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Pear 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

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EXTENSION FOLDER F-202 (Revised)

Pear 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

SUGGESTION

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

Pear Grader's Manual



(The purpose of this manual is to summarize the grading provisions of the Michigan regulation dealing with the grading, branding, packing, and sale of pears prepared for market and to provide practical interpretations of the United States grades for pears. 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. 528 AS AMENDED

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

Summary of provisions relating to grading:

All pears, when prepared for market, offered for sale, or sold, must meet the requirements for one of the U. S. grades established for summer and fall pears, August 20, 1955, by the United States Department of Agriculture. Lots of pears not graded to conform with such U. S. grades may be marketed as "Unclassified," provided that not more than 3 percent of such lots are affected by decay and/or an additional 5 percent by serious worm damage.

"Unclassified" is not a grade. It is a designation to show that the pears have not been graded in conformance with established U. S. grades.

Provisions of this regulation shall not apply to pears sold directly to a canning or preserving plant or when sold by the grower direct to the consumer.

Copies of the full text of Michigan Regulation No. 528 as Amended, and of the official United States Standards for Pears, may be obtained from the Division of Foods and Standards, Michigan Department of Agriculture, Lansing 13, Michigan.

PACKING REQUIREMENTS

The pears in the shown face must be reasonable samples in size and quality of the contents of the package.

GRADE FACTORS

Variety

Packages of graded pears must contain only one variety.

Summer and fall varieties: Bartlett, Hardy, etc.

Winter varieties: Anjou, Bosc, Comice, Winter Nelis, etc.

Maturity

Graded pears must be mature but not overripe.

Size

The numerical count or minimum size must be indicated on the package. The number of pears in a box must not vary by more than three from the indicated number.

When the numerical count is not shown, the minimum size must be plainly marked on the container in terms of whole inches, whole and half, whole and quarter, and whole and eighth inches, in accordance with the facts. It is suggested that both minimum and maximum sizes be indicated.

Size means the greatest diameter at right angles to a line from the stem to the blossom end.

Handpicked — Clean

All grades must be carefully handpicked and clean.

Miscellaneous

This category includes the following: Black End, Decay, Freezing Injury, Internal Breakdown, Scald, Worm Holes.

None permitted in any grade.

TOLERANCES

Grade

Not over 10 percent of the pears in any container may fail to meet grade requirements, provided:

(1) Not over 5 percent are seriously damaged by insects, and

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

When applied to the combination grade, no part of the tolerance shall be used to reduce the percentage of U. S. No. 1 pears required, but individual

LIMITS OF DEFECTS IN U. S. PEAR GRADES

Grade Factors (Continued)	U. S. Extra No. 1 (Winter varieties only)	U. S. No. 1								
SHAPE	May differ slightly from variety if general appearance is not greatly changed.	May differ slightly, but not lessen eye appeal. Winter Nelis may have typical slight depression or flattening on one side and/or other side. Slight changes in shape which do not harm appearance.								
HARD END	None permitted.	<i>Summer and fall varieties:</i> Not permitted if pear shows a distinctly flattened end, or unusually smooth rounded base which is unusually dry, tough or woody. <i>Winter varieties:</i> Not permitted if pear shows unusual yellowing of base with little or no calyx depression, or								
DROUGHT SPOT	None permitted.	Only one spot or outer injury less than 1/8 inch in diameter or of 3/8 inch in diameter permitted. Much corky tissue or brownish discoloration not allowed.								
CORK SPOT	Not permitted if pear shows depressions or other external evidence of the disease.	<i>Summer and fall varieties:</i> Injury must not affect appearance, eating or shipping quality. <i>Winter varieties:</i> Not permitted if more than one is visible when outer injury exceeds 3/8 inch diameter.								
RUSSETING	Russeting <i>not</i> permitted under following circumstances: On all varieties, any russeting that shows "frogging" or slight cracking. On Comice, Anjou, and other smooth skinned varieties, slightly rough russeting or thick russeting to a total area of over 1/2 inch in diameter. Smooth, solid russeting to a total of over 1/2 inch diameter and smooth netlike russeting that exceeds 15 percent of surface. On Comice, when smooth, solid or smooth, netlike russeting exceeds 1/3 of surface. In addition, on these and similar varieties, any amount of characteristic smooth russeting on calyx end visible for more than 1/2 inch along contour of pear when calyx is down on a flat surface. On any of the following or similar varieties, rough or thick russeting not permitted when total area exceeds 1/2 inch in diameter. Any amount of characteristic russeting is permitted on the following varieties: <table style="margin-left: 40px; border: none;"> <tr> <td>Bosc</td> <td>Kieffer</td> </tr> <tr> <td>Clairgeau</td> <td>Seckel</td> </tr> <tr> <td>Easter Beurre</td> <td>Sheldon</td> </tr> <tr> <td>Flemish Beauty</td> <td>Winter Nelis</td> </tr> </table>	Bosc	Kieffer	Clairgeau	Seckel	Easter Beurre	Sheldon	Flemish Beauty	Winter Nelis	Russeting <i>not</i> permitted under following circumstances: <i>Summer and fall varieties:</i> On all varieties, russeting which shows "frogging" or slight cracking. On Bartlett and other smooth skinned varieties, slightly rough russeting when total area exceeds 3/4 inch diameter; smooth solid netlike russeting when total area exceeds 15 percent of surface. On Hardy, Sand, and similar varieties, rough or thick russeting when total area exceeds 1/2 inch in diameter. (On these varieties, amount of characteristic russeting is not permitted.) <i>Winter varieties:</i> On all varieties, russeting which shows "frogging" or slight cracking when total area exceeds 1/2 inch diameter. On Anjou and other smooth skinned varieties, slightly rough russeting or thick russeting when total area exceeds 3/4 inch in diameter. On smooth, solid or netlike russeting when total area exceeds 15 percent of surface. On these and similar varieties, any amount of characteristic smooth russeting on calyx end is not permissible when not visible for more than 1/2 inch along contour of pear when calyx
Bosc	Kieffer									
Clairgeau	Seckel									
Easter Beurre	Sheldon									
Flemish Beauty	Winter Nelis									

lessen eye appeal. Slight dents or other slight blemishes not harm appear-

Not permitted if pear is excessively flattened or elongated, or is constricted or deformed so it will not cut three fairly uniform good quarters, or is so badly misshapen that the appearance is seriously affected.

A distinctly constricted bulge or unusual yellow color at blossom end, or if flesh near calyx is woody.

Unusual yellow color at blossom end, or unusually smooth rounded depression, or if flesh near calyx is unusually dry, tough, or woody.

Less than total area. Much corky tissue not allowed.

Not permitted with more than two spots, or when external injury exceeds total of $\frac{3}{4}$ inch in diameter, or when appearance of flesh is seriously affected by corky tissue or brownish discoloration.

Appearance, eating or shipping quality. Injury is visible, or more than $\frac{1}{2}$ inch diameter.

Summer and fall varieties:
When injury seriously affects appearance, edible or shipping quality.
Winter varieties:
When more than two visible, or when external injury exceeds $\frac{1}{2}$ inch diameter.

Under the following circumstances:

Russetting not permitted under following circumstances:

Which shows "frogging" or slight cracking when total area exceeds 15 percent of surface.

Summer and fall varieties:
On all varieties, russetting which shows "frogging" or slight cracking when total area exceeds $\frac{3}{4}$ inch in diameter. Thick russetting on more than 15 percent of surface.

On Anjou, smooth, solid or smooth, netlike russetting when total area exceeds $\frac{2}{3}$ of surface.

Winter varieties:
On all varieties, russetting which shows "frogging" or slight cracking when total area exceeds $\frac{3}{4}$ inch in diameter. Thick russetting on more than 15 percent of surface.

On Anjou, smooth, solid or smooth, netlike russetting when total area exceeds $\frac{2}{3}$ of surface.

Any amount of characteristic smooth russetting on calyx end is permissible when not visible for more than $\frac{1}{2}$ inch along contour of pear when calyx is placed on a flat surface. On Flemish Beauty, smooth russetting permitted on entire surface.

On Anjou, smooth, solid or smooth, netlike russetting when total area exceeds $\frac{2}{3}$ of surface. Any amount of characteristic smooth russetting on calyx end is permissible when not visible for more than $\frac{1}{2}$ inch along contour of pear when calyx is placed on a flat surface.

Pears in any container must be tightly packed. All packages must be well filled, but the contents must not show excessive or unnecessary bruising because of overfilled packages.

Pears in bushel baskets must be ring faced.

Not over 5 percent of the pears in any container may fail to meet size requirements, provided that when minimum and maximum sizes are stated, an additional 10 percent shall be allowed for pears that are larger than the stated maximum.

Each container of pears shall be clearly marked with the name of the variety, if known, the minimum size or count, the name and address of the packer, the grade or term "Unclassified," and the true contents. The same information shall be shown on the invoices or shipping papers accompanying bulk shipments.

Containers of pears marked "Unclassified" must be jumble-packed and not ring faced, and the shown surface must not be of better quality or color or of larger size than the rest of the package or bulk lot.

U. S. GRADES FOR PEARS

SUMMER AND FALL VARIETIES	WINTER VARIETIES
<i>U. S. No. 1</i>	<i>U. S. Extra No. 1</i>
<i>U. S. No. 2</i>	<i>U. S. No. 2</i>
<i>U. S. Combination</i>	<i>U. S. Combination</i>

A combination of U. S. No. 1 and U. S. No. 2 may be packed. At least 50 percent of the pears in any container must meet U. S. No. 1 requirements.

containers may have not more than 10 percent less than the required percentage of U. S. No. 1, provided the entire lot averages the specified percentages.

Individual packages in a lot may vary from the tolerances above, provided the averages for the entire lot are within the specified tolerances.

For packages which contain more than 10 pounds, and when a tolerance of 10 percent or more is provided, individual packages in any lot must have not more than one and one-half times the tolerance specified. For packages which contain more than 10 pounds and when a tolerance of less than 10 percent is provided, individual packages in any lot must have not more than double the tolerance specified, except that at least one pear which is seriously damaged by insects or affected by decay or internal breakdown may be permitted in any package.

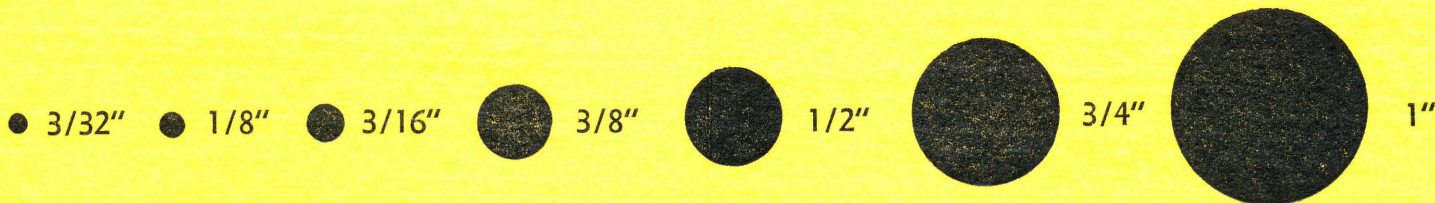
For packages which contain 10 pounds or less, individual packages in any lot are not restricted as to the percentage of defects or off-size: *Provided*, That not more than four times the tolerance specified may be permitted in any package for pears which are seriously damaged by insects or affected by decay or internal breakdown, except that at least one defective pear may be permitted in any package.

Size

Not over 5 percent of the pears in any container may fail to meet standard size requirements, provided that when minimum and maximum sizes are both stated, an additional 10 percent tolerance shall be allowed for pears larger than stated maximum size.

Not over 10 percent of the containers in any lot may fail to meet the packing requirements.

DIAMETERS IN FRACTIONS OF AN INCH FOR MEASURING DEFECTS:



placed on a flat surface.
On any of following or similar varieties, rough or thick russeting not permitted when total area exceeds $\frac{3}{4}$ inch diameter. Any amount of characteristic russeting is permitted on the following varieties:

Bosc	Kieffer
Clairgeau	Seckel
Easter Beurre	Sheldon
Flemish Beauty	Winter Nelis

LIMB RUBS

Not permitted if cracked, softened, more than very slightly depressed, dark, or exceeding a total area of $\frac{3}{4}$ inch in diameter.

Not permitted if cracked, softened or more than slightly depressed.
Discolorations must not total over:
Black— $\frac{3}{8}$ inch
Dark brown— $\frac{1}{2}$ inch
Slightly rough, light colored— $\frac{3}{4}$ inch
Smooth, light colored—1 inch

**HAIL MARKS
AND SIMILAR
SCARS**

Not permitted if deep or covering a total area of more than $\frac{1}{4}$ inch in diameter.

Not permitted if deep or covering a total area of more than $\frac{3}{8}$ inch in diameter.

**SPRAYBURN,
SUNBURN**

Not permitted if normal color of fruit is materially changed, or skin blistered or cracked, or flesh softened or discolored.

Not permitted if skin is blistered, cracked, or shows any light tan or brownish color, if shape is flattened, or if flesh is softened or changed in color (except that sprayburn of russet character shall be considered as russeting).

**SCAB, SOOTY
BLOTCH**

No black scab spots with total area more than $\frac{1}{8}$ inch in diameter are permitted (except scab spots of russet character, which shall be considered as russeting).
Sooty blotch thinly scattered over more than 5 percent of surface, or dark, heavily concentrated spots affecting area more than $\frac{3}{8}$ inch in diameter are not permitted.

**INSECT
INJURIES**

More than 2 healed slight stings, or any stings that greatly affect the general appearance are not allowed.
Deep Blister mite or canker worm injury, or injury affecting a total area of more than $\frac{1}{4}$ inch is not allowed.

More than two healed codling moth stings, any sting over $\frac{3}{32}$ inch in diameter, or stings affecting appearance to an equal extent are not allowed. Blister mite, deep canker worm injury, or injury affecting a total area of more than $\frac{3}{8}$ inch in diameter is not allowed.

BRUISES

Slight handling and package bruises from good commercial handling in a tight pack shall not be considered damage.

BROKEN SKIN

Any pear with one skin break larger than $\frac{3}{16}$ inch in diameter or depth, or with more than one skin shall be considered damaged and scored against the grade tolerance. Small, inconspicuous skin break not be considered damage. In addition, only 15 percent of pears in any container may have more than $\frac{1}{4}$ inch in diameter or depth.

varieties,
mitted when
ter. Any
g is per-

Nelis

l or more Not permitted if more than slightly cracked, very rough, dark brown or black, or over a total area of $\frac{3}{4}$ inch in diameter.

ch

total area Must not mar the fruit or be over $\frac{3}{4}$ inch in diameter.

cracked, or color, if softened or sprayburn of russet as russeting). Not permitted if skin is blistered, cracked, or shows any brownish color, if shape is greatly flattened, or if flesh is softened or greatly changed in color (except that sprayburn of russet character shall be considered as russeting).

cept scab Same as for U. S. No. 1, except that total area must be not more than $\frac{1}{4}$ inch in diameter.
concentrated Same as for U. S. No. 1, except it must total not over 15 percent of surface, or affect area more than $\frac{3}{4}$ inch in diameter.

th stings, or stings of greater extent are affected by canker worm or other insects. May not have more than three healed codling moth stings, of which not over two may exceed $\frac{3}{32}$ inch in diameter or other stings affecting appearance to greater extent. May not have blister mite or canker worm injury which greatly deforms or disfigures fruit. Injury may not total more than $\frac{3}{4}$ inch in diameter.

shall not Must be free from bruises that seriously affect the appearance, eating or shipping quality.

more than one skin break $\frac{1}{8}$ inch or larger in diameter or depth, or numerous skin breaks less than $\frac{1}{8}$ inch in diameter or depth shall not have more than one skin break from $\frac{1}{8}$ to $\frac{3}{16}$ inch in

OTHER GRADER'S MANUALS

Potatoes	F-186 Rev.
Apples	F-199 Rev.
Grapes	F-200 Rev.
Peaches	F-201 Rev.
Muskmelons	F-203 Rev.
Slicing Cucumbers	F-204 Rev.
Tomatoes	F-205 Rev.

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