Canadian Food Inspection Agency | Agence canadienne d'inspection des aliments

Potato Inspection Manual

Fresh Products Section
Agrifood Division
Canadian Food Inspection Agency

Canada

1911330.5

Table of Contents

Potatoes

NOTE: The most current Test Market List should be referenced. Please note that for easier reference, we have included some longstanding test markets into this manual. They will be designated by an asterisk (*) (TM) indication.

1. General Requirements

1.1 Grades

The grades and grade names for potatoes in the *Fresh Fruit and Vegetable Regulations* ("Regulations") are:

Canada No. 1; and
Canada No. 2.

1.2 Similar Varietal Characteristics

All grades of potatoes are required to be of similar varietal characteristics within a container. This means that potatoes within a container are of the same general shape, skin colour, flesh colour or russetting of the skin. (Potatoes shall not be artificially coloured.) Therefore, long type potatoes cannot be mixed with round type potatoes, red skin potatoes cannot be mixed with white skin potatoes, yellow flesh potatoes cannot be mixed with white flesh potatoes, nor can russet potatoes be mixed with non-russet potatoes. However, for potatoes that are 3/4 inches to 1 5/8 inches (creamer) and 1 1/2 inches to 2 1/4 inches (small), they may be of mixed colour and variety when packed in containers of 2.27 kg (5 lb) and 1.36 kg (3 lb) and under. (*TM)

Due to varietal characteristics of the potato, as well as fluctuations in growing conditions and growing seasons, the tuber shape (round, oval, long, oblong to long, elliptical to oblong, etc.) may vary. The tuber shape may also vary if the potatoes are harvested early, for example, small long types often are round.

The inspector will determine the tuber shape as either round or long, based on the visual appearance of the lot at the time of inspection. Many varieties are clearly round or long type. For other less obvious varieties the inspector must determine the type and flesh colour based upon the physical appearance, or when available by referencing the Canadian Potato Varieties link at:
http://www.inspection.gc.ca/english/plaveg/potpom/var/indexe.shtml

On handwritten "E" and "S" inspection certificates, the actual shape should be shown under "Product or Declared Variety" heading, i.e., Potatoes, Long Type. For yellow-fleshed potatoes, the flesh colour as well as the shape should be indicated, i.e., Yellow Flesh Potatoes, Long Type. The skin colour will appear under the "Colour" heading. For MCAP certificates, shape and colour information must be included in the "product description" field.

1.3 Properly Packed

Potatoes must be "properly packed". This means that:

A) the potatoes are packed in a manner that is not likely to result in damage to the potatoes during handling or transport; and

B) the container contains not less than the net quantity of potatoes declared on the label as determined by the net quantity verification system.

Potatoes meeting the above requirements and those as defined in Schedules I and II of the Regulations may be reported as "properly packed".

In some instances, there may be a correlation between fill and short weight. An applicant may request a weight inspection because of slackness in fill. For example, if such a weight inspection revealed that thirty per cent of the packages in a lot of produce were below weight, then the lot would be detained for underweight. On handwritten certificates, a statement on actual weights should be made on the certificate as well as the statement "mostly properly packed, many slack filled" under the heading "Condition of Vehicle, Load, Packages and Pack". For MCAP, this statement must be included in the “product remarks” field.

1.4 Properly Marked

The Regulations require that containers of potatoes shipped interprovincially be properly marked. All the general requirements on labelling are prescribed in Part II of the Regulations. All markings are to be provided either directly on the package or on a tag attached thereto.

The following table is an example of the proper markings that are required for each size designation for Canada No. 1 grade. The table does not include the special lot tolerances for size or conversion to metric or weight equivalencies. Those are explained further under size requirements.

Type	Conditions	Size	Proper Marking
Round	No conditions apply (see note)	2 1/4" to 3 ½"	Canada No. 1
Round	New potatoes marketed before October 1 *(TM)	1 7/8" to 3 ½"	Canada No. 1
Round	*(TM)	1 ½" to 2 1/4"	Canada No. 1 1 ½" to 2 1/4" or Canada No. 1 Small 1 ½" to 2 1/4" or Canada No. 1 Small Round (cannot be marked just Canada No. 1 Small)
Long	No conditions apply (see note)	2" to 3 ½"	Canada No. 1
Long	Marketed inter-provincially only	1 7/8" to 3"	Canada No. 1 1 7/8" to 3"
Long	New potatoes marketed before July 1	1 7/8" to 3 ½"	Canada No. 1
Long	*(TM)	1 ½" to 2"	Canada No. 1 1 ½" to 2" or Canada No. 1 Small 1 ½" to 2" or Canada No. 1 Small Long (cannot be marked just Canada No. 1 Small)
All types	*(TM)	3/4" to 1 5/8"	Canada No. 1 3/4" to 1 5/8" or Canada No. 1 Creamer 3/4" to 1 5/8" or Canada No. 1 Creamer
All types	No conditions apply (see note)	2 3/4" to 4 ½"	Canada No. 1 Chef or Canada No. 1 2 3/4" to 4 ½" or Canada No. 1 Chef 2 3/4" to 4 ½"
All types	No conditions apply (see note)	3" to 4 ½"	Canada No. 1 Large or Canada No. 1 3" to 4 ½" or Canada No. 1 Large 3" to 4 ½"

Note: There are no conditions in regards to date, intended market and test market.

In addition, where potatoes are packed in cartons, they must meet the diameter, weight or count requirements and be labelled with either:

A) A count designation. When marked with a count designation, the carton must contain the number of potatoes declared by the count designation

within the tolerance specified in the regulations. The tolerance is that not more than 10% of the cartons shall contain up to 5% fewer or more potatoes than the count designation shown on the label. The potatoes shall have a minimum diameter according to the type and grade of the potatoes as well as meeting all other size requirements for the type and grade declared; or

B) One of the size designations (minimum and maximum weight) set out in Table 1 of this manual. Although the size designation is expressed as a count, it is actually a size. For example, when 70 size potatoes are packed in a 50 lb carton, there will be approximately 70 potatoes in the carton. If 70 size potatoes were packed in a 20 lb carton, there would be approximately 25 to 30 potatoes in the carton. In both cases the declaration of 70 size is correct if the potatoes are within the specified range permitted for 70 size in the table which is a minimum weight of 255 g (9 ounces) and a maximum weight of 425 g (15 ounces); or

C) A minimum weight designation. Where the potatoes are packed in containers that are labelled with the designation "283 g min." or "10 oz min.", the potatoes shall have a minimum weight of 283 g (10 ounces) as well as meeting all other size requirements for the type and grade declared.

Table 1
Size - Weight Designations

Item	Column I Size Designation	Column II Minimum Weight	Column III Maximum Weight
1.	Under 50	425 g (15 oz)	No maximum weight
2.	50	340 g (12 oz)	539 g (19 oz)
3.	60	283 g (10 oz)	454 g (16 oz)
4.	70	255 g (9 oz)	425 g (15 oz)
5.	80	227 g (8 oz)	369 g (13 oz)
6.	90	198 g (7 oz)	340 g (12 oz)
7.	100	170 g (6 oz)	283 g (10 oz)
8.	110	142 g (5 oz)	255 g (9 oz)
9.	120 and over	113 g (4 oz)	227 g (8 oz)

1.5 Packages

Containers of potatoes shall be free from stains and shall not be so soiled, warped, broken or otherwise damaged as to affect the shipping quality or saleability of the potatoes packed therein. The containers of produce shall be securely closed in a manner appropriate for the type of container.

In addition, the Regulations require that potatoes be packed in new, clean containers, free of stains and should be reported as such. Packages used for field or storage containers are not likely to qualify as new containers within this definition.

Potatoes are currently packed in various types of containers, e.g., paper bags, plastic bags, jute sacks and cartons. Standard containers for potatoes are:
1.36 kg or less (3 lb or less)*(TM)
2.27 kg (5 lb)
4.54 kg (10 lb)
6.80 kg (15 lb)*(TM)
9.07 kg (20 lb)
22.7 kg (50 lb)
34 kg (75 lb)
45.4 kg (100 lb)

Note: Canada No. 1 Small Round and Canada No. 1 Small Long potatoes may only be packaged in standard containers of 1.36 kg (3 lb) or less, 2.27 kg (5 lb), 22.7 kg (50 lb), 34 kg (75 lb), and 50 kg (110 lb)

2. Size

2.1 Requirements

The Canada No. 1 grade provides for various minimum and maximum size designations, but in all other respects meet the requirements of Canada No. 1. All Canadian grades require that potatoes be sized. Potatoes may meet either the minimum and maximum diameter size or weight requirements. The specific tolerance for each grade is as follows:

Canada No. 1

A) Round type potatoes:

i) Have a minimum diameter of 57 mm (2 1/4 inches) and a maximum diameter of 89 mm (3 ½ inches), or have a minimum weight of 142 g (5 ounces) and a maximum weight of 340 g (12 ounces);

ii) In the case of new potatoes (round type), may have a minimum diameter of 48 mm (1 7/8 inches), where the new potatoes are shipped before October 1*(TM) in the year in which they were grown.

iii) In the case of round type potatoes commonly referred to as “Small”,

may have a minimum diameter of 38 mm (1 ½ inches) and a maximum diameter of 57 mm (2 1/4 inches).*(TM)

B) Long type potatoes:

i) Have a minimum diameter of 51 mm (2 inches) and a maximum diameter of 89 mm (3 ½ inches), or a minimum weight of 113 g (4 ounces) and a maximum weight of 340 g (12 ounces); except that potatoes 89 mm (3 ½ inches) or more in length may have a minimum diameter of 44 mm (1 3/4 inches) and, in either case, at least 60 per cent by weight of the potatoes in the lot shall have a diameter of at least 57 mm (2 1/4 inches) or a weight of at least 142 g (5 ounces);

ii) In addition to meeting the requirements for long type potatoes, new potatoes (long type), may have a minimum diameter of 48 mm (1 7/8 inches) rather than 51 mm (2 inches), where the new potatoes are shipped before July 1 in the year in which they were grown.

iii) Long type potatoes shipped on the interprovincial market only**,** all year round, may have a minimum diameter of 48 mm (1 7/8 inches) and a maximum diameter of 76 mm (3 inches), or
a maximum weight of 283 g (10 ounces), and at least 75 per cent by weight of the potatoes in the lot shall have a diameter of at least 51 mm (2 inches) or a weight of at least 113 g (4 ounces). This applies only where the packages are labelled with the Grade/Size designation “Canada No. 1 1 7/8" to 3" “.

iv) In the case of long potatoes commonly referred to as “Small”, may have a minimum diameter of 38 mm (1 ½ inches) and a maximum diameter of 51 mm (2 inches).*(TM)

C) Potatoes of any type

Canada No. 1 19 mm to 41 mm (3/4 to 1 5/8 inches), commonly referred to as “Creamer”

i) A minimum diameter of 19 mm (3/4 inches) and a maximum diameter of 41 mm (1 5/8 inches); *(TM)

Canada No. 1 Chef 70 mm to 114 mm (2 3/4 to 4 ½ inches)

i) A minimum diameter of 70 mm (2 3/4 inches) and a maximum diameter of 114 mm (4 ½ inches); or

ii) A minimum weight of 227 g (8 ounces) and a maximum weight of 794 g (28 ounces).

Canada No. 1 Large 76 mm to 114 mm (3 to 4 ½ inches)

i) A minimum diameter of 76 mm (3 inches) and a maximum diameter of 114 mm (4 ½ inches); or

ii) A minimum weight of 283 g (10 ounces) and a maximum weight of 794 g (28 ounces).

Canada No. 2

Potatoes of any type:

i) Potatoes shipped all year round have a size of 44 mm (1 3/4 inches) to 114 mm (4 ½ inches) in diameter or a maximum weight of 794 g (28 ounces), provided that 75% by weight of the specimens in the lot have a diameter of at least 51 mm (2 inches) or a weight of at least 113 g (4 ounces).

2.2 Measuring Size

The measurement for minimum and maximum diameter shall be the greatest distance of a potato taken at right angles to the longitudinal axis, disregarding the position of the stem.

To determine off-size specimens, inspectors shall use a metal ring sizer. Suspected specimens are placed on the ring. When checking for oversize, if the potato supports its own weight without falling through the ring, it will be scored for oversize when checking the upper size range. However, when checking for undersize, if the potato passes through the ring even if it touches the sides, it will be scored for undersize when checking the lower size range.

Note: The percentage of undersize or oversize specimens should not be noted on the certificate if the lot meets the size requirements for the grade unless the applicant specifically requests this information. In cases where the lot fails the size requirements, the exact percentage should be shown under the "Grade Defects" heading.

2.3 Special Lot Tolerance for Size

Certification of Canada No. 1 long type potato of a size 51 mm to 89 mm (2 to 3 1/2 inches) has a special lot tolerance requiring 60% to be 57 mm (2 1/4 inches) or greater. Likewise, certification of Canada No. 1 long type (interprovincial) 48 mm to 76 mm (1 7/8 to 3 inches) and Canada No. 2 potatoes include special lot tolerance for size requiring 75% to be 51 mm (2 inches) or greater. It should be noted that U.S. No. 1 and U.S. No. 1 Size A also have special lot tolerances for size.

The procedure for inspecting to the special lot tolerances will be explained below using the 60% tolerance as an example.

Sampling for lot compliance with the lot tolerance (60% or 75%) for size is based on a reduced sample size unless there is an indication of non-compliance.

When verifying the 60%, 57 mm (2 1/4 inches) or 142 g (5 ounces) and larger size requirements on long varieties of potatoes, inspectors should initially determine

the percentage of potatoes 57 mm (2 1/4 inches) and larger or 142 g (5 ounces) and larger in the first four samples inspected in the lot.

The weight and the calculated percentage of potatoes 57 mm (2 1/4 inches) or 142 g (5 ounces) and larger should be shown on the detail sheet. **(See Figure 1.)**

The same samples should also be checked at this time for defects, undersize and oversize.

If, in the first four samples the average number of specimens 57 mm (2 1/4 inches) or 142 g (5 ounces) and larger in size is 65% or less, or if any bag is below 60%, then four additional samples should be examined for the special lot tolerance. **(See Figure 2.)** Using an additional 5% as a cut-off provides an "insulation factor" when sampling the first four samples.

If the average still does not exceed 65%, 57 mm (2 1/4 inches) or 142 g (5 ounces) and larger, then all remaining packages in the sample should be measured to determine compliance with the special lot tolerance for size. **(See Figure 3.)**

Note: There is a possibility that the load may fail for undersize, but meet the special lot tolerance. However, the Regulations require that both be met for the load to pass.

On the face of the certificate under the "Size" heading, the inspector should show the size range and the compliance to the 60% requirement. If all samples have been examined for meeting the size requirement and the actual percentage found is greater than or equal to 60%, (i.e., 65%, 57 mm (2 1/4 inches) or 142 g (5 ounces) and larger), inspectors are advised to only report on the certificate, that the 60%, 57 mm (2 1/4 inches) or 142 g (5 ounces) and larger requirement has been met and leave the detail to show the actual size and percentage.

Potatoes packed by count

Where potatoes are packed and labelled with a count designation, they shall meet the minimum and maximum size designations according to variety and grade. However, not more than 10% of the cartons shall contain up to 5% fewer or more potatoes than the count designation shown on the label.

When undersize or oversize specimens are also defective

Undersize and oversize specimens which are also defective should be scored twice. First as off-size, second as a defect. This is necessary because the grades have separate tolerances for off-size and defects.

Inspection Details - Détails d'inspection		Inspection	Date	Time Heure
Verbal Notification of Findings / Notification verbale des conditions To / À Time / Heure: Date:	Cert. No. / N° de cert. Car or Truck No./ N°. wagon ou camion	Requested		
		Started		
		Finished		

Packer or Grower Établisse-ment d' emballage ou producteur	Product or Variety Produit ou variété	Declared Déclaré(e)		Package Colis		No. or Weight Insp. N°. ou poids insp.	Decay	Mechanical	Sunburn			Undersize 2" min or 4 oz	WT 2 1/4" or 5 oz and over	% 2 1/4" or 5 oz and over	Total Defects Total Défauts
		Grade Cat.	Size Cal.	No. N°.	Kind Sorte										
Ace Packing Company	Table Potatoes	Can. No.1	2" to 3 ½"	750 X	Jute Bags	50	-	-	-			1	34	68	
	(Long Type)			50 lb		50	-	1¼	-			2½	29	**58**	sample below 60%
			60%			50	½	-	1½			1½	33	66	
			2¼ & over			50	-	-	-			1	32	64	
						50									
						50									
						50									
						50									
						50									
						50									
						50									
						50									
					Total	600									
					% Total									**64**	Avg. less than 65%

No. of Packages in Lot N°. d'emballages dans le lot	No. Packages Inspected N°. d'emballages inspectés	Inspector Inspecteur

Figure 1

Inspection Details - Détails d'inspection		Inspection	Date	Time
Verbal Notification of Findings / Notification verbale des conditions To / À Time / Heure Date:	Cert. No. / N° de cert. Car or Truck No. / N°. wagon ou camion	Requested		
		Started		
		Finished		

Packer or Grower Établisse-ment d' emballage ou producteur	Product or Variety Produit ou variété	Declared Déclaré(e)		Package Colis		No. or Weignt Insp. N°. ou poids insp.	Decay	Mechanical	Sunburn			Undersize 2" min or 4 oz	WT 2 1/4" or 5 oz and over	% 2 1/4" or 5 oz and over	Total Defects Total Défauts
		Grade Cat.	Size Cal.	No. N°.	Kind Sor-te										
Ace Packing Company	Table Potatoes	Can No.1	2" to 3 ½"	750 X	Jute Bags	50	-	-	-			1	34	68	
	(Long Type)			50 lb		50	-	1¼	-			2½	29	58	
			60%			50	½	-	1½			1½	33	66	
			2¼ & over			50	-	-	-			1	32	64	
						50	¾	-	-			-	32	66	
						50	-	-	-			2	32	64	
						50	-	1	3			3	29	58	
						50	-	-	-			1	34	68	
						50									
						50									
						50									
						50									
					Total	600									
					% Total									**64**	Avg. less than 65%
No. of Packages in Lot N°. d'emballages dans le lot				No. Packages Inspected N°. d'emballages inspectés								Inspector Inspecteur			

Figure 2

Inspection Details - Détails d'inspection		Inspection	Date	Time
Verbal Notification of Findings / Notification verbale des conditions	Cert. No. / N° de cert.	Requested		
To / À		Started		
Time / Heure Date:	Car or Truck No. / N°. wagon ou camion	Finished		

Packer or Grower Établisse-ment d' emballage ou producteur	Product or Variety Produit ou variété	Declared Déclaré(e)		Package Colis		No. or Weight Insp. N°. ou poids insp.	Decay	Mechanical	Sunburn			Undersize 2" min or 4 oz	WT 2 1/4" or 5 oz and over	% 2 1/4" or 5 oz and over	Total Defects Total Défauts
		Grade Cat.	Size Cal.	No N°.	Kind Sorte										
Ace Packing Company	Table Potatoes	Can. No.1	2" to 3 ½"	750 X	Jute Bags	50	-	-	-			1	34	68	
	(Long Type)			50 lb		50	-	1¼	-			2½	29	58	
			60% 2¼ and over			50	½	-	1½			1½	33	66	
						50	-	-	-			1	32	64	
						50	¾	-	-			-	32	66	
						50	-	-	-			2	32	64	
						50	-	1	3			3	29	58	
						50	-	-	-			1½	34	68	
						50	-	-	-			1	30	60	
						50	-	1¼	-			2	31	62	
						50	-	-	-			1½	29	58	
						50	-	-	-			1	30	60	
					Total	600	1¼	3½	4½			18			
								8							
					% Total		0.2	1.33				3		**63**	To be reported on cert

No. of Packages in Lot N°. d'emballages dans le lot	No. Packages Inspected N°. d'emballages inspectés	Inspector Inspecteur

Figure 3

3. Maturity and Firmness

3.1 Requirements

The maturity and firmness requirements for each grade are as follows:

A) Canada No. 1

i) Not be shrivelled or flabby;
ii) Except in the case of new potatoes shipped before September 16th in the year in which they were grown, have skins that will not loosen readily during ordinary handling and have not more than ten per cent (10%) of the surface flesh exposed.

B) Canada No. 2

i) Potatoes are reasonably firm;
ii) Have no skinning requirements.

3.2 Terminology Used

Firmness and readily loosened skin are the two factors quoted in the grade standards that may be associated with potato maturity. Readily loosened skin may be referred to as "feathered".

The degree of skinning on individual potatoes refers to the amount of skin missing or feathered. Usually the more immature the potatoes, the greater the degree of skinning. In order to properly describe the degree of maturity, the following terminology shall be used:

A) "Practically no skinning" means that not more than one-tenth (10%) of the skin of the individual potato is missing or feathered.
B) "Slightly skinned" means that not more than one-quarter (25%) of the skin of the individual potato is missing or feathered.
C) "Moderately skinned" means that more than one-quarter but not more than one-half (25-50%) of the skin of the individual potato is missing or feathered.
D) "Badly skinned" means that more than half (50%) of the skin of the individual potato is missing or feathered.
E) "Firm" means that the potato is compact, solid, not shrivelled or flabby or pliable and unyielding to moderate pressure.
F) "Reasonably firm" means that the potato is slightly wrinkled, slightly pliable and yields slightly to moderate pressure.
G) "Flabby" means that the potato is soft, limp, pliable and yields to moderate pressure.

Since no skinning requirements exist for Canada No. 2 potatoes or new potatoes shipped before September 16 in the year in which they were grown, the inspector should use one of these terms that accurately describe the degree of skinning. Commencing September 16, the inspector should use the term "mature", which means "firm, practically no skinning" and indicates compliance with Canada No. 1 grade requirements. With respect to firmness, the term "reasonably firm" for Canada No. 2 is used to indicate compliance with the grade requirements.

The September 16 date should not be confused with the October and July dates that affect the size requirements for new potatoes.

In the majority of cases, it is expected that firmness and skinning would be sufficiently uniform that the use of more than one descriptive term for each would be unnecessary. However, where necessary, general terms may be used, e.g., "mature" or "badly skinned, firm", or "slightly to badly skinned, generally moderately skinned, firm".

When a lot of potatoes fails grade on account of lacking firmness or skinning requirements, report the exact percentage of specimens failing the specific requirement. For example, if the lot fails due to excess skinning, the percentage of specimens should be reported as: "average 22% badly skinned, the remainder moderately skinned". Similarly, if the lot fails on account of lacking firmness, (i.e., flabby) it should be reported as: "average 28% flabby, remainder firm to reasonably firm".

4. Colour and Cleanliness

There is no colour requirement for all grades of potatoes, such as, what you would normally see in a commodity like apples.

On the other hand, this does not exclude defects that affect the colour of the skin such as scald or healed over flesh nor does it exclude the requirement of not permitting artificial colour.

Note: Artificial colouring is not permitted in either grade.

Cleanliness is a very important part of the Canada No. 1 grade. Canada No. 1 potatoes are required to be reasonably clean.
"Reasonably clean" has been defined to mean:

i) The potatoes are reasonably free from dirt; and
ii) Where the potatoes are in a container, there is not more than a slight amount of loose dirt or foreign material in the container.

Canada No. 2 potatoes shall not be more than slightly dirty.
"Slightly dirty" means:

i) There is an appreciable amount of dirt adhering to the potatoes; and
ii) Where the potatoes are in a container, there is not more than a moderate amount of loose dirt or foreign material in the container.

A) Canada No. 1

Score when individual specimens:

i) show caked dirt, mould or decayed matter on more than 5% of the surface in the aggregate. "Caked dirt" is dirt which is dried on and is difficult to remove; or

ii) have more than 15% of the surface in the aggregate lightly stained or covered by adhering soil.

B) Canada No. 2

Score when individual specimens:

i) show caked dirt, mould or decayed matter on more than 25% of its surface in the aggregate; or

ii) have more than 50% of the surface in the aggregate covered by bad dirt stains and/or dirt.

The word "washed" may be used in connection with either grade of potatoes, if prior to being packed the potatoes have been washed and are clean. "Clean" means there is no adhering soil.

On a handwritten certificate, both colour and cleanliness will be shown on the certificate under the "Colour" heading. The colour will show the varietal colour. For example, "Red, washed, clean", "white, reasonably clean" or "white, mostly clean, some dirty". When a lot fails on account of dirty specimens, a description should be given in general terms under the "Colour" heading along with the phrase "See Grade Defects". In MCAP, only the colour will appear in the colour heading. Comments relative to cleanliness should be made under “Remarks”. The actual percentage of failing specimens will be shown under the "Grade Defects" heading.

5. Shape

The shape of potatoes should be considered from the standpoint of shape characteristic of a particular variety. Some varieties have peculiar characteristics that make them outstanding from the standpoint of shape (e.g. fingerlings).

The term “fingerling” refers to shape, not colour or texture. While classic varieties are either round or oval (long), fingerlings have a slender, elongated form with many eyes. Most varieties have red or yellow skin and yellow, waxy flesh. (See Appendix IV for more information on fingerlings.)

Misshapen Specimens

Misshapen specimens could take different forms. The potato may be curved, pointed or creased, have the form of a dumbbell, a bottle neck or have knobs on the tuber. The most common causes of misshapen potatoes are environmental factors affecting growth such as irregularities in soil moisture and nutrients. (See Appendix II)

Misshapen specimens should be scored when the potatoes are:

A) Canada No. 1
- i) materially pointed; or
- ii) materially dumb-bell shaped or otherwise materially deformed.

B) Canada No. 2
- i) seriously pointed; or
- ii) seriously dumb-bell shaped or otherwise seriously deformed.

Folded Ends

Folded end is the term used to describe areas that fold inward on potatoes. These areas develop during the growing process and generally occur on the end of the potato.

Score folded ends when:

A) Canada No. 1
- i) materially detracting from the appearance of the potato.

B) Canada No. 2
- i) seriously detracting from the appearance of the potato.

Visual Aids Refer to POT.-L-1-May 1998 photos 114 - 117 (USDA)

Second Growth

Second growths are commonly attributed to high field temperatures and drought. They may, however, result from regeneration following any condition causing irregular rates of tuber development, such as uneven availability of nutrients or moisture, extremes in temperature, or vine-defoliation from hail or frost. When growing conditions improve, resumption of tuber growth becomes evident as second growth. (For visual aid, refer to diagram of ‘Knobby Tubers’ in Appendix II)

Second growths are to be scored when:

A) Canada No. 1
- i) materially detracting from the appearance of the potato.

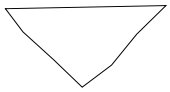
B) Canada No. 2
- i) seriously detracting from the appearance of the potato.

6. Special Inspection Procedures

6.1 Method of Cutting to Determine Waste

In determining the amount of waste required to remove a defect, the recommended procedure is to first make a straight cut about 6 mm (1/4 inch) deep across the potato to remove all or most of the damage. If the damage is still present, then a curved or half-moon cut should be made. The amount removed by both the straight cut and curved cut should be used to determine waste. The above method is probably not practical or fair in assessing "damage" on the flat side of a potato. In these instances only, a curved or half-moon cut should be used to remove the defect.

e.g. Correct (half-moon) Incorrect (V-shaped)



Offices are supplied with scales to assess "cut-off" damage. Inspectors should frequently practice making 5% and 10% "cut-offs" so that their judgement in assessing "damage" and "serious damage" will be uniform and accurate.

6.2 Procedure for Sampling for Internal Defects

6.2.1 Preliminary Examination

Potatoes are subject to having internal defects, for example, net necrosis, hollow heart, etc. Some of these defects may give an external indication of problems, but some do not. Therefore, in order to confirm that there are no internal defects present, the inspector should always make a preliminary examination by cutting some randomly selected specimens from the first three samples examined.

When the inspector is satisfied that there are no internal defects in the samples, the inspector does not need to cut any more specimens. If the preliminary examination shows internal defects are present, the inspector must decide if the external appearance is a reliable indicator of the internal defect or if the defect is hidden. This will dictate which of the following two methods to use to inspect for internal defects.

6.2.2 Sampling Method for Internal Defects that Have No External Indications (Composite)

When the preliminary examination confirms that there are hidden internal defects where the outward appearance gives no indication of the defect or is not reliable, the inspector should take random samples by selecting a predetermined weight of specimens from each package. The samples are then cut and defective specimens found must be scored against the cut sample only.

For example, when inspecting a 22.7 kg (50 lb) bag of potatoes, the inspector finds that internal discolouration is present but the outward appearance of the specimens gives no indication of the defect. The inspector then takes 4.5 kg (10 lb) from the bag completely at random and, after cutting every specimen, finds that .9 kg (2 lb) are showing internal discolouration.

The .9 kg (2 lb) of internal discolouration would be scored against the 4.5 kg (10 lb) sample (2/10 x 100 = 20%). The sample to be cut must be selected completely at random and the size of the sample must be accurate and consistent from each bag. The remaining 18.2 kg (40 lb) are used exclusively for scoring size, grade and condition defects. Never score the same specimen twice.

It is acceptable to either cut the 4.5 kg (10 lb) sample and score it as each package is inspected, or the 4.5 kg (10 lb) from each sample may be set aside and accumulated for inspection as a composite sample after the other samples are inspected.

However, on the certificate, no ranges shall be reported on a composite sample.

6.2.3 Sampling Method for Internal Defects that Have External Indications

If the outward appearance of the specimen does give some indication of the defect, the inspector should select the suspect specimens from the total sample and cut them for examination. Those specimens found to be defective must be scored against the total sample. For example, if a preliminary examination of a 22.7 kg (50 lb) bag of potatoes reveals that only the larger rough potatoes have hollow heart, this type of potato is picked out of the lot and cut for examination.

If 4.5 kg (10 lb) are picked out of a 22.7 kg (50 lb) bag and, after cutting every specimen, 2.3 kg (5 lb) are scoreable for hollow heart, then the 2.3 kg (5 lb) are scored against the total 22.7 kg (50 lb) sample. (5/50 x 100 = 10%). In this method, internal defects are to be reported on the certificate showing range.

Defects

General tolerance for the grade are based on external and internal defects; however, for the convenience of the inspector, defects are also identified as Permanent or Condition by a (P) or a (C), respectively.

Note: All USDA visual aids which reference photos are from POT.-L-1-May 1998.

7. External Defects

External defects are defects which can be detected externally. However, cutting may be required to determine the extent of the injury.

7.1 Air Cracks (C)

Air cracks sometimes occur during harvest or packing, or after packing if the packages are too tight, overfilled, or roughly handled.

They may appear as fresh, longitudinal cracks and are scored if they materially or seriously affect the appearance of the potato.

For more information, please refer to visual aid: POT-2, (06/96) (CFIA).

Air cracks are scored when:

A) Canada No. 1

i) the air crack(s) exceed 1/3 the length/diameter of the potato (whichever is greater) in the aggregate; or

ii) the damage cannot be removed without the loss of more than 5% of the weight of the potato.

B) Canada No. 2

i) the air crack(s) exceed 3/4 the length/diameter of the potato (whichever is greater) in the aggregate; or

ii) the damage cannot be removed without the loss of more than 10% of the weight of the potato.

7.2 Bruises (P & C)

Bruises on potatoes generally manifest as one of two kinds: **shatter bruises** or **pressure bruises**. Bruises from rough handling that produces areas of cracked, shattered skin, or severe breaks to the flesh are considered shatter bruises. These nearly always result in damage to the underlying tissue. Areas that are flattened or depressed due to pressure at points of contact with adjacent potatoes or the floor are considered to be pressure bruises.

Shatter Bruises

The term “shatter bruises” is used to describe recent injury to a potato from rough handling. In some lots, almost invisible bruising or shattering is followed by extensive rot.

For more information, please refer to visual aid POT-3 (06/96) (CFIA), and photos 97 – 99 (USDA).

Damage by shatter bruises is scored when:

A) Canada No. 1

i) affects more than 5% of the surface area in the aggregate; or
ii) the injury to the surface area cannot be removed without a loss of more than 5% of the weight of the potato; or
iii) materially affects the appearance of the potato.

B) Canada No. 2

i) affects more than 10% of the surface area in the aggregate; or
ii) the injury to the surface area cannot be removed without a loss of more than 10% of the weight of the potato; or
iii) seriously affects the appearance of the potato.

Note: Shatter bruises should be scored as a condition defect at destination if there is reason to suspect the damage occurred subsequent to grading and packing. They should be reported as “Shattering”.

If the inspector suspects the damage occurred at shipping point, then the defect should be reported as “shattered” and scored as a grade defect. All bruises at shipping point are considered to be grade defects.

Pressure Bruises

Pressure bruises develop in storage on some tubers late in the season. There appears to be a relation between maturity, storage conditions, and pressure bruises. This defect is more often the result of pressure bruises at point of contact with adjacent potatoes or the floor. In most instances, there will be no discolouration of the underlying flesh at time of packing, however, grayish to black discolouration may develop in this tissue, to a considerable depth, upon arrival in the market. It is impossible to predict whether discolouration will occur, or how extensive it will be, from the appearance of the flattened or depressed areas.

Damage by pressure bruises is scored when:

A) Canada No. 1

i) affects more than 5% of the surface area in the aggregate; or
ii) the injury to the surface area cannot be removed without a loss of more than 5% of the weight of the potato; or

iii) materially affects the appearance of the potato (as determined by the following table A)).

B) Canada No. 2

i) affects more than 10% of the surface area in the aggregate; or
ii) the injury to the surface area cannot be removed without a loss of more than 10% of the weight of the potato; or
iii) seriously affects the appearance of the potato (as determined by the following table B)).

All pressure bruises may be lumped under one defect heading, however, if reported as such, the inspector must use the general terms to identify the type of pressure bruises (eg. generally flattened and depressed, few sunken and discoloured). If reported separately, the use of the general terms is not required.

The following tables should be used as guides when scoring pressure bruises to determine if they materially or seriously affect the appearance. Descriptions of the different types of pressure bruises are as follows:

Flattened or Depressed Areas (C)

These flattened or depressed areas are usually not found until after the potatoes have been in storage for several months. This defect is most often the result of pressure at points of contact with adjacent potatoes or floor. These areas will exhibit a rubbery feel and a slight wrinkling or a soft elasticity of the skin over the flattened area. If these qualities are not present on the flattened or depressed areas the potato is more likely to be affected by a shape problem.

Visual Aids Refer to photo 137 (USDA).

Sunken Discoloured Areas (C)

These areas vary in size and are sunken in comparison with the adjacent surface. They are darker than the skin colour of the potato and vary in their degree of darkness from light brown to dark brown to black.

Visual Aids Refer to photo 138 (USDA).

Sunken Discoloured Sticky Areas (C)

Discolouration of this kind is more serious than the previous types as soft rot may often develop in transit. This condition most frequently occurs on skinned areas of potatoes which are harvested during extremely hot weather with no protection from the sun or wind. Cutting may be done to determine sticky areas.

Visual Aids Refer to photo 138 (USDA) for ID only.

Score as *"materially affects"* when the affected area(s) affects more surface area than allowed as outlined in the following table.

A) Canada No. 1

Potato Diameter		**Potato Weight**		**Flattened Depressed Areas** ***(in the aggregate)***	**Sunken Discoloured Areas** ***(in the aggregate)***	**Sunken Discoloured Sticky Areas** ***(in the aggregate)***
inches	***mm***	***ounces***	***g***	**Not more than:**		
< 2	< 51	< 4	<113	13 mm (½ inch)	10 mm (3/8 inch)	6 mm (1/4 inch)
2 - 2 ½	51-63	4-6	113-170	26 mm (1 inch)	18 mm (3/4 inch)	13 mm (½ inch)
>2 ½ - 3	>63-76	>6-8	>170-227	32 mm (1 1/4 inch)	26 mm (1 inch)	18 mm (3/4 inch)
>3 - 3 ½	>76-89	>8-14	>227-397	39 mm (1 1/2 inch)	32 mm (1 1/4 inch)	26 mm (1 inch)
>3 ½ - 4	>89-101	>14-20	>397-568	44 mm (1 3/4 inch)	39 mm (1 1/2 inch)	32 mm (1 1/4 inch)
>4 - 4 ½	>101-114	>20-28	>568-795	51 mm (2 inch)	44 mm (1 3/4 inch)	39 mm (1 1/2 inch)
>4 ½ - 5	>114-127	>28-36	>795-1022	57 mm (2 1/4 inch)	51 mm (2 inch)	44 mm (1 3/4 inch)
> 5	>127	>36	>1022	64 mm (2 1/2 inch)	57 mm (2 1/4 inch)	51 mm (2 inch)

Score as *"seriously affects"* when the affected area(s) affects more surface area than allowed as outlined in the following table.

B) Canada No. 2

Potato Diameter		**Potato Weight**		**Flattened Depressed Areas** ***(in the aggregate)***	**Sunken Discoloured Areas** ***(in the aggregate)***	**Sunken Discoloured Sticky Areas** ***(in the aggregate)***
inches	***mm***	***ounces***	***g***	**Not more than:**		
< 2	< 51	**< 4**	**< 113**	26 mm (1 inch)	18 mm (3/4 inch)	13 mm (1/2 inch)

2 - 2 ½	51-63	4-6	113-170	39 mm (1 1/2 inch)	26 mm (1 inch)	18 mm (3/4 inch)
>2 ½ - 3	>63-76	>6-8	>170-227	44 mm (1 3/4 inch)	32 mm (1 1/4 inch)	26 mm (1 inch)
>3 - 3 ½	>76-89	>8-14	>227-397	48 mm (1 7/8 inch)	39 mm (1 1/2 inch)	32 mm (1 1/4 inch)
>3 ½ - 4	>89-101	>14-20	>397-568	51 mm (2 inch)	44 mm (1 3/4 inch)	39 mm (1 1/2 inch)
>4 - 4 ½	>101-114	>20-28	>568-795	57 mm (2 1/4 inch)	51 mm (2 inch)	44 mm (1 3/4 inch)
>4 ½ - 5	>114-127	>28-36	>795-1022	69 mm (2 3/4 inch)	57 mm (2 1/4 inch)	51 mm (2 inch)
> 5	>127	>36	> 1022	84 mm (3 1/4 inch)	64 mm (2 ½ inch)	57 mm (2 1/4 inch)

7.3 Cuts/ Clipped Ends/ Knobs Removed (P)

7.3.1 Cuts

Cuts are areas where some of the flesh of the potato has been exposed. This may occur during harvest, storage or packing. Do **not** confuse this defect with clipped ends, knobs removed or mechanical damage.

Note: Digger cuts are considered the same as cuts and should be scored under the same heading.

Cuts are to be scored when:

A) Canada No. 1

i) one (1) smooth cut affects more than 5% of the surface area.

B) Canada No. 2

i) cut(s) affect more than 10% of the surface area in the aggregate; or

ii) a single cut extends beyond one-half (½) the length of the potato.

7.3.2 Clipped Ends

This defect has been included as a result of the Canada/U.S. potato grade harmonization talks. This is intended for information purposes only and is not to be implemented by Canadian inspection staff.

Do not confuse this defect with knobs removed, mechanical damage or cuts.

7.3.3 Knobs Removed

The two main causes of this defect include knobs breaking off accidentally when they are not well attached to the tuber or trimming of these knobs during the sorting and grading process.

Knobs removed is scored when:

A) Canada No. 1

i) more than one knob is removed;
ii) the area of one removed knob affects more than 5% of the surface; or
iii) the affected area is rough or jagged.

B) Canada No. 2

i) affects more than 10% of the surface area in the aggregate; or
ii) the area that is rough or jagged affects more than 5% of the surface area in the aggregate.

Visual Aids Refer to photos 100 – 101 (USDA)

7.4 Dried Stems (P)

This defect is rather unusual and occurs mostly during seasons of extreme drought when enlarged, tough stems do not readily separate from the tubers.

Dried stems which remain attached to individual potatoes are **not** scoreable as a defect against either the Canada No. 1 or Canada No. 2 grades.

7.5 Dry Rot (C)

This term is used to describe the dry decomposition usually starting in cuts, bruising or other injuries. It may be moist but not wet. Inspectors should follow the same rule as decay regarding the identification of this disease.

Dry rot is scored when:

A) Canada No. 1

i) affects the flesh of the potato and cannot be removed without a waste of more than 5% by weight of a potato.

B) Canada No. 2

i) affects the flesh of the potato and cannot be removed without a waste of more than 10% by weight of a potato.

7.6 Elephant Hide (P)

Elephant hide manifests as a severe roughened scaling of the skin unlike typical scab infections. The skin often appears darker and thicker than normal with deep checking, cracking or scaling.

Elephant hide is to be scored when:

A) Canada No. 1

i) affects more than 10% of the surface of the potato.

B) Canada No. 2

i) affects more than 25% of the surface of the potato.

7.7 Enlarged Lenticels (P & C)

Excessive moisture before harvest is the main cause of this disorder. Normally lenticels are inconspicuous on tubers but under high moisture conditions they rise about 1.6 mm (1/16 inch) and form numerous whitish protuberances over the tuber surface. If tubers are held in moist atmospheres, these elevated areas remain whitish, but when the tubers dry, they become skin coloured, open and somewhat depressed. They make excellent openings for micro-organisms, particularly soft rot bacteria.

For more information, please refer to visual aid: POT-1, (01/95) (CFIA) and photos 105 - 107 (USDA).

Enlarged lenticels are scored when:

A) Canada No. 1

i) it materially affects the appearance.

B) Canada No. 2

i) it seriously affects the appearance.

7.8 External (Surface) Discolouration (C)

Note: External discolouration, previously specified as ‘Other Than Healed Over Flesh or Scald’, ‘Healed Over Flesh’, and ‘Scald’, has now been grouped into one defect, referred to as External Discolouration.

External discolouration is usually caused by a rapid loss of moisture and oxidation through skinned areas. Although some browning occurs eventually on any injured tissue exposed to the air, it is most serious on skinned potatoes. This type of discolouration is usually only skin deep and rarely affects the flesh of the potato.

Areas that are light tan or lighter in colour and blend with the colour of the tuber

should be ignored. These scoring guides are to be used in conjunction with the official USDA visual aids.

Score external discolouration when:

A) Canada No. 1

i) more than 30% of the surface is affected with light tan or light brown and does not blend; or

ii) more than 15% of the surface is affected with areas darker than light tan or light brown in colour.

B) Canada No. 2

i) more than 60% of the surface is affected with light tan or light brown and does not blend; or

ii) more than 30% of the surface is affected with areas darker than light tan or light brown in colour.

Visual Aids Refer to photos 108 - 113 (USDA) and to POT-7, (07/97) and POT-8, (07/97) (CFIA)

7.9 Freezing and/or Chilling Injuries (P&C)

Frozen means that the potato temperature is still below freezing; the potato remains firm without the soft, leaking, wet breakdown associated with tubers that have thawed. Ice crystals will be evident within the tissue.

Freezing injury is the term that refers to potatoes that have been frozen but are not in a frozen state at the time of inspection. Tubers with freezing injury may be firm but show internal discoloration and breakdown of the cells. When ice crystals form in the cells, then thaw, tissue may become soft and watery. A dark line often separates the damaged tissue from healthy tissue. Externally, the potato may appear flabby and darker in appearance. Vascular tissue is very susceptible to low temperatures and may turn black.

Where a tuber has been exposed to freezing temperatures for a short period of time, superficial damage may occur with the lesions becoming a dry, leathery, chalky white, starchy mass.

Chilling injury may be the result of prolonged exposure to temperatures at or slightly above the freezing point. Affected areas may appear as: darkening or necrosis of the vascular bundles, Mahogany Browning, or internal pink, grey or purple discolouration. See Section 8.4 Internal Discolouration for information on Mahogany Browning.

For both Canada No. 1 and Canada No. 2 grades, if wet, soft, mushy or leaky type of injury is present, score against the tolerance for decay.

Freezing and/or chilling injury is scored when:

A) Canada No. 1

i) external dry type of freezing and/or chilling injury is present affecting the flesh of the potato and cannot be removed without a loss of more than 5% by weight of the potato (score as dry rot against the general tolerance for external defects); or

ii) discolouration of the tissue of the potato is present which cannot be removed without a loss of more than 5% by weight of the potato; or there are more than the equivalent of three (3) scattered spots 3mm (1/8 inch) in diameter on a potato of 63 mm (2 ½ inches) or a weight of 170 g (6 ounces).

Correspondingly, lesser or greater affected spots are allowed on smaller or larger potatoes.

B) Canada No. 2

i) external dry type of freezing and/or chilling injury is present affecting the flesh of the potato and cannot be removed without a loss of more than 10% by weight of the potato (score as dry rot against the general tolerance for external defects); or

ii) discolouration of the tissue of the potato is present which cannot be removed without a loss of more than 10% by weight of the potato; or there are more than the equivalent of six (6) scattered spots 3mm (1/8 inch) in diameter on a potato of 63 mm (2 ½ inches) or a weight of 170 g (6 ounces).

Correspondingly, lesser or greater affected spots are allowed on smaller or larger potatoes.

Note: Discolouration of the flesh of the tuber should be scored on a waste basis if the damage is entirely outside of the vascular bundles, and should be scored on the basis of the equivalent of 3 or 6 scattered spots 1/8 inch in diameter in an individual tuber when the damage is entirely within the vascular ring.

Visual Aids Refer to photos 29 – 31 (USDA)

It is very important to show the location of the freezing injury both within the package and vehicle. The location of affected specimens generally provides conclusive proof of whether the damage occurred prior to or after loading.

For example:

i) Wet freezing damage found mixed throughout sacks and mixed throughout piling in the vehicle would indicate that freezing had occurred prior to loading (field frost).

ii) Wet freezing damage found in specimens and sacks contacting and/or adjacent to the floor, wall and doors of the vehicle would indicate that freezing occurred in transit or after loading into the vehicle.

It would be in order to state on the certificate that the location indicates that freezing damage did or did not occur in the vehicle if the facts bear this out. This statement should not be made on certificates covering lots of produce that have been set aside in vehicles, as these lots are not in the original piling.

Every effort should be made to inspect the complete contents of the vehicle. When the vehicle is fully loaded and the load is in a frozen state, it would be in order to take temperature readings, make note of the piling and location of wet bags (if possible) and leave the load until it has thawed out. Both sound bags and wet bags should be examined and the results and quantity of each shown on the certificate.

7.10 Grass Damage / Wireworm Holes (P)

Grass Damage

Usually grass damage is caused by quack grass. The sharp growing points of the stolons penetrate into or completely through the tubers. There is usually evidence of the weed attached to the potato.

Visual Aids Refer to photo 54 (USDA).

Wireworm Holes

Early injury, when the tubers are small, the larva causes deep, funnel-shaped cavities to be formed as the potatoes mature. Mid-season injury results in the formation of pits 6 to 13 mm (1/4 to ½ inch) deep and 1.6 to 3 mm (1/16 to 1/8 inch) in diameter, sometimes lined with discoloured scar tissue. Late injury consists of clean cut round holes, scar tissue is not prominent.

Wireworm holes or grass damage are scored when:

A) Canada No. 1

i) affect the flesh of the potato and cannot be removed without a waste of more than 5% by weight of the potato.

B) Canada No. 2

i) Affect the flesh of the potato and cannot be removed without a waste of more than 10% by weight of the potato.

7.11 Greening (C)

Greening tubers are found in many warehouses and stores where they are

exposed to artificial light. The disorder is serious because it may cause solanine poisoning. Exposed skin surfaces of the tuber turns greenish or green. Usually the inner flesh becomes yellow or cream-coloured.

The affected area could be located anywhere on the tuber. Usually the green colour found on greening tubers is lighter than that found on sunburn tubers. Do not mistake greening with sunburn. For a description of sunburn, please refer to Section 7.25 of this manual.

Score greening when:

A) Canada No. 1

i) when removal causes a loss of more than 5% of the total weight of the potato; or

ii) when materially detracting from the appearance of the potato.

Green colour affecting more than 25% of the surface in aggregate is considered materially detracting.

B) Canada No. 2

i) when removal causes a loss of more than 10% of the total weight of the potato; or

ii) when seriously detracting from the appearance of the potato.

Green colour affecting more than 50% of the surface in aggregate is considered seriously detracting.

Visual aids Refer to photo 55 (USDA).

7.12 Growth Cracks (P)

Growth cracks may be caused by very rapid growth, such as when a rainy period follows a long dry spell. Growth cracks most often occur towards the bud end of the tuber and usually extends lengthwise. The cracks vary in size but usually heal over with no rot following the injury.

Growth cracks are assessed on appearance, not on cut-off waste and are scored when:

A) Canada No. 1

i) they affect more than ½ the length of the potato in the aggregate on round varieties or more than 1/3 the length in the aggregate on long varieties; or

ii) the depth of growth cracks is greater than the depth allowed in Table 3.

B) Canada No. 2

i) they affect more than 3/4 the length of the potato in the aggregate; or

ii) the depth of growth cracks is greater than the depth allowed in Table 3.

Table 3

DEPTH ALLOWED FOR GROWTH CRACKS			
POTATO DIAMETER	WEIGHT	DEPTH ALLOWED FOR CANADA No. 1	DEPTH ALLOWED FOR CANADA No. 2
< 51 mm (2")	< 113 g (4 oz)	< 3 mm (1/8")	< 6 mm (1/4")
51-64 mm (2" - 2 ½")	113-170 g (4-6 oz)	6 mm (1/4")	10 mm (3/8")
> 64-76 mm (2½" - 3")	> 170-227 g (6-8 oz)	10 mm (3/8")	13 mm (½")
> 76 mm (3")	> 227 g (8 oz)	13 mm (½")	16 mm (5/8")

7.13 Insect Injury (P)

7.13.1 Flea Beetle Injury

Flea beetle injury may appear as surface injury, internal injury, or both. Surface injury consists of pimple-like eruptions or rough, winding trails about 1.6 mm (1/16 inch) wide and of varying length. These trails are produced by larvae feeding just beneath the epidermis of new tubers. Internal injury consists of single or groups of narrow, brown slivers or feeding tunnels that extend into the tuber for 6 to 19 mm (1/4 to 3/4 inch). Cracks occur where their tunnels come together.

For more information, please refer to visual aid: POT-6, (06/96) (CFIA), and photo 50 (USDA).

Flea beetle injury is scored when:

A) Canada No. 1

i) affects more than 5% of the surface area in the aggregate; or

ii) cannot be removed without the loss of more than 5% of the weight of the potato.

B) Canada No. 2

i) affects more than 10% of the surface area in the aggregate; or

ii) cannot be removed without the loss of more than 10% of the weight of the potato.

7.13.2 Grub Damage

Grub damage is caused by the larvae of June beetles. Injury consists of small to large feeding cavities 6 to 25 mm (1/4 to 1 inch) or more in diameter. The irregular-shaped cavities usually are wider than deep, with characteristic rough ridges inside, half or more of the tuber sometimes being consumed.

Grub damage is scored when:

A) Canada No. 1

i) affects more than 5% of the surface area in the aggregate; or

ii) cannot be removed without the loss of more than 5% of the weight of the potato.

B) Canada No. 2

i) affects more than 10% of the surface area in the aggregate; or

ii) cannot be removed without the loss of more than 10% of the weight of the potato.

7.14 Mechanical Damage (P)

Mechanical damage may be used for any defects other than cuts or bruises caused by mechanical means during harvesting, storage or packing and the inspector should describe the type of damage under defect description.

Mechanical damage is scored when:

A) Canada No. 1

i) the injury is not well healed, rough and exceed an aggregate area of more than 5% of the surface; or

ii) any kind of injury which cannot be removed without wasting more than 5% by weight.

B) Canada No. 2

i) the injury is not well healed, rough and exceed an aggregate area of more than 10% of the surface; or

ii) any kind of injury which cannot be removed without wasting more than 10% by weight.

7.15 Nematode Damage (P)

Potatoes with advanced infestation usually have a roughened, irregular, bumpy or warty appearance due to the presence of galls on the outer surface. When such potatoes are cut, the egg laying nematodes are seen in abundance scattered throughout the outer tissues with most of them approximately 3 mm to 6 mm (1/8 to 1/4 inch) beneath the skin. To the naked eye, they appear to be somewhat discoloured, slightly water-soaked spots. As deposits of eggs in the flesh sometimes hatch out and the nematode starts feeding after the potato has been harvested, infestation may sometimes show no external symptoms.

Nematode damage is scored when:

A) Canada No. 1

i) the affected area cannot be removed without wasting more than 5% of the weight of the potato.

B) Canada No. 2

i) the affected area cannot be removed without wasting more than 10% of the weight of the potato.

Visual Aids Refer to photos 69, 69a and 69b (USDA).

7.16 Rhizoctonia (P)

Rhizoctonia or black scurf on the tuber is identified by the presence of hard, black or dark brown bodies called sclerotia resting on the surface of the tubers. Frequently it is called "the dirt that will not wash off". The sclerotia will vary in size from small specks to large masses nearly 25 mm (1 inch) across. Frequently, the fungus is confined to mild to severe netting or scurf, and often, even in extreme cases, only a portion of the tuber is affected.

Rhizoctonia is scored when:

A) Canada No. 1

i) damage that exceeds an aggregate area of more than 5% of the surface.

B) Canada No. 2

i) damage exceeds an aggregate area of more than 25% of the surface.

7.17 Rodent and Bird Damage (P)

Frequently, rodents such as field mice, gophers and rabbits gnaw into potatoes and cause cavities. Generally the cavities made by rodents bear the marks of the teeth of the animal in the forms of corrugations or ridges.
Bird damage, such as is caused by chickens or other birds, is easily identified by the pit-like markings lining the cavity.

Rodent and bird damage is scored when:

A) Canada No. 1
- i) affecting more than 5% of the surface area; or
- ii) causing more than 5% waste

B) Canada No. 2
- i) affecting more than 10% of the surface area; or
- ii) causing more than 10% waste

7.18 Russetting (P)

The exact cause of russetting on non russet type potatoes is unknown. Other than affecting the outward appearance and marketability of the affected potato, it does not lead to decay in storage or in transit.

There are two types of russetting that may occur, either smooth or rough. Smooth russetting may appear as streaked, patchy or solid and is smooth to touch. Rough russetting will be considered as rough when the potatoes show rough skin with minor shallow splitting.

For more information, please refer to visual aid POT-4, (06/96) (CFIA) (top two pictures only).

Russetting that is not characteristic of the variety is scored when:

A) Canada No. 1
- i) more than 50% of the surface area in the aggregate is affected.

B) Canada No. 2
- i) not scoreable.

7.19 Scab (P)

Scab of potatoes is caused by two very different of organisms; one fungal; one bacterial. Scab lesions may appear as purplish-brown sunken areas, pitted areas, raised pustules, raised corky rough areas, or nearly smooth lesions blending with the skin of the tuber.

For the purposes of scoring scab, however, regardless of the causal agent, the

defect is assessed in terms of the symptoms observed, which would be: a) Pitted Scab; b) Russet Scab; or c) Surface Scab. All scab may be lumped under one defect heading, however if reported as such, the inspector must use the general terms to identify the type of scab, ie. generally pitted scab; few russet scab. If reported separately, the use of the general terms is not required.

7.19.1 Pitted Scab

Pitted scab is generally the result of early infection with the uninjured tissues growing up around the affected areas. The resulting pitted depression may be relatively shallow or may extend 1/4 inch or more into the tuber flesh.

Score pitted scab:

A) Canada No. 1

i) when removal causes a loss of more than 5% of the total weight of the potato; or

ii) when materially detracting from the appearance.

When scab affects an aggregate area of more than 12mm (1/2 inch) on a potato that has a diameter 63 mm (2 ½ inches) or a weight of 170 g (6 ounces) that is considered materially detracting from the appearance.

B) Canada No. 2

i) when removal causes a loss of more than 10% of the total weight of the potato; or

ii) when seriously detracting from the appearance.

When scab affects an aggregate area of more than 25 mm (1 inch) on a potato that has a diameter 63 mm (2 ½ inches) or a weight of 170 g (6 ounces) that is considered seriously detracting from the appearance.

Visual Aids Refer to photos 129 & 130 (USDA).

7.19.2 Russet Scab

Russet scab is a roughening, scurfing or cracking of the tuber skin. The affected tissues vary from light tan to brown colour. Russet scab may occur in localized areas or in large areas on the skin of a potato. The scab will appear as smooth, rough or may be cracked.

Smooth russetting means net-like, streaked, patchy or solid, readily apparent but smooth to touch.

Rough russetting means bark-like, pebbly or thick, not blending with the

skin of the tuber. It has more of a coarse sand paper feel when lightly brushed over the affected area.

Score russet scab when it:

A) Canada No. 1
- i) smooth - affects more than 1/3 of the surface area; or
- ii) rough - affects more than 10% of the surface area in aggregate.

B) Canada No. 2
- i) smooth - not scoreable;
- ii) rough - affects more than 25% of the surface area in aggregate.

Visual Aids For more information, please refer to visual aid: POT-4, (06/96) (CFIA) (bottom picture only), or to photos 77a, 77b & 143 (USDA).

7.19.3 Surface Scab

The lesions affected by surface scab may be superficial, slightly raised or sunken, rough or corky depending on such factors as the susceptibility of the variety of potato, time of infection of the tubers, environmental conditions, and the aggressiveness of the particular bacterium. Lesions may vary in size and shape from 6 mm (1/4 inch) to 18 mm (3/4 inch) in diameter, may be few or many scattered over the entire tuber surface, may be highly concentrated in one or more isolated areas of the tuber, or may appear as net-like on a large area of the tuber surface.

Score surface scab when it:

A) Canada No. 1
- i) affects more than 5% of the surface area in the aggregate of an individual potato

B) Canada No. 2
- i) affects more than 25% of the surface area in the aggregate of an individual potato.

Visual Aids For more information, please refer to visual aid POT-6, (06/96) (CFIA) or to photos 78 & 78a (USDA).

7.20 Shape (P)

See Section 5 for description of shape defects.

7.21 Silver Scurf (C)

Silver scurf is characterized by a gray, smooth, leathery appearance of the skin and is more noticeable when the tubers are wet because of the silvery sheen. This silvery condition is caused by a fungus which penetrates the tubers through the lenticels and epidermis.

The occurrence of superficial brownish spots more or less circular in outline, constitutes the first symptoms. The disease may spread in storage, especially under high humidity and temperatures. As the disease progresses the affected areas become silvery brown and may coalesce to cover most of the tuber surface. In severe cases the entire surface of the tuber may be affected with little or no contrast with the natural skin colour. In advanced stages of the disease affected areas begin to shrivel or wrinkle.

Keep in mind that these guidelines apply to any shade or colour of the defect.

Visual Aids Refer to photos 81 – 82g (USDA).

Score silver scurf when:

A) Canada No. 1

i) it affects more than 50% of the surface area of the potato in the aggregate

B) Canada No. 2

i) its severity causes a wrinkling of the skin over more than 50% of the surface

7.22 Skin Checks or Thumbnail Marks (C)

This disorder is caused by rough handling, excessively dry atmosphere or is associated with sudden changes in temperature. Actually, skin checks appear similar to the injury caused by pressing a thumbnail directly into the tuber. The surface is covered with many crescent-shaped slits which are sometimes confused with symptoms of ring rot. The tubers dry out rapidly and shrivel unless stored in moist conditions.

For more information, please refer to visual aid POT-5, (02/99) (CFIA), or photos 134 & 135 (USDA).

Skin checks or thumbnail marks are scored when:

A) Canada No. 1

i) it materially affects the appearance, edibility or shipping quality of the potatoes.

B) Canada No. 2

i) it seriously affects the appearance, edibility or shipping quality of the potatoes.

7.23 Skin Spot (P)

Skin spot of potatoes in storage is characterized by purplish-black, slightly raised spots up to 2 mm (approximately 1/16") in diameter, singly or in groups over the surface of the tuber. They may appear either at random over the surface or aggregated around the eyes. Sometimes larger necrotic areas form over the tuber surface. These necrotic areas can be picked out, leaving circular pits of healthy flesh.

Skin spot is scored when:

A) Canada No. 1

i) purplish-black, slightly raised areas or areas where the damage penetrates the flesh, no matter the colour. Score when affecting more than 5% of the surface area in the aggregate; or

ii) smooth, brown coloured areas which tend to blend into the surface of the tuber, particularly in the case of varieties with a russet skin or where silver scurf is present. Score when affecting more than 25% of the surface area in the aggregate.

B) Canada No. 2

i) purplish-black, slightly raised areas which do not penetrate the flesh. Score when affecting more than 25% of the surface area in the aggregate; or

ii) penetrates the flesh and cannot be removed without a waste of more than 5% by weight of the potato; or

iii) skin spot does not affect this grade when smooth, brown coloured areas which tend to blend into the surface of the tuber.

7.24 Sprain (Corky Ring Spot) (C)

This disease in potatoes may also be known as corky ring spot or internal rust spot. Affected tubers show rings, semi-circles or spots on the surface with similar marks on the interior tissues. The tuber skin over some of the brown, sunken rings often cracks. The affected tissues are moderately firm and corky.

Both grades must be free from this disease.

7.25 Sunburn (P)

Sunburned tubers are found in many potato fields. The disorder is serious in table stock, as the tubers may cause solanine poisoning. The skin of the tuber turns as green as the above ground parts of the plant. Typically, the bud end is affected and may involve only one area of the tuber. Usually the inner flesh becomes yellow or cream-coloured.

Sunburn is caused by exposure to sunlight as opposed to greening, which is caused by exposure to light in storage. For a description and tolerance of greening, please refer to Section 7.11 of this manual.

Although sunburn is scored on the waste basis, it is usually possible for experienced inspectors to determine, without cutting, whether individual specimens are scoreable by judging the size of the affected area and the intensity of green colour. Inexperienced inspectors should always cut potatoes to determine the amount of waste. Any amount of green colour of the flesh is scoreable, if over the tolerance allowed. When the inspector is in doubt as to whether the flesh is green or yellow, he should cut an unaffected portion of the potato, preferably on the opposite side of the affected area. If the flesh of the affected area is definitely more greenish than the unaffected area, he scores the greenish part against the waste basis.

For more information, please refer to visual aid POT-6, (06/96) (CFIA) (bottom two pictures only), or photos 86 & 87 (USDA).

Sunburn is scored when:

A) Canada No. 1

i) removal causes loss of more than 5% of the total weight of the potato (TM).

B) Canada No. 2

i) removal causes loss of more than 10% of the total weight of the potato (TM).

7.26 Sunken Discoloured Areas with Underlying Flesh Discoloured (C)

This defect is most noticeable on storage potatoes and appears to be related to bruising and rough handling at time of harvesting or while in storage. In some cases, sunken areas alone will not sufficiently materially or seriously affect the appearance and it will be necessary for the inspector to cut to determine if there is discolouration of the underlying flesh.

Score sunken discoloured areas with underlying flesh discoloured when:

A) Canada No. 1

i) removal causes a loss of more than 5% of the total weight of the potato.

B) Canada No. 2

i) removal causes a loss of more than 10% of the total weight of the potato.

Visual Aids Refer to photo 138 (USDA) for ID only. Cutting must be done to determine underlying flesh discolouration.

7.27 Surface Cracks (P)

Surface cracks are the superficial cracking of the skin of some varieties of potatoes and should not be confused with russetting. The cracks are generally wider and more pronounced than russetting.

Score this defect when:

A) Canada No. 1

i) fine, net-like cracking - **not** scoreable; or
ii) smooth, shallow cracking affecting more than 1/3 of the surface area; or
iii) rough, deep cracking affecting more than 5% of the surface area.

B) Canada No. 2

i) fine, net-like cracking - **not** scoreable; or
ii) smooth, shallow cracking - **not** scoreable; or
iii) rough, deep cracking affecting more than 10% of the surface area.

7.28 Tuber Moth Damage (C)

Score this defect when:

A) Canada No. 1

i) any live larvae is present; or
ii) when materially detracting from the appearance of the potato; or
iii) the affected area cannot be removed without the loss of more than 5% of the weight of the potato.

B) Canada No. 2

i) any live larvae is present; or
ii) when seriously detracting from the appearance of the potato; or
iii) the affected area cannot be removed without the loss of more than 10% of the weight of the potato.

Visual Aids: Refer to photos 88 & 89 (USDA).

7.29 Other External Defects

Other external defects which are not described in Sections 7.1 to 7.28 are scored as free from any injury or defect or a combination thereof that:

A) Canada No. 1

i) affects the flesh of the potato and cannot be removed without a loss of more than 5% of the weight of a potato; or

ii) materially affects the appearance, edibility or shipping quality of the potatoes.

B) Canada No. 2

i) affects the flesh of the potato and cannot be removed without a loss of more than 10% of the weight of a potato; or

ii) seriously affects the appearance, edibility or shipping quality of the potatoes.

8. Internal Defects

Internal Defects are defects which cannot be detected without cutting the potato.

8.1 Black Heart (C)

Black heart is a non-parasitic disease and it is caused by high temperatures accompanied by poor aeration. It is mainly a storage problem. The centre portions of tubers are usually affected most severely. The tissue turns slate gray, then dark and finally black. In extreme cases, the potato breaks down completely, and in those cases, it should be scored as decay.

Canada No. 1 and Canada No. 2
Any amount of black heart should be scored for either grade.

Visual Aids Refer to photos 27 & 28 (USDA).

8.2 Black Leg (C)

This is a bacterial disease. Its name is derived from the inky-black colour of the stem just above the soil line. Typically, the rot caused by black leg starts at the stem end and appears as slightly sunken, black tissue which may eventually extend through the centre of the tuber. Black leg rot may be common in the field and continue to develop in storage. Secondary infection may develop.

Black leg is scored as follows:

A) Canada No. 1

i) If the tissues are soft and watery, score black leg against the decay tolerance.

ii) If the tissues are dry and removal of dry rot causes a loss of more than 5% of the total weight of the potato, score as black leg.

B) Canada No. 2

i) If the tissues are soft and watery, score black leg against the decay tolerance.

ii) If the tissues are dry and removal of dry rot causes a loss of more than 10% of the total weight of the potato, score as black leg.

8.3 Hollow Heart (P)

Hollow heart is a condition brought about by too rapid or irregular growth. It often occurs during wet seasons in potatoes grown in very fertile or heavily irrigated soils. Hollow heart consists of more or less irregular cavities of varying size within the potato and is usually lined with light-brown to brown dead tissue. This defect is usually found, but not always, in large, rough, misshapen potatoes. The potato should be cut lengthwise, parallel to the flat side, to determine the defect. If the potato is not cut lengthwise, the hollow heart may not be detected.

Hollow heart is scored when:

A) Canada No. 1

i) the area affected exceeds that of a circle 13 mm (½ inch) in diameter on a potato that has a diameter of 63 mm (2 ½ inches) or a weight of 170 g (6 ounces) (TM).

B) Canada No. 2

i) the area affected exceeds that of a circle 19 mm (3/4 inch) in diameter on a potato that has a diameter of 63 mm (2 ½ inches) or a weight of 170 g (6 ounces) (TM).

For areas allowed on correspondingly larger or smaller potatoes, for both Canada No. 1 and Canada No. 2, please see Table 4.

Note: When hollow heart with discolouration is found, and the discolouration falls within the allowed area, the defect is not to be scored. If the discolouration falls outside the allowed area, even if the hollow heart does not, then it is to be scored as hollow heart.

Visual Aids Refer to photos 121 – 122e (USDA).

TABLE 4

Guide for Maximum Area Allowed for Hollow Heart, or Light Brown Discolouration (Brown Center)

CANADA NO. 1 AND CANADA NO. 2

Potato Diameter		Potato Weight		Area Allowed Diameter of Circle			
				Canada No. 1		Canada No. 2	
inches	mm	ounces	g	inches	mm	inches	mm
2	51	4	113	3/8	9	5/8	16
2 ½	63	6	170	½	13	3/4	19
2 3/4	70	7	198	5/8	16	7/8	22
3	76	8	227	3/4	19	1	25
3 1/4	83	10	283	7/8	22	1 1/4	32
3 ½	89	14	397	1	25	1 ½	38
3 3/4	95	16	454	1 1/8	29	1 5/8	41
4	102	20	567	1 1/4	32	1 7/8	47
4 1/4	108	24	680	1 3/8	35	2	50
4 ½	114	28	794	1 1/2	38	2 1/8	54

1 Note: Correspondingly lesser or greater areas in smaller or larger potatoes.
2 Note: These dimensions are based on **area affected not aggregate area.**
3 Note: When determining maximum area allowed use the size column which allows the greatest area affected (i.e. In the Canada No. 1 grade a potato 76 mm (3 inches) in diameter, which weighs 283 g (10 ounces) is allowed 22 mm (7/8 inch) in diameter area affected.)

8.4 Internal Discolouration (P & C)

This section has been modified as a result of the Canada/U.S. potato grade harmonization talks. Both Canada and the U.S. will score internal discoloration the same way, i.e., 5%/10% cut-off or 3/6 spots.

For the purposes of scoring this defect in Canada, only the term internal discoloration will be used, even though the discoloration may be caused by various factors such as heat necrosis, net necrosis and internal brown spot, etc., with the

exception of black heart, which has a tolerance established in the Regulations (Subsection 88(f)).

U.S. inspectors will use the names of the following factors causing internal discoloration when describing this defect: net necrosis, stem-end browning, vascular discoloration, internal potato necrosis, internal brown spot, heat or drought necrosis, internal black spot, internal mahogany browning and internal pink to purple discoloration.

Internal discolouration can be caused by various disorders. They are mainly vascular discolourations, net necrosis, heat necrosis, internal brown spot or black heart. Some internal discolouration is associated with chilling or freezing injuries (see Section 7.9 for more information). In addition, it has been claimed that certain non-parasitic factors are sometimes involved. For example, chemical vine killing may produce internal discolouration similar to vascular discolouration, but usually a light brown, narrow ring results. Since inspectors are not pathologists, it will not be their duty to name the specific discolouration.

Vascular Discolouration
This disease is caused by a fungus and the symptoms are a slight discolouration of tissue below the stem end. Discolouration of the vascular ring appears as a slight netting or in some cases a severe brown coloured streaking in part or all of the vascular ring, sometimes extending nearly to the bud end of the tuber.

Net Necrosis
This discolouration is usually a result of current season infection with the leafroll virus. Tuber shape and external appearance may be perfectly normal, with net necrosis being seen only when the tuber is cut. The phloem tissue is more or less filled with a network of fine lines, usually brown in colour. This netting may extend only a short distance or throughout the entire potato. Discolouration increases in amount and severity during storage. The finer netting and presence of phloem discolouration differentiates it from the vascular type.

Heat Necrosis
The cause of this non-parasitic disease is the result of high temperatures, especially when vines die early on light sandy soil. Affected tubers show slate-grey to brown patches in tissue near and perhaps associated with the vascular system. There are no external symptoms and diagnosis depends on cutting the tubers.

Internal Brown Spot
This disease is probably due to a lack of adequate soil moisture during the latter part of the growing season. No external symptoms are evident. Groups of dead cells which are free from fungi and bacteria appear as irregular, dry, brown or rust-coloured spots scattered through the central portion of the tuber.

Mahogany Browning
This appears as reddish-brown areas or blotches in the flesh. They occur in irregular patches anywhere in the flesh. The margins are not definite, and no sharp lines exist between discoloured and normal tissue. The colour of affected tissue varies in intensity from light to reddish brown. The affected tissues are of normal texture. Varieties vary in susceptibility, but under sufficient exposure to chilling, temperatures (0 °C to 1 °C), most will develop some degree of mahogany browning.

Internal discolouration is scored when:

A) Canada No. 1

i) any discolouration which cannot be removed without wasting more than 5% by weight of the potato; or

ii) there are more than the equivalent of three (3) scattered spots 3 mm (1/8 inch) in diameter on a potato that has a diameter of 63 mm (2½ inches) or a weight of 170 g (6 ounces).

Correspondingly lesser or greater affected areas are allowed on smaller or larger potatoes.

B) Canada No. 2

i) any discolouration which cannot be removed without wasting more than 10% by weight of the potato; or

ii) there are more than the equivalent of six (6) scattered spots 3 mm (1/8 inch) in diameter on a potato that has a diameter of 63 mm (2 ½ inches) or a weight of 170 g (6 ounces).

Correspondingly lesser or greater affected areas are allowed on smaller or larger potatoes.

8.5 Light Brown Discolouration (Brown Center) (P)

This is a condition that may develop while tubers are very small. The center of the potato shows areas of dead, brown cells. During the growing season these cells can split apart and form cavities (ie. hollow heart).

Light brown discolouration shall be scored (based on a potato 63 mm (2-1/2 inches) in diameter or 170 g (6 ounces) in weight) when:

A) Canada No. 1

i) the area affected exceeds that of a circle 13 mm (1/2 inch) in diameter.
(correspondingly lesser or greater areas in smaller or larger potatoes)

B) Canada No. 2

i) the area affected exceeds that of a circle over 18 mm (3/4 inch) (correspondingly lesser or greater areas in smaller or larger potatoes)

Note: See Table 4 for a guide for area of maximum allowed on various potato sizes.

Visual Aids Refer to photos 123 & 124 (USDA)

8.6 Presence of Insects (C & P)

The presence of any live or dead worms or insects within the flesh of the potato will be scored against both grades.

If the worms or insects are "live", treat as a condition defect as they may not have been present at shipping point.

If the worms or insects are "dead", treat as a permanent defect, since they were probably present at shipping point.

In cases where there are both "live" and "dead" worms or insects present, treat as a condition defect.

8.7 Watery Translucent Flesh (C)

This defect generally affects white fleshed potatoes of the Superior variety and is believed to be related to drought conditions. The flesh will be firm, with a watery translucent appearance accompanied by yellow greyish discolouration within the vascular ring.

When scoring this defect, the potato will be cut in half lengthwise through the greatest width. The random composite sampling procedure for hidden defects will be used when a preliminary sampling reveals that the defect is present.

Watery translucent flesh is scored when:

A) Canada No 1

i) the colour of the flesh within the vascular ring is materially affected when contrasted to the colour of the unaffected flesh outside the vascular ring; and

ii) the area affected is greater than 18 mm (3/4 inch) in the aggregate on a 64 mm (2 ½ inches) potato and is watery and darker than pale yellow.

B) Canada No 2

i) the colour of the flesh within the vascular ring is seriously affected when contrasted to the colour of the unaffected flesh outside the vascular ring; and

ii) the area affected is greater than 39 mm (1 1/2 inches) in the aggregate on a 64 mm (2 1/2 inches) potato and is watery and darker than light yellow.

8.8 Other Internal Defects

Other internal defects which are not described in Section 8.1 to 8.6 are scored as free from any injury or defect or a combination thereof that:

A) Canada No. 1

i) affects the flesh of the potato and cannot be removed without the loss of more than 5% of the weight of the potato; or

ii) materially affects the appearance, edibility or shipping quality of the potatoes.

B) Canada No. 2

i) affects the flesh of the potato and cannot be removed without the loss of more than 10% of the weight of the potato; or

ii) seriously affects the appearance, edibility or shipping quality of the potatoes.

9. Decay and Wet Breakdown

Decay (C)

The term decay is used in describing a deterioration or decline involving decomposition, which is induced by a fungi and/or a bacteria, and which is of a complete and progressive nature. Inspectors are not pathologists, so it is not their duty to name the specific decay affecting the tuber.

Any amount of decay is scoreable against both grades.

The following are scored under the tolerance for decay:

A) Any soft, mushy breakdown (soft rot);
B) Any soft leaking specimens (freezing injury described in Section 7.9);
C) Bacterial ring rot (described below);
D) Soft and watery tissue of black leg (described below);
E) Wet or soft blight (described below).

Bacterial Ring Rot (C)

Bacterial ring rot is one of the most serious diseases of potatoes in Canada. It is highly infectious and is readily spread by potato cutters, planters, harvesters and even containers.

Infested tubers may have reddish areas near the eyes or the skin may be cracked or swollen. Lightly infected tubers may appear healthy. When the tuber is cut across the stem end, a creamy-yellow to light-brown rot shows in the vascular ring; the rot is crumbly to cheesy and odourless. If you squeeze a cut tuber between the thumb and fingers, a substance oozes from the affected part of the ring. Often infected tubers are invaded by soft rot organisms and may disintegrate, leaving only the outer shells. Such hollow tubers are often found in the field.

Most of the severely affected tubers do not reach storage but are occasionally found there. If storage conditions and temperatures are proper, probably little change takes place in the amount of decay. Otherwise, the rot advances and is classed as soft rot.

Suspected bacterial ring rot should be scored as decay on the worksheet.

Bacterial ring rot is scored as follows:

A) Canada No. 1 and Canada No. 2

i) Any amount of bacterial ring rot is scoreable against the decay tolerance in both grades.

Note: Suspect samples should be submitted to the Regional Plant Health Lab for verification.

Blight (C)

There are two kinds of blight: early blight and late blight. These diseases are caused by two different types of fungus.

Early blight lesions on tubers are dark brown to black, of several shapes including circular to oblong and about 6 to 51 mm (1/4 to 2 inches) in diameter. Often they are slightly sunken and have raised purplish borders. The lesions on a tuber vary from one to many. The affected areas may be similar to those caused by the late blight organism, but early blight areas are shallower and sharply set off from the healthy tissue by a layer of cork. The decay does not spread irregularly into healthy tissue as does late blight. The flesh of the tubers, 3 to 13 mm (l/8 to 1/1 inch) deep beneath the lesions, is black and often surrounded by a yellowish zone.

Late blight may develop in a dry or wet rot either before or after harvest, depending on environmental conditions and the presence or absence of secondary organisms. At first, a brown or purplish-black metallic discolouration of the skin and a reddish-brown discolouration of the tissue just below the skin develops, usually not penetrating more

than 6 mm (1/4 inch). However, secondary organisms may result in a partial or complete breakdown of the affected tuber.

Both early and late blight are scored as follows:

A) Canada No. 1
Free from blight.
i) If wet or soft, score against the decay tolerance;
ii) If dry, score against the external defect tolerance

B) Canada No. 2
i) If wet or soft, score any amount against the decay tolerance; or
ii) If dry, and cannot be removed without the loss of more than 5% of the weight of a potato, score against the external defect tolerance.

10. Sprouts

Sprouts are the result of eyes on the potato actually beginning to grow. They sometimes occur singularly or in clusters. Their length varies according to what stage of growth they are in, and progress rapidly at non-refrigerated temperatures. Growth generally begins opposite the stem end of the potato.

10.1 Sprouts (External) (C)

External sprouts are scored when:

A) Canada No. 1
Not more than 5% of the potatoes in the lot may have individual or clusters of sprouts where:
i) the length exceeds 6 mm (1/4 inch) at Shipping Point or Repacking
ii) the length exceeds 12 mm (1/2 inch) at Destination

B) Canada No. 2
Not more than 10% of the potatoes in the lot may have individual or clusters of sprouts where:
i) the length exceeds 12 mm (1/2 inch) at Shipping Point or Repacking
ii) the length exceeds 25 mm (1 inch) at Destination

Visual Aids Refer to photo 136 (USDA).

10.2 Sprouts (Internal) (P)

Ingrown sprouts are sprouts that have actually grown back into the flesh of the potato. There is usually obvious indication of some abnormal sprout growth on the outside of the tuber which will reveal internal growth upon taking an exploratory cut.

Internal sprouts are scored when:

A) Canada No. 1

i) they cannot be removed without a loss of more than 5% of the weight of a potato.

B) Canada No. 2

i) they cannot be removed without a loss of more than 10% of the weight of a potato.

Visual Aids Refer to photos 60 & 61 (USDA).

Note: This defect should be scored against the tolerance for internal defects. This defect should not be included in the lot tolerance for sprouts.

11. Tolerances

11.1 TABLE OF TOLERANCES - Canada No. 1

SHIPPING POINT or REPACKING	%	DESTINATION	%
1. LOT TOLERANCES		**1. LOT TOLERANCES**	
External Sprouts	5	External Sprouts	5
Surface flesh exposed on more than 10% of the potato	10	Surface flesh exposed on more than 10% of the potato	10
2. INDIVIDUAL TOLERANCES		**2. INDIVIDUAL TOLERANCES**	
Undersize or underweight		Undersize or underweight	
- for potatoes less than 2 1/4 inch (57 mm) in diameter, or a weight of 142 g (5 ounces)	3	- for potatoes less than 2 1/4 inch (57 mm) in diameter, or a weight of 142 g (5 ounces)	3
- for potatoes of a minimum 2 1/4 inch (57 mm) in diameter, or a weight of 142 g (5 ounces)	5	- for potatoes of a minimum 2 1/4 inch (57 mm) in diameter, or a weight of 142 g (5 ounces)	5
Oversize or overweight	10	Oversize or overweight	10

3. GENERAL TOLERANCES		3. GENERAL TOLERANCES	
Total internal and external defects including not more than:	8	Total internal and external defects including not more than:	10
- Internal	5	- Internal	7 *
- External	5	- External	7 *
- Decay	1	- Decay	2
		* of which no more than 5% are permanent	

TABLE OF SIZE REQUIREMENTS - Canada No. 1

CURRENT SIZE REQUIREMENT FOR LONG TYPE	SPECIAL LOT REQUIREMENT FOR SIZE
Canada No. 1: 51 mm to 89 mm (2 inches to 3 1/2 inches) in diameter, or 113 g to 340 g (4 oz to 12 oz) in weight; except when potatoes are 89 mm (3 1/2 inches) or more in length, the minimum diameter may be 44 mm (1 3/4 inches)	60% by weight of the potatoes in the lot must have a minimum diameter of 57 mm (2 1/4 inches) or a minimum weight of 142 g (5 ounces).
Canada No. 1 shipped interprovincially: 48 mm to 76 mm (1 7/8 inches to 3 inches) in diameter, or maximum weight of 283 g (10 ounces)	75% by weight of the potatoes in the lot must have a minimum diameter of 51 mm (2 inches) or a minimum weight of 113 g (4 ounces).

11.2 TABLE OF TOLERANCES - Canada No. 2

SHIPPING POINT or REPACKING	%	DESTINATION	%
1. LOT TOLERANCES		**1. LOT TOLERANCES**	
External Sprouts	10	External Sprouts	10
2. INDIVIDUAL TOLERANCES		**2. INDIVIDUAL TOLERANCES**	
Undersize or underweight		Undersize or underweight	
- for potatoes less than 2 1/4 inch (57 mm) in diameter, or a weight of 142 g (5 ounces)	3	- for potatoes less than 2 1/4 inch (57 mm) in diameter, or a weight of 142 g (5 ounces)	3
- for potatoes of a minimum 2 1/4 inch (57 mm) in diameter, or a weight of 142 g (5 ounces)	5	- for potatoes of a minimum 2 1/4 inch (57 mm) in diameter, or a weight of 142 g (5 ounces)	5
Oversize or overweight	10	Oversize or overweight	10
3. GENERAL TOLERANCES		**3. GENERAL TOLERANCES**	
Total internal and external defects including not more than:	10	Total internal and external defects including not more than:	12
- Internal	6	- Internal	8 *
- External	6	- External	8 *
- Decay	1	- Decay	2
		* of which no more than 6% are permanent	

TABLE OF SIZE REQUIREMENTS - Canada No. 2

CURRENT SIZE REQUIREMENT FOR ANY TYPE	SPECIAL LOT REQUIREMENT FOR SIZE
Canada No. 2: 44 mm to 114 mm (1 3/4 inches to 4 1/2 inches) in diameter, or maximum weight of 794 g (28 ounces)	75% by weight of the potatoes in the lot must have a minimum diameter of 51 mm (2 inches) or a minimum weight of 113 g (4 ounces).

12. Requirements for Movement of Potatoes

12.1 Interprovincial Movement

Potatoes shall not be sent or conveyed from one province to another unless they are packed and marked properly and meet one of the grades established in the Regulations or unless there is a valid test market in effect to cover any additional sizes, grades or packages.

Potatoes moving from the provinces of Prince Edward Island, Nova Scotia, New Brunswick, Quebec and Ontario must be accompanied by

- an inspection certificate; or
- a release permit issued by an inspector where an inspection cannot be performed

The above two requirements may be waived if the packer is operating as a Registered Establishment (Registered Produce Warehouse).

12.2 Import

All potatoes imported into Canada must be inspected and certified to meet the requirements of Canada No. 1 grade (or test markets issued with respect to the Canada No. 1 grade) and they must be packed and labelled in accordance with the requirements of the Regulations.

Potatoes that are artificially coloured are not acceptable for importation into Canada.

It should be noted that potatoes imported into Canada must also meet all requirements of the *Plant Protection Act and Regulations.*

A) Potatoes from the United States or Puerto Rico

The CFIA recognizes inspections and certification issued by the United States Department of Agriculture (USDA).

Therefore, potatoes imported from the United States and Puerto Rico or shipped to Canada from another country through the United States, except a lot that is bonded, shall be accompanied by a Federal-State Inspection Certificate, or evidence of such, issued by the United States Department of Agriculture. The USDA inspection certificate must state “Meets Canadian Import Requirements”.

Potatoes from the United States and certified by the USDA shall be based on the following standards:

U.S. Extra No. 1 or U.S. No. 1 grade

However, potatoes coming from the U.S. must meet the requirements of “slightly skinned” and “fairly clean” as defined in the U.S. Standard for Grades of Potatoes, our maturity requirements as defined in Section 3 of this manual and our size requirements (including those for Test Markets) as defined in Section 2 of this manual.

These requirements apply to properly packed potatoes going for the fresh market. Potatoes imported in bulk for repacking or for processing purposes or those that do not meet the above requirements are subject to Ministerial Exemptions granted by the Minister or his delegate.

Where a lot of potatoes is **not accompanied** at the port of entry by a USDA certificate, an inspector shall inspect the potatoes either at the port of entry or another authorized inspection point. These are termed as Customs Clearance inspections. The inspection shall be made in accordance with the applicable general tolerances set out in the Potato Grade Standard where the potatoes are inspected at the time of shipping or repacking (i.e., shipping point tolerances).

B) Potatoes from Places Other than the United States and Puerto Rico

Potatoes imported into Canada from other countries shall meet the Canada No. 1, Canada No. 1 Small* (TM), Canada No. 1 Creamer*(TM), Canada No. 1 Chef or Canada No. 1 Large standard or any other test markets issued with respect to the Canada No. 1 grade.

An inspector shall inspect the lot of potatoes either at the port of entry or another authorized inspection point. The inspection shall be made in accordance with the applicable general tolerances set out in the Potato

Grade Standard where the potatoes are inspected at a time other than at the time of shipping or repacking.

12.3 Export

There are no Canadian export requirements contained within the *Fresh Fruit and Vegetable Regulations*. Shipments of potatoes therefore need only meet the requirements of the importing country.

Potatoes Going to the United States or Puerto Rico

a) General Requirements

Section 8e of the U.S. *Agricultural Marketing Agreement Act of 1937* (Act) provides that when certain domestically produced commodities are regulated under a U.S. federal marketing order, imports of the commodity must be inspected and certified to meet the same or comparable grade, size and maturity requirements.

Potatoes are a commodity that are subject to the requirements of Section 8e of the Act. Grading and quality inspection by the USDA Agricultural Marketing Service (AMS) is required for each lot (shipment) of potatoes imported into the United States and Puerto Rico. Therefore, potatoes shipped to the United States and Puerto Rico must meet the U.S. import requirements as outlined in Appendix III. A Canadian Inspection Certificate is accepted by the USDA for potatoes in lieu of one performed by USDA AMS and certification may be based on a Canadian grade for quality, but must meet U.S. import requirements for size and maturity.

Should a Canadian exporter of potatoes not wish to have their potatoes inspected in Canada prior to shipment to the United States or Puerto Rico, they should be informed to contact the appropriate fresh commodity inspection office in the United States prior to entry for specific details on how to obtain a release from U.S. Customs Service.

Note: Bulk, field run potatoes for processing purposes do not require an inspection to meet the U.S. import requirements, nor do they require a Ministerial Exemption. However, the applicant is required to provide a copy of the U.S. Exempt Commodity form (FV-6) to U.S. Customs and to the Marketing Order Administration Branch (MOAB) of the USDA Agricultural Marketing Service (AMS) at the time of entry into the United States.

b) Certification

As indicated above, the USDA accepts CFIA inspection certificates. In order to meet this acceptance, inspectors must certify potatoes according to Canadian quality standards but must take into consideration the U.S. marketing order requirements for size and maturity. Inspectors must witness the load going into the vehicle.

Only in instances where a positive lot identification system is in place could a warehouse inspection be performed. This could either be if the warehouse itself has a positive lot identification system or if the load is taped and identified by the inspector. The inspection certificate, however, must indicate the lot identification numbers. If the inspector is informed of the identification number of the vehicle into which this lot will be loaded, this information is to be recorded under the "Remarks" heading of the certificate, i.e., "Shipper advised produce to be shipped via trailer licence number .....".
*Refer to the Inspection Manual for Fresh Fruit and Vegetables for procedures on positive lot identification.

Note: Under no circumstances are warehouse inspections to be performed on produce being shipped to the U.S. where individual lots cannot be distinguished from one another at time of inspection.

The following statement must appear on the inspection certificate for potatoes going to the U.S. under the "Certification" heading:

"Meets U.S. Import Requirements of 7 U.S.C. 608 e-1."

Regarding size requirements, inspectors must consult the current U.S. import requirements for potatoes (Appendix III). For example:

Canada No. 1 long type potatoes allow specimens of 89 mm (3 ½ inches) or more in length to have a minimum diameter of 44 mm (1 3/4 inches). This tolerance is not acceptable for the U.S. when their import requirement specifies their minimum size as 51 mm (2 inches).

However, our requirement of 60% of specimens having a diameter of at least 57 mm (2 1/4 inches) must be applied if they are labelled as Canada No. 1.

Canada No. 1 Creamers (19 mm to 41 mm or 3/4 inch to 1 5/8 inches) from round red varieties (all flesh colours) and from long type varieties may be certified for export to the US as this size meets the minimum diameter requirements set out in the US import requirements for potatoes.

Potatoes being shipped as Canada No. 1 that do not meet the Canadian size requirements but do meet the U.S. import requirements for size should be labelled to reflect the size of potatoes packed within the containers. For example:

The Canada No. 1 designation for white round type potatoes implies that the size is 57 mm (2 1/4 inches) to 89 mm (3 ½ inches). However, U.S. import requirements for all round type potatoes, other than round red varieties, allow for the size to be a minimum of 2 inches. Therefore, containers labelled with the Canada No. 1 designation must also include the appropriate size range (eg. Canada No. 1 2" and up).

Should the potatoes arrive at a U.S. destination and containers not be marked with the specific size designation as above, they will be inspected to the Canada No. 1 grade and may be held for misbranding.

For more information on the U.S. import requirements, please consult with your supervisor.

Under Part II, Packaging, Section 8. (a) and (c) of the Regulations, all potatoes must be packed in containers that are securely closed, new, clean and free from stains.

References

1. Control of Diseases and Pests of Potatoes

Compiled by K. M. Graham, W. A. Hodgson, J. Munro and D. D. Pond, Research Station, Fredericton, N.B., Canada Department of Agriculture - Publication 1215, 1967

2. Handling, Transportation and Storage of Fruits and Vegetables

Volume 1, second edition, A. Lloyd Ryall, M.S., Werner J. Lipton, Ph.D., Avi Publishing Company Inc. Wesport, Connecticut, 1979.

3. Market Diseases of Potatoes

Wilson L. Smith, Jr. and Jack B. Wilson, Agricultural Research Service, Agriculture Handbook No. 479, March 1978

4. Potato Tuber Diseases, Defects and Insect Injuries in the Pacific Northwest

Earle C. Blodgett and Avery E. Rich, The State College of Washington Institute of Agricultural Sciences, Washington Agricultural Experiment Stations, August 1950

5. Potatoes - Market Inspection Instructions

United States Department of Agriculture
Food Safety and Quality Service
Fruit and Vegetable Quality Division
Fresh Products Branch, Washington, D.C.
November 1976

6. Potatoes - Shipping Point Inspection Instructions

United States Department of Agriculture
Food Safety and Quality Service
Fruit and Vegetable Quality Division
Fresh Products Branch, Washington, D.C.
April 1978

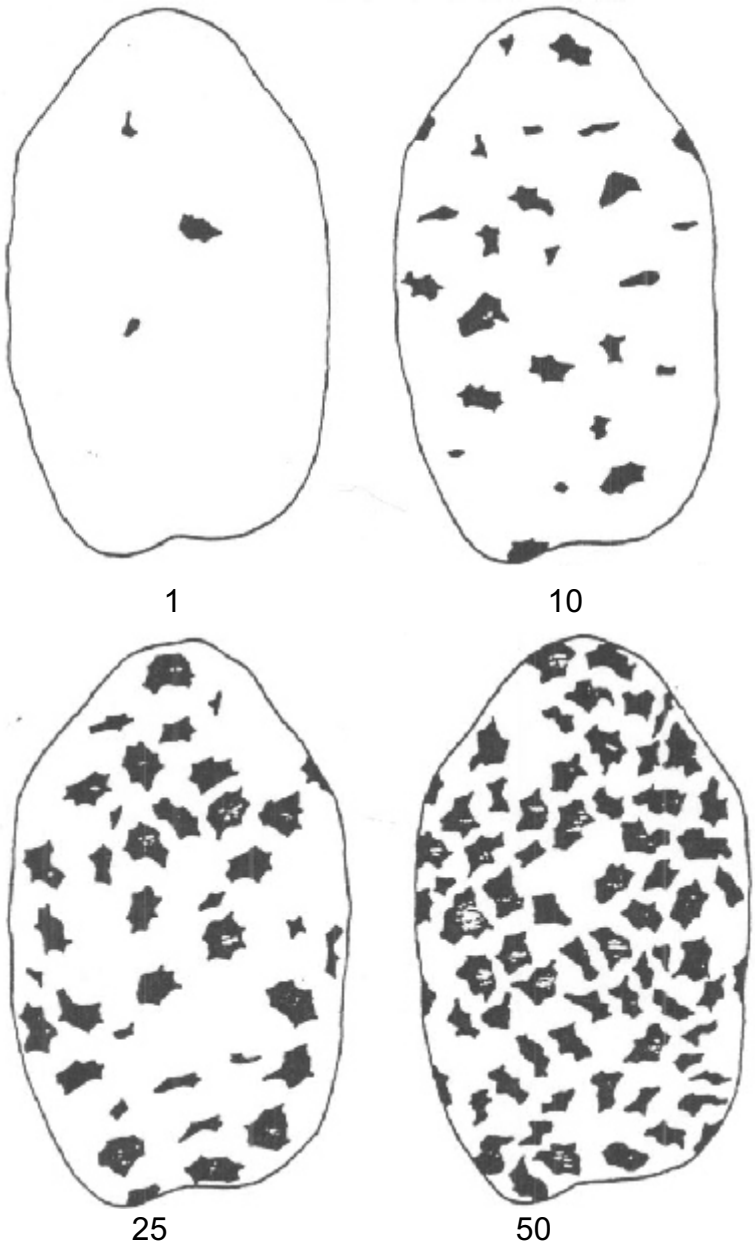
7. Compendium of Potato Diseases

The American Phytopathological Society
3340 Pilot Knob Road St. Paul, Minnesota 1990

Appendices

APPENDIX I

Assessing Severity of Scab



Percentage of Aggregate Area Covered

APPENDIX I

Assessing Severity of Rhizoctonia

Percentage of Aggregate Area Covered

APPENDIX II

Shape of Potatoes

Dumbbell Tubers

Canada No. 1 (Lower Limit)

Canada No. 2 (Lower Limit)

APPENDIX II

Curved Tubers

Canada No. 1 (Lower Limit)

Canada No. 2 (Lower Limit)

APPENDIX II

Shape of Potatoes

Pointed Tubers

Canada No. 1 (Lower Limit)

Canada No. 2 (Lower Limit)

APPENDIX II

Shape of Potatoes

Knobby Tubers

Canada No. 1 (Lower Limit)

Canada No. 2 (Lower Limit)

APPENDIX III

Summary of the U.S. Potato Import Regulations

Application: This section applies to **all** potatoes exported to the U.S. and Puerto Rico, not just Canadian grown potatoes. Even U.S. potatoes in original containers in Canada, re-exported to the U.S. must be recertified as meeting the U.S. Potato Import Regulations.

Exemptions: Potatoes exported to the U.S. for processing, charity or relief purposes and shipped under the "Importer's Exempt Commodity Form" are exempted from these Regulations and do not require a Ministerial Exemption or a compulsory inspection.

Maturity: Since we are only required to meet U.S. Potato Import Regulations, the following skinning definitions must be applied:

> "**practically no skinning**"- means that not more than 5 percent of the potatoes in the lot have more than one-tenth of the skin missing or "feathered";
>
> "**slightly skinned"** - means that not more than 10 percent of the potatoes in the lot have more than one-fourth of the skin missing or "feathered";
>
> **"moderately skinned"** - means that not more than 10 percent of the potatoes in the lot have more than one-half of the skin missing or "feathered"; and
>
> **"badly skinned"** - means that more than 10 percent of the potatoes in the lot have more than one-half of the skin missing or "feathered".

Cleanliness: All varieties must meet the requirements of minimum cleanliness as required by the U.S. grade standard. U.S. No. 1 grade potatoes must be “fairly clean, while U.S. No. 2 potatoes must “not be seriously damaged by dirt”. "Fairly clean" means that at least 90 percent of the potatoes in any lot are reasonably free from dirt or staining and not more than a slight amount of loose dirt or foreign matter is present in the container.

Size Markings: Potatoes being shipped in packages marked Canada No. 1 and not meeting Canadian size requirements, but meeting the U.S. Import Regulations, should be labelled to reflect the size of potato packed within. If the size range is not declared on the package, inspections performed in the United States will be based on the regular size requirements of the Canada grade declared.

APPENDIX III

A Canadian Inspection Certificate issued for potatoes exported to the United States is based on an equivalent Canadian grade for quality, but must meet U.S. import requirements for size and maturity.

Type of Potato	Period	Minimum Grade	Minimum Maturity	Minimum Diameter or Weight
Round Red Varieties (all flesh colours)	January 1 to Dec. 31	U.S. No. 2 or better	Not more than moderately skinned.	1 7/8 inches (48 mm) (no maximum size); or 3/4 inch (19 mm) if U.S. No. 1 or better (no maximum size)*.
All Other Round Varieties	January 1 to Dec. 31	U.S. No. 2 or better	Aug. 1 to Oct. 31 for U.S. No. 2 moderately skinned, and for other grades, slightly skinned. Thereafter, no maturity requirements.	2 inches (51 mm) (no maximum size); or 1 inch to 1 3/4 inches (25 mm to 44 mm) if U.S. Commercial** or better; or Size “B”*** (1 1/2 inches to 2 1/4 inches) (38 mm to 57 mm) if U.S. Commercial** or better****.
Long Type Varieties	January 1 to Dec. 31	U.S. No. 2 or better	White Rose variety Aug. 1 to Dec. 31 moderately skinned. Other varieties, slightly skinned. Thereafter no maturity requirements.	2 inches (51 mm) or 4 ounces (113 g) provided that 40% of potatoes must be at least 5 ounces (142 g) or heavier (no maximum size); or Creamers 3/4 inch to 1 5/8 inches (19 mm to 41 mm) if U.S. No. 1 or better; or Size “B” (1 1/2 inches to 2 1/4 inches) (38 mm to 57 mm) if U.S. No. 1 or better.*****

Note:
U.S. potato import requirements do not apply to quantities of potatoes of 500 lb or less. The entire shipment, including all potato types and package sizes, is considered in aggregate and must be less than 500 lb to be exempt from the provisions of the import requirements.

There are no size requirements for Canada No. 1 or U.S. No. 1 or better grade potatoes in containers of 3 lbs or less; however lot must be accompanied by an inspection certificate.

* Potatoes 38 mm to 57 mm (1 1/2 inches to 2 1/4 inches) if Canada No. 1 Small Round or U.S. No. 1 Size “B” or better would also meet the minimum diameter requirement for round red varieties (all flesh colours).

* Creamers 19 mm to 41 mm (3/4 inch to 1 5/8 inches) if Canada No. 1 or U.S. No. 1 or better would also meet the minimum diameter requirement for round red varieties (all flesh colours).

** U.S. Commercial grade is better than U.S. No. 2, but less than U.S. No. 1 grade. However since there is no equivalent Canadian grade, the next highest grade must be used which is Canada No. 1.

***Size “B” potatoes range in size from 38 mm to 57 mm (1 1/2 inches to 2 1/4 inches) in diameter (round or long type). The term Size “B” must not be used in conjunction with a Canada grade name.

**** Potatoes 38 mm to 57 mm (1 1/2 inches to 2 1/4 inches) if Canada No. 1 Small Round would also meet the minimum diameter requirement for all round type potatoes other than red varieties.

***** Potatoes 38 mm to 51 mm (1 1/2 inches to 2 inches) if Canada No. 1 Small Long would also meet the minimum diameter requirement for long type varieties.

Size “A” potatoes must have the minimum size for the grade and 40% of the potatoes must be at least 170 g (6 ounces) or 64 mm (2 1/2 inches) or larger (no maximum size). The term Size “A” must not be used in conjunction with a Canada grade name.

APPENDIX IV

Fingerling Potatoes

The term "fingerling" refers to shape, not colour or texture. While classic varieties are either round or oval (long), fingerlings have a slender, elongated form with many eyes. Most varieties have red or yellow skin and yellow, waxy flesh.

Characteristics

Fingerlings are generally thin-skinned. Even brief dry periods during the growing season will produce misshapen or smaller tubers. Sizes vary, but most are 25 mm to 50 mm (1 to 2 inches) in diameter and 50 mm to 76 mm (2 to 3 inches) long. The Austrian Crescent variety can produce tubers that are 250 mm (10 inches) long.

Availability

In the midwestern United States, fingerling potatoes are generally in season from mid-July through September. Peak season for California fingerlings is the Fall.

Best - Known Varieties of Fingerlings

French Fingerling: Silky-smooth, cranberry-red to reddish-orange skin, covers moist yellow flesh marbled with red, especially just under the skin. Tubers measure 38 mm (1 1/2 inches) in diameter by 76 mm (3 inches) long. Tubers have a waxy, moist flesh and a nutty flavour.

Russian Banana: Yellow to beige skinned, yellow-fleshed, and medium-sized tubers. 'Russian Banana' tubers measure 25 mm (1 inch) in diameter by 76 mm (3 inches) long. Tubers have a waxy, moist flesh and a rich and buttery flavour.

Austrian Crescent: Pale yellow skin with waxy flesh. The skin is tan, smooth, and firm; the flesh is light yellow. This variety produces 50 mm (2 inches) in diameter by 250 mm (10 inches) long tubers. Sometimes the skin is bitter. Tubers have a waxy, moist flesh.

Ruby Crescent (also called Rose Finn Apple): Smooth, rose-coloured skin and deep creamy yellow flesh. Tubers are 25 mm (1 inch) in diameter by 76 mm (3 inches) long and are often knobby. About a quarter of the tubers produced by the vigorous plants have knobby, short growths on the main tuber. Tubers have a waxy, moist flesh and a deep, earthy flavour.

LaRatte: Late maturity. Smooth, buff skin and pale yellow flesh.

Ozette: Yellow-skinned and yellow-fleshed tubers have deeply set eyes that spiral around the 50 mm (2 inches) in diameter by 76 mm (3 inches) long tuber. Ozette may also be sold or listed under the alternate names 'Haida' or 'Kasaan'. Tubers have a mealy, dry flesh.

Butterfinger (also called Swedish Peanut): The skin is slightly rough and brown and flesh is yellow. Full-sized tubers are about 25 mm (1 inch) in diameter by 64 mm (2 ½ inches) long. Tubers have a mealy, dry flesh.

Purple Peruvian: Uniquely purple skin and flesh. The tubers measure 19 mm (3/4 inch) in diameter by 50 mm (2 inches) long. Tubers have a mealy, dry flesh.

Red Thumb: Smooth and easily cleaned red skin and red flesh. The tubers generally measure 25 mm (1 inch) in diameter by 50 mm (2 inches) long. Tubers have a mealy, dry flesh.

Performing Inspections on Fingerling Potatoes

Canadian import requirements for potatoes apply to Fingerling potatoes. As such, they must meet the requirements of the Canada No. 1 grade for quality.

Depending on the variety, size ranges would be graded against the requirements for either the Canada No. 1 Creamer (3/4 inch - 1 5/8 inches) or Canada No. 1 Small (Long Type) (1 1/2 inches - 2 inches) grades. Inspectors should record the size range used to perform the inspection under the Remarks section of the certificate.

In terms of common name of product, it is not necessary for the word “Fingerlings” to be marked on the package; “potatoes” would be sufficient. However, we would encourage inspectors to review, if possible, Bills of Lading or inward manifests to determine if the product is of the fingerling variety and not just off-size long types.

In terms of shape, the fingerling potatoes should be considered from the standpoint of shape characteristic of a particular variety. Fingerlings are an example of potatoes that have peculiar characteristics that make them outstanding from the standpoint of shape. Please refer to the attached USDA Visual Aid for shape (USDA Visual POT.-L-1-July 1999).

We would note to you that the photos showing “U.S. No. 2, Not Seriously Misshapen” would not be acceptable as meeting Canada No. 1 and should therefore be scored. The Fresh Products Section will develop a Visual Aid for Canadian use, but in the meantime, please reference Visual POT.-L-1-July 1999 prepared by the USDA.

AIR CRACKS
CREVASSES

CANADA NO. 1*

CANADA NO. 1*

CANADA NO. 2*

* MAXIMUM ALLOWED
* MAXIMUM PERMIS

POT - 2

(06/96)

BRUISES
MEURTRISSURES

CANADA NO. 1*

CANADA NO. 2*

CANADA NO. 2*

* MAXIMUM ALLOWED
* MAXIMUM PERMIS

POT - 3

(06/96)

RUSSETTING
ROUSSISSEMENT

CANADA NO. 1*

CANADA NO. 1*

RUSSET SCAB (SMOOTH)
GALE ROUSSE (LISSE)

CANADA NO. 1*

* MAXIMUM ALLOWED - EQUAL AMOUNT OR LESS ALLOWED ON OPPOSITE SIDE
* MAXIMUM PERMIS – QUANTITÉ ÉQUIVALENTE OU MOINDRE PERMISE SUR LE CÔTÉ OPPOSÉ

POT - 4

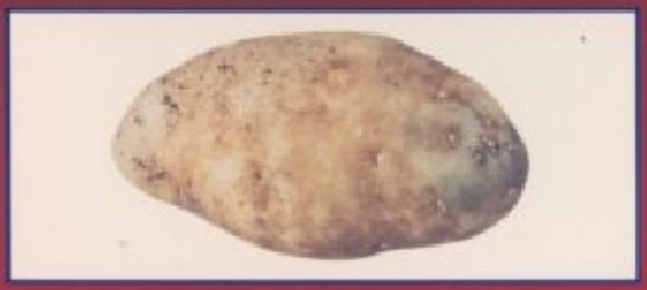
(06/96)

IDENTIFICATION

FLEE BEETLE – ALTISE

SURFACE SCAB - GALE SUPERFICIALLE

SUNBURN – INSOLATION



POT - 6

(06/96)

EXTERNAL DISCOLORATION
DÉCOLORATION EXTERNE

DARKER THAN LIGHT TAN OR LIGHT BROWN

UNE COULEUR PLUS FONCÉE QUE LA COULEUR DU TAN PÂLE OU BRUNE PÂLE

CANADA NO.1*

CANADA NO.1*

CANADA NO.2**

* MAXIMUM ALLOWED

* MAXIMUM PERMIS

** MAXIMUM ALLOWED - EQUAL AMOUNT OR LESS ALLOWED ON OPPOSITE SIDE

** MAXIMUM PERMIS - QUANTITÉ ÉQUIVALENTE OU MOINDRE PERMISE SUR LE CÔTÉ OPPOSÉ

POT - 8

(07/97)