CHAPTER 1555
DEPARTMENT OF AGRICULTURE
FOOD DEFINITIONS AND STANDARDS

1555.6730 DEFINITIONS.

[For text of subps 1 to 3, see M.R.]

Subp. 3a. **Class.** "Class" means the seed quality level as it relates to compliance with the specified tolerances for diseases and varietal purity.

Subp. 3b. **Clone.** "Clone" means a unit of seed potatoes, being the progeny of one plant, which has been tested to become eligible to produce Primary Foundation 1 seed potatoes.

[For text of subps 4 to 6, see M.R.]

Subp. 6a. **Explant.** "Explant" means an in vitro potato plant or plantlet produced by rooting an excised tip of a tuber sprout or an axillary bud from a growing plant which serves as a parent for a whole clone or accession of micropropagated plants or plantlets.

[For text of subp 7, see M.R.]

Subp. 8. **Field.** "Field" means a plot of land on a farm on which potatoes are grown for certification. The potatoes shall be of one variety from one certified seed potato growing operation and shall be grown in physical separation from other fields.

[For text of subps 9 and 10, see M.R.]

Subp. 10a. **Material in maintenance.** "Material in maintenance" means propagative material, plantlets, or tubers that are maintained, not multiplied under controlled laboratory conditions.

Subp. 10b. **Physical separation.** "Physical separation" means separated by at least the width of one row.

[For text of subps 11 to 14, see M.R.]

Subp. 15. **Tuber unit.** "Tuber unit" means the separate pieces of one tuber that are planted consecutively in two or more hills in a row.

Statutory Authority: *MS s 21.118*

History: *21 SR 482*

1555.6740 GENERAL GUIDANCE.

[For text of subpart 1, see M.R.]

Subp 2. **Seed potato certification.** In order to produce certified seed potatoes, a grower must comply with the following procedures:

A. Potatoes entered for certification shall be inspected while growing in the field and again after harvest at the time of shipment. Certification shall be based upon visual inspection by the commissioner of sample plants and tubers from each field and lot, or for varieties that do not express visible symptoms of a specific pathogen, seed potatoes must be subjected to laboratory tests to determine the level of the pathogen in a seed lot. This testing may occur during the growing season, storage season, or winter testing. Certificates shall be issued to show the varietal purity, freedom from disease, and physical defects of the potatoes at the time of inspection.

[For text of item B, see M.R.]

Subp. 3. **Winter testing.** In order to detect certain virus diseases, samples from all classes higher than Certified class as defined in parts 1555.6840 and 1555.6845 shall be winter tested. In the event of serious malfunctions of the winter test, classification of lots in the certified classes must be based on the previous summer field readings.

Subp. 4. **Certified seed potato classes.** Seed potato certification classes are differentiated by their compliance level with disease tolerances and varietal purity. The origin of the seed also determines the class. The classes, accordmg to their origin, in the generation system m descendmg order are: Prenuclear (PN), Nuclear (N), Generation 1 (G1), Generation 2 (G2), Generation 3 (G3), Generation 4 (G4), and Generation 5 (G5). Equivalent to this in the clonal system in descending order are: Primary Foundation 1 (PF1), Primary Foundation 2 (PF2), Foundation 1 (F1), Foundation 2 (F2), and Certified (C)

[For text of subp 5, see M.R.]

Subp. 6. **Zero tolerance for bacterial ring rot and potato spindle tuber viroid.** Certification rules make provisions to allow the presence of certain diseases at levels sufficiently low as to preclude significant effects on certified seed potato value. For bacterial ring rot and potato spindle tuber viroid, there is a zero tolerance, and the discovery of a single plant in the field or a tuber in storage infected with one of these diseases shall cause the rejection of the field or lot The absence of a finding shall not be construed to mean that the field or lot inspected is free from the disease.

[For text of subp 7, see M.R.]

Statutory Authority: *MS s 21.118*

History: *21 SR 482*

1555.6800 SEED POTATOES ELIGIBLE FOR MINNESOTA CERTIFICATION PLANTING.

Subpart 1. **Authorization.** A field may not be inspected for certification unless both the seed potato variety and the particular lot planted have the authorization of the commissioner. In considering seed potato varieties for authorization for certification planting, the commissioner shall consider scientific evidence and expert opinion. To be eligible for certification planting, seed potatoes must meet the requirements of subpart 2 or 3.

Subp. 2. **Minnesota grown seed potatoes.** The following classes of seed potatoes grown in Minnesota are eligible for planting: Prenuclear, Nuclear, Generation 1, Generation 2, Generation 3, Generation 4, Primary Foundation 1, Primary Foundation 2, Foundation 1, Foundation 2, and experimental status seed potatoes. The commissioner shall authorize the planting of Certified class or Generation 5 class seed potatoes if there is no source of higher classes than Certified class or Generation 5 class seed potatoes available to the grower and the lot has been winter tested.

Subp. 3. **Non–Minnesota grown seed potatoes.** Seed potatoes grown outside of the state approved for certification planting by the certifying agency in another state or a Canadian province may be planted if tolerances for certification meet Minnesota tolerances for certified seed potatoes of classes higher than Certified class or Generation 5 class, as indicated on an import affidavit.

Subp. 4. **Experimental status.** Seedlings or numbered selections may be accepted for entrance into the certification system in an experimental status. The applicant shall submit a written statement with the certification application from the breeder, originator, or originator's designee that the applicant has full and unrestricted rights to introduce the seedling or numbered selection into the commercial market, and that the seedling or numbered selection must be named within five years from acceptance of the application. If the seedling or numbered selection is not named within five years from acceptance of the application, a two–year waiting period must pass before the seedling or numbered selection may be reentered into the certification program. Seedlings or numbered selections in experimental status must be designated as a class and conform to the requirements of that class. The word "EXPERIMENTAL" must be added on the tag. Lots from a breeder's seed that have not gone through the testing and, when necessary, virus–freeing, are considered either Foundation class 1 or 2, "EXPERIMENTAL."

Subp 5. **Protected varieties.** Before a seed potato variety protected under the Plant Variety Protection Act Amendments of 1994 may be entered into the certification system, the applicant must submit a written statement with the certification application from the breeder,

originator, or originator's designee that the applicant has full and unrestricted rights to introduce the protected variety into the commercial market.

Statutory Authority: *MS s 21.118*

History: *21 SR 482*

1555.6810 [Repealed, 21 SR 482]

1555.6820 [Repealed, 21 SR 482]

1555.6830 [Repealed, 21 SR 482]

1555.6840 REQUIREMENTS FOR CERTIFIED SEED POTATO PRODUCTION.

Subpart 1 **Requirements.** The standards in this part and part 1555.6845 must be met before potatoes may be classified as certified seed potatoes.

Subp. 2. **Field inspection and laboratory testing.** Certification must be based upon information regarding the following: stand, general vigor, varietal purity, disease tolerances, and factors affecting field inspection. At least two field inspections must be made of each field during the growing season. A final inspection must be made for bacterial ring rot, when symptom expression is optimal. If a final inspection cannot be carried out, because of management practices of the grower, the seed lot must be rejected. If a final inspection cannot be performed for reasons out of the grower's control, a laboratory test is necessary to maintain eligibility for certification. Additional inspections and laboratory tests may be made if necessary to meet phytosanitary requirements in established markets such as other states and Canadian provinces.

A. Stand. A field shall be rejected if there are a large number of plants missing due to disease.

B. General vigor A field shall be rejected if it contains a large number of weak plants.

C. Ring rot. If bacterial ring rot is found in any field or lot, the remaining crop is not eligible for certification planting.

D. Varietal purity. A field must be rejected if it contains more than the tolerances acceptable for a specific class as listed in Tables 1 and 2 in part 1555.6845, subparts 11 and 12.

E. Disease tolerances (percentage of infected plants). A field must be rejected if it contains percentages of diseased plants in excess of those acceptable for a specific class as listed in Tables 1 and 2 in part 1555.6845, subparts 11 and 12.

F. Factors affecting field inspection. A field shall be rejected if any of the following are present to such an extent that satisfactory inspection for diseases cannot be made: early or late blight, blackleg or wilt of any kind, weeds; insect injury; chemical damage.

A field shall be rejected if any other conditions are present to such an extent that satisfactory inspection for diseases cannot be made. A field is ineligible for certification if there are cull piles in such close vicinity to the field that contamination of the field can be expected.

Subp. 3 **Roguing.** If any of the diseases listed in part 1555.6845 are present in a field in amounts less than the maximum disease tolerance level, the field must be rogued and the infected plants removed before the final inspection. If roguing is done after tubers form, the tubers from the rogued plants shall also be removed and destroyed.

Subp. 4. **Storage.** Lots shall not be stored in any warehouse where other potatoes are stored, nor shall they be stored under conditions of possible disease contamination. If more than one grower stores lots in the same warehouse, each grower's lots shall be properly identified by labeling the bin with the grower's name and address, variety, and amount in the bin. If the lots are to be stored in a public warehouse or storage unit not directly under the control of the grower, a complete record giving location of the storage unit, number of the bin, variety, and the quantity stored shall be sent to the commissioner when the lots are put into storage. If it is available, a copy of the warehouse receipt shall also be sent to the commissioner.

Equipment used for grading and handling lots shall not be used for any other potatoes. If any equipment is used on other potatoes, the lots shall be rejected.

Any firm handling lots on contract shall label all bins containing lots with the name of the grower whose lots are being stored. Responsibility for proper labeling and subsequent

handling rests with the firm. No certification tags or bulk certificates shall be issued until this is done.

Each grower shall submit a completed storage and yield report on each lot on forms furnished by the commissioner. Certification tags shall not be issued to growers who have not submitted the report.

Subp. 5. **Tags and bulk certificates.** Official blue, yellow, or white tags, bearing the grower's name and address, the potato variety, and the crop year shall be issued when the potatoes meet the certification requirements described in parts 1555.6740 to 1555.6845. Tags shall be fastened onto sacks so as to constitute a seal at the time the lots are prepared for shipment. Bulk certificates must also show the date of issuance, the class, the grade, and the approximate weight of the load.

Tags shall be issued only to growers, except when lots are stored in a public warehouse or in a storage unit not under direct control of the grower. They shall be issued to the owner or manager of the storage unit upon receipt of written authorization from the grower.

Responsibility for ordering tags shall rest entirely with each grower.

[For text of subp 6, see M.R.]

Statutory Authority: *MS s 21.118*

History: *21 SR 482*

1555.6845 REQUIREMENTS FOR PRODUCTION OF DIFFERENT CLASSES OF CERTIFIED SEED POTATOES.

Subpart 1. **Prenuclear class certified seed potatoes (PN).**

A. A lot grown as and intended to be Prenuclear must be grown from plants tested and shown to be free from the following pathogens:

(1) *Clavibacter michiganensis ssp. sepedonicus* (ring rot),

(2) *Erwinia carotovora* (blackleg);

(3) potato virus X,

(4) potato virus S;

(5) potato virus A;

(6) potato virus M;

(7) potato virus Y;

(8) potato spindle tuber viroid; and

(9) potato leaf roll virus

Each initial explant or tuber must also have been tested for any other organisms for which testing is required by the phytosanitary requirements in another state or Canadian province. Material in maintenance must have been tested during the year of the production of prenuclear class.

B. Prenuclear class seed potatoes must be produced in a greenhouse or screenhouse under sanitary conditions, free from insects and weeds that can harbor or transmit potato diseases or other conditions of possible disease contamination. All facilities must be sufficiently insulated from insects by screens and double doors. The facilities and the equipment are subject to inspection to verify freedom from possible disease contamination.

C. One percent of each lot or ten plants or tubers from each lot, whichever is greater, must be tested during the growing season to verify that the crop is free from potato virus X, potato virus Y, potato leaf roll virus, *C. michiganensis*, and *E. carotovora*.

D. Prenuclear tubers may originate from greenhouse tubers for one year only if the greenhouse tubers have remained at the same growing operation and have remained isolated from field-grown tubers.

E. A lot must be rejected if it contains any diseased plants at any inspection, or varietal mixture at final inspection.

F. The allowable tolerances for disease and varietal mixture for seed potatoes classified as prenuclear are in Table 1 in subpart 11 under column PN.

Subp. 2. **Nuclear class certified seed potatoes (N).** Nuclear class seed potatoes must meet the following requirements:

A. The seed source must be either Prenuclear tubers or plantlets.

B. Tubers or plantlets must be planted m identifiable family units

C. Each field must be tested during the growing season for potato virus X. For a lot to be tagged "virus tested (VT)," no more than one percent of the plants tested may be infected with potato virus X.

D. Each lot must be stored in an individual identifiable unit.

E. The allowable tolerances for disease and varietal mixture for seed potatoes classified as Nuclear are in Table 1 in subpart 11 under column N.

Subp. 3. **Generation 1 class certified seed potatoes (G1).** Generation 1 class seed potatoes must originate from Nuclear class seed potatoes. Each field may be tested during the growing season for potato virus X at grower's request. For a lot to be tagged "virus tested (VT)," no more than three percent of the plants tested may be infected with potato virus X. The allowable tolerances for disease and varietal mixture are in Table 1 m subpart 11 under column G1.

Subp. 4 **Generation 2 class certified seed potatoes (G2).** Generation 2 class seed potatoes must originate from Generation 1 class seed potatoes. The allowable tolerances for disease and varietal mixture are in Table 1 in subpart 11 under column G2.

Subp. 5. **Generation 3 class certified seed potatoes (G3).** Generation 3 class seed potatoes must originate from Generation 2 class seed potatoes The allowable tolerances for disease and varietal mixture are in Table 1 in subpart 11 under column G3.

Subp. 6 **Generation 4 class certified seed potatoes (G4).** Generation 4 class seed potatoes must originate from Generation 3 class seed potatoes. The allowable tolerances for disease and varietal mixture are in Table 1 in subpart 11 under column G4.

Subp. 7. **Generation 5 class certified seed potatoes (G5).** Generation 5 class seed potatoes must originate from Generation 4 class seed potatoes. This class is not winter tested. The allowable tolerances for disease and varietal mixture are in Table 1 in subpart 11 under column G5.

Subp. 8. **Primary Foundation classes (PF).**

A. A lot grown as and intended to be Primary Foundation certified seed potatoes must originate from clonal selection, with all clones laboratory tested and be proven free from the following pathogens:

(1) *Clavibacter michiganensis ssp. sepedonicus* (ring rot);

(2) potato virus A,

(3) potato virus M;

(4) potato virus Y;

(5) potato spindle tuber viroid; and

(6) potato leaf roll virus.

B. A lot must be kept under direct control of the grower and must not be stored in any warehouse in which other potatoes are stored.

C. The two classes of Primary Foundation seed potatoes are PF1 and PF2

(1) PF1 class certified seed potatoes must originate from clonal multiplication where all clones have been laboratory–tested. PF1 class seed potatoes are tuber united. Crops must be free of bacterial ring rot for a minimum of two years to be eligible to be PF1 class seed potatoes. The allowable tolerances for disease and variety mixture are in Table 2 in subpart 12 under column PF1.

(2) PF2 class certified seed potatoes must origmate from PF1 class seed potatoes and originate from the same farm operation. They must be grown from potatoes produced on a tuber unit seed plot. Crops must be free of bacterial ring rot for a minimum of two years to be eligible to be PF2 class seed potatoes. The allowable tolerances for disease and varietal mixture are in Table 2 in subpart 12 under column PF2.

Subp 9. **Foundation classes (F).** The two classes of Foundation class seed potatoes are F1 and F2.

A. F1 class certified seed potatoes must originate from Primary Foundation class seed potatoes. The allowable tolerances for disease and varietal mixture are m Table 2 in subpart 12 under column F1.

B. F2 class certified seed potatoes must originate from F1 class seed potatoes. The allowable tolerances for disease and varietal mixture are in Table 2 in subpart 12 under column F2.

Subp. 10. **Certified class certified seed potatoes.** Certified class seed potatoes must originate from Foundation or Generation classes of seed potatoes. This class is not winter tested. The allowable tolerances for disease and varietal mixture are in subpart 11, Table 2, under column C

Subp. 11. **Table 1.**

TABLE 1
TOLERANCES FOR DISEASES AND VARIETAL MIXTURE FOR GENERATION CLASSES

	CLASSES						
	PN	N	G1	G2	G3	G4	G5
Severe Mosaic	0	0.1	0.2	0.2	0.3	0.3	0.4
Leaf roll	0	0.1	0.2	0.2	0.3	0.3	0.4
Total	0	0 1	0.2	0.2	0.3	0.3	0.4
Total other viruses (S and X excluded)	0	0.1	0.2	0.2	0.3	0.3	0.4
Mycoplasms	0	0.1	0.2	0.2	0.3	0.3	0.4
Total	0	0.1	0.2	0 2	0.3	0.3	0 4
Mild Mosaic (S)	0						
Mild Mosaic (X)	0	VT:1	VT:3	VT:3	VT:3	VT:3	VT.3
Blackleg	0	0	0.2	0.5	1.0	exc.	exc.
Varietal Mixture	0	0	0	0	0.1	0.1	0.2
Ring Rot and Spindle Tuber	0	0	0	0	0	0	0
Winter Test:							
Virus, Ch. Dam.		0 5	0.5	0.5	0.5	0.5	
BRR, PSTV		0	0	0	0	0	
Summer Test:							
PVX, VT*	0	1.0	3.0	3.0	3.0	3.0	3.0
Virus, BRR, PSTV	0						

Numbers represent percentages

VT means Virus Tested

Mycoplasms: Haywire, Witches Broom, Yellow Dwarf

Severe Mosaic: PVY, PVA, PVM

BRR means Bacterial Ring Rot

PSTV means Potato Spindle Tuber Viroid

Ch. Dam means Expressing symptoms of chemical damage

* For the classes G1 and lower, the summer test for PVX is done on request of the grower only. The lot may be labeled "Virus Tested," if the tolerance of one percent for N and three percent for the lower classes is met.

Subp. 12. **Table 2.**

TABLE 2
TOLERANCES FOR DISEASES AND VARIETAL MIXTURE FOR CLASSES ORIGINATING FROM CLONAL MULTIPLICATION

	CLASSES					
	CLONE	PF1	PF2	F1	F2	C
Severe Mosaic	0	0.1	0.2	0.3	0.3	1.00
Leaf roll	0	0 1	0.2	0.3	0.3	0.3
Total	0	0.1	0.2	0.3	0.3	1.0

Total other viruses (S and X excluded)	0	0.1	0.2	0.3	0.3	0.5
Mycoplasms	0	0 1	0.2	0 3	0.3	0.5
Total	0	0.1	0.2	0.3	0 3	0.5
Mild Mosaic (S)						
Mild Mosaic (X)						
Blackleg		0.1	0.2	exc.	exc.	exc.
Varietal Mixture				0.1	0.2	0.2
Ring Rot and Spindle Tuber	0	0	0	0	0	
Winter Test:						
Virus, Ch. Dam.		0 5	0.5	0.5	0.5	
BRR, PSTV		0	0	0	0	
Summer Test:						
Virus, BRR, PSTV	0					

Numbers represent percentages
VT means Virus Tested
Mycoplasms· Haywire, Witches Broom, Yellow Dwarf
Severe Mosaic· PVY, PVA, PVM
BRR means Bacterial Ring Rot
PSTV means Potato Spindle Tuber Viroid
Ch. Dam. means Expressing symptoms of chemical damage.

Statutory Authority: *MS s 21.118*

History: *21 SR 482*

1555.6850 [Repealed, 21 SR 482]

1555.6851 [Repealed, 21 SR 482]

1555.6852 [Repealed, 21 SR 482]

1555.6860 [Repealed, 21 SR 482]

1555.6870 [Repealed, 21 SR 482]

1555.6880 [Repealed, 21 SR 482]

1555.6890 [Repealed, 21 SR 482]

1555.6900 [Repealed, 21 SR 482]

1555.6950 MINNESOTA CERTIFIED SEED POTATO GRADES AND TOLERANCES.

Subpart 1. **Minnesota certified seed potato grades.** Before potatoes are eligible for grading as certified seed potatoes, the requirements of parts 1555.6750 to 1555.6845 must be met.

Subp. 2. **Minnesota blue tag certified seed potato grade.** To be graded as Minnesota blue tag certified seed potatoes, the potatoes must meet the requirements in items A to C.

A. Condition. The potatoes must be, at the time of final inspection, of one variety, unwashed, fairly well–shaped, free from bacterial ring rot, powdery scab, late blight, freezing, black heart, and soft rot or wet breakdown, and free from damage caused by soil or other foreign matter, second growth, air cracks, cuts, shriveling, sprouts, pitted scab, surface scab, russet scab, dry rot, other diseases, insects or worms, mechanical or other means, flattened or depressed areas with underlying flesh discoloration, and from serious damage caused by hollow heart, wire worm, growth cracks, or internal discoloration other than hollow heart. Sunburn and silver scurf are not factors.

[For text of item B, see M.R]

C. Lot tolerances. In order to allow for variations incident to proper grading and handling, the following tolerances, by weight, are provided:

(1) For defects:

[For text of units (a) and (b), see M.R.]

(c) ten percent for potatoes damaged by soil or other foreign matter;

(d) 20 percent for potatoes damaged by sprouts;

(e) ten percent for potatoes seriously damaged by wireworm; and

(f) six percent for potatoes which fail to meet the remaining requirements of the grade, provided that included in that amount not more than the following percentages are allowed for the following defects:

i. soft rot, frozen, or wet breakdown, 0.5 percent;

ii. damage by surface or pitted scab, 2.0 percent;

iii. damage by dry rot, 2.0 percent, of which not more than 1.0 percent late blight tuber rot;

iv. bacterial ring rot, 0.0 percent;

v. powdery scab, 0 0 percent; and

vi. late blight tuber rot, 1.0 percent; and

(g) the following do not affect seed quality and must not be scored against the grade:

i. brown discoloration following skinning;

ii. dried stems;

iii. flattened or depressed areas showing no underlying flesh discoloration;

iv. greening;

v. sunburn;

vi. skin checks; and

vii. silver scurf.

[For text of subitem (2), see M.R.]

Subp. 3. **Minnesota yellow tag certified seed potato grade.** To be graded as Minnesota yellow tag certified seed potatoes, the potatoes must meet the requirements of blue tag with the exceptions in items A to D.

[For text of item A, see M.R.]

B. Lot tolerances:

[For text of subitem (1), see M.R.]

(2) The following do not affect seed quality and must not be scored against the grade:

(a) sprouts; and

(b) flattened or depressed areas with or without underlying flesh discoloration.

[For text of item C, see M.R.]

D. Shape. The potatoes must be fairly well shaped, with an exception for long varieties where the tag states "except for shape." In that case the tubers may be misshapen.

Subp. 4 **Minnesota white tag certified seed potato grade.** Minnesota white tag certified seed potato grade consists of certified seed potatoes that are graded according to agreement between the seller and the purchaser as to size and defects, except that not more than one–half percent of soft rot, frozen, or wet breakdown and two percent dry rot, of which not more than one percent late blight tuber rot is allowed.

The use of the white tag certified seed potato grade must be restricted to intrastate shipments.

[For text of subps 5 and 6, see M.R.]

Subp. 7. **Definitions.** For the purpose of this part, the terms in items A to J have the meanings given them unless the context clearly indicates otherwise.

[For text of items A to E, see M.R.]

F. "Diameter" means the greatest dimension at right angles to the longitudinal axis. The long axis shall be used without regard to the position of the stem (stolon).

G. "Soft rot or wet breakdown" means any soft, mushy, or leaky condition of the tissues

H. "Dry rot" means decaying tissue that is dry

[For text of item I, see M.R.]

J. "Serious damage" means any defect or combination of defects which seriously affects the appearance of the individual potato or which cannot be removed without a loss of more than ten percent of the total weight of the potato including the peel covering the defective area. Any one of the following defects or any combination of defects, the seriousness of which exceeds the maximum allowed for any one defect shall be considered as serious damage:

[For text of subitems (1) to (5), see M.R.]

(6) surface or pitted scab, individually or in combination, which covers an area of more than 25 percent of the surface of the potato in the aggregate, or causes a loss of more than ten percent of the total weight of the potato including peel covering defective area;

[For text of subitem (7), see M.R]

Statutory Authority: *MS s 21.118*

History: *21 SR 482*