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Tomato Graders Manual

Michigan State University Cooperative Extension Service

F Folder Series

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Department of Agriculture

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EXTENSION FOLDER F-205 (REVISED)

Tomato Grader's
Manual



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in cooperation with
DIVISION OF FOODS AND STANDARDS
MICHIGAN DEPARTMENT
OF AGRICULTURE

MICHIGAN STATE UNIVERSITY
COOPERATIVE EXTENSION SERVICE
EAST LANSING

Suggestion:

For easy reference, fasten this manual to the packing house wall.

Tomato Grader's Manual



(The purpose of this manual is to summarize the grading provisions of the Michigan regulation dealing with the grading, packing, and marking of fresh tomatoes and to provide practical interpretations of the United States and Michigan grades for tomatoes. The author acknowledges the contributions of Miles Nelson, M. D. Murphy, Don Palmer and Hunter Hering of the Division of Foods and Standards, Michigan Department of Agriculture.)

REGULATION NO. 502

(Under provisions of Act 91, P. A. of 1915)

This Michigan regulation establishes grade standards and tolerances for Michigan No. 1 and Michigan No. 2 grades of tomatoes. Tomatoes may also be graded according to United States grade standards.

Copies of the full text of Michigan Regulation No. 502, and of the official United States Standards for Tomatoes, may be obtained from the Division of Foods and Standards, Michigan Department of Agriculture, Lansing 13, Michigan.

TOMATO GRADES

- U. S. No. 1 Michigan No. 1
- U. S. No. 2 Michigan No. 2
- U. S. Combination

U. S. Combination consists of a combination of U. S. No. 1 and U. S. No. 2 — provided that at least 60 percent, by count, meet the requirements of U. S. No. 1 grade.

“Unclassified” is not a grade, but a designation to show that no grade has been applied to the lot.

Since the United States standards for tomatoes are somewhat higher than for comparable Michigan grades and are better known to members of the produce trade, it may be preferable to use the United States grades, especially for shipments into other states.

TOLERANCES

Grade

U. S. No. 1:

At shipping point, not over 10 percent, by count, in any lot may fail to meet grade requirements, provided:

- (1) Not over 5 percent have defects causing serious damage, and
- (2) Not over 1 percent are tomatoes that are

GRADE FACTORS	
SHAPE	Must have <i>well developed</i> shape. Must be <i>fairly well</i> rounded, <i>lopsided</i> , <i>elongated</i> . Must be <i>fairly smooth</i> .
BRUISES, HAIL, INSECTS, SUNBURN, SUNSCALD, DISEASE, MECHANICAL AND OTHER INJURIES	Must be free of any defects that affect appearance, eating or shipping.
PUFFINESS	Not permitted if it materially affects appearance. Must be centered at right angles to surface.
SCARS	Must be free from scars. Scars on a tomato 2 inches or larger must have lesser area than scars on greater areas, provided that the appearance of the tomato is not affected by scars permitted.
CATFACES	Not permitted when they extend into the locule; or when they are larger than that of a circle $\frac{1}{2}$ inch in diameter.
GROWTH CRACKS	Must be free of growth cracks that affect appearance, eating or shipping. Cracks less than $\frac{1}{2}$ inch beyond stem are permitted.
CUTS	Must be free of cuts that extend more than $\frac{1}{2}$ inch into the locule.
DIRT	Not permitted.

LIMITS OF

GRADE FACTORS (Continued)	
SHAPE	Must be <i>fairly well</i> rounded, <i>lopsided</i> , <i>elongated</i> .
BRUISES, HAIL, INSECTS, SUNBURN, SUNSCALD, DISEASE, MECHANICAL AND OTHER INJURIES	Must be free of any defects that affect appearance, eating or shipping.
PUFFINESS	Not permitted if it materially affects appearance. Must be centered at right angles to surface.
SCARS	Must be free from scars. Scars on a tomato 2 inches or larger must have lesser area than scars on greater areas, provided that the appearance of the tomato is not affected by scars permitted.
CATFACES	Must be free from catfaces that extend deeply into the locule.
GROWTH CRACKS	Must be free of growth cracks that are very narrow, numerous as to seriously affect appearance, eating or shipping.
CUTS	Must be free from cuts that extend more than $\frac{1}{2}$ inch into the locule.

LIMITS OF DEFECTS IN U. S. TOMATO GRADES

U. S. NO. 1	U. S. NO. 2
<p>be <i>well developed</i> or normal growth. <i>Fairly well formed</i> — not decidedly kidney-shaped, elongated, angular, or otherwise deformed. <i>Fairly smooth</i> — not conspicuously ridged or rough.</p>	<p>Must not be <i>badly misshapen</i> — must be fairly well formed.</p>
<p>Free of any defect which materially affects appearance or shipping quality. Must be free from worms.</p>	<p>Must be free of any defect which seriously affects appearance, eating or shipping quality. Must be free from worms.</p>
<p>Not permitted if open space in one or more locules materially affects appearance when the tomato is cut through the center at right angles to a line from stem to blossom end.</p>	<p>Not permitted if open space in two or more locules seriously affects appearance when the tomato is cut through the center at right angles to a line from stem to blossom end.</p>
<p>Free from scars totaling more than $\frac{3}{8}$ inch in diameter on a tomato $2\frac{1}{2}$ inches in diameter. Smaller tomatoes and larger tomatoes may have lesser areas of scars and larger tomatoes may have greater areas, provided such scars do not affect the appearance of the tomatoes to a greater extent than that caused and permitted on a $2\frac{1}{2}$-inch tomato.</p>	<p>Must be free from scars that seriously affect appearance, eating or shipping quality.</p>
<p>Not permitted when rough or deep, or when channels extend into the locule; or when fairly smooth and the area exceeds a circle $\frac{1}{2}$ inch in diameter on a $2\frac{1}{2}$-inch tomato.</p>	<p>Must not seriously affect appearance, eating or shipping quality.</p>
<p>Free of growth cracks not well healed that materially affect appearance, or any radiating crack that extends more than $\frac{1}{2}$ inch beyond stem scar.</p>	<p>Must not seriously affect appearance, eating or shipping quality.</p>
<p>Free of cuts that are not shallow, not well healed, or more than $\frac{1}{2}$ inch long.</p>	<p>Must be free from unhealed cuts or holes.</p>
<p>Must not materially affect appearance, eating or shipping quality.</p>	

LIMITS OF DEFECTS IN MICHIGAN TOMATO GRADES

MICHIGAN NO. 1	MICHIGAN NO. 2
<p><i>Fairly well formed</i> — Not decidedly kidney-shaped, elongated, angular or otherwise deformed.</p>	<p>Must not be <i>badly misshapen</i> — appearance not seriously affected.</p>
<p>Free of any defect which materially affects appearance or shipping quality. Must be free from worms.</p>	<p>Must be free of any defect which seriously affects appearance, eating or shipping quality. Must be free from worms.</p>
<p>Not permitted if open space in one or more locules materially affects appearance when the tomato is cut through the center at right angles to a line from stem to blossom end.</p>	<p>Not permitted if open space in two or more locules seriously affects appearance when the tomato is cut through the center at right angles to a line from stem to blossom end.</p>
<p>Free from scars totaling more than $\frac{3}{4}$ inch in diameter on a tomato 2 inches in diameter.</p>	<p>Must be free from scars that seriously affect appearance, eating or shipping quality.</p>
<p>Free from smooth scars greater in area than a circle 1 inch in diameter, or from rough or deep scars or channels which penetrate into the fruit.</p>	
<p>Free of growth cracks not well healed, or more than 1 inch long; not more than three cracks to the tomato, except narrow, well-healed cracks running around the stem scar shall not be considered as serious damage unless so damaged as to seriously damage the appearance.*</p>	
<p>Free from cuts that are not shallow, not well healed, or more than $\frac{1}{2}$ inch long.</p>	<p>Must be free from unhealed cuts or holes.</p>

TOLERANCES

Grade

U. S. No. 1:

At shipping point, not over 10 percent, by count, in any lot may fail to meet grade requirements, provided:

(1) Not over 5 percent have defects causing serious damage, and

(2) Not over 1 percent are tomatoes that are soft or affected by decay.

U. S. No. 2:

At shipping point, not over 10 percent, by count, may fail to meet grade requirements — provided not over 1 percent are soft or affected by decay.

U. S. Combination:

At shipping point, not over 10 percent, by count, in any lot may fail to meet requirements of U. S. No. 2 grade — provided not over 1 percent is for tomatoes that are soft or affected by decay.

Michigan No. 1:

Wherever inspected, not over 10 percent, by count, in any container may fail to meet grade requirements, provided:

(1) Not over 5 percent are seriously damaged from catfaces or growth cracks, and

(2) Not over 1 percent are soft or affected by decay.

Michigan No. 2:

Not over 10 percent, by count, in any container may fail to meet grade requirements — provided not over 1 percent are soft or affected by decay.

Size

United States standards provide that not more than 10 percent, by count, of the tomatoes in any lot may be smaller than the specified *minimum* diameter or larger than the specified *maximum* diameter.

SCARS

Must be free from
eter.

CATFACES

Must be free from
extend deeply into

GROWTH CRACKS

Must be free of gr
that very narrow,
numerous as to ser

CUTS

Must be free from
or more than 1/2 inc

DIRT

Must not material
quality.

*For Michigan No. 2 grade, serious damage means any injury which tomato over that which would result from trimming if the tomato

Individual Packages

When graded according to U. S. grade standards, contents of individual containers are subject to the following limitations, provided the averages for the entire lot are within specified tolerances:

When a tolerance is 10 percent or more, individual containers shall have not more than one and a half times the specified tolerance. When less than 10 percent, individual containers shall have not more than twice the specified tolerance. At least one defective and one off-size specimen may be permitted in any container.

GRADE FACTORS

Variety

Both United States and Michigan standards require that packages of graded tomatoes contain tomatoes of similar varietal characteristics. This means that they shall be alike in firmness of flesh and shade of color; that is, soft-fleshed, early maturing varieties are not to be mixed with firm-fleshed, midseason or late varieties, or bright red

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fects appearance when the tomato is cut through the center at right angles to a line from stem to blossom end.

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free from scars totaling more than $\frac{3}{4}$ inch in diam-

Must be free from scars that seriously affect appearance, eating or shipping quality.

free from smooth scars greater in area than a circle 1 inch in diameter, or from rough or deep scars or channels which deeply into the fruit.

free of growth cracks not well healed, or more than 1 inch long; not more than three cracks to the tomato, except very narrow, well-healed cracks running around the stem scar shall not be considered as serious damage unless so serious as to seriously damage the appearance.*

free from cuts that are not shallow, not well healed, or more than $\frac{1}{2}$ inch long.

Must be free from unhealed cuts or holes.

not materially affect appearance, eating or shipping

No requirement.

injury which cannot be removed in the ordinary process of trimming without a loss of more than 20 percent (by weight) of the tomato were perfect.

varieties mixed with varieties having a purplish tinge. The simplest way to meet this requirement is to include only one variety in each graded lot.

DIAMETERS IN FRACTIONS OF AN INCH FOR MEASURING DEFECT AREAS:

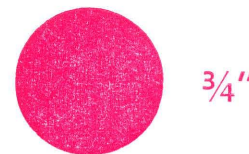
Maturity

Totatoes of all United States and Michigan grades must be mature, but not overripe or soft.



Size

United States standards provide that the size of tomatoes in any type of container may be specified in terms of minimum, or minimum and maximum, diameter in whole inches (or in whole inches and not less than sixteenth-inch fractions thereof) in accordance with the facts. Such diameters shall be the largest diameter measured at right angles to a line from the stem to the blossom end.



Decay and Freezing Injury

None allowed in any grade.

OTHER GRADER'S MANUALS

Potatoes	F-186 Rev.
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.

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