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Apple Graders Manual

Michigan State University Cooperative Extension Service

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Department of Agriculture

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EXTENSION FOLDER F-199 (Revised)

# *Apple Grader's*

# *Manual*



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OF AGRICULTURE



MICHIGAN STATE UNIVERSITY  
COOPERATIVE EXTENSION SERVICE

EAST LANSING

## **SUGGESTION**

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

# Apple Grader's Manual



(The purpose of this manual is to summarize the grading provisions of the Michigan Apple Marketing Law and to provide practical interpretations of the United States grades for apples. The author acknowledges the assistance of Miles Nelson, M. D. Murphy, Don Palmer, and Hunter Hering of the Division of Foods and Standards, Michigan Department of Agriculture.)

## MICHIGAN APPLE MARKETING LAW

(Act 132, P. A. 1937)

### Summary of provisions relating to grading:

SEC. 1—The standard apple grades are limited to U. S. grades, and must conform to the latest standards established by the United States Secretary of Agriculture and accepted as the legal standards for Michigan. Apples may not be sold that do not meet the requirements of these grades, except as provided in Section 2 of this act. The Director of Agriculture, however, may establish grades or combination grades; and he may also establish a superior grade to be sold under bond.

SEC. 2—Apples which do not conform to the foregoing grades may be sold or shipped as *unclassified*. Such apples must not contain over 20 percent of apples that would conform to any combination of the superior grades. No facing or top dressing shall be permitted; the contents of such packages or bulk-lot containers must not be inferior to the shown surface, and must not contain wormy or decayed fruit.

Any grade of apples not harmful to health may be sold directly to processing or byproduct plants, or sent directly to a packing house to be graded. Apples sold for byproduct purposes shall not again be offered for sale as fresh fruit. Shipments of byproduct apples may be made outside the state only on declaration at destination and with the knowledge and approval of the Director of Agriculture.

Windfalls or drop apples may be packed and

Apples in other types of boxes may be placed packed, faced jumble packed, or jumble packed, but all packs must be well filled.

Apples in boxes with cell compartments or molded trays must be of proper size for the cells or trays. Apples in consumer units must completely fill the master container.

## U. S. GRADES FOR APPLES

|                          |                           |
|--------------------------|---------------------------|
| <i>U. S. Extra Fancy</i> | <i>U. S. No. 1 Cooker</i> |
| <i>U. S. Fancy</i>       | <i>U. S. No. 1 Early</i>  |
| <i>U. S. No. 1</i>       | <i>U. S. Utility</i>      |
|                          | <i>U. S. Hail</i>         |

## Combination Grades

There are only three combination U. S. grades for apples:

*Combination U. S. Extra Fancy and U. S. Fancy*

*Combination U. S. Fancy and U. S. No. 1*

*Combination U. S. No. 1 and U. S. Utility*

The following abbreviations may be used for U. S. grade names:

*U. S. Ex. Fcy.* for U. S. Extra Fancy

*U. S. Fcy.* for U. S. Fancy

*U. S. Util.* for U. S. Utility

*Comb. U. S. Fcy.—U. S. No. 1* for Combination U. S. Fancy and U. S. No. 1

Similar abbreviations apply to other combination grades.

In *Comb. U. S. Ex. Fcy.—U. S. Fcy.*, at least 25 percent of the apples in any lot must meet the requirements of the higher grade in the combination.

In the other two combination grades, at least 50 percent of the apples in any lot must meet the requirements of the higher grade in the combination.

*Unclassified* is not a grade, but a term for use as described in Section 2 of Act 132, P. A. 1937, previously cited.

## LIMITS OF DEFECTS IN

| Grade Factors  | U. S. Extra Fancy   | U. S. Fancy, U. S.  |
|--|---|---|
| VARIETY  | Any package of graded apples must contain only one variety.   |   |
| MATURITY   | All grades except U. S. No. 1 Early must be mature but not overripe. U. S. No. 1 Early must be mature but not overripe.   |   |
| HANDPICKED   | Apples of all grades except "Michigan Drops" must be carefully handpicked.  |   |
| DIRT, SPRAY RESIDUE  | Apples of all grades must be clean, except that U. S. Utility must be free from dirt.   |   |
| SHAPE  | Must have normal shape for variety.   | May be slightly abnormal in appearance.   |
| SIZE   | The count or minimum diameter of the apples in a container shall be marked on the smallest apple. When the count is not marked, it is suggested that the <i>Minimum size</i> is the largest diameter at right angles to a line from the stem to the core. The <i>Maximum size</i> is the smallest size determined by passing the apple through a ring of the same diameter. |   |
| BITTERPIT, DECAY, INTERNAL BREAKDOWN, INTERNAL BROWNING, FREEZING INJURY, JONATHAN SPOT, SCALD, WATER CORE | None permitted.   | None permitted for the five grades.   |
| BROKEN SKIN, BRUISES   | None permitted except those slight ones which occur during proper handling and packing.   | None permitted except those slight ones which occur during proper handling and packing, except that well-healed hail marks are permitted. |
| SCAB   | None permitted.   | Total permitted: $\frac{1}{4}$ inch in diameter.  |
| DROUGHT SPOTS, SCARS, HARD DRY BRUISES, HAIL MARKS   | No noticeable discoloration other than russetting is permitted. Superficial indentations are permitted. Individual indentations $\frac{1}{8}$ inch in diameter or total of $\frac{1}{4}$ inch are permitted, provided skin is not broken.   | Permitted if superficial, skin is not broken.   |
| LIMB RUBS  | Dark brown or black: total of $\frac{1}{8}$ inch in diameter permitted. Light brown limb rubs shall be considered as russetting.  | Total permitted: $\frac{1}{2}$ inch diameter.   |
| CEDAR RUST, APPLE BLOTCH   | Total permitted: $\frac{1}{8}$ inch in diameter.  | Total permitted: $\frac{1}{4}$ inch diameter.   |
| SOOTY BLOTCH, FLY SPECK  | If thinly scattered, 5 percent of surface permitted; if dark and concentrated, $\frac{1}{4}$ inch in diameter permitted.  | If thinly scattered, 1/10 of surface permitted.   |
| RED SKIN SPOTS   | If thinly scattered, 1/10 of surface permitted; if dark and concentrated, $\frac{1}{4}$ inch in diameter permitted.   | If thinly scattered, 1/10 of surface permitted.   |
| HEALED INSECT STINGS   | Total permitted: $\frac{1}{8}$ inch in diameter, including encircling discolored rings.   | Total 3/16 of an inch in diameter.  |

# U. S. APPLE GRADES

No. 1, U. S. No. 1 Cooker, U. S. No. 1 Early, U. S. Hail

U. S. Utility

Any package of graded apples must contain only one variety.

Early need not be mature, but must be not less than 2 inches in diameter.

dirt which seriously affects the appearance or the eating or shipping quality.

shape for the variety but not enough to take away from its

Must not be so misshapen that its appearance is seriously affected.

the container. When the count is marked on the container, the largest apple shall not be more than  $\frac{1}{4}$  inch larger both minimum and maximum diameters be marked on the container. the blossom end. round opening.

des in this column.

No decay, internal breakdown, internal browning, freezing injury, or scald is permitted. Visible water core must not be over  $\frac{1}{2}$  inch in diameter.

resulting during proper handling and packing. U. S. Hail: same marks where the skin has been broken are permitted, if apples are

Must not seriously affect appearance or keeping quality.

diameter in the five grades in this column.

Total permitted:  $\frac{3}{4}$  inch in diameter.

not broken, and total area no more than  $\frac{1}{2}$  inch in diameter.

Total permitted: 1/10 of surface if fruit is not materially disfigured or deformed, except well-healed hail marks totaling  $\frac{1}{2}$  inch diameter. Unhealed hail marks not permitted.

ter. Light brown limb rubs shall be considered as russetting.

Total permitted: 1/10 of surface.

ter for the five grades in this column.

Total permitted:  $\frac{3}{4}$  inch in diameter.

face permitted. If dark and concentrated,  $\frac{1}{2}$  inch in diameter

$\frac{1}{3}$  of surface permitted.

face. If dark and concentrated,  $\frac{1}{2}$  inch in diameter permitted.

$\frac{1}{3}$  of surface permitted.

ter, including encircling discolored rings.

Total permitted:  $\frac{1}{4}$  inch in diameter, including encircling discolored rings.

sold—if the face is not more than 10 percent of a better quality than the contents and none of the fruit is seriously damaged. Containers must be stenciled “Michigan Drops.”

SEC. 4—It is unlawful for any person, firm, etc., to pack, store, transport, offer for sale, sell, or otherwise handle apples which do not meet the requirements of the grade.

SEC. 5—Containers of apples prepared for market shall be clearly branded or stenciled with the name and address of the party responsible for grading and packing, the grade, variety (or marked unknown), minimum size or numerical count, 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 name and address of the consignee, if known.

SEC. 9—The provisions of this act do not apply to growers who sell apples produced by themselves directly to consumers.

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

## PACKING REQUIREMENTS

Apples on the shown face shall be reasonably similar in size, color, and quality to the contents of the package.

Apples in U. S. standard half-bushel, five-eighths bushel, and bushel baskets may be ring-faced—and must be tightly packed. Allow enough bulge to prevent much movement of the apples when bushel is lidded.

Apples in standard northwestern boxes shall be arranged according to recognized methods with the stems toward the ends of the boxes, except when jumbled. Fill packages compactly as possible without causing excessive or unnecessary bruising and allow enough bulge to prevent much movement of the apples when container is lidded. Wrapped apples must be completely enclosed by their individual wrappers.

## TOLERANCES

### Grade

Not more than 10 percent of the apples in any lot may fail to meet grade requirements. Not more than half of that amount, or 5 percent, is allowed for apples seriously damaged by insects, including not more than 1 percent for apples with decay, internal breakdown or both.

When applied to Combination U. S. Extra Fancy and U. S. Fancy grade, no reduction is allowed for the lot as a whole in the 25 percent of the higher grade apples required in the pack—but individual containers shall have not less than 15 percent of the higher grade.

When applied to the other two combination grades, no reduction is allowed for the lots as a whole in the 50 percent of apples of the higher grade required—but individual containers shall have not less than 40 percent of the higher grade.

### Size

Not more than 5 percent of the apples in any lot may fail to meet size requirements—but when the minimum and maximum sizes are stated, an additional 10 percent is allowed for apples larger than the stated maximum.

### Pack

Not over 5 percent of the containers in any lot may fail to meet packing requirements.

For packages which contain more than 10 pounds, and a tolerance of 10 percent or more is provided, individual packages must not have more than  $1\frac{1}{2}$  times the specified tolerance. For packages which contain more than 10 pounds, with a tolerance of less than 10 percent, individual packages must not have more than double the specified tolerance.

For packages which contain 10 pounds or less, individual packages in any lot are not restricted as to percentage of defects; provided that not more than one apple seriously damaged by insects or affected by decay or internal breakdown is permitted in any package.

**SAN JOSE SCALE AND SIMILAR TYPES**

1 heavy mark or large scale, or 3 slight marks or 3 small scales permitted on green surfaces; 2 heavy marks or large scales, or 4 to 6 light marks or scales permitted on red surface, depending on prominence; 3 to 6 marks or scales permitted in calyx of well-colored apples.

3 heavy marks or 3 large scale on red surfaces depending on well-colored apples.

**RUSSETING**

The russeting permitted is in addition to other defects.

Any amount permitted in stem cavity or calyx basin which cannot be seen when apple is placed stem or calyx down on flat surface except when rough or barklike or when appearance is materially affected. Amounts permitted outside of stem cavity or calyx basin:

- (1) Smooth, netlike; total 5 percent of area if no very marked contrast with background color; lesser amount if more noticeable.
- (2) Smooth, solid, total area 1/2 inch if pattern and color show no very marked contrast with background color; lesser amount if more noticeable.
- (3) Slightly rough; total area 1/4 inch.
- (4) Rough; none.

**U. S. Fancy**

Any amount permitted in stem basin which cannot be seen placed on flat surface, except rough or barklike or when materially affected. Amounts permitted outside calyx basin:

- (1) When not excessively rough; Russets or similar varieties.
- (2) Smooth, netlike; total area 5 percent of surface if no very marked background color.
- (3) Smooth, solid; total area 5 percent and color show no very marked contrast with background; lesser amount if more noticeable.
- (4) Slightly rough; total area 5 percent.
- (5) Rough; 1/4 inch diameter.

**COLOR**

As specified for the variety.

U. S. Fancy and U. S. No. 1: A  
 U. S. No. 1 Cooker: Not enough  
 U. S. No. 1 Early: No color required

Grades of apples with color requirements must have the percentage of color specified for that variety in the table.

For the solid red varieties, the percentage stated means the area of the surface which must be covered with a good shade of solid red, characteristic of the variety. An apple with a lighter shade of solid red or striped red than that considered characteristic of the variety may be admitted to a grade—if it has *enough additional area covered* so the appearance is as good as that of those apples having the minimum percentage of good red required.

For the striped red varieties, the percentage stated means the area of surface in which the stripes of a good shade of red, characteristic of the variety, shall predominate over stripes of lighter red, green, or yellow. However, an apple with a lighter shade than that considered as a good shade of red may be admitted to a grade—if it has *enough additional area covered* to give it as good an appearance as an apple with the minimum percentage of stripes of a good red required.

**COLOR REQUIREMENTS FOR**

| VARIETY  | PERC              |
|--|-------------------|
|  | U. S. Extra Fancy |
| <b>SOLID RED OR RED SPORT:</b>   |                   |
| Detroit Red, Gano, King David, Spitzenburg, and similar varieties  | 75%               |
| <b>STRIPED OR PARTIALLY RED:</b>   |                   |
| Jonathan, McIntosh, Snow (Fameuse)   | 66                |
| Baldwin, Ben Davis, Delicious, King, Northern Spy, Stayman, Turley, Wagener, Wealthy and similar varieties | 50                |
| Duchess, Hubbardston, Stark, and similar varieties   | 50                |
| <b>RED-CHEEKED OR BLUSHED:</b>   |                   |
| Maiden Blush, Winter Banana, and similar varieties   | Blush Cheek       |



permitted on green surfaces; 5 to 10 marks or scales permitted prominence; marks or few scales permitted in calyx basin of

Marks or scales thick or grouped, 1/10 of surface permitted; thinly scattered, 1/3 of surface permitted.

**U. S. No. 1, U. S. No. 1 Cooker,  
U. S. No. 1 Early, U. S. Hail**

Same as U. S. Fancy except:  
(1) Smooth, netlike; total area 25 percent of surface.  
(2) Smooth, solid; total area 25 percent of surface.

Smooth, solid; total: 1/2 surface including any russetting in stem cavity or calyx basin, or slightly rough or excessively rough, or bark-like russetting which does not detract from appearance more than the amount of smooth russetting permitted. Any amount permitted on Roxbury Russet and similar varieties.

cavity or calyx when apple is not excessively appearance is  
vities:  
h on Roxbury  
of 15 percent contrast with  
percent if pat-arked contrast  
unts if more  
1/2 inch.

s specified for the variety.  
h to meet requirements for U. S. No. 1.  
quirements.

No color requirements.

**SPECIFIED GRADES OF PRINCIPAL MICHIGAN APPLE VARIETIES**

| PERCENT OF COLOR |             |
|------------------|-------------|
| U. S. Fancy      | U. S. No. 1 |

**GREEN:**  
Grimes Golden, R. I. Greening, and similar varieties..... Characteristic ground color  
**YELLOW:**  
Golden Delicious ..... 75% characteristic color

50%                      25%

33                        25

25                        15

15                        10

**DIAMETERS IN FRACTIONS OF AN INCH FOR MEASURING DEFECT AREAS:**



Tinge                      None

## OTHER GRADER'S MANUALS

|                         |            |
|-------------------------|------------|
| Potatoes .....          | F-186 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. |

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