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Potato Graders Manual

Michigan State University Cooperative Extension Service

F Folder Series

G.N. Motts, Agricultural Economics; Bureau of Foods and Standards, Michigan

Department of Agriculture

Revised September 1958

7 pages

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EXTENSION FOLDER F-186

1958 Revision

Potato Grader's
Manual



Prepared by
G. N. MOTTS
AGRICULTURAL ECONOMICS DEPARTMENT

in cooperation with

DIVISION OF FOODS AND STANDARDS
MICHIGAN DEPARTMENT
OF AGRICULTURE



MICHIGAN STATE UNIVERSITY
COOPERATIVE EXTENSION SERVICE

EAST LANSING

Potato Grader's Manual



(The purpose of this manual is to summarize the grading provisions of the Michigan Potato Marketing Law and to provide practical interpretations of the United States grades for potatoes. The author acknowledges the contribution of Miles Nelson, M. D. Murphy, Don Palmer and J. F. Hartzell of the Division of Foods and Standards, Michigan Department of Agriculture.)

MICHIGAN POTATO MARKETING LAW (Act 220, P.A. 1929, as amended)

Summary of provisions relating to grading:

SEC. 1—The latest potato grade standards established by the United States Secretary of Agriculture shall be accepted as the legal standards for Michigan.

A person who buys potatoes with the intent to ship or have them shipped by truck must be a licensed grader or furnish a licensed grader for the grading of said potatoes.

SEC. 3—It is unlawful for any person, firm, etc. to pack, store, transport, offer for sale, sell or otherwise handle potatoes which do not meet the requirements of the declared grade.

SEC. 4—Containers of potatoes prepared for market shall be clearly branded or stenciled with the name and address of the person responsible for grading and packing, the grade, and true net contents. Bulk shipments shall be accompanied by two cards showing the name and address of the shipper, the grade, name of the loading station, date of loading, and the name and address of the consignee, if known.

SEC. 5—Potatoes held in storage or in transit which show deterioration or decay but are otherwise up to the grade declared shall be inspected as to condition and not to grade.

SEC. 8—The provisions of this act do not apply to growers who sell potatoes produced by themselves directly to consumers.

Copies of the full text of the Michigan Potato Marketing Law and of the official United States Standards for Potatoes may be obtained from the Division of Foods and Standards, Michigan Department of Agriculture, Lansing 13, Michigan.

U. S. GRADES FOR POTATOES

U. S. FANCY U. S. COMMERCIAL
U. S. NO. 1 U. S. NO. 2

“Unclassified” is not a grade and may not be used in Michigan.

Waste in preparation and appearance are the two main considerations in grade determination.

Grade Factors	U. S. Fancy	
VARIETY	Means potatoes having “similar varieties”	
MATURITY	Not more than slightly skinned.	No
MINIMUM SIZES	2 inches minimum, 60 percent must 2¼ inches or larger, including 30 percent 2¾ inches or larger.	1 7/8
	Size requirements herein apply to round or intermediate shaped varieties. Size is measured by diameter, and the diameter indicates the screen size.	
	Three size classifications may be used.	
SHAPE	Must be well shaped. Slight variations of shape permitted if not pointed, dumbbell-shaped or otherwise ill-formed.	Mu if r forr
SHAPE	Shape is a matter of appearance only.	
CONDITION—SHRIVELING	Shriveled means soft, dried or shrunken.	Only firm potatoes permitted
SPROUTING		Not over 10 percent
FREEZING	Injury may occur in the field or in storage. Break-down and rot usually follow, with discoloration.	Not allowed in any grade. Not
BLACK HEART, LATE BLIGHT, RING ROT, WET ROT		None allowed in any grade. None
CUTS	Scars from broken-off second growth knobs are considered cuts.	Not over 5 percent waste permitted. Fancy, U. S. No. 1 and U. S. Commercial
SECOND GROWTH, GROWTH CRACKS, AIR CRACKS		Appearance of individual potatoes must not over 5 percent waste for U. S. No. 1 and
BRUISES		Not over 5 percent waste permitted.
DIRT, STAIN, FOREIGN MATTER	Stain usually due to decay or rot.	Must be practically free from dirt or other foreign matter. Gen be m
HOLLOW HEART		Internal appearance must not be materially affected. Inter be m
INTERNAL BROWNING OR BLACKENING	Internal discoloration is that caused by rot or other types of necrosis, stem-end browning, internal brown spot or other similar forms of discoloration not visible outwardly, except black-heart.	Not over 5 percent waste permitted. of the individual potato.
EXTERNAL DISCOLORATION	Surface discoloration, such as “burn” following skinning, are surface injuries and are considered on the	Appearance must not be materially affected

LIMITS OF DEFECTS IN U. S. POTATO GRADES

	U. S. No. 1	U. S. Commercial	U. S. No. 2
similar varietal characteristics." The practical requirement is only one variety in a container in any grade.			
No requirements but the degree of skinning may be termed: "Slightly skinned"—not more than 10 percent of the potatoes in any lot have more than one-fourth of the skin missing or "feathered." "Moderately skinned"—not more than 10 percent of the potatoes in any lot have more than half of the skin missing or "feathered." "Badly skinned"—more than 10 percent of the potatoes in any lot have more than half of the skin missing or "feathered."			
ent er, 2¾	1⅞ inches minimum for U. S. No. 1 and U. S. Commercial.		1½ inches minimum.
may be used for all grades except U. S. Fancy:		Size A: 1⅞ inches minimum, 60 percent 2¾ inches or larger. Size B: 1½ to 2¾ inches. Size C: 1 to 1½ inches.	
ght ted all- ill-	Must be fairly well shaped. Some variations in shape allowed if not materially pointed, dumbbell shaped, or otherwise ill-formed.		Must not be seriously pointed, dumbbell shaped, or otherwise badly deformed.
potatoes permitted.		Must not be more than moderately shriveled, spongy, or flabby.	Must not be excessively shriveled, spongy or flabby.
10 percent with sprouts over ¾ inch long permitted.			No requirement.
de.	Not allowed in any grade.	Not allowed in any grade.	Not allowed in any grade.
de.	None allowed in any grade.	None allowed in any grade.	None allowed in any grade.
te permitted. Appearance must not be materially affected for U. S. S. Commercial.			Cuts must be fairly smooth. Only one end may be clipped, but not more than ¼ of potato cut away. Irregular cuts—not over 10 percent waste permitted, or appearance must not be seriously affected.
potatoes must not be materially affected. Air cracks must not cause U. S. No. 1 and U. S. Commercial.			Appearance of individual potatoes must not be seriously affected.
te permitted. Appearance must not be materially affected.			Not over 10 percent waste permitted. Appearance must not be seriously affected.
ree ign	General appearance must not be more than slightly dirty.	General appearance must not be seriously affected by foreign matter or tubers badly caked with dirt.	
not	Internal appearance must not be materially affected.	Internal appearance must not be materially affected.	Internal appearance must not be seriously affected.
te permitted. Must not materially injure eating quality or appearance			Not over 10 percent waste permitted. Must not seriously injure eating quality or appearance of the individual potato.
materially affected for U. S. Fancy, U. S. No. 1 and U. S. Commercial.			Appearance must not be seriously affected.

U. S. GRADES FOR POTATOES

U. S. FANCY

U. S. COMMERCIAL

U. S. NO. 1

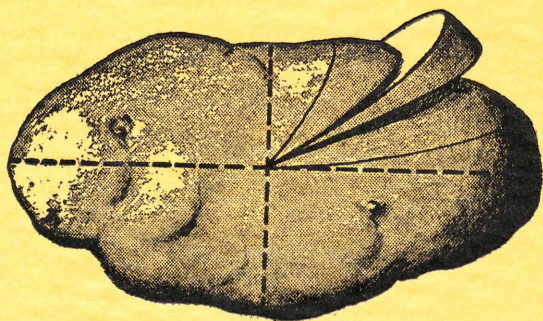
U. S. NO. 2

"Unclassified" is not a grade and may not be used in Michigan.

Waste in preparation and appearance are the two main considerations in grade determination.

Each grade is a standard of quality and condition.

Waste is determined by rounded, straight or curved cuts and not by careful digging, curved or bored cuts. Five percent (5%) waste of a potato is equivalent to one-fifth of one-quarter of a potato. (See drawing.)



The percentage of off-grade potatoes in a bag is determined by weight.

TOLERANCES

Tolerances for size for all grades

Below 2 $\frac{1}{4}$ inch minimum	3%
2 $\frac{1}{4}$ inches or larger minimum	5%
Above any specified maximum	10%

For packages of 15 pounds or less: individual packages shall have not less than one-half of the specified percentage.

For packages of more than 15 pounds: individual packages shall have not less than three-fourths of the specified percentage.

INTERNAL BROWNING OR BLACKENING
Internal discoloration is that caused by rot or other types of necrosis, stem-end browning, internal brown spot or other similar forms of discoloration not visible outwardly, except black-heart.

Not over 5 percent waste permitted of the individual potato.

EXTERNAL DISCOLORATION

Surface discoloration, such as "burn" following skinning, are surface injuries and are considered on the basis of appearance.

Appearance must not be materially affected.

SURFACE SCAB

Not over 5 percent of surface permitted if no pronounced contrast with background.

PITTED SCAB

Not over 5 percent waste permitted. Fancy, U. S. No. 1 and U. S. Commercial.

RHIZOCTONIA

Appearance of potato materially affected.

RUSSET SCAB

Appearance of potato materially affected.

DRY ROT, other than late blight, is graded on basis of waste and appearance.

Not over 5 percent waste permitted. Fancy, U. S. No. 1 and U. S. Commercial.

SUNBURN—GREENING

When sunburn or greening affects edible quality, the internal discoloration from exposure to light is included in determining amount of injury.

Not over 5 percent waste permitted of the individual potato.

WIREWORM, GRASS ROOT OR SIMILAR INJURIES are handled on basis of length of holes, except for U. S. Fancy which is handled on basis of waste and appearance.

The maximum length of hole and total number of holes per potato.

Any hole over $\frac{3}{4}$ inch in length, or more than one hole per potato. U. S. Fancy, U. S. No. 1 and U. S. Commercial.

Tolerances for Defects

U. S. Fancy: 5 percent total allowed for internal and external defects, with not more than 2 percent for bacterial wilt, ring rot and late blight, including therein not over $\frac{1}{2}$ percent for frozen potatoes, soft rot, and wet breakdown.

permitted. Must not materially injure eating quality or appearance	Not over 10 percent waste permitted. Must not seriously injure eating quality or appearance of the individual potato.
materially affected for U. S. Fancy, U. S. No. 1 and U. S. Commercial.	Appearance must not be seriously affected.
permitted for U. S. Fancy, U. S. No. 1 and U. S. Commercial, with background color; 3% if pronounced contrast.	Not over 50 percent of surface permitted if no pronounced contrast with background color; 25 percent if pronounced contrast.
permitted. Appearance must not be materially affected for U. S. Commercial.	Not over 10 percent waste permitted. Appearance must not be seriously affected.
materially affected or surface materially caked with black scurf.	Appearance of potato seriously affected or surface badly caked with black scurf.
materially affected.	Appearance of potato seriously affected.
permitted. Appearance must not be materially affected for U. S. Commercial.	Not over 10 percent waste permitted. Appearance must not be seriously affected.
permitted. Must not materially injure eating quality or appearance	Not more than 10 percent waste permitted. Must not seriously injure eating quality or appearance of the individual potato.
hole and total length of holes for these grades are based on a potato weighing 6 to 8 ounces. Allow more or less for larger or smaller	
length, or total length of all holes over 1¼ inches not permitted for U. S. Commercial, and not over 5% waste permitted.	Any hole over 1½ inches in length, or total of all holes over 2 inches not permitted, and not over 10 percent waste.

U. S. No. 1 and U. S. No. 2: 6 percent total allowed for external defects, with not more than 3 percent for bacterial wilt, ring rot and late blight, including therein not over 1 percent for frozen potatoes, soft rot and wet breakdown. In addition, not over 5 percent allowed for internal discoloration and hollow heart.

U. S. Commercial: 20 percent allowed for total defects, including not over 6 percent serious damage by external defects and not over 5 percent serious damage by internal defects. Included in the above tolerances, not more than 3 percent permitted for frozen, southern bacterial wilt, ring rot, late blight, soft rot or wet breakdown, including therein not over 1 percent for soft rot, wet breakdown, or frozen potatoes.

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1958 Revision

U. S. N. 2

SUGGESTION:

For easy reference, fasten this manual to the packinghouse wall.

OTHER GRADER'S MANUALS

Apples	F-199 Rev.
Grapes	F-200 Rev.
Peaches	F-201 Rev.
Pears	F-202 Rev.
Muskmelons	F-203 Rev.
Slicing Cucumbers	F-204 Rev.
Tomatoes	F-205 Rev.

Cooperative extension work in agriculture and home economics. Michigan State University and U. S. Department of Agriculture cooperating. Paul A. Miller, Director, Cooperative Extension Service, Michigan State University, East Lansing. Printed and distributed under acts of Congress, May 8 and June 30, 1914.

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