from “ true potato seed ”
-LSP	material in the certified line selection program
-PVX	lots lab tested for PVX
-PVY	lots lab tested for PVY
-PLRV	lots lab tested for PLRV
-OUO	lots for grower’s own use only*

* cannot be sold as certified seed the subsequent year but may be used by the same grower to produce a certified lot.

X. CROP HISTORY

Table 3 - Years Out of Potatoes

Generation Produced	Years out of Potatoes*
Pre-Nuclear	Approved Lab/Greenhouse
Nuclear/Gen 1	Three years
Generation 2, 3	Two years
Generation 4,5	One year

* Unless prior crop was a higher class and same variety.

A. **Bacterial Ring Rot:** Land will not be eligible for certified seed production until the fifth year following the identification of bacterial ring rot. Volunteers in a field with the above history will disqualify the field for certification.

B. **Volunteers:** Volunteer potatoes in excess of those shown on the Table 5 “Field/Harvest Tolerance” (pg. 16) will not be permitted in any field, except where the previous crop of the same variety was of an earlier generation than that

being produced.

C. **Modification of crop history:** May be approved by the Seed Certification office when cultural practice has proven to be successful. Cultural practices may include mechanical means (such as deep plowing) and/or chemical (such as use of fumigants, flooding, or other material) for seedbed preparation. Materials and methods must be a matter of record in the Seed Certification office. Whichever method is used, it must be approved and adequate to maintain variety and disease purity. Plants outside of the defined row may be construed as volunteers.

XI. FIELD MANAGEMENT

A. **Nuclear Seed Production** – Special recommendations and requirements for the handling, testing, growing, storage, and increase procedures for early generation seed stock (EGSS) materials are available from the Seed Certification office. EGSS should be planted and harvested prior to handling any other seed generations. The earliest generation should be handled prior to later classes within the program.

B. **Lot identification:** Seed lots must be staked at both ends and at least every 300 feet along dividing rows. A skip row is required between different varieties.

C. **Isolation - see Table 4**

Table 4 - Isolation Requirements

Classification of seed being produced	Isolation Required
Pre-Nuclear	Approved Greenhouse or Laboratory
Nuclear-Generation 1	300 feet from fields planted with seed higher than G3 class”*1, *3, *4
Generation 2 & 3	300 feet from fields planted with seed higher than certified G4 class*2, *3
Generation 4 & 5	Distinct separation from commercial

*1 i.e. must be isolated from fields using G4 and G5 seed as planting stock.

*2 i.e. must be isolated from fields using G5 class seed stock for planting; also does not apply if ‘own use only’ sub-class.

*3 This isolation requirement is waived if adjacent to experimental lines that can be documented as having the same, or higher, testing status as materials of a similar class to those being certified in the block.

*4 It is strongly recommended that Nuclear and G1 fields be isolated from Alfalfa stands due to potential spread of Alfalfa Mosaic Virus (Calico).

- D. **Spread of Potato Pathogens:** Precautions should be taken when roguing, irrigating, or cultivation to prevent the spread of potato pathogens.
- E. **Roguing of diseased and off-type plants:** Roguing should begin early in the season and be performed as often as necessary. Plants, seed pieces, and all new tubers from diseased hills should be removed from fields and destroyed. Leaving them in the field may be cause for rejection. However, roguing bacteria ring rot plants is not permitted in a Certified seed field.
- F. **Insect Vector Control:** Vector control should be maintained throughout the growing season. It is recommended that the grower follow pest control program described in the current PNW Insects Management Handbook (see page 3 for link).
- G. **Fall Harvest:** Field planted lots not harvested by December 21st are no longer eligible for certification.

XII. FIELD & HARVEST INSPECTIONS

A. Overall Provisions:

- Inspections:** Inspections are performed according to prescribed procedural methods and will include at least two field inspections, the first to occur before (or close to) row closure. Fields must meet the minimum tolerances for each certified class as shown on Table 5 to be to be accepted for certification at that class. Greenhouse testing will be required in lieu of a second field-testing evaluation at the discretion of the agency/inspector. The Winter Grow-Out sample size under these conditions will be double the number of tubers normally required for the acreage inspected. Nuclear seed stock will be exempt from the double sample size. Additional field, digging, bin, and tuber inspections, including laboratory tests, will be made at the discretion of the inspector.
- Grower Notification:** Each grower must notify OSCS of a spraying date(s) for the inspector's protection. Growers are urged to use spray schedule signs in all fields. These signs are available through the county Extension office.
- Refusal to Inspect:** Any field condition making thorough inspection impossible, such as frost, weeds, blight, Rhizoctonia etc., may be cause for refusal to inspect or withholding of certification pending winter test plot results. In such cases, the winter test sample must be at double the standard sample size required.
- Late Blight** found during field inspection and confirmed by lab diagnosis will be reported on the Field Inspection Report and Final Report.
- Bacterial Ring Rot Inspections:** Fields withdrawn after a 1st inspection but prior to 2nd inspection (and not destroyed) must be inspected for BRR where conditions

allow (even if grower's own seed).

- Zero Tolerance** means none found during the normal inspection procedures. Zero is not a guarantee that the lot inspected is free of disease or other varieties. Lots showing more disease than permitted for the class being produced will be downgraded, or refused certification. See definition of seed lot (page 38).

- Descriptions of Symptoms** expressed by diseases noted in these Standards, and recent information about such diseases, can be found in the current on-line edition of the PNW Plant Disease Management Handbook – Potato Section (<https://pnwhandbooks.org/plantdisease>).

B. Chemical Damage:

- The presence of chemical damage severe enough to mask disease symptoms will be a basis for reclassification of the seed lot.
- Visible symptoms of chemical injury of any magnitude to an incident of 3% or more of the sample inspected in the field may result in the field being withheld from certification pending test plot results where results will be noted on the final reports. A representative of the Certification office may sample fields held for winter test on grid basis before harvest. The samples will be tested in the greenhouse.
- Additional fees covering the additional expenses of sampling and testing of field exhibiting symptoms of chemical damage may be charged to the grower(s) as deemed necessary by the Seed Certification office.

- Bacterial Ring Rot:** Any BRR found in a seed lot of a Seed Farm will be cause to remove the lot from certification. All lots on that Seed Farm planted with the same seed lot as the rejected field will also be refused certification. Bacterial ring rot is not permitted in or out of count and is a non-roguable disease. A third or additional inspection will be required on remaining seed lots and a winter test will be required at double the normal size. All other seed lots associated with or planted after the rejected lot will not be eligible for recertification, but will be eligible for commercial planting if all other certification requirements are met. The Certificate of Final Certification and/or tag shall be clearly marked with the words "**Not Eligible for Recertification**" for those lots so identified. The grower shall be responsible for marking all appropriate tags and shipping certificates as not eligible for recertification

- Inspection of Non-Certified Fields:** All acreage planted to potatoes, but not entered into the certification program for re-certification on a seed farm, must be inspected at least once during the growing season for the presence of bacterial ring rot, except (1) when a grower plants his own certified seed or (2) when the seed produced is for the producers' use only and will not be eligible for sale as certified seed.

No bacterial ring rot is permitted in fields not entered

Table 5 - Tolerances - Field/Harvest Inspections

Factor ^{a, d}	Generation								
	PN ^b	N ^b	G1 ^b	G2		G3 & 4		G5	
				1 st	2 nd	1 st	2 nd	1 st	2 nd
Leafroll	0.00	0.00	0.05	0.20	0.10	0.50	0.25	0.50	0.25
Mosaic	0.00	0.00	0.10	0.30	0.20	2.00	1.00	3.00	2.00
Other visible viruses ^g	0.00 ^e	0.00	0.10	0.30	0.20	2.00	1.00	3.00	2.00
Total visible virus	0.00	0.00	0.10	0.50	0.20	2.00	1.00	4.00	3.00
Blackleg ^c	0.00 ^f	0.00	0.10	0.30	0.20	3.00	1.00	3.00	1.00
Chemical Injury	3% ^h (all classes)								
Variety mixture/ off type	0.00	0.00	0.01	0.20	0.10	0.50	0.25	2.00	0.50

^a There is a zero tolerance for the following at all classes: **Spindle Tuber Viroid, Bacterial Ring Rot, and Root-Knot Nematode**. Tolerance for disease symptoms caused by **Tobacco Rattle Virus, Potato Mop Top Virus, and Potato Virus Y-ntn** strains in foliage or tubers is not to exceed 0.5% for seed eligible for recertification, nor 2.0% for certified seed ineligible for recertification.

^b Last inspection requirements.

^c As caused by *Pectobacterium* spp. or *Dickeya* spp. bacterium. This tolerance is based on the presence of a typical, inky black stem symptoms near soil surface without obvious symptoms of White Mold (*Sclerotinia sclerotiorum*). It is not based on laboratory identification. Tolerance does not take into consideration the presence of blackleg bacteria that may be present on the plant but not causing disease symptoms or other symptoms such as aerial stem rot, below ground stem decay, tuber decay, or early dying. Tolerance is no indication that this is a true value for the amount of blackleg in a seed lot.

^d Protocols on file specifying what constitutes a confirmation of diagnosis.

^e Also, zero tolerance for PVX, PVY and PLRV with ELISA testing.

^f Plants or tubers tested for bacteria.

^g Does not include Calico (Alfalfa Mosaic Virus) which is reported as a percent found, but not scored against the lot. Disease caused by *Phytoplasma* (I.e. Purple Top, Aster Yellow, etc.) or *Candidatus liberibacter* (Zebra Chip) are reported but are not counted against the class unless severe enough to mask scoring of other diseases

^h Field withheld from certification pending Post-Harvest Test results where results will be noted on the final reports.

for certification. Finding bacterial ring rot in the uncertified fields will cause Certified seed fields to be subject to the bacterial ring rot requirement noted on Page 15 (“C. **Bacterial ring rot**”).

A special application for the inspection of uncertified fields must be completed along with a map showing the location of each field.

Failure to comply with the Seed Farm inspection requirement will result in downgrading the seed grower’s entire crop one generation.

E. Harvest Inspections: A harvest or bin inspection of tubers is a requirement for final certification unless this inspection is considered not possible by the Harvest Inspector due to circumstances out of the grower’s control. Any lot not so inspected will have the sentence “No harvest/bin inspection conducted on this lot”

included on the Final Report. Lots not inspected due to lack of cooperation by the grower, such as failure in communicating harvest dates to the Harvest Inspector, may not be eligible for certification.

XIII. LATENT VIRUS TESTING

A. Leaf Sampling & Latent Virus Determination: Leaf samples will be taken in late August, or from the Winter Grow-Out sample, by Seed Certification personnel for virus determination. Applications for virus testing from the field must be made by July 30. A late fee will be charged for acreage applied for after this date. Requests for latent virus testing of a lot from the Winter Grow-Out sample should be indicated at the time the WGO sample is delivered, and at least within 4 weeks of tuber delivery.

Pre-Nuclear lots must be tested for PVX, PVS, PVY, and PLRV. Testing for PVX is optional at all other classes. Nuclear* and Generation-1 lots of varieties known to be

Table 6 - Tolerances - Latent Virus Testing^a

Latent Virus	Generation					
	PN	N	G1	G2	G3-G4	G5
PVX	0.0	0.0	1.00	3.00	6.00	6.00
PVY	0.0	0.0	0.10	0.20	1.00	2.00
PLRV	0.0	0.0	0.10	0.20	1.00	2.00
Sampling Frequency ^b (Plants/acre)	* ^c	25%	500	50	20	20

Footnotes

^a Latent virus testing is only required at Pre-Nuclear class (i.e. greenhouse produced material) for all varieties, and for varieties latent for PVY or PLRV, and those of unknown symptom expression to PVY, at the Nuclear and G1 Class. Latent virus testing of field-produced classes beyond Nuclear Class (G1– G5) is only used to assign a sub-class and not to downgrade a lot. See XIII. LATENT VIRUS TESTING, page 16, for additional details).

^b Minimum number of plants to be sampled is 100. For WGO lots, all plants, up to 400 per lot, will be sampled.

^c See page 12 “Sampling Requirements” for information of number of plants to be sampled.

symptomless to PVY (see B below) or varieties of unknown symptom expression to PVY, must be laboratory tested for PVY. Nuclear* and Generation-1 lots known to be symptomless to PLRV (see C below) must be laboratory tested for PLRV. Testing for PVY or PLRV is optional for all other generations.

In field testing, test results for Nuclear Class generation seed lots can be identified with specific sections of no more than 40 plants each. Only those sections with test results that exceed the tolerance will be downgraded. Any lot for which the % of removed blocks exceeds 7% will be sub-classed “Own Use Only” and not available for sale as certified seed.

The standard sample for Latent Virus Testing of WGO lots is 400 leaves per lot (regardless of lot size, or 100% of emerged plants for lots with less than 400 plants). The grower may request additional sampling for larger lots.

* NOTE: Nuclear Class seed for “own use only” is exempt from the requirement for latent virus testing provided a winter grow-out sample of at least 220 tubers is submitted.

B. Latent PVY Testing (for asymptomatic varieties): All varieties identified by the breeder/developer or the seed certification agency as not readily expressing PVY symptoms, or recognized as showing only very mild symptoms of PVY under WGO conditions, or of unknown PVY symptom expression in field and winter grow-out greenhouses, must be lab tested by ELISA (or test of equivalent accuracy) for the presence of PVY through Generation-1.

Varieties that are marked with an asterisk (*) in Section VI – A fall into this category and include (but may not be limited to) **CalWhite, Gem Russet, GemStar Russet, LaRatte, Pike, Sage, Shepody, all Russet Norkotah, and Winema.**

C. Latent PLRV Testing (for symptomless varieties): All varieties identified by the breeder/developer or a seed certification agency as not readily expressing PLRV symptoms, or recognized as showing only very mild symptoms of PLRV in field and winter grow-out greenhouses, must be lab tested by ELISA (or test of equivalent accuracy) for the presence of PLRV through Generation-1. The Experimental line **TX1523-1Ru/Y (“Sierra Gold”)** is the only variety currently on this list.

D. Official Testing Laboratories: The Seed Certification office shall keep a list of plant diagnostic laboratories that will be recognized for official testing of certified samples to determine eligibility of a seed lot. The Seed Certification office will select one or more labs for final diagnosis of the sample.

E. Tolerances for Latent Viruses: Tolerances are based on percent virus infection as determined through laboratory testing of leaf samples collected at the sampling frequency indicated in Table 6. Seed lots that meet the specified PVX, PVY, and PLRV test tolerances for the seed generation being evaluated will have the respective sub-class PVX, PVY or PLRV designation added to the classification of that seed lot. Zero tolerance means none found in the sample tested, using approved laboratory test procedures. Zero is not a guarantee that the lot tested is free of disease. Only the generations indicated will be downgraded if the percent virus exceeds the specified tolerance.

XIV. POST-HARVEST TESTING REQUIREMENTS
(AKA Winter Grow-out, WGO)

A. Lots Requiring Winter Testing: All seed lots entered for certification require Winter Testing for final certification, with the exception of:

1. Lots documented to be 750 pounds or less; or

2. Lots shipped within 90 days of harvest.

For those seed lots entered for Winter Testing, and shipped prior to completion of Winter Testing, the statement, "Pending Winter Test Results," will be printed on the tag or Final Certificate of Certification. A winter test of any lot may be required at the discretion of the inspector regardless of shipping date. The policy on granting this exemption to the Winter Grow-Out for "Special Cases" is on file.

B. Acceptance of tuber tested lots: A Post-Harvest Test (PHT) in Oregon is construed to mean a winter grow-out of plants that are then visually evaluated. Lots that have only been subjected to laboratory-based tuber testing as the PHT will only be accepted from states or provinces where a winter grow-out is not an option. Tuber tested lots from states or provinces where there is a WGO option will only be accepted as a 'special case' (policy on file).

C. Dates: Winter test samples should be submitted by November 20th or an additional fee will be charged. OSCS should be notified in advance of any samples to arrive after December 15th. **No winter test samples will be accepted after January 2nd.** Growers will be responsible for transportation of sample to the winter test greenhouses in Corvallis. Planting sequence will be determined by the date of arrival at Corvallis, and treatment time necessary to break dormancy.

D. Minimum sample size:

1. Winter test samples must be submitted in bags weighing no more than approximately 50 pounds.
2. Sample amounts:

a. Fields less than 1 acre:	220 tubers*
b. Fields 1-20.9 acres:	420 tubers
c. Fields 21-40.9 acres:	840 tubers
d. Fields 41 acres and above:	1,260 tubers

* May be eye-indexed if early generation material

E. Sample Selection: The sample must be representative of the field. The sample can either be (1) handpicked from all over the field; or (2) a few tubers selected from each truckload. Sampling from cellars is strongly discouraged. Tuber size should be four to six ounces. Exceptions to this rule for small lots will be considered. Contact the OSCS office for acceptable alternatives.

F. Sample Maturity: Tubers must be the same maturity as that required for storage. Immature tubers break down during the high temperature dormancy-breaking treatment, resulting in loss of part of the sample. Immature tubers of certain varieties do not respond to dormancy-breaking procedure. Conversely, OSCS staff should be informed of any varieties known to have very short dormancy, or lots that have been stored more than 2 months from harvest, to avoid over exposure to gibberellic acid during standard handling of the Winter Grow-out lots.

Table 7 – Tolerances – Winter Grow-out

Factor ¹	Nuclear	Gen 1	Gen 2	Gen 3	Gen 4	Gen 5
Leafroll	0	0.25	0.30	0.75	1.0	BSA ^a
Mosaic						
- Other varieties	0	0.25	0.50	1.00	2.00	
- Latent PVY varieties ^b	0	0.25	0.50	1.00	5.00 ^d	BSA
Other visible virus ^c	0	0.25	0.75	2.00	2.00	BSA
Total visible viruses						
- Other varieties	0	0.50	0.75	2.00	2.00	BSA
- Latent PVY varieties ^b	0	0.50	0.75	2.00	5.00 ^d	BSA
Variety mixtures	0	0	0.25	0.50	1.00	BSA

There is a zero tolerance for **Spindle tuber viroid, Bacterial Ring Rot, and Root-Knot Nematode** at all classes. Protocol on file specifying what constitutes a confirmation of diagnosis for BRR.

a **BSA:** Acceptance of the seed lot will be based on buyer/seller agreement (see Part XVIII - 2 "Contract Grade", Pg 20)

b **Latent Varieties:** See definition on page 17, include (but may not be limited to) CalWhite, Gem Russet, GemStar Russet, LaRatte, Pike, Sage, Shepody, all Russet Norkotah, and Winema.

c **Other Visual Virus:** Includes diseases caused by phytoplasma organisms (i.e., Purple Top, Aster Yellow) and Zebra Chip (if confirmed). Does not include virus-infected plants showing no visual symptoms.

d **Virus Cap:** Only lots at or below 2% mosaic are eligible for recertification.

G. **Winter Greenhouse Test Tolerance** (percent visible symptoms): Potato varieties showing no or little visual symptom expression when infected by PVY (i.e. asymptomatic or ‘latent’ varieties) may be serologically tested during the winter.

Zero tolerance for chemicals, disease, or other varieties means none found during the normal inspection procedures. **Zero is not a guarantee that the lot inspected is free of disease or other varieties.**

XV. BIN & STORAGE REQUIREMENTS

A. **Storage Location:** The grower must notify the Certification Office or Harvest Inspector of the storage location(s) before storing a crop. Bin inspections will be made at the discretion of the certification inspector.

B. **Sanitation:** Sanitation shall include careful cleaning and disinfection of the storage area and all equipment. New sacks must be used for Nuclear and Generation 1 Class seed. Disposable boots and gloves, &/or disinfectant solution, should be available to visitors to sanitize shoes, knives, etc.

C. **Prohibited Diseases:** No bacterial ring rot or visible external symptom of root-knot nematode or wart is allowed in any class of certified seed. The discovery of these diseases will be cause for rejection. Any seed stored in a cellar with potatoes having bacterial ring rot will not be eligible for recertification, however seed could be sold for commercial planting.

D. **Separation & Maps:** Certified seed lots of in storage must be clearly distinguished from other seed lots and stored separately from commercial potatoes. Empty bins or tight walls between certified and commercial seed lots are acceptable (paper is not acceptable). Where more than one seed lot is stored in a cellar, all bins should be numbered, and those cellars and bins used for storing each lot must be recorded and cellar maps submitted to the Certification Office before tags, shipping certificates, or greenhouse results will be issued.

XVI. SORTING REGULATIONS

A. **Prohibited Diseases:** No bacterial ring rot, root-knot nematode, or wart, are allowed in certified seed. Policy available upon request as to how seed is evaluated for bacterial ring rot and root-knot nematode infections, and how it is reported. Discovery and proof of the presence of these diseases after tagging and/or sale may be basis for certification withdrawal by the Oregon Seed Certification office.

B. **Sanitation:** All equipment that contacts the tuber (sacks, truck beds, pliers, bin boards, etc.) should be disinfected each year before use and between each lot. Disinfection is not effective or satisfactory unless given adequate exposure time and preceded by scouring for removal of dirt, debris, rot smears, etc.

C. **Exotic Diseases:** Lots showing a disease new or uncommon to Oregon may have certification withheld pending further investigation (i.e. Corky Ringspot, Zebra Chip, Potato Yellow Vein Virus). No disease that may result in an APHIS-sanctioned quarantine is allowed in certified seed and must be reported to the Oregon Department of Agriculture if found and confirmed.

D. **Physiological Disorders:** Heat, frost, rot, excessive sprouting, or other conditions adversely affecting seed value may be cause for rejection if excessive.

XVII. TAGGING, SEALING, AND SHIPPING

A. **Tags attached:** All seed moved to another area of production must have tags attached or be accompanied by a Certificate of Final Certification. Failure to do so will be cause for withdrawal of certification. Tags and certificate booklets can be obtained through the Seed Certification office. Certificates are available ‘on line’ through the eCertification page (see page 3).

B. **Tag Colors:** Three colors of tags are available for use on Oregon Certified Seed Potatoes; color of tag designates grade only. The blue color represents the US#1 Seed Potato Grade, and the yellow, the Contract Grade between buyer and seller. White tags are used for “Experimental Lines” (see Part VI-b).

C. **Tags and Certificate of Final Certification:** Appropriate statements will be placed on each certification tag or Certificate of Final Certification to identify the seed stock. Whether tags or Certificates, they will indicate the following:

1. **Variety**

2. **Class** of seed: Pre-Nuclear, Nuclear, Generation 1, 2, 3, 4, or 5.

3. **Sub-class:** of PVX, PVY, PLRV, OUO, TPS, SC, LSP (and combination thereof). If no sub-class is indicated, the material is assumed to be derived from *in vitro* material.

4. **"Pending Winter Test Results"** if testing has not been completed at time of tagging and a sample has been submitted for winter testing.

5. **"Not Eligible for Re-certification"** if not Winter Tested or is Generation 5.

D. **SEALING:** the use of seals is optional on bulk seed in Oregon, but shippers should be aware of the sealing requirements of the receiving state.

XVIII. GRADE INSPECTIONS

Shipping-point inspections on Oregon seed are carried out by the Oregon Department of Agriculture Commodity Inspections Division ((503) 986-4570). They are optional on lots of Oregon certified seed potatoes not shipped out-of-state. The seed grower must check the shipping point inspection requirements of the receiving states before moving seed out of Oregon. The quality of graded potatoes is the full responsibility of the seed grower. When the buyer or importing state requests a shipping point inspection, the U.S. No. 1 seed potato or Contract Grade tolerance will be followed.

The grower is also advised that some states have additional special requirements for seed being shipped into their states, so the certification agency of the destination state should be contacted to determine if requirements additional to those required in Oregon are needed for seed imports. An **Agency Contact List** has been posted at:

https://seedcert.oregonstate.edu/sites/seedcert.oregonstate.edu/files/paa-agency_contact_list_-_web.pdf

GRADE REQUIREMENTS

1. **U.S. No. 1 Seed Potatoes:** See Appendix, page 33.
2. **Contract Grade:** Contract grade shall consist of potatoes that meet all the requirements of grade and condition established by a buyer-seller agreement except that not more than 1% (percent) late blight, soft rot, wet break-down, or dirt or debris will be allowed. No bacterial ring rot or root knot nematode based on visible external symptoms permitted. This grade will be tagged with a yellow tag.

NOTE: Oregon participates in the **Seed Potato Quality Management Program** (aka “MOU”), which requires adhering to the requirements in the “**Necrotic Virus Management Plan Management Plan for Potato**” (NVMP). Under these two agreements some conditions unique to interstate seed shipments include: (1) All seed shipped out of state must be inspected for Necrotic arcs caused by one of the ‘necrotizing viruses (PVY, PMTV, TRV, AlfMV); (2) A post-harvest test is required for all seed lots transported across state/provincial or international boundaries that are to be entered into the certification process or sold for use in commercial production, (3) The post-harvest test of tolerant varieties, i.e. those in which virus symptoms cannot reliably be observed, will use ELISA (or another approved assay) rather than visual observation to determine the virus incidence. These rules only apply to seed shipped out-of-state.

For more information on the NVMP see:

<https://cpb-us-e1.wpmucdn.com/blogs.cornell.edu/dist/5/6962/files/2018/06/Potato-Tuber-Necrotic-Disease-Management-Plan-6-14-18-2h32laj.pdf>

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A. Varieties Eligible for Certification in Oregon

(1-30-2019)

Note: Designations as presented below relate to how OSCS applies the requirement, found on page 11, that all varieties listed as ‘proprietary in the US’ need the owner’s permission for certified production. The OSCS definition of ‘proprietary in the US’ is found on page 38. The legal owner of a variety listed as ‘public’ may challenge that listing by contacting OSCS, however, once a seed lot is accepted into the program, the variety status for that lot will not change for that production year or any further production by that grower.

Varieties that are marked with an asterisk (, **) are those that the breeder/developer or a seed certification agency have identified as not readily expressing PVY, PLRV symptoms (respectively), or recognized as showing only very mild symptoms of PVY/PLRV and thus **must be** lab tested by ELISA. For more information on variety ownerships and proprietary nature of various varieties see **Variety Identification & Ownership Chart** at: <https://seedcert.oregonstate.edu/sites/seedcert.oregonstate.edu/files/varietyidownerschart.pdf>*

1. Public Varieties Eligible for Certification in Oregon (no restrictions on production)

Atlantic	Gogu Valley	Red Pontiac
Bannock Russet	HiLite Russet	Red Ruby
Bintje	HO2000 (“Blushing Belle”)	Redsen
Brigus	IPM-ABR	Rose Gold
Butte	Irish Cobbler	Russet Burbank
CalRed	Kennebec	Russet Norkotah*
CalWhite*	Krantz	Russet Nugget
Caribe	La Ratte*	Sangre
Carlingford	Lemhi Russet	Sante
Cascade	Maris Peer	Shasta
Century Russet	Maris Piper	Shepody*
Cherry Red	Monona	Sierra
Chieftain	Moonlight	Snowden
Chipeta	Nooksack	Steuben
Ciklamen	Norchip	Targhee
Coastal Russet	Norgold Russet	Tejon
Denali	Norking Russet	Viking
Desiree	Norland (inc. Red, Dark Red)	White Rose
Donna	Pike*	Yukon Gold
Fontenot	Pioneer	
Frontier Russet	Ranger Russet	
Gemchip	Red La Soda	

A. Varieties Eligible for Certification in Oregon (continued, page 2)

2. Proprietary Varieties Eligible for Certification in Oregon

Growers of proprietary varieties must have owner's permission for certification. See page 11 and 38 for more information.

A91556-1W (Ivory Rose)	FL 1533	Penta
AC Stampede Russet	FL 1867	Perline
Accelerate	FL 1879	Piccolo Star
Achill	FL 2048	Premier Russet
Adora	FL 2126	Princess
Agata	FL 2137	Purple Majesty
Alpine Russet	FL 2204	Purple Pelisse
Alturas	Gala	Purple Prince (aka Mi Negra)
AmaRosa	Gem Russet*	Red Sunset
Anuschka	GemStar Russet*	Rio Grande Russet
Apache	Goldrush	Romanze
Avalanche	Highland Russet	Russet Legend
Baby Boomer	Ida Rose	Russet Norkotah 112*
Blazer Russet	Invigorate	Russet Norkotah 223*
Canela Russet	Ivory Crisp	Russet Norkotah 278*
Castle Russet	Jacqueline Lee	Russet Norkotah 296*
Cecile	Klamath Russet	Russet Norkotah Selection 3*
Challenger	Lady Alba	Russet Norkotah Selection 8*
Classic Russet	Lady Amarilla	Saginaw Chipper
Clearwater Russet	Lady Anna	Smilin Eyes
Colorado Rose	Lady Claire	Soprano
Crimson Red	Lady Terra	Summit Russet
Cultivate	Lamoka	Tebina
Dakota Crisp	Marcy	TerraRosa
Dakota Diamond	Mazama	Teton Russet
Dakota Jewel	Modoc	Toscana
Dakota Pearl	Molli	TX1523-1Ru/Y
Dakota Ruby	Morning Gold	(aka "Sierra Gold") **
Dakota Russet	Mountain Gem Russet	Umatilla Russet
DarkRed Chieftain	NDA050237B-1R	Wallowa Russet
Defender	Nicolet	Waneta
Divina	NorDonna	Willamette
Echo Russet	NorValley	Winema*
Elfe	Owyhee Russet	Yukon Gem
Fabula	Payette Russet	Yukon Nugget
FL 945	Penni	

B. LIMITED GENERATION CERTIFIED SEED POTATOES
LIMITED GENERATION CERTIFIED SEED POTATOES
- Field Planting Comparison Table -

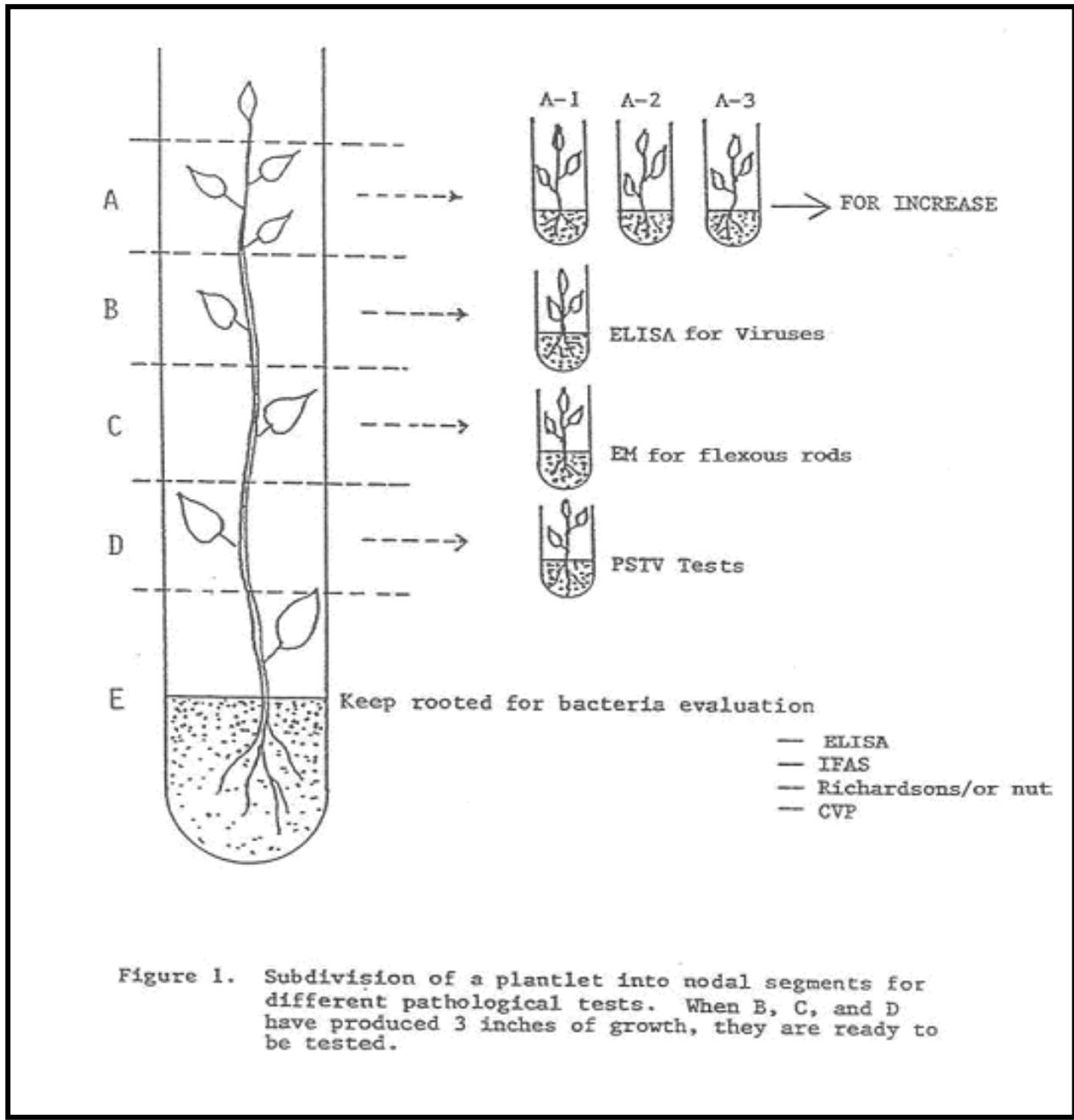
Adapted from table prepared by Potato Association of America**

Agency	<u>YEAR IN THE FIELD *</u>							
	1 ²	2	3	4	5	6	7	8
Alaska	G1 ³	G2	G3	G4	G5	G6	G7	G8
California	G1	G2	G3	G4	G5	.....	.....	.....
Colorado	G1	G2	G3	G4	G5	G6	.....	.....
Idaho	N	G1	G2	G3	G4	G5	G6	.....
Maine	FY1	FY2	FY3	FY4	FY5	FY6	.....	.....
Michigan	FY1	FY2	FY3	FY4	FY5	FY6	.....	.....
Minnesota	G1	G2	G3	G4	G5	G6	C	.....
Montana	N	G1	G2	G3	G4	.....	.....	.....
Nebraska / Wyoming	N	G1	G2	G3	G4	G5	.....	.....
Nevada	N	G1	G2	G3	G4	G5	.....	.....
New York	N1	N2	G1	G2	G3	G4	G5	G6
N. Dakota	N	G1	G2	G3	G4	G5	C	.....
Oregon	N	G1	G2	G3	G4	G5	.....	.....
Utah	N (G1)	G2	G3	G4	G5	G6	.....	.....
Washington	N	G1	G2	G3	G4	G5	.....	.....
Wisconsin	FY1	FY2	FY3	FY4	FY5	FY6	C	.....
Canada	PE (G1)	E1 (G2)	E2 (G3)	E3 (G4)	E4 (G5)	F (G6)	C (G7)	.....

* - Year in the field unless lot downgraded due to exceeding tolerance for specific trait or disease. Some states use a separate system to denote eligible class and field year. See state regulations (link below) for specifics on class terminology by state.

** The most current version of this chart as well as the current PAA State Regulations chart posted at: <https://seedcert.oregonstate.edu/potato-certification-national-level>

C. Testing requirement for Entry Level Mother Plants



Additional References Available for Early Generation Production

“OSCS Laboratory Pathology Testing Audit & Facilities Inspection”

“Pre-Nuclear Class Production Lab & Greenhouse – requirements and recommendations”

(includes: “OSCS Greenhouse Inspection Checklist”

“Pre-Nuclear Class Production - General notes” OSCS PP Procedure Sheet (#8a)

“Nuclear Class Seed Potato Production” - OSCS PP Procedure Sheet (#8b)

“Tagging of Certified Potato Lots” OSCS PP Procedure Sheet (#14)

D. Limited Generation Seed Stock Exemption (“EXC Program”)

Requirements:

1. Permitted only when insufficient quantity of Limited Generation seed stock of a given variety, clone, or selection exists in Oregon and with the permission of the originator of the variety or line where applicable.
2. Requests for exemption should be made in writing to the Oregon Certification office prior to planting. The request must include: (1) the reason(s) that an exemption from the Limited Generation Program is being made; (2) the source of planting stock; and (3) and the name of the originator of the variety or line where applicable.
3. If the clone has not been released as a variety, an Experimental Variety Request application to the Oregon Seed Certification office must be submitted.
4. If there is no suitable Entry Level material available for the variety or line as defined in “VII. MICROPROPAGATION - B. [Testing Requirements for Entry](#) Level on page 11 of the Potato Standards, Ten (10) typical tubers of the variety or clone must be submitted during the first year of exemption to an approved lab for clean-up, testing, and in vitro propagation for potential increase under the Limited Generation program.

NOTE: the EXC program is not be used to qualify seed that has not been subjected to a winter grow-out (see [Policy Statements #2 "No Winter Test"](#) for details).

Classes: Three (3) classes of seed stock are recognized under this program:

A. EXC-1

1. Increase will be limited to **1,100 pounds** of planting stock.
2. Seed sources over 100 pounds must have fifty (50) tubers tested for bacterial ring rot*, PVY, and PLRV by an approved plant diagnostic lab. Testing costs will be borne by the person requested exemption.
3. Seed must be unit-planted. Seed sources derived from a pathogen tested tissue culture program, but **NOT** meeting the Limited Generation requirements because of the presence of PVS, will not have to be unit planted.
4. Field certification tolerances for this class will coincide with those listed for G3 (see page 14).
5. Must be winter tested and meet G3 winter test tolerance (see page 16 in the 2003 Standards).

B. EXC-2

1. Seed source must be from EXC-1.
2. Field certification tolerances for this class will be those listed for G4.
3. Seed must be winter tested and meet G4 winter test tolerances.

C. EXC-3

1. Seed sources must be from EXC-1 or EXC-2, or where no EXC-1 or EXC-2 seed available, seed from a Limited Generation Program (as defined in the Standards) may be used. Seed increase at this level is limited to one year.
2. Field certification tolerances for this class will be G5.
3. The Winter Test is optional.

E. Experimental Line Selection Program

BACKGROUND: A one-year pilot program in which lots will consist of multi-genetic clones, derived from a single mother plant that may, or may not, be true-to-type. Material coming out of this program is not considered ‘certified’, but will be eligible (in Oregon) for production of certified material at a class appropriate to the field year and tolerances met. ELSP lots will undergo the same inspection and testing requirements of any other certified Nuclear or G1 lot and will only vary from certified Nuclear or G1 lots in their genetic make-up (being multi-cloned lots). As such, this material will satisfy the Seed Farm and isolation requirements of OSCS, and should be considered in compliance with local Potato Seed Control Districts in regards to acceptable planting stock, as well as meeting Oregon State's Certified Seed only requirements.

GENERAL REQUIREMENTS: The “General Requirements’ as specified in **Parts I, II, III, and IV** of the Standards applies to this program with exception of references to ‘variety mixtures’. **Part V and VI** would not apply, and the ‘lot’ certified would simply be identified as “Group YY-A”, B, C etc. in regard to variety name (YY=year designation, i.e. Group A for 2013 would be “13-A”). A listing of the contents of the group in regards to number of lines, and line ID, would have to be supplied to OSCS.

REQUIREMENTS FOR MICROPROPAGATION FACILITY (Lab and Greenhouse)

A. The Basic Requirements

The requirements put forth in **Part VII** of the Standards would be basically adhered to with minor changes to meet the unique aspects of this program (see below). Lab and Greenhouse inspections would have to be conducted by a third independent party such as the state’s seed certification service or Department of Agriculture. Testing and sampling requirements done out-of-state would have to be approved by the Seed Certification Service or the Department of Agriculture in the state of origin.

B. Inspection and Pathology Requirements for Entry Level (TC) material:

Inspections: Lab used to produce material used in this program must be inspected at least annually to assure that: (1) Material is being handled in a manner that precludes, as much as possible, the re-introduction of pathogens; and (2) Is properly labeled and handled to assure the *final certified* product in subsequent years is genetically pure (i.e., a single genotype and not a mixture of clones).

Sampling and Testing³: Testing of 100 percent of the mother plants for the pathogens listed below is required. In addition, all mother plants will be screened for bacteria and fungi with Richardson medium and/or nutritional broth. Screening with Richardson medium and/or nutrient broth may be done by production lab. All plant material to be mass propagated must test negative for the pathogens listed. Plant material may be requested by the certification office for further testing.

³ This material taken directly from Part 7B of the 2013 Potato Standards. Future modification of Section 7B would also apply to this section.

E. Experimental Line Selection Program (*continued*)

1. *Clavibacter michiganensis* subsp. *sepedonicus* by ELISA or PCR.
2. *Pectobacterium* (*f. Erwinia*) by crystal violet pectate (CVP), with *Pectobacterium* tested for being defined as *Pectobacterium atrosepticum* (*f. Erwinia carotovora* sub species *atroseptica* (Eca)) and *Pectobacterium carotovorum* subsp. *carotovorum* (*f. Erwinia carotovora* subspecies *carotovora* (Ecc)) and *Dickeya* spp. (syn. *E. chrysanthemi*)²;
3. **Potato viruses X, Y, S, M, A, Leafroll, and PMTV** by ELISA, or other approved test;
4. **Potato spindle tuber viroid** by cDNA, dot hybridization or gel electrophoresis.

Note: (1) Repeat testing of tissue culture lines used in subsequent years would follow the requirements put forth in Part 7C of the Oregon Potato Standards. (2) Modification of the above testing requirements may be possible if approved in advance. (3) Some testing requirements may be waived if the original source of the material used to initiate the tissue culture lines can be documented to be free of the specified pathogens and handled in such a manner to preclude their reintroduction.

C. Facility and Pathology Sampling Requirements Greenhouse produced material

Inspections: All facilities and material produced in this program must be inspected at least once during the growing cycle to assure material is: (1) being handled in a manner that precludes, as much as possible, the re-introduction of pathogens; and (2) properly labeled and handled to assure the final certified product is genetically pure (single genotype).

Sampling and Testing:

1. Pathogens: All material used in this program must sampled for the following pathogens (and results received) prior to shipment: *Pectobacterium* (*f. Erwinia*) (as defined in B2 of the Potato Standards) and *Clavibacter michiganensis* subsp. *sepedonicus* bacteria⁴, and **Potato viruses X, Y, and Leafroll**⁵.

2. Sampling: A minimum of one percent of the plants or tuber population, but no less than 20 samples per “group” must be tested. The sampling will be taken under the supervision of an official seed certification agency or State Department of Agriculture (unless otherwise approved). Tests are to be conducted by an independent diagnostic laboratory or may be ‘in-house’ if approved/supervised by the third party inspectors.

3. Tolerances: There is a zero tolerance for the above-mentioned pathogens for any material used in this program. A group may be resampled at 3X the initial rate if a questionable test results is obtained &/or specific situation resulting in the + test is rectified. If 3X testing finds no confirmed disease results, then said ‘group’ may continue the certification path. Alternatively, if the ‘group’ again returns positive for disease with

⁴ Protocol on file specifying what constitutes a confirmation of diagnosis for *Pectobacterium* and *Clavibacter michiganensis* subsp. *sepedonicus*. Tests using CVP, bioassay, or other recommended tests for the purpose intended will be limited to 5 bulked plants per test. Greenhouse minitubers or transplants are only rejected if found to yield positive tests for *Pectobacterium atrosepticum* or *Dickeya* spp but not for *Pectobacterium carotovorum* subsp. *carotovorum*.

⁵ Virus tests limited to ELISA or other approved test. No more than 5 plants or tubers may be bulked when running the ELISA tests unless otherwise approved in advance.

E. Experimental Line Selection Program (*continued*)

3X testing, then the ‘group’ must be tested at 10x rate to identify the source line of the contamination and be removed before the ‘group’ can further be considered in the certification process.

D. Shipment and Eligibility Requirements:

Material produced, tested, and handled as noted above will be considered eligible for production of Nuclear Class Line Selection Seed Stock (N-LSP) in Oregon. Shipment of this material must be accompanied by: (1) summary of the testing results which must include sample designation, type of test, laboratory name, and signature of laboratory representative; (2) letter from the independent party responsible for inspection of facilities used and supervising sampling and testing of the material used.

IV. REQUIREMENTS FOR FIELD PRODUCTION

Field production requirements will follow as much as possible those put forth in the Oregon Potato Standards for the production of Nuclear class material in regards to isolation, field history, and inspections (Parts IX, X, X1, X11 - except any references to variety or off-types). Parts XIII and XIV would not apply. These requirements are summarized below.

1. **Eligible Material:** Material used as planting stock must have been handled and tested as noted above for this program as described in Parts II and III.
2. **Field History and Management:** At least 3 years out of potato production. No history of Bacterial Ring Rot or serious nematode (i.e., Northern or Columbia Root Knot, Potato Cyst). No volunteers allowed (i.e. between row-plants &/or obvious off-types in row sections designated as a single genotype); any present must be removed to maintain eligibility. Each “group” must be clearly marked at both ends of the row . The size of a “group” will be up to the grower.
3. **Isolation:** At least 300 feet from fields planted with seed higher than certified G2 class. A skip row is required between EGLSP groups and adjacent potato lots. Skip row are recommended between individual lines in the group but not required.
4. **Sanitation:** (see Parts XI-E, F, G, H of the current Standards).
5. **Field Inspections:** Inspections are performed according to prescribed procedural methods and will include at least two field inspections, the first to occur before (or close to) row closure. Fields must meet the minimum tolerances for Nuclear class as shown on Table 5 (with the exception of off-types) to be to be accepted for certification, i.e., zero tolerance for the following: PLRV, Mosaic and other visible virus including Calico, Blackleg, Spindle Tuber Viroid, Bacterial Ring Rot, Tobacco Rattle Virus and Northern or Columbia Root Knot Nematode, Potato Cyst Nematode, and chemical injury over 3% of material planted. Roguable defects found during the second inspection may be removed to maintain class if deemed at low enough number to bring the ‘group’ within tolerances. Lines selected from “groups” that exceed these tolerances for Nuclear class will still be eligible for the class for which tolerances are met.

E. Experimental Line Selection Program *(continued)*

6. Latent Virus Testing: A single leaf from each clone within the lot must be tested for PVY (post-harvest testing of tubers or WGO sample may substitute for a summer leaf sampling). A "Sampling and Handling" fee for leaf sampling at \$2.40 per ELISA sample (5 leaves) will be charged. The grower pays the lab fee directly. Use of PCR with a much larger bulking rate also acceptable.

V. Harvest Inspections:

An inspection of the harvested tubers of selected lines is required for final certification. This inspection may be done in the bin or in the field and will primarily focus on the detection of Bacterial Ring rot, and serious nematode (as noted above). There is a zero tolerance for all pathogen noted in Parts IV-5 above.

VI. Winter Greenhouse Requirements:

Exempt - It is assumed that all lines selected would be less than 750 lbs., thus exempt from the Winter Grow-Out requirements IN OREGON. The grower is advised that any state receiving this material may have different requirements in this regard. The grower is also advised that some states have additional testing requirements for seed entering the state (i.e., PVY testing in Idaho, Late Blight Testing in Colorado). See **Parts XIV** of the Potato Standards for specific of the Winter Grow-Outs. Disease tolerance in the WGO for this type of material (if tested) would have to meet those noted in **Table 7** of the Standards for Nuclear class (including the "Variety Mixtures" line).

VII. Post-Harvest Storage, Tagging, and Shipping Requirements:

The provisions set forth in **Parts XV** and **XVI** of the Standards will apply to these lots. These lots will only be eligible for White tags (as "experimental lines"). The official class of this material will be listed as "N-LSP" for Nuclear Class- Line Selection Program". This material would be eligible for G1 production in Oregon⁶No grade inspection will be required by Oregon on material coming out of this program.

VIII . Fees - Fees for this program { *to be determined - suggested fee is \$60 per 0.1 acres inspected* }

⁶ Grower is cautioned that not all states may accept this material as G1 (FY@) eligible and is advised to check with the destination states seed certification agency for acceptance criteria prior to shipping.

F. Oregon Administrative Rules containing OARs 8-15-13

OREGON DEPARTMENT OF AGRICULTURE

DIVISION 52 - PEST AND DISEASE CONTROL

603-052-0830

Commercial Potatoes Produced in Oregon to be Grown from "Certified Seed"

(1) As authorized by ORS 570.405 to 570.435, a control area is established for the protection of the Oregon potato industry against the introduction and spread of serious bacterial, fungal, viral, and nematode diseases of potatoes. Such control area includes all of the state of Oregon.

(2) The following methods of control are declared to be proper methods to be used in the control area described in section (1) of this rule:

(a) All commercial potato plantings in Oregon in excess of one acre in size shall be propagated from "certified seed" only;

(b) All Oregon potato growers shall be responsible for obtaining proper certification documents or tags to verify that all seed potatoes used for potato propagation comply with this rule. Such documents shall be retained by the grower for one calendar year and shall be provided to the Oregon Department of Agriculture upon written request for such documentation. Such documentation shall include the total weight of certified seed potatoes received by the grower in questions, and shall be issued only by a legal certifying agency in the state or country of origin. Falsification of seed potato certification documents shall be deemed to be in violation of ORS 570.410;

(c) Oregon Department of Agriculture officials may sample any potato seed lot for the purpose of testing and verification of compliance with "certified seed" only standards. Such department official may enter any potato field for the purpose of conducting inspections which may be required to carry out this rule;

(d) Definitions: "Certified seed" shall be limited to seed which meets those standards established for "certified seed" by the representing agency officially recognized by the state or country of origin.

(3) Exceptions to the "certified seed" only requirement may be permitted by the Director of the Oregon Department of Agriculture when availability of "certified seed" does not allow compliance with this rule. Such exceptional permit shall be obtained prior to planting. Specific requirements may be stipulated in the Director's permit.

(4) Any violation of this rule shall be deemed to be a violation of ORS 570.410 and may subject the violator to the penalty provisions of ORS 570.990.

Stat. Auth.: ORS 561 & ORS 570 Stats. Implemented: ORS 561.190, ORS 561.510 - ORS 561.600, ORS 570.305, ORS 570.405 & ORS 570.410 - ORS 570.415 Hist.: AD 5-1990, f. & cert. ef. 3-19-90

G. United States Standards for Grades of Seed Potatoes

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Fruit and Vegetable Division – Fresh Products Branch

United States Standards for Grades of Seed Potatoes

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§51.3000 General.

Compliance with the provisions of these standards shall not excuse failure to comply with provisions of applicable Federal or State Laws.

§51.3001 Grade.

"U.S. No. 1 Seed Potatoes" consist of unwashed potatoes identified as certified seed by the state of origin by blue tags fixed to the containers or official State or Federal State certificates accompanying bulk loads, which identify the variety, size, class, crop year, and grower or shipper of the potatoes, and the State certification agency.

These potatoes must meet the following requirements:

- (a) Fairly well shaped.
- (b) Free from:
 - (1) Freezing injury;
 - (2) Blackheart;
 - (3) Late Blight Tuber Rot;
 - (4) Nematode or Tuber Moth injury;
 - (5) Bacterial Ring Rot; *
 - (6) Soft rot or wet breakdown; and,
 - (7) Fresh cuts or fresh broken-off second growth.
- (c) Free from serious damage caused by:
 - (1) Hollow Heart; and,
 - (2) Vascular ring discoloration.
- (d) Free from damage by soil and any other cause. (See §51.3005 - 06).
- (e) Size:
 - (1) Minimum diameter, unless otherwise specified, shall not be less than 1-1/2 inches (38.1 mm) in diameter;
 - (2) Maximum size, unless otherwise specified, shall not exceed 3-1/4 inches (82.6 mm) in diameter or 12 ounces (340.20 g) in weight.

§51.3002 Tolerances.

In order to allow for variations incident to proper grading and handling in the foregoing grade, the following tolerances, by weight, are provided as specified.

- (a) For defects:
 - (1) 10 percent for potatoes in any lot which are seriously damaged by hollow heart;
 - (2) 10 percent for potatoes in any lot which are damaged by soil;
 - (3) 5 percent for potatoes in any lot which are seriously damaged by vascular ring discoloration;

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- (4) 11 percent for potatoes which fail to meet the remaining requirements of the grade including therein not more than 6 percent for external defects and not more than 5 percent for internal defects: Provided, that included in these tolerances not more than the following percentages shall be allowed for the defects listed:

	Percent
Bacterial Ring Rot	0.00
Serious damage by dry or moist type Fusarium Tuber Rot	.200
Late Blight Tuber Rot	1.00
Nematode or Tuber Moth injury	0.00
Varietal mixture	0.25
Frozen, soft rot or wet breakdown	0.50

Provided that en route or at destination, an additional 0.50 percent, or a total of 1 percent, shall be allowed for potatoes which are frozen or affected by soft rot or wet breakdown.

(b) For off-size:

- (1) For undersize: 5 percent for potatoes in any lot which fail to meet the required or specified minimum size.
- (2) For oversize: 10 percent for potatoes in any lot which fail to meet the required or specified maximum size.

§51.3003 Application of tolerances.

Individual samples (See §51.3004) shall not have more than double the tolerances specified, except that at least one defective and one off-size potato may be permitted in any sample; Provided, that en route or at destination, one-tenth of the samples may contain three times the tolerance permitted for potatoes which are frozen or affected by soft rot or wet breakdown; and provided further, that the averages for the entire lot are within the tolerances specified for the grade.

§51.3004 Samples for grade and size determination.

Individual samples shall consist of at least 20 pounds (9.06 kg). The number of such individual samples drawn for grade and size determination will vary with the size of the lot.

§51.3005 Definitions.

- (a) "Fairly well shaped" means that the potato is not materially pointed, dumbbell-shaped or otherwise materially deformed.
- (b) "Nematode or Tuber Moth injury" means the presence of, or any evidence of, Nematode or Tuber Moth.
- (c) Soil:
- (1) "Fairly clean" means that at least 90 percent of the potatoes in the lot have no more than 10 percent of the surface covered with caked soil.
 - (2) "Damage by soil" means that caked soil covers more than 25 percent of a potato's surface.
 - (3) "Loose soil" -- A lot of seed potatoes is not considered damaged by the presence of loose soil, clods, rocks, vines, and foreign material, but such will be considered a tare factor if the following allowances are exceeded:
 - 8 ounces (226.80 g) in a 100 pound (45.3 kg) container.
 - 4 ounces (113.40 g) in a 50 pound (22.65 kg) container.
 - 2 ounces (56.70 g) in a 25 pound (11.33 kg) container or less.1 percent in a bulk load
- (d) "Shriveling" -- Damage by shriveling means that the individual potato is more than moderately shriveled, spongy or flabby.
- (e) "Freezing injury" means that the potato is frozen or shows evidence of having been frozen.
- (f) "Soft rot or wet breakdown" means any soft, mushy or leaky condition of the tissue.
- (g) "Zero Tolerance" (0.00) means none found during the normal inspecting procedures. Certification of a lot is not a guarantee that the lot inspected is free of a zero tolerance disease or injury.
- (h) "Damage" means any defect or any combination of defects which materially detracts from the internal or external appearance of the potato, or any external or internal defect which cannot be removed without a loss of more than 5 percent of the total weight of the potato (See §51.3006).
- (i) "Serious damage" means any defect or any combination of defects which seriously detracts from the internal or external appearance of the potato, or any internal or external defect which cannot be removed without a loss of more than 10 percent of the total weight of the potato (See §51.3006).
- (j) "External defects" are defects which can be detected by examining the surface of the potato. Cutting may be required to determine the extent of the injury (See §51.3006, Table I).
- (k) "Internal defects" are defects which cannot be detected without cutting the potato (See §51.3006, Table II).
- (l) "Permanent defects" are defects which are not subject to change during storage or shipment.
- (m) "Condition defects" are defects which may develop or change during storage or shipment.

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§51.3006 Classification of defects.

(a) Brown discoloration following skinning, dried stems, flattened depressed areas (showing no underlying flesh discoloration), greening, skin checks and sunburn do not affect seed quality and shall not be scored against the grade.

(b) Table I -- External Defects.

x-indicates method of scoring unless otherwise noted.

Defect	Damage	
	When materially detracting from the appearance of the potato	or When removal causes a loss of more than 5 percent of the total weight of the potato.
Air cracks.....	.....	X
Bruises.....	.....	X
Cuts and broken-off second growth (healed).....	X.....	X
Elephant hide (scaling)	X.....	
Enlarged, discolored or sunken lenticels.....	X.....	
Folded ends.....	X.....	
Second growth.....	X.....	
Shriveling.....	When more than moderately shriveled, spongy, or flabby.	
Sprouts.....	When more than 20 percent of the potatoes in any lot have any sprout more than 1 inch (25.4 mm) in length.	
Surface cracking.....	X.....	X
Flea Beetle injury.....	X.....	X
Grub damage.....	X.....	X
Rodent and/or bird damage.....	X..... X	
Wireworm or grass damage.....	Any hole more than 3/4 inch (19.1 mm) long or when the aggregate length of all holes is more than 1-1/4 inches (31.mm). ¹	
Dry rots.....	.....	X
Rhizoctonia.....	X.....	
Scab, pitted.....	X.....	X
Scab, russet.....	When affecting more than 1/3 of the surface.....	
Scab, surface.....	When affecting more than 5 percent of the surface	
Silver Scurf.....	When affecting more than 25 percent of the surface.....	
Growth cracks.....	When seriously detracting from the appearance.....	
Pressure bruises and sunken areas-with underlying flesh discolored.	.....	When removal causes a loss of more than 10 percent of the total weight.

¹- Definitions of damage and serious damage are based on potatoes that are 2-1/2 inches (63.5 mm) in diameter or 6 ounces (170.10 g) in weight. Correspondingly lesser or greater areas are permitted on smaller or larger potatoes.

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(c) Table II- Internal Defects.

Defect	Damage	
	When materially detracting from the appearance of the potato	or When removal causes a loss of more than 5 percent of the total weight of the potato
Ingrown sprouts.....	.....	X
Internal discoloration occurring interior to the vascular ring (such as, Internal Brown Spot, Mahogany Browning and Heat Necrosis.) All other internal discoloration excluding discoloration confined to the vascular ring.	When more than the equivalent of three scattered light brown spots 1/8 inch (3.2 mm) in diameter ¹	X

¹ - Definitions of damage and serious damage are based on potatoes that are 2-1/2 inches (63.5 mm) in diameter or 6 ounces (170.10 g) in weight. Correspondingly lesser or greater areas are permitted on smaller or larger potatoes.

Defect	Serious Damage	
	When seriously detracting from the appearance of the potato	or When removal causes a loss of more than 10 percent of the total weight of the potato
Internal Discoloration confined to the vascular ring. Hollow Heart or Hollow Heart with discoloration.	..... When affected area exceeds that of a circle 3/4 inch (19.1mm) in diameter. ¹	X

¹ - Definitions of damage and serious damage are based on potatoes that are 2-1/2 inches (63.5 mm) in diameter or 6 ounces (170.10 g) in weight. Correspondingly lesser or greater areas are permitted on smaller or larger potatoes.

NOTE:

For “U.S. **Export Standards for Seed Potatoes**” See:

<https://www.ams.usda.gov/grades-standards/seed-potatoes-grades-and-standards>

For information on ‘**State National Harmonization Program**’ see

https://www.aphis.usda.gov/plant_health/acns/downloads/SeedHealthProgram/snhp-mou-generic-template.pdf

http://nationalplantboard.org/wp-content/uploads/docs/2012_meeting/npb_2012_snhp.pdf

H. Review of Out-of-State Requirements for Seed Shipped at Harvest

For any lots shipped off farm at harvest there are the following considerations:

1. Cellar Inspections: OSCS only inspect cellars that are in-state or near the state line. Cellar inspection are not required to have potato seed certified, but are considered educational and help document the condition of your storage at the time of filling should a need arise. Having cellars in another state independently inspected would be the responsibility of the grower if so desired.
2. Winter grow-out samples: If you desire to have a lot eligible for recertification the next season, be sure to take your winter grow-out sample prior to shipping! Under the NVMP all out-of-state seed shipment are required to have a post-harvest test.
3. Appropriate Forms – All certified seed ship off farm must be accompanied by appropriate ‘official’ certification paperwork to maintain certified status. When shipped at harvest, the use of a “Shipping Certificate” (from the booklets) is most appropriate, though a tag could be requested. **Lots shipped off-farm without being accompanied by a Shipping Certificate (or tag) are no longer considered certified.** In addition, the Harvest Inspector or Certification Office must be informed as to the exact destination of the material shipped (i.e. storage location, and map of storage if used for multiple lots).
4. Necrotic Arc Inspections: The Necrotic Virus Management Plan (NVMP) requires that all potato seed lots shipped out-of-state be inspected for internal necrotic arcs after at least two months of storage. Lots shipped out of state at harvest are not exempt from this requirement, but it will be up to the receiver of this seed to have it so inspected and to inform the seller and OSCS if necrotic arcs are found in excess of the tolerances (0.5% to be eligible for re-certification, 2.0% for certified seed).
5. Phytosanitary requirements of destination states/countries. Various states and countries have imposed particular phytosanitary requirements in excess of the OSCS Certification requirements. For example, Colorado requires an additional Late Blight and PVYn test of the tubers be conducted, and Nebraska has a nematode requirement, Idaho and New Brunswick now require all lots be PVY tested, etc. You would be advised to contact the Seed Certification Agency of the destination state to inquire of any such requirements BEFORE shipping (or contact OSCS for assistance, the Agency Contact List is posted at:
<http://seedcert.oregonstate.edu/sites/default/files/potato/PIE/paa-agencycontactlist-current.pdf>).

Seed headed to Canada must be tested for Bacterial Ring Rot and contain a statement that the farm used to produce the seed was free of potato cyst nematodes (see <http://www.inspection.gc.ca/english/plaveg/protect/dir/d-98-01e.shtml> for specific Canadian requirements).

All aspects of requirements involving a Phytosanitary Certificate or Inspections at Shipping Point are the domain of the Oregon Department of Agriculture. Contact Elizabeth A. Savory, Plant Health Program Manager, ODA for specific information- (503) 986-4570.

I. DEFINITIONS

Approved Labs: A laboratory is considered 'approved' for disease diagnostic purposes or viral 'clean-up' when it meets any one of the following criteria: (1) Be a state or federal facility (including university labs, and those run by Crop Improvement Associations) whose primary purpose is diagnosis or testing of plant pathogens or viral cleanup of micropropagation material; (2) Be an APHIS approved lab for this same purpose; or (3) Be approved for this purpose by a sub-committee of at least 3 OSU plant pathologist.

Commercial – Any potato field not entered into the OSCS potato certification program for re-certification

Entry Level Material - Plant material new to propagation facility, disease status not yet confirmed by recipient.

Experimental Line Selection Program: See page 28

Experimental Line: Pre-released potato material within a recognized variety development program that is a single genotype with definable and unique characteristics. Experimental lines within the OSCS program must have a basic variety description on file and have completed a "Experimental Line" approval application. Experimental lines are only eligible for white tags (not blue). All Experimental Lines are considered proprietary in regards to need the owner's permission to propagated as a certified class.

Limited Generation Program -Seed lot drops to the next (i.e., older) class with each year of production. Seed under the TC Program is not more than six years away from the initial mother plant or protected environment. Within this program the term "higher" (i.e. higher class or generation) refers to a class or generation closer to the initial mother plant, and "lower" refers to a class or generation that has been grown for *more* years in the field.

Isolation (Micropropagation) - Procedural and physical separation to prevent pathogen spread to disease tested stock.

Lot - The boundaries of a seed lot will be determined originally by the grower. Seed lots must be staked at both ends and at least every 300 feet along dividing rows with a skip row between varieties. If a grower has several adjacent lots that are so small that they are unduly expensive to inspect, the inspector may refuse to inspect the lots until they have been determined to be of a size which will permit efficient inspection.

A lot may be subdivided with permission of the inspector, however once a lot is assigned a certification class by the inspector, the entire lot will be of that class only. If a lot is rejected for any reason, the entire lot will be considered rejected. A grower may appeal the assigned classification according to page 9 on procedures and ask for a reinspection, except in fields found to have bacteria ring rot and or root-knot nematode.

Lots of the same certification class may be combined in storage, and a composite sample may be submitted for greenhouse testing. Lots from a field placed in storage in such a manner that their identity is lost in relation to other lots may subject all lots so stored together to rejection when ring rot, root-knot nematode, or other problems occur.

Micropropagation - The production of *in vitro* plants or microtubers and/or greenhouse plants or minitubers.

Microtubers - Tubers produced *in vitro*

Minitubers - Tubers produced under controlled greenhouse conditions.

Mother Plant (Explant) - Initial *in vitro* plant from which Pre-Nuclear plantlets or tubers are derived. In vitro plant must be retested each new propagation year.

Proprietary Variety – (for the sake of applying rule VI-C on page 11) a variety that has any one of the following: (1) A PVP certificate is 'issued' or 'pending'; (2) Is a pre-commercial advanced line of a university/USDA/private variety development program, requiring MTA for production; or (3) Has been patented in the U.S. Varieties with PVP in which the owner had indicated the variety is open with no production restrictions, will be considered 'public' by OSCS. Varieties registered in Canada, but not meeting 1 or 2 above, are not considered 'proprietary' in regards to Oregon certification rules on grower needing owner approval to apply for certification.

Propagation Year - Any twelve consecutive months after testing mother plant.

Seed Farm - A Seed Farm is a clearly independent operation, managed separately, and includes all land, facilities (storage, etc.) equipment, operational personnel and where the lowest class planted must have been certified.

Sub-class: Sub-class designations are used to specify certain aspects of a class that are not related to its field-year or having met tolerances for disease/off-type of the class noted. (see page 14)

Volunteer – potato plant not believed to be derived from the seed stock listed on the application.

Winter Test – A post harvest grow out evaluation for presence of seed-borne diseases, and off-types. Chemical damage observed in the winter test is reported to grower but not scored unless link to field observations the previous season.

Zero Tolerance - Zero tolerance (0) means none found during the normal inspection procedures. ***Zero is not a guarantee that the lot inspected is free of the disease.***

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**Oregon Seed Certification Service
Oregon State University
Corvallis, Oregon**