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Agricultural Marketing Service

Fruit and Vegetable Programs

Fresh Products Branch

Pears

Shipping Point and Market Inspection Instructions

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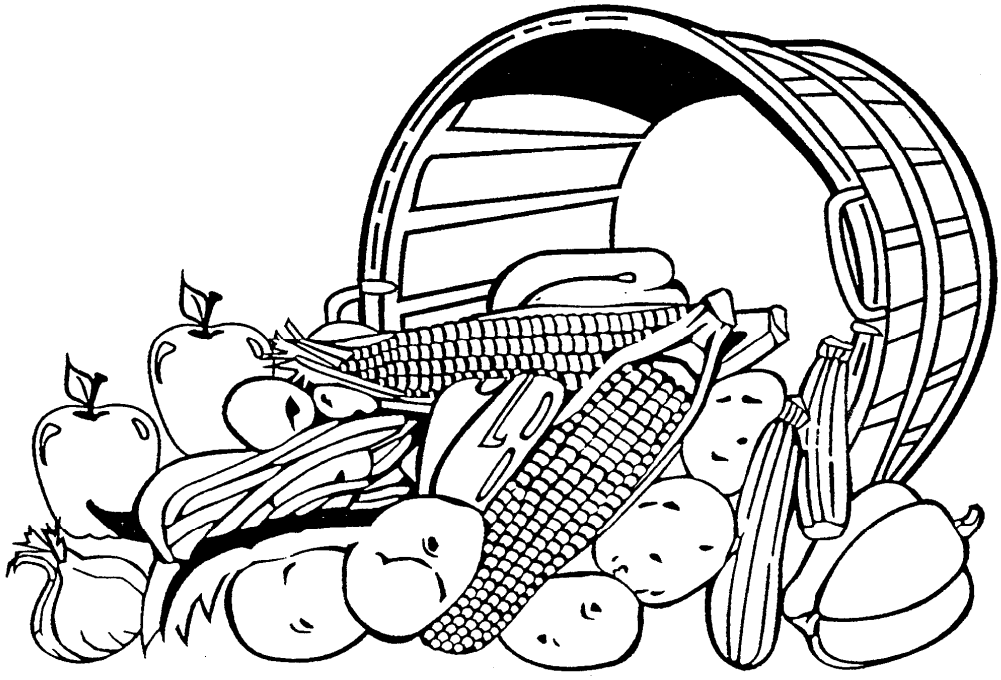

Shipping Point and Market Inspection Instructions for Pears

These inspection instructions are specifically developed by the Fresh Products Branch to assist officially licensed inspectors in the interpretation and application of the United States Standards for Summer and Fall Pears, Section 51.1260 and United States Standards for Winter Pears, Section 51.1300.

These instructions do not establish any substantial rule not legally authorized by the official grade standards. This publication supersedes any previously issued inspection instructions.

Refer to the General Inspection Instructions for additional information pertaining to date, inspection point, carrier, condition of carrier, lading, etc. that is not covered in this handbook. Reference to "General Inspection Instructions" in all Fresh Products Branch publications refers to any one or all of the following - General Shipping Point Inspection Instructions, General Market Inspection Instructions, or Fresh Fruit and Vegetable Certificate Writing Handbooks.

Any portion of these instructions beginning with the section number §51.--- and followed by **bold** print are sections or portions of sections copied directly from U.S. standards. The U.S. Standards for Grades of United States Standards for Summer and Fall Pears and United States Standards for Winter Pears are printed in the appendix of this handbook. All U.S. standards are available on the Internet under the USDA homepage.

November 2007

This replaces Pears, Shipping Point Inspection Instructions dated, July 1984, and Market Inspection Instructions dated, July 1973.

Factors noted with **(Q)** are considered quality only. Factors noted with **(C)** are considered condition at market. Factors noted with **(Q or C)** may be quality or condition depending on the circumstances. Factors not designated do not pertain to either category.

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GENERAL

Pears are available throughout the year in most terminal markets either from domestic production or imported from other countries. The domestic production may be shipped as soon as harvested or may be placed in cold storage for later shipment.

Fresh pear production is largely concentrated in the States of Washington, Oregon, and California. Pears are also grown in lesser volumes in the States of New York, Michigan, and Illinois.

Pears are covered by two separate standards. One of these standards is United States Standards for Grades of Winter Pears. These standards cover pears that store well or which do not ripen until winter. The other is the United States Standards for Grades of Summer and Fall Pears. These standards cover pears that ripen in the summer or fall and are not ideal for winter storage.

U.S. and State Grades

There is a general provision applied to the pear standards for the summer and fall as well as for the winter standards for pears:

> **§51.1268 and §51.1309 Condition after storage or transit. Decay, scald, or other deterioration which may have developed on pears after they have been in storage or transit shall be considered as affecting condition and not grade.**

This means that even if the listed condition defect exceeds tolerance, the grade statement will still read: "U.S. No. 1 (or whichever grade is applied), Decay (or other condition defects) being a factor of condition."

Serious Damage Tolerance

The serious damage tolerance is 5% and only applies to serious damage by insects.

Winter Pears

> **§51.1300 General. These standards apply to varieties such as Anjou, Bosc, Winter Nelis, Comice, Flemish Beauty and other similar varieties.**

In the U.S. standards, Oregon State and Washington State Standards for Winter Pears, the U.S. Extra No. 1, Oregon Extra Fancy, and Washington Extra Fancy grades have the same requirements as to grade defects. This also applies to the U.S. No. 2,

Oregon Fancy and Washington Fancy grades. The U.S. No. 1 is an intermediate grade between U.S. Extra No. 1 and U.S. No. 2.

In all the standards for winter pears, the requirements are specific and the various grade factors are covered in detail. Therefore, no attempt will be made to discuss all the grade factors other than to offer an explanation on some points which are not altogether self explanatory. Inspectors must refer to the standards for the definition of the factor in question.

Summer and Fall Pears

§51.1260 General. These standards apply to varieties such as Bartlett, Hardy and other similar varieties.

In the U.S. standards for summer and fall pears, the requirements are specific and the various grade factors are defined in detail. Remember, that the U.S. No. 1 is the top grade in this set of standards. There is no U.S. Extra No. 1 grade in these standards.

The Oregon State Standards for summer and fall pears are identical to the U.S. standards in definitions but not in names, as follows:

Oregon Extra Fancy meets all the requirements of U.S. No. 1. Oregon Fancy meets all the requirements of U.S. No. 2. Oregon Combination meets all the requirements of U.S. Combination.

Washington State Standards for summer and fall pears differ substantially from the U.S. Standards in some respects. Inspectors using this grade should receive full instructions on terminology and definitions from their supervisors.

Things to Remember About Grading Pears

1. There are separate standards for summer and fall varieties and for winter varieties. This applies to U.S. Standards and State of Oregon and Washington standards. Be sure to apply the proper standards.

2. In both sets of U.S. Standards the requirements for U.S. No. 1, U.S. No. 2, and U.S. Combination are practically the same.

3. In the U.S. Standards for winter pears the top grade is U.S. Extra No. 1 (corresponding to Oregon and Washington State Extra Fancy); U.S. Standards for summer varieties omit this grade, making U.S. No. 1 the top grade.

4. For winter pears the Oregon and Washington State Extra Fancy Grades are identical with U.S. Extra No. 1, and the State Fancy grades are identical with U.S. No. 2 grade. For summer varieties refer to the State standards for requirements.

5. Requirements of all U.S. Grades are the same for the following factors: One variety, mature, not overripe, carefully hand picked, clean, free from decay, internal breakdown, scald, freezing injury, worm holes and black end and free from damage caused by broken skins.

6. There is a 15% allowance for pears having one skin break 1/8 to 3/16 inch in diameter or depth in all U.S. pear grades. Pears having one skin break larger than 3/16 inch in diameter or depth, or having more than one break 1/8 inch or larger are scored against the 10% grade tolerance. Skin breaks, which are less than 1/8 inch in diameter or depth, are not counted as a defect.

7. There is a 5% tolerance for serious damage by insects in all the grades.

8. Decay, scald or other deterioration in the market affects condition and not the grade. When any of these condition factors exceed the grade tolerance, the proper grade statement is similar to the following: U.S. No. 1, decay being a factor of condition."

9. There are no export standards for pears.

10. Ground color should be reported in connection with firmness. Size is not part of any of the grades.

REPRESENTATIVE SAMPLING

The importance of obtaining representative samples cannot be over emphasized. Accurate certification is possible only if the samples examined are truly representative of the entire lot or accessible portion. All portions of a lot or load should receive the same attention in sampling regardless of the difficulty involved in reaching all layers or parts of a lot or load. Anytime the entire lot requested is not accessible for sampling, the inspection and certificate must be restricted to the accessible portion.

Basis for Calculating Percentages

§51.1267 Basis for calculating percentages.

(a) When the numerical count is marked on the container or when pears are packed in a container to weigh 5 pounds or less, percentages shall be calculated on the basis of count.

(b) When the minimum diameter or minimum and maximum diameters are marked on a container packed to weigh more than 5 pounds or when the pears are jumbled in a container packed to

weigh more than 5 pounds, percentages shall be calculated on the basis of weight or an equivalent basis.

The percentages in the Washington State Standards for Summer and Fall Pears are based on count regardless of the type of pack or method of indicating size.

Number of Samples at Shipping Point

The certificate is based on the examination of samples selected to be representative of the lot. The inspector's sample of pears for inspection may consist of the contents of two trays from a tray-pack carton, about one-fourth a place-packed standard box or carton or a proportionate quantity from other wholesale containers. It may, at times, be the entire contents of a container. It is always the entire contents of a consumer size container.

When a lot is of uniform quality and condition, and it is definitely within grade tolerance, only the minimum number of containers instructed by the OIC/Federal Program Manager need be selected as samples per lot or carlot. However, if quality and condition factors are found to be irregular, or close to the grade tolerance, or several growers lots are noted, more samples must be examined.

Code numbers and other grower's marks must be recorded on the inspector's notes in connection with each sample. The importance of complete and legible notes cannot be over emphasized.

Sampling Pears That Have Not Been Sized

When size is reported in diameters in connection with a U.S. Grade, the size of the sample examined is usually twenty pounds. When inspecting, face and fill packs, care must be exercised not to include a disproportionate number of pears from the face, as these are usually superior in quality to those in the fill.

Bin Sampling

When specifically authorized by the OIC/Federal Program Manager, some of the samples may be taken from the packing bins. However, a large proportion of the samples must be taken from boxes in order to determine the factors of pack, size, wrap, arrangement and bruising caused in packing and when box lids are applied. The notesheet must indicate the samples from bins.

Increasing Size of Sample

It should be remembered that the above instructions for size of samples are only minimums, and that, in some cases, it will be desirable to increase the size of the sample taken from individual packages. This is especially true when the container tolerance is exceeded.

Note: No lot should be put out of grade only account excessive defects in an individual sample unless the entire contents of the container have been used as the sample.

Number of Samples at Market

As a general rule a minimum of 1% of the lot must be examined. For lots of less than 300 packages a minimum of three samples must be examined. It is the inspector's responsibility to examine additional representative samples when the quality, condition, or size in samples is decidedly different to ensure an accurate description of the lot.

Twenty pounds is the usual size sample for bulk loads or large containers marked to denote diameter. Care should be exercised not to include a disproportionate number of pears from the "face" in faced containers. If the inspector tightens but does not otherwise disturb the outside ring of pears in faced baskets, it is possible to get samples from the bottom.

Pears in boxes, which are packed in rows and layers or otherwise where the numerical count, is designated should be inspected on the basis of count. Representative samples can be obtained by opening the box on the side and taking specimens from all layers and rows. At least one sample should be taken from each size. However, if any of the sizes are out of grade or there are major differences in the sizes, then at least three samples shall be taken. Sample size shall be a minimum of fifty pears. For pears in consumer packages within master containers - sample at a rate of two times the number of consumer packages in a master container for each full lot (sample proportionately for greater or lesser amounts, i.e., half a carlot would be the equivalent of only one time the number of consumer packages in a master container). In addition, the samples must be drawn from various master containers throughout the lot.

It should be remembered that fifty pears is a minimum only and in some cases it may be necessary to increase the size of sample in individual packages. This is especially important when samples show more than 1-1/2 times or double the tolerance, as the case may be. It should be remembered that no lot should be put out of grade account of excessive defects in individual samples unless the entire contents have been used in at least the first sample which exceeded the tolerances.

Containers and contents should always be left in as near their original condition as possible, and no cut specimens should be left in the conveyance.

TOLERANCES AND APPLICATION OF TOLERANCES

The following tolerances apply to both the summer and fall pears as well as the winter pear grades respectively.

§51.1265 and §51.1306 Tolerances. (a) In order to allow for variations incident to proper grading and handling, not more than a total of 10 percent of the pears in any lot may fail to meet the requirements of grade: *Provided*, That not more than 5 percent shall be seriously damaged by insects, and not more than 1 percent shall be allowed for decay or internal breakdown.

Summary of Tolerances	
Total Defects, including:	10%
Seriously Damaged by Insects, and	5%
Decay or Internal Breakdown.	1%

Application of Tolerances

The following application of tolerances applies to both the summer and fall pears as well as the winter pear grades respectively.

§51.1266 and 51.1307 Application of tolerances.

(a) The contents of individual packages in the lot, based on sample inspection, are subject to the following limitations, provided the averages for the entire lot are within the tolerances specified for the grade:

(1) For packages which contain more than 10 pounds, and a tolerance of 10 percent or more is provided individual packages in any lot shall have not more than one and one-half times the tolerance specified. For packages which contain more than 10 pounds and a tolerance of less than 10 percent is provided, individual packages in any lot shall 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.

(2) 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.

Summary of Application of Tolerances for packages which contain **more than 10 pounds:**

Total Defects, including:	10% x 1-1/2 = 15%
Serious damage by insects, and	5% x 2 = 10%
Decay or internal breakdown.	1% x 2 = 2%

Except at least one pear which is seriously damaged by insects or affected by decay or internal breakdown may be permitted in any package.

Summary of Application of Tolerances for packages which contain **10 pounds or less:**

Total Defects, including and providing that:	Individual packages in any lot are not restricted as to the percentage of defects or off-size.
Serious damage by insects, and	5% x 4 = 20%
Decay or internal breakdown.	1% x 4 = 4%

Except that at least one defective pear may be permitted in any package.

NOTESHEET AND CERTIFICATE

Entries on hand written notesheets and certificates must be kept in a legible and accurate manner. All information that appears on the certificate must be supported by information on the notesheet. It is the responsibility of the inspector to ensure that all information is properly recorded. Notations shall be recorded so that anyone familiar with inspection procedures can interpret them and write a certificate. Also remember that notesheets and certificates are prima facie evidence and must be able to withstand legal scrutiny.

Detailed instructions pertaining to date, inspection point, place of inspection, type of carrier, lading, etc., which are not covered by these instructions may be found in one of the General Inspection Instructions. Your supervisor may give you additional information and instructions.

Product

The common name “Pears” shall be used to describe this commodity in the product heading. Also, in order to denote whether the summer (S) or winter (W) standards are applied, following “Pears,” add an (S) or (W). The variety may be reported in “Product / Variety” section on shipping point notesheet and certificate or in the “Lot ID” section on market notesheet and certificate.

Number/Type of Containers

The number of containers shall always be reported. In the market and at shipping point locations for stationary lot certification, the inspector shall always verify the container count provided by the applicant for each lot and report it as the “inspector’s count.” If the number of containers available for inspection does not match the application it is the inspector’s responsibility to confirm that the amount presented for inspection constitutes the lot. If an accurate count cannot be determined the inspector may report the count at someone else’s authority. However, the reason for doing so must be reported on the notesheet (i.e., numerous pallets with mixed product).

Brands/Markings

The brand, variety, size, count, grade, weight, point of origin and other important information appearing on the container should be reported on the notesheet in the “Brands/Markings” section. Only the brand name and other key markings necessary to properly identify the lot for certification should appear in this section on the certificate.

Origin

The inspectors should not make a positive statement on their own authority, but when container markings list the State or country of origin, it should be quoted in the appropriate space on the notesheet and the certificate. If origin is not marked, it is the inspector’s responsibility to make an effort to obtain this information from the applicant. This policy is necessary because some firms may use one brand on the same product packed in several States. The inspector can certify the marks on the containers.

CONDITION OF PACK

Refer to the General Shipping Point or the General Market Inspection Instructions for instructions as to reporting tightness of pack, filling of containers, presence of pads, liners, wraps, etc.

Many pears are marketed in cartons and in half-box size cartons of various types and sizes. Most winter pears are wrapped and place packed; however, some are tray packed or consumer packaged. Summer pears may be wrapped and place packed or not wrapped and “volume filled.” Pears may also be packed lengthwise in rows and layers in common commercial arrangements.

Standard Pack

The purpose of Standard Pack is to certify that packs are tight or containers are full and that any sizing is fairly uniform and the containers are properly marked as to size.

§51.1269 and §51.1310 Sizing.

(a) The numerical count, or the minimum size of the pears packed in closed containers shall be indicated on the package. The number of pears in the box shall not vary more than 3 from the number indicated on the box.

(b) When the numerical count is marked on western standard pear boxes the pears shall not vary more than three-eighths inch in their transverse diameter for counts 120 or less; one-fourth inch for counts 135 to 180, inclusive; and three-sixteenths inch for counts 193 or more.

(c) When the numerical count is marked on western standard half boxes or special half boxes packed three tiers deep, the pears shall not vary more than three-eighths inch for counts 75 or less; one-fourths inch for counts 80 to 110, inclusive; and three-sixteenths inch for counts 115 or more.

(d) When the numerical count is marked on western standard half boxes or special half boxes packed two tiers deep, the pears shall not vary more than three-eighths inch for counts 50 or less; one-fourth inch for counts 55 to 70, inclusive; and three-sixteenths inch for counts 80 or more.

(e) When the numerical count is not shown, the minimum size shall be plainly stamped, stenciled or otherwise marked on the container in terms of whole inches, whole and half inches, whole and quarter inches, or whole and eighth inches, as 2-1/2 inches minimum, 2-1/4 inches minimum, or 2-5/8 inches minimum, in accordance with the facts. It is suggested that both minimum and maximum sizes be marked on the container, as 2-1/4 to 2-3/4 inches, 2-1/2 to 2-3/4 inches, as such marking is especially desirable for pears marketed in the export trade.

(f) "Size" means the greatest transverse diameter of the pear taken at right angles to a line running from the stem to the blossom end.

§51.1270 and §51.1311 Packing.

(a) Each package shall be packed so that the pears in the shown face shall be reasonably representative in size and quality of the contents of the package.

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

(c) Pears packed in boxes shall be arranged in containers according to the approved and recognized methods with the pears packed lengthwise. A bridge shall not be allowed in any standard pack. When wrapped, each pear shall be fairly well enclosed by its individual wrapper.

(d) Pears packed in round stave bushel baskets, tubs or in barrels shall be ring faced.

§51.1271 and §51.1312 Tolerances for standard pack.

(a) In order to allow for variations incident to proper sizing, not more than 5 percent of the pears in any lot may fail to meet the size requirements: *Provided,* That when the maximum and minimum sizes are both stated, an additional 10 percent tolerance shall be allowed for pears which are larger than the maximum size stated.

(b) In order to allow for variations incident to proper packing, not more than 10 percent of the containers in any lot may fail to meet these requirements, but no part of this tolerance shall be allowed for bridge packs, or for packs with different sizes and arrangements such as layers of 195 size and arrangement, and layers of 180 size and arrangement packed in the same box.

Packing

Pears shall be tightly packed and containers well filled but not overfilled to the point of causing excessive bruising. This means that the package is sufficiently filled or tight in layers to prevent movement of product within and to furnish a proper bulge for packages requiring a bulge.

Pears packed in boxes shall be arranged in containers according to approved and recognized methods. In place packs, this means that the pears shall be packed lengthwise in rows and layers in officially recognized arrangements. In “jumble filled” containers, this means that the pears have been firmly settled and leveled to approximately the top of the box or carton, and that their net weight at least slightly exceeds that marked on the containers.

When wrapped, each pear shall be fairly well enclosed by its wrapper. Pears in cell or tray containers must fill the individual cells or cups so that there is no movement of the fruit. When pears have settled in storage or transit, the container should be considered well filled if it weighs 5% more than the standard net weight of the container.

TEMPERATURE OF PRODUCT

Inspectors would not normally determine or report temperatures at shipping point. However, due to the importance of the pulp temperature of fresh fruits and vegetables when in transit or at destination, it is essential that the inspector accurately determine and report the temperature or range in temperatures on each lot. Pulp temperature should be reported regardless of the location of the product, whether in the carrier, warehouse, or stacked on the platform. Remember to precool the thermometer in order to obtain accurate readings. Report all temperatures to the nearest whole degree.

A minimum of three temperatures for each lot must be taken and recorded on the notesheet. More temperatures must be taken if the lot is abnormally cold, heated, or there is a specific request for temperature, and these must be reported in greater detail specifying location in lot or load.

SIZE

In the U.S. Standards for Pears, “Size” is separate from grades as are the “Standard Pack Requirements.”

> **§51.1269 and §51.1310 Sizing. (f) “Size” means the greatest transverse diameter of the pear taken at right angles to a line running from the stem to the blossom end.**

When determining either the minimum or maximum size of pears, measure the greatest transverse (crosswise) diameter at right angles to a line from the stem to the blossom end.

When size is designated by diameter, state the range and, if the range is three-fourths inch or greater, also show a “mostly.” When the range of size is only one-half inch and the sizes are uniformly distributed within the range, do not show “mostly.”

When the numerical count is marked on the containers, no attempt should be made to show the range in inches or fractions thereof, except when there is a specific request to show this information. In reporting size of pears packed by count the following terms should be used unless the pears are packed on the basis of “Standard Pack” or on the basis of some State grade which contains other definitions for these terms:

"Fairly uniform" may be used when the pears meet the size variations permitted in Standard Pack and the pears in the container are not more than one size smaller and one size larger than the size marked.

"Irregular" is used when the pears fail to meet the size requirements of Standard Pack and when the pears in a container vary more than three sizes.

Interpretation of Size Tolerance

All of the U.S. Standards for pears and the State Standards for winter pears provide for a tolerance of 5% for undersize, but no individual package may contain more than 10% undersize; in addition there is a 10% tolerance for oversize when a maximum size is stated. However, when there is no undersize, the total tolerance of 15% may be used for oversize, which would permit individual packages to contain 22% oversize specimens, providing the average is 15% or less. Thus, any unused portion of the 5% tolerance for undersize may be used to increase the percentage of oversize allowed. For example, if a lot contained only 3% undersize, it would be permissible to have an average of 12% oversize. These tolerances appear in the Standards as requirements of Standard Pack. They also apply when Standard Pack is not certified in connection with the Grade.

- Undersize 5% (10% permitted in a sample)
- Oversize 10% (When maximum size is stated)
- 15% Total
- Unused % of undersize may be applied to oversize (except WA State grades)
- Oversize up to 15% (22-1/2% permitted in a sample)
- Example: 3% undersize, 12% oversize
- Example: No undersize, then 15% oversize

The Oregon State Standards for Summer and Fall Pears contain the same tolerances as the U.S. Standards.

The Washington State Standards for Bartlett and Other Summer and Fall Pears provide a 5% tolerance for undersize and a separate 10% tolerance for oversize. Therefore individual samples may not contain more than 10% undersize or 15% oversize.

Certifying Minimum Size When Fruit Shows Higher Minimum

In reporting size of lots which show 5% or less, undersize for the next higher 1/4 inch than marked, the facts should be reported in such a way that the certificate will not be misleading. This can be accomplished by showing under the "Size" heading that the lot complies with the actual marking on the container, but in addition that it contains less than 5% under the next higher 1/4 inch. For example, a lot marked "2-1/4 inch and up"

but containing 5% or less under 2-1/2 inches, should be reported: "Generally 2-1/4 to 3-1/4, mostly 2-1/2 to 3 inches in diameter, averaging 3% under 2-1/2 inches in diameter.

If the packages are marked "2-1/4 inch up" and there are none under 2-1/2 inches, that size should be shown as the bottom of the range followed with the statement: "None under 2-1/2 inches."

Size in Count Packs

In determining whether more than five percent (5%) of the pears in a container vary more than is allowed, the inspector may have to resort to trial and error to determine his starting or base size. The problem is to find the smallest percentage outside the range allowed. In some instances, the smallest percentage outside the range may be the larger pears; in another instance it may be the smaller pears; or, it may be that some of each may give the smallest figure.

Example: In a box of 100-size, the variation allowed is 3/8 inch.

1 pear	2-11/16"
4 pears	2-12/16"
15 "	2-13/16"
25 "	2-14/16"
25 "	2-15/16"
15 "	3"
9 "	3-1/16"
2 "	3-2/16"
3 "	3-3/16"
1 pear	3-4/16"

So we have seven pears (7%), the smallest percentage, outside of a 3/8 inch range, the variation allowed. Therefore, the sizing should be reported as "irregular." It must be remembered that the application of one and one-half times the tolerance does not apply to the 5% of pears that are permitted to vary more than the ranges permitted.

Size Marks on Lugs and Other Containers

Pears in lugs and other containers can be sized with the same uniformity as pears in packed standard boxes, and if their size conforms to the definition of the term, they should be reported as being "fairly uniform."

Reporting the range of size in each size would be cumbersome and impractical if there are a number of sizes in a lot, but it is often desirable to report the over-all range of size for the lot, thus: "Generally 2-1/4 to 3-1/4 inches in diameter, fairly uniform sizing in cartons."

Sometimes pears in other containers are marked with the size they would pack in standards boxes, such as "120 size" or "equiv. to 120 size," etc. When these marks are

used, they may be reported under the “Products” heading thus: “Boxes stamped to indicate standard box size (100’s to 165 sizes noted).”

Count-Size Marked or Lugs and Other Containers

Containers are usually marked with standard pear box count-sizes such as 100, 120, or 165, etc.

When containers are marked with count-sizes, the pears must meet the diameter and tolerance requirements of U.S. Standard Pack.

In order to determine whether the pears in a container marked to denote count-size meet the size requirements, the following procedure has been approved:

From the container being checked for size, select at random the number of pears equal to one-half the number of the count-size designated: for example for 100 size select 50 pears. The net weight of this sample should be between 22 and 25 pounds (based on the range of net weights of a standard wood pear box). If the weight of the sample falls outside the 22 to 25 pound range, the container is mismarked as to size. However, since there are marketing orders from some States, check with those States to verify that a marketing order does not have another requirement (i.e., 165 standard pack and larger - Such pears shall be of a size that a sample of 82 1/2 pears, representative of the sizes of the pears in the package or container, weighs not less than 20 pounds).

Sizing and Marking

Packages must be marked with numerical count, count-size, or minimum diameter. When marked with count, the number of pears in a standard box shall not vary more than three (3) from count marked. CA, OR, and WA normally use 44 lb. net wt. or equivalent container as a standard box. For western boxes (usually 18 inches long, 11 1/2 inches wide, and 8 1/2 inches deep [inside measurements]) marked with count, and other containers marked with count-size, the following size variations are permitted:

When the numerical count is marked on western standard pear boxes the pears shall not vary more than the following in their transverse diameter:
120 and larger ..... 3/8 inch
135’s to 180s ..... 1/4 inch
195’s and smaller ..... 3/16 inch

Five percent (5%) of the pears in a container may vary from these limitations and still meet Standard Pack. It provides that 10% of the containers in a lot may not meet the above requirements. Refer to the U.S. Standards for size variations permitted in smaller containers and for other details of Standard Pack.

When count or count size is not marked on the container it must be marked with the minimum or minimum and maximum size in whole inches and not less than one - eighth inch variations.

Undersize averaging 5% and oversize averaging 10% are permitted. (See section entitled "Interpretation of Size Tolerance.")

DEFECTS (QUALITY AND CONDITION)

Statements pertaining to freshness, maturity, shape, color, the amount and type of defects, and the amount of decay are shown under the appropriate headings.

Factors noted with **(Q)** are considered as **QUALITY** only (**Quality,** sometimes referred to as **"permanent" defects**) means defects, which do not change during storage or shipment (i.e., shape, scars, etc.).

Factors noted with **(C)** shall be reported as **CONDITION** on market certificates. (**Condition defects** are defects that are subject to change during shipment or storage, including but not limited to bruising, discoloration, shriveling and decay.)

Those factors noted with **(Q or C)** may be considered as **QUALITY or CONDITION,** depending on the circumstances.

Defects at Shipping Point

At shipping point all defects are considered quality factors at the time of packing. Progressive defects of pears such as decay, scald, and cork spot are to be considered as affecting grade within a seven day storage period, provided they have not been in transit. However, if the pears have been in storage for more than seven days after packing, these progressive defects are scored as condition factors.

> **§51.1268 and §51.1309 Condition after storage or transit. Decay, scald, or other deterioration which may have developed on pears after they have been in storage or transit shall be considered as affecting condition and not grade.**

Note: In the U.S. Standards for Grades of Winter Pears, the top grade is U.S. Extra No. 1 (corresponding to Oregon and Washington State Extra Fancy).

Anjou Cork Spot (Q or C)

Cork Spot should be treated as a factor of condition when found on Anjou pears inspected at destination or which are or have been in storage, although it is treated as a grade defect at time of packing. The occurrence of Anjou Cork Spot is usually found on the calyx-end half of the pear. The flesh in the affected areas is brown and corky. In less severe cases, the corky tissue can only be detected by cutting the fruit. When the injury is more pronounced, shallow surface depressions that are often difficult for the untrained eye to detect will appear above the corky spots. The areas become more evident as the pears ripen. Badly cork-spotted fruits are bumpy and irregular due to the numerous surface depressions caused by the disease. The internal spots may be so numerous as to involve almost the entire periphery of the fruit and may even occur deep in the flesh. The cause is unknown; however, occurrence tends to increase with a calcium deficiency.

As a guide, the following amounts of **external** cork spot shall be scored when external evidence exists:

- Score against U.S. Extra No. 1 when the pear shows depressions or the flesh is more than slightly affected.
- Score against U.S. No. 1 when more than one spot is visible externally or when the flesh is materially affected.
- Score against U.S. No. 2 when more than two spots are visible externally or when the flesh is seriously affected.

The above grades limit internal cork by referring to the degree of injury to the flesh of the fruit.

As a guide, the following amounts of **internal** cork spot shall be allowed if no external evidence exists:

- For the U.S. Extra No. 1 grade, one spot 1/4 inch in diameter or an aggregate area of smaller spots not to exceed 1/4 inch;
- For the U.S. No. 1 grade, one spot 1/2 inch in diameter or an aggregate area of smaller spots not to exceed 1/2 inch;
- For the U.S. No. 2 grade, one spot 3/4 inch in diameter or an aggregate area of smaller spots not to exceed 3/4 inch.

In judging whether individual fruits should be scored as injury, damage, or serious damage, they must be considered from an external and internal basis as well as a combination of the two.

Therefore, when externally visible cork spot is found that is within the limitations of each definition, the inspector should cut or peel the pear to determine whether there is additional internal cork spot. If the external evidence is in excess of the respective definitions, obviously it will not be necessary to cut.

When pear lots are being inspected, the inspector should cut or peel all suspicious cork spot specimens. If specimens are found that show cork spot not visible externally, representative specimens should be cut, following the selection procedure provided below.

Sampling for Internal Defects

When inspecting for internal defects cut a **minimum of two pears** selected at random. If no scorable defects are found it is not necessary to make additional cuts for internal defects in that sample. If scorable defects are found cut an additional 8 pears from the sample for a minimum of 10 pears. When container tolerance is exceeded cut an additional 10 pears for a total of 20 pears. If the container tolerance is exceeded then cut the **entire contents** (**100 count** for bulk bins) of at least one sample. If the lot fails to meet the container tolerances after an entire container has been cut, the remaining cut samples shall consist of 20 pears. If scorable defect is not detected in three successive samples, it is permissible to return to the cutting a minimum of two pears.

The percentage of internal defects shall be calculated on the basis of the cut sample. A column on the notesheet shall be kept to record the number of fruit cut per sample.

The correct procedure for detecting internal cork spot is to remove a thick paring from 1/4 to 1/2 of the area of the pear nearest the calyx.

Anjou Greening (Q)

The external appearance of the pear may resemble Cork Spot although there is no appreciable flesh discoloration associated with it. As the pear ripens, the green spots change very little in color.

In order to score, Anjou greening has been classed into three categories depending on the degree of concentration of the spots.

Anjou Greening Scoring Guideline (Degree of Concentration of Spots) Based on a mid-size pear (90 or 100)			
	Thinly Scattered	Moderately Scattered	Heavily Concentrated
Injury Score against U.S. Extra No. 1	When an area over 10% of surface is affected.	When affecting an area larger than a circle 1/2 inch in diameter.	When affecting an area larger than a circle 3/8 inch in diameter.
Damage Score against U.S. No. 1	When an area over 50% of the surface is affected.	When an area over 10% of the surface is affected.	When affecting an area larger than a circle 1/2 inch in diameter.
Serious Damage Score against U.S. No. 2	Allow 100% of surface.	When an area over 25% of the surface is affected.	When an area over 5% of the surface is affected.

Note: Areas affected means that portion of the pear in which the spots are thinly or moderately scattered or heavily concentrated. Areas of spots should be aggregated when determining the portion of the pear affected but in no case should individual spots be aggregated to determine this.

Black End (Q)

Black End is a free from defect which means any amount is scored as serious damage against all U.S. grades for pears.

Black End of pears is a physiological disease; that is, no bacteria or fungi are found associated with it. A water imbalance in the trees seems to cause this disorder. Other factors that contribute to this disorder are excessive subsoil moisture in the spring and irregular irrigation during the growing season.

In its development, the first symptoms become evident when the fruit is a third to half grown, as a protrusion of the tissues around the calyx and an enlargement of the calyx opening. At this time the skin over the affected portion appears tight and shiny. As the disease progresses, the calyx lobes turn black, the tissues surrounding the calyx opening become woody and a brownish discoloration begins to form. This discoloration may appear at first in separate spots, which later coalesce; in other instances a large area may become completely and uniformly discolored from the beginning. The final color of the affected tissues is black.

On many specimens the discoloration is confined to an area extending back from the calyx for a quarter to half an inch; on some, it covers half of the surface of the fruit.

Occasionally, specimens are found that are not discolored at all, but have hard gritty flesh around the calyx, and the pointed or peaked appearance that characterizes true Black End fruits.

Blister Mite Injury (Q)

It occurs as a result of mites feeding on the developing pears, from the green-tip stage through bloom, causing russet spots. These spots, which are often oval in shape, are usually depressed with a surrounding halo of clear tissue. They are 1/4-1/2 inch in diameter and frequently run together. When the injury is severe or has occurred early in the life of the pear, it results in irregularly shaped scars or depressions.

Score as injury against the U.S. Extra No. 1 grade when injury is not very shallow and superficial or where the injury affects an aggregate area of more than 1/4 inch.

Score as damage against the U.S. No. 1 grade when the injury is not shallow or superficial (the injury has sunk below its surrounding area), or when the injury affects an aggregate area more than the area of a circle 3/8 inch in diameter.

Score as serious damage against the U.S. No. 2 grade when the injury affects an aggregate area more than the area of a circle 3/4 inch in diameter or which materially deforms or disfigures the fruit.

Blush

Blush as used in the description of pears, refers to the red color usually occurring over the sun-exposed cheeks. There are no blush or color requirements in any of the grades, but it is desirable to report the blush when present. Varieties like the Seckel, Flemish Beauty and Red Bartlett may show considerable red color over the cheek. When there is an appreciable amount of blush, it should be described in general terms. Thus, “Many pears show blush on cheeks,” or “Some pears show blush on cheeks,” or “Pears generally show reddish blush on 1/4 to 3/4 of surface.”

Bruising (C)

Most shipments of pears reach the markets in a hard or firm condition, so little or no bruising is found in these shipments. However, some shipments are subject to bruising, especially if the pears are ripening or have been subjected to rough handling. The description of bruising on the certificate should include the location in the container and load, degree of firmness of the affected fruit and as to whether they cause damage or serious damage. Flattened, discolored bruises causing damage or serious damage are sometimes found in bottom layer containers in the car or trailer, possibly due to overhead weight, excessive vibration of the load, etc.

The U.S. Extra No. 1 and U.S. No. 1 grades for winter pears, and the U.S. No. 1 grade for summer and fall pears states that pears shall be free from damage by bruising.

The following shall be scored against these grades:

- any soft bruise*****;
- any bruise over 3/16 inch in depth;
- any bruise over 7/8 inch in diameter; or
- any combination of lesser bruises which detracts from the appearance, edible or marketing quality of the pear to an extent greater than any one bruise described in (a), (b), or (c) above.

***** "Soft" means that the affected flesh is mushy, often water soaked or discolored, and the bruised area yields readily to slight pressure.

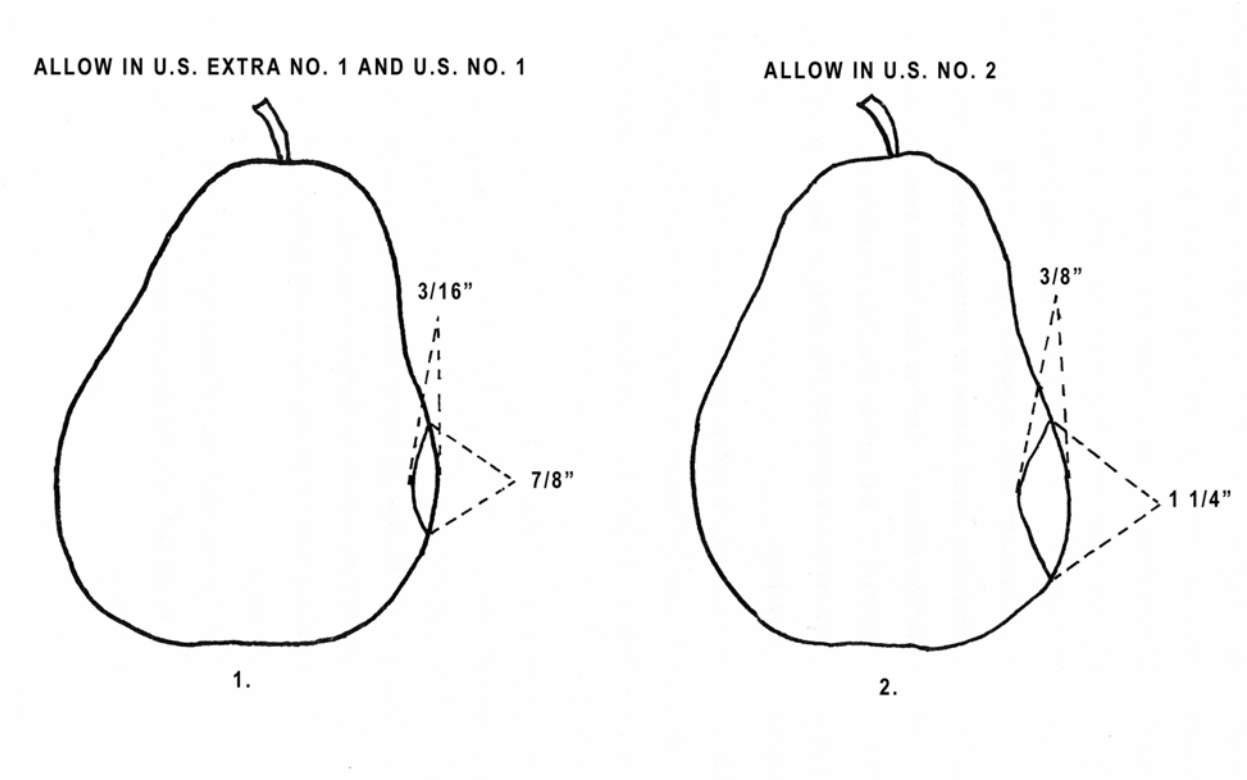
The U.S. No. 2 grade for both winter pears and summer and fall pears states that the pears shall be free from serious damage by bruising.

The following shall be scored against these grades:

- any bruise over 3/8 inch in depth;
- any bruise over 1-1/4 inches in diameter; or
- any combination of lesser bruises which detracts from the appearance, edible or marketing quality of the pear to an extent greater than any one bruise described in (a) or (b) above.

The interpretation of scoring bruises applies to individual pears and the grade tolerances for defects. The dimensions of bruises allowed apply to medium sizes (100 to 135 counts or 2-1/2 to 3 inches in diameter). Slightly larger bruises would be allowed on pears larger than 100 count (3 inches) and slightly smaller bruises would be allowed on pears smaller than 135 count (2-1/2 inches).

Diagram of Pear Bruising Guide (Not to Scale)



Cleanness (Q)

In connection with cleanness, it should be remembered that all U.S., Washington and Oregon Grades require the fruit to be clean. Even the Oregon Unclassified Grade and Washington 3rd Grade have the same requirements as the Extra Fancy for cleanness. The definition of "clean" is the same in all grades, which means, "Free from excessive dirt, dust, spray residue, or other foreign material." Cleanness may be an important factor of quality under certain conditions. This is especially true when the foreign material is spray residue.

The following terms should be used to describe cleanness:

- **"Clean"** means free from excessive dirt, dust, spray residue, or other foreign material.
- **"Fairly clean"** means showing sufficient dirt, dust, spray residue or other foreign material to materially affect the appearance of the individual specimen or lot. Pears reported as "fairly clean" would fail to meet the requirements of any grade.

- **"Dirty"** means showing considerable dirt, dust, spray residue or other foreign material that seriously detracts from the appearance of the individual specimens or lot.

Cottony Cork (Q)

A disease about which very little is known is Cottony Cork of the Anjou pear. It is suspected to be caused by stink bugs feeding on the fruit late in the season. It should not be confused with Anjou Cork Spot. The affected tissues of Cottony Cork are white and spongy or cottony rather that brown and corky. Furthermore, Anjou Cork Spot is considered a factor of condition when found in lots of pears out of storage. Cottony Cork almost always appears near the stem end of the pear in contrast to Cork Spot, which typically is restricted to the calyx end. Cottony Cork is recognized readily by sharply sunken surface areas of varying shapes and sizes conforming to the location of the internal affected areas. The striking character of the spot is the cottony or pithy center and lack of browning.

When fruits with Cottony Cork are sliced through the affected areas, the rapid browning due to oxidation occurs only on the healthy tissue. This is a good diagnostic symptom of Cottony Cork. Cottony Cork is not widely distributed and as of yet, has not become prevalent. Score Cottony Cork on the same basis as Anjou Cork Spot; but, as a quality defect.

Discoloration (Dark Skin or Otherwise) (Q or C)

Frequently the tender skinned varieties such as Bartlett, Comice and Flemish Beauty will show discolored areas due to rubbing against each other in the container or against the container. The brown or black discoloration also may be caused by rubbing against the belts of the sizing machines or sorting tables or excessive vibration in the vibrating machines at time of packing. Inspectors often apply different names to this skin injury, but for the sake of uniformity, the term "dark skin discoloration" should be used. If the discoloration occurred at shipping point, then score it as quality. If it occurred at destination or in transit, then score it as condition.

Score as damage against the U.S. No. 1 grade when:

- The color of the affected areas is a medium brown and the areas aggregate more than 5% of the surface, or

- The color of the affected areas is very dark brown or black and the aggregate area exceeds that of a circle 3/4 inch in diameter, or

- The color of the affected areas is a combination of medium brown and very dark brown or black and the appearance is affected to a greater extent than the maximum allowed in (a) or (b).

Score as serious damage against the U.S. No. 2 grade when:

- The color of the affected areas is a medium brown and the areas aggregate more than 15% of the surface, or,

- The color of the affected areas is very dark brown or black and the aggregate area exceeds that of a circle 1-1/4 inches in diameter, or,

- The color of the affected areas is a combination of medium brown and very dark brown or black and the appearance is affected to a greater extent that the maximum allowed in (a) or (b).

Correspondingly larger areas shall be allowed when the affected areas are of lighter shades of brown than specified above. When describing this dark skin discoloration on the certificate, the percentage, color, and area affected and location in the containers and load should also be reported. Refer to color comparator PR-2, Dark Skin Discoloration, for illustrations of very dark brown and medium dark brown discoloration.

Ammonia Injury

Occasionally a leak will develop in the refrigeration equipment allowing ammonia gas to escape and come in contact with the fruit. Exposure to these fumes at first causes reddish-brown rings around the lenticels and at abrasions. Upon removal to air free from ammonia fumes, the discolored areas turn black. With severe exposure, lenticel spots may become much enlarged and finally coalesce and the discoloration may extend into the flesh. Pears with a moist surface are more susceptible to injury than are dry pears.

Score on the same basis as “Discoloration.” If ammonia injury cannot be readily identified, report and score it as “dark skin discoloration” on the notesheet and certificate.

Firmness (C)

The first indication can be obtained by thumb or finger pressure along with the appearance, or “ground color” of the fruit. If the ground color is green to light green and the flesh resists considerable pressure, the fruit is hard. This varies considerably; however, depending upon the variety. In some instances, the fruit may show considerable yellow “ground color” and still be hard, while in other instances the “ground color” will be green and yet will yield readily to pressure. Finally, a more reliable test will be a combination of pressure, “ground color,” taste, and chewing of the pared flesh. Sweetness or sourness to the taste cannot be given too much weight in determining firmness as the flesh of some varieties may have considerable flavor and still be hard. The flesh of a hard pear is coarse and granular. As the pear advances in maturity, the flesh gives more readily to pressure and the flesh becomes smoother in texture. A firm ripe pear generally shows yellowing to yellow ground color and the flesh is mellow

depending upon the variety. A hard or firm pear leaves a residue of pulp in the mouth after chewing; a firm ripe or ripe pear is mellow and melts away with chewing. Dead ripe fruit has a mushy or slippery texture and discolors readily. All varieties taste and feel more crisp and firm when cold than at room temperature, and it is advisable to check the taste and feel after the fruit has been out of cold storage long enough to warm up.

Normally the ground color of a hard pear is green to light green; of a firm ripe pear, turning; of a ripe pear, yellow. As previously indicated, too much dependence should not be placed upon ground color, however, for it will vary considerably within the same stage of firmness, depending upon the method of storage, temperature, degree of maturity when picked, length of time after picking before placed in storage, varietal characteristics and climate, soil and cultural conditions under which grown. Pears held at low temperature may show a green color and yet be firm to firm ripe.

Pressure Testing

Pressure testing can be useful in determining the firmness of pears, especially in the case of "borderline" firmness of pears. However, as in the case of any of the indices that may be used to determine firmness, it should not be considered as the sole means or "absolute test" for determining firmness. As with the other indices there are variables that cannot be controlled precisely with this test that contribute to imprecise results. Keep in mind that it is best to perform pressure testing on pears before they have been put in cold storage or after they have reached room temperature. Nonetheless, this index used with other indices and the collective judgment of the inspector should provide a reasonably accurate determination of the degree of firmness of the fruit.

USDA Circular 627, "Fruit Pressure Testers and Their Practical Application," describes in more detail the use of pressure testers and contains pressure test limits recommended for harvesting pear varieties. Official firmness tables that define the stage of ripeness for pears have not been developed. When using a pressure tester for pears, remember use the 5/16 of an inch plunger.

In order to perform a pressure test, at least 5 pears from each container must be selected and punctured. (Advise the applicant of this fact.) Each pear must be punctured twice on nearly opposite sides. Do not make the second puncture exactly opposite of the first puncture, as there may be damage to the tissue from the first test. The two readings are recorded individually. Only average two readings if specifically requested to do so by the applicant. Report the results in general terms using hard, firm, firm ripe, or ripe on the certificate in the "Description of Products" section on the shipping point certificate and in the "Other" section on the market certificate. For example, "Generally firm, few firm ripe." If the applicant requests the readings to be reported on the certificate, report a range and mostly statement in the "Description of Products" section on the shipping point certificate and in the "Other" section on the market certificate. For example, "Pressure Test Readings (pounds): 8.0 to 11.5, mostly

9.0 to 11.0." Also, report in the "Remarks" section of the certificate "Pressure test readings reported at applicant's request."

The following terms should be used in reporting the firmness of pears:

- **Hard** means the flesh of the pear is solid and does not yield appreciably even to considerable pressure. The chewed flesh is coarse, granular and has a starchy flavor. Such pears are in suitable condition for long storage periods for the variety.

- **Firm** means the flesh of the pear is fairly solid but yields somewhat to moderate pressure. This yielding is often first detectable around the neck near the stem. The chewed flesh is becoming less coarse and brittle, and a noticeable decrease in starchy flavor, with a slight increase in sweetness, can be detected. The ripening process, at this stage is further advanced than in hard pears, and they cannot be held in storage as long. Winter varieties can be held longer at this stage than early varieties.

- **Firm ripe** means the flesh of the pear yields to moderate pressure. The pear is approaching the stage at which it is in prime eating condition. The flesh is becoming sweet in flavor and smooth in texture. Such pears may be held for a brief period although winter varieties can be held longer than the early varieties.

- **Ripe** means that the pear is in its most desirable condition for eating. The flesh has reached its peak in sweetness and smoothness of texture.

When pears are beyond the stage of "ripe," the pears shall be scored as overripe.

§51.1273 and §51.1314 Overripe. "Overripe" means dead ripe, very mealy or soft, past commercial utility.

Reporting Firmness

Stages of firmness should be reported in general terms, thus: "mostly hard, some firm" or "mostly firm, many hard, some firm ripe." When growers' lots or any other lots vary materially, show firmness by lots. Contrary to the rule of reporting stages of firmness in general terms, undesirable overripe pears should be reported in definite percentages.

Frozen or Freezing Injury (C)

Freezing injury may occur when temperatures drop below the freezing point of the fruit. Inspectors must always clearly distinguish between fruit in a frozen condition and those affected by freezing injury. The term "frozen" should only be used when ice crystals are present. "Freezing injury" is the term that should be used when it is evident

that the pear has been frozen but is not in a frozen condition at the time of inspection. It may be difficult to distinguish between bruising, freezing injury and internal breakdown.

When reporting freezing or freezing injury it is important to give the following information:

- Record pulp temperatures taken at various locations.
- Determine and record extent of the injury in the load.
- Determine and record extent of the injury in the containers.
- Determine and record degree to which individual specimens are affected.
- Describe the **pattern** of freezing or freezing injury in clear, concise terms.

When the location of injury indicates where or when the freezing occurred this is to be stated. For example: "Freezing injury so located as to indicate occurred after packing but not in present location."

Ground Color

Ground color refers to the underlying color of the skin over that area of the fruit, which shows no blush or red color. This color commonly changes from green on a hard pear to light green to yellowish green on a firm pear and to yellowish green to yellow on a firm ripe to ripe pear. However, it must be remembered that certain varieties produced in certain sections may vary considerably in degree of ground color with relation to firmness. For example, Bartletts produced in the mountain section of California may show a distinct yellow ground color and yet be firm, whereas, in some other sections the ground color of firm Bartletts will be green or yellowish green.

The following terms should be used in reporting ground color:

- Green
- Light Green
- Yellowish Green
- Yellow

Ground color should always be reported by the use of general terms in connection with the firmness statements unless the pears are so heavily russeted that it is impossible to determine ground color. This sometimes occurs on lots of Bosc and Winter Nelis pears.

Hail Marks or Other Similar Depressions or Scars (Q)

Pears that have been subjected to hail injury in their early stages may outgrow most of the injury but have a tendency to become misshapen.

When pears are struck by hail late in the season, the cuticle covering the affected spots may be cracked and torn but often remains intact. Some spots range from 1/4 to 1/2 inch in diameter, are slightly sunken and the underlying flesh is brown and spongy. Usually hail hits only the upper part of the fruit as it hangs on the tree.

Score as injury against the U.S. Extra No. 1 grade when:

- The depth is not very shallow or superficial; or,
- The affected area aggregates more than the area of a circle 1/4 inch in diameter.

Score as damage against the U.S. No. 1 grade when:

- The affected area aggregates more than the area of a circle 3/8 inch in diameter; or,
- More than 1/8 inch in depth including any underlying flesh, which is discolored.

Score as serious damage against the U.S. No. 2 grade when:

- The aggregate area is greater than the area of a circle 3/4 inch in diameter; or,
- More than 1/4 inch depth including any underlying flesh which is discolored; or,
- The pear is materially deformed or disfigured.

Hard End (Q)

This disease is closely related to Black End and is thought to be due to the same cause. Hard End is considered damage if the pear shows:

- A distinctly constricted protrusion at the blossom end; or,
- An abnormally yellow color at the blossom end; or,
- An abnormally smooth, rounded base with little or no depression at the calyx; or,
- If the flesh near the calyx is abnormally dry and tough or woody.

Cutting is necessary to determine the extent of damage. Damage by Hard End is scored against all grades. However, the U.S. Extra No. 1 grade requires the pears to be free from injury by Hard End.

Insects (Q or C)

All of the U.S. pear grades have a limitation tolerance of 5% for serious damage by insects. If the lot fails to grade U.S. Extra No. 1 account serious damage by insects it, likewise, fails to grade U.S. No. 2.

Pears with worms, worm holes, more than three Codling Moth stings, more than two Codling Moth stings over 3/32 inch in diameter, other insect stings affecting the appearance to an equal extent, Blister Mite or Canker Worm injury which affects an aggregate area of more than 3/4 inch in diameter, or which materially deforms or disfigures the fruit, should be scored as serious damage by insects.

In scoring defects of pears, a separate column should be kept for serious damage by insects.

Wormholes should be scored against all grades regardless of the depth or size of the hole. Holes made just before harvest are often very small and difficult to see. The fruit must be examined carefully to detect such injury.

Worm Development While Shipment Is In Storage or Transit (C)

Late brood codling moth injury may develop after packing. Codling moth eggs may hatch shortly after shipping point inspection, and worm injury may develop where the pears are held for several days in common storage before shipment, or during transit.

If the small site of the worms, presence of worm frass, or fresh worm holes found, raises a reasonable doubt in the mind of the inspector as to whether the injury occurred after packing, this injury should be treated as condition and serious damage against the 5% restricted tolerance for insects and reported as fresh worm damage.

Concealed Worm Damage (Cutting Procedures)

Pears should be carefully examined for wormholes, as they are often difficult to detect, especially those occurring in the blossom end and especially so after the fruit has been washed. There may be no outward evidence if the worms are small and enter through the calyx cup.

Inspectors will use the following cutting policy:

Stationary Lots (and When Requested May Be Used For In-Line Inspection)

When there is evidence that concealed worm damage is present in the lot, a minimum of five (5) pears will be cut from each sample. When one (1) defective pear is found in the five (5) count sample, cut an additional fifteen (15) pears in the sample

(total of twenty pears cut), or a total of five (5) pounds, when inspected on the basis of weight.

If only two (2) pears are found in the twenty (20), no additional cutting for that sample is necessary. If more than two (2) pears are found in the twenty (20) count sample, (or more than 10% by weight), the entire container must be cut in order to determine if the container has met or exceeded the container tolerance of 10% for serious damage.

When it is found that container tolerances are exceeded in one of the containers, it will only be necessary for market inspectors to cut twenty (20) pears from each of the remaining samples and shipping point inspectors to cut five (5) pears from each of the remaining samples.

Internal Breakdown (Core Breakdown) (C)

The breakdown is characterized by an extremely soft watery condition about the core, followed by rapid disintegration and discoloration in the tissue of this region, sometimes leaving only a shell of the outer tissue unaffected. It frequently occurs during the ripening of fruit that has been left on the tree too long before harvesting and also may occur in fruit that has been held too long in storage at low temperatures. In Bartlett pears, ripening at too high temperatures, in which case it is not confined to the core region, aggravates it. Breakdown is scored against the 1% tolerance for decay in all grades.

Film bag liners in pear containers sometimes result in internal breakdown developing in pears if the bags are not perforated prior to ripening. This is a result of damage to the respiratory processes of the pear as it ripens due to depletion of oxygen and a build up of carbon dioxide gas in the bag. Most film bags liners are manufactured with small holes in the film to prevent the build up. When this is not the case, the bags are usually perforated at time of shipment. Occasionally, this is over-looked and a high percentage of internal breakdowns often result.

All grades specify free from Internal Breakdown, but the pathologists refer to this condition as Core Breakdown. Likewise, in *Misc. Pub. No. 168*, *Market Diseases of Fruits and Vegetables and Agricultural Handbook No. 376, Market Diseases of Apples, Pears and Quinces*, the term “Core Breakdown” is used for this condition. Even though the grades refer to the condition as Internal Breakdown, it should be reported on the certificate as Core Breakdown.

Limb Rubs (Q)

Limb rubs are generally recognized by a brown to black hard scar that, upon cutting, will show a corky to hard mass underneath. The scar and a little of the area immediately surrounding it will frequently be depressed.

Score as injury against the U.S. Extra No. 1 grade when:

- They are cracked, softened, more than very slightly depressed, not light in color; or,
- They exceed an aggregate area of 3/4 inch in diameter.

Score as damage against the U.S. No. 1 grade when:

- They are cracked, softened or more than slightly depressed; or,
- Affected by black discoloration exceeding the area of a circle 3/8 inch in diameter; or,
- Dark brown or excessively rough and larger than the area of a circle 1/2 inch in diameter; or,
- Light colored and exceeding the area of a circle 3/4 inch in diameter; or,
- Smooth, light colored scars larger than the area of a circle 1 inch in diameter.

Score as serious damage against the U.S. No. 2 grade when:

- They are more than slightly cracked or excessively rough; or,
- Showing dark brown or black discoloration exceeding the area of a circle 3/4 inch in diameter; or,
- Other limb rubs, which affect an aggregate area of more than 1/10 of the surface.

Maturity (Q)

All grades require that pears be in a mature state, which means that the pears have reached the stage of maturity that will ensure the proper completion of the ripening process. Pears must be picked in a hard stage of firmness to ripen into a satisfactorily edible product. No one indication is a positive sign of maturity but all of the following conditions taken together will give a fairly accurate indication that a pear has become mature: i.e., break in ground color from dark green to a lighter green, plumpness of seeds, dark color of seeds, spreading open of seed cavities, corking over of lenticels making them more prominent (especially on Bartlett), and increased accumulation of natural wax giving the fruit a “finish” (especially on Anjou). The pressure test is of considerable value in determining maturity. The test should be made with a plunger 5/16 inch in diameter on a peeled area.

Do not use “mature.” The term “mature” should not be used on the certificate because some receivers have misconstrued this term to mean ripe or ready for immediate consumption. However, if the pears are immature, this should be reported under the Quality heading as a part of the Quality statement or as a grade defect.

Indicators of Immaturity

Indication of immaturity is shriveling (when picked in a sufficient length of time to permit shriveling without ripening normally), white or undeveloped seeds, no break in ground color, dull green color of skin, hard, rubbery feel, not well rounded or filled out, somewhat angular, harsh surface as opposed to a waxy smooth surface for well matured pears, flesh exceedingly chewy, tough, starchy and granular. No one factor will hold true in all cases and any one may be misleading. All these factors vary to some extent with the variety, district in which grown, season, and weather conditions. No one factor should be considered positive proof of immaturity, with the possible exception of shriveling, but all should be considered in arriving at a decision.

Mealy Bug (Q)

The Mealy bug is a small, oval, flat insect less than 1/4 inch long, covered with white, powdery wax and normally has several white, tail-like filaments nearly half as long as the body. The egg sacs look like small masses of cotton. Sticky masses of gum in and around the calyx or other portions of the fruit indicate their injury.

Score as damage against the U.S. No. 1 grade when the mass of gum materially injures the appearance.

Score as serious damage against the U.S. No. 2 grade when the masses of gum severely injure the appearance.

Moldy or Sloughing Stems of Winter Pears (C)

Occasionally, winter pears that have been in cold storage until late in the spring will show surface mold and dampness on their stems. Sometimes this mold will progress until it has penetrated the woody tissues of the stem causing it to soften and to slough off when rubbed between the fingers. Studies by pathologists and by pear specialists indicate that the rate of progression of this stem infection is relatively slow. Also, while decay affecting the flesh of the pear is occasionally associated with the infection of the stem, there is no certainty that organisms affecting the stem also cause decay of the flesh. It is possible that flesh decay is a secondary infection.

It has been observed that when moldy or soft and sloughing stems are exposed to warm air, the condition soon dries up and disappears. On becoming dry, the stems darken and become hard; or, if the softening and sloughing has progressed to advanced stages, the tissue dries to a dust. In either case, there is rarely an objectionable appearance that would be noticed by the consumer.

Only at applicant's request as not affecting grade should moldy, soft, and sloughing stems on winter pears be reported on the certificate. In such instances, the percentage of pears with stems that are only moldy and damp should be reported separately from the percentage of pears on which the stems have become soft and will slough off when rubbed between the thumb and fingers.

One Variety (Q)

A mixture of two or more varieties in the same container should be scored against all grades when not intentionally packed and labeled this way. Most of the commercial pear varieties are so different in characteristics that they are seldom mixed. Individual pears of a different variety are scored as defects when found mixed in containers.

If pears are intentionally packed and labeled or it is plainly visible (i.e., gift pack containing a single layer of fruit) with two or more varieties (i.e., Comice, green and red Anjous) then each variety would be inspected and reported as separate lots.

Pear Pyslla Injury (Q)

Pear Pyslla injury appears as a mass of tiny black specks ranging from thinly scattered to heavily concentrated on the cheek of a pear. It is the result of a black fungus on the honeydew produced by the psylla insect. The honeydew is usually removed in the washing process; but, the black fungus specks do remain.

To facilitate uniform scoring, pear psylla injury has been classed into three categories depending on the degree of concentration of the spots. See visual aid C-1, Pear Psylla, May 1990, for examples of moderately scattered and heavily concentrated. Also, two colored 35 mm slides (Pears 134 and 135) have been developed which illustrate these categories. With the aid of these slides and the visual aid, the following instructions should be followed when scoring pear psylla injury.

Pear Psylla Injury / Degree of Concentration of Spots

	Thinly Scattered	Moderately Scattered	Heavily Concentrated
Injury Not U.S. Extra No. 1 Not Extra Fancy	When an area over 10% of surface affected.	When affecting an area larger than a circle 1/2 inch in diameter.	When affecting an area larger than a circle 3/8 inch in diameter.
Damage Not U.S. No. 1	When an area over 1/4 of surface affected.	When affecting an area larger than a circle 3/4 inch in diameter.	When affecting an area larger than a circle 1/2 inch in diameter.
Serious Damage Not U.S. No. 2 Not State Fancy	When an area over 1/2 of surface affected.	When affecting an area larger than a circle 1-1/4 inches in diameter.	When affecting an area larger than a circle 3/4 inch in diameter.

Note:

Area affected means that portion of the pear in which the spots are thinly or moderately scattered or heavily concentrated. Areas of spots should be aggregated when determining the portion of the pear affected but in no case should individual spots be aggregated to determine this.

In applying the table on “Degree of Concentration of Spots,” it should be remembered that the limit of each degree of psylla injury (thinly scattered, moderately scattered, and heavily concentrated) is not permitted on an individual pear. For example, a pear of U.S. Extra No. 1 grade cannot have an area of 10 percent of the

surface affected with “Thinly Scattered” spots, plus an additional area of 1/2 inch of “Moderately Scattered” spots, plus still another area of 3/8 inch of “Heavily Concentrated” spots.

However, more often than not, there probably will be combinations of different degrees of injury on individual pears. Such pears shall be judged on the basis of the appearance as compared with the maximum permitted for any one degree of injury. For example, if a pear being judged for U.S. No. 1 grade has an area of about 1/8 of its surface covered with thinly scattered injury it could, in addition, have an area the equivalent of about 3/8 inch circle of moderately scattered injury or an area the equivalent of about 1/4 inch circle of heavily concentrated injury.

Pithy Brown Core (C)

Pithy, brown discolored areas in the core region of the fruits characterize this defect. Affected tissues are dry and pithy, in contrast to the soft, watery texture found in core breakdown.

Sampling For Pithy Brown Core

When cutting for pithy brown core, a random sample is to be used to determine percentages. As a general rule 5 to 15 pears, by count, or 5 pounds by weight, depending upon the size of the fruit and container, should be taken from each sample and cut. The cuts for pithy brown core shall be a lengthwise cut to determine the presence or absence of the defect and two crosswise cuts, one equal distance between the stem and calyx end and the other an equal distance between the center cut and the calyx end to determine the degree. If either crosswise cut shows a sufficient degree to be scorable then that pear would be scored according to the grade being worked. The percentages shall be based on the cut sample and not on the total grade sample. Each cut sample must be recorded so that a range as well as an average may be reported. A mixing of samples, commonly called a composite sample, is not allowed. This is because of the limitation of individual container tolerances in the standards.

Scoring pithy brown core: Pithy brown core shall be scored against the 10% lot tolerance. Score as injury when the flesh outside the seed cavity is slightly affected. Score as damage any discoloration outside a 7/8-inch circle including the seed cavity. Score as serious damage any discoloration outside a 1 inch circle including the seed cavity or if the flesh is separated.

Russeting (Q)

Russeting may be due to any one of a number of causes. Solid russeting over most of the surface usually is characteristic of some varieties, such as Hardy, Bosc, and Winter Nelis. Many other varieties usually show some russeting, particularly at the calyx, while some varieties usually are smooth with little or no russeting. Differences exist, not only between varieties, but also within the same variety as grown in different

districts or locations. Also a variety grown in the same orchard will show considerable variation from one season to another. Such district or seasonal variations are due to climatic influence, and it generally is believed that low temperatures and high humidity during the early growth of the fruit tend to cause or increase russeting.

On the contrary, warm dry weather during early growth may reduce the russeting, which normally is characteristic of varieties like Bosc or Winter Nelis.

Frost injury to young pears will cause “frost markings” which usually show quite distinct, thick, and somewhat rough russeting. When severe, such marks usually show as depressions in the fruit as it matures, often showing complete or nearly complete depressed encircling rings that are normally heavily russeted. Such fruit, or course, usually is excluded from all commercial packs.

Early Scab later killed by spraying or by hot dry weather, leaves russet scars which frequently become “frogged” or “excessively rough.” Chafing by “leaf whips” or by light limb rubs also induces russeting. Some spray causes russeting, and have, in fact, been used at times to increase russeting on Bosc and Winter Nelis.

Scoring Russeting Under U.S. Grades (and State Winter Pear Grades)

Regardless of the cause, russeting is classified in the U.S. Standards according to its appearance as “smooth net-like,” “smooth solid,” “slightly rough or thick,” “rough or thick,” and “excessively rough.” In addition, speckled russeting, commonly occurring around the lenticels on some varieties, should be considered both as normal and characteristic or, on smooth skinned varieties, be covered by the same restrictions as “smooth solid” russeting.

The tabulation of the amounts of russeting permitted in the standards refers to aggregate areas of specific types of russeting on individual pears. Combinations of one or more types of russeting are permitted which do not detract from the appearance to a greater extent than the maximum amount of any one type permitted. When an individual fruit has the maximum amount of any one type of russeting, no additional russeting of any type is permitted, except characteristic smooth russeting confined to the calyx end as specified in the winter pear standards.

Smooth Solid and Smooth Net-Like Russeting

It will be noted that smooth solid and smooth net-like russeting are considered on the same basis, with the single exception of Anjou in the U.S. Extra No. 1 grade. This type of russeting is, or course, limited only in the smooth varieties, with the single exception of Comice in the U.S. Extra No. 1 grade.

The variation in the density and pattern of net-like russeting sometimes makes it difficult for inspectors to aggregate areas affected with this type of russeting. Therefore, as a guide, inspectors should keep in mind the areas affected with net-like russeting, as

specified for each grade, should affect the appearance of a pear to the same degree as the area of smooth solid russeting specified for the grade.

Slightly Rough or Thick Russeting

It will be noted that in Comice and other smooth skinned varieties there are restrictions in the U.S. Extra No. 1 and the U.S. No. 1 grades on "slightly rough russeting, or thick russeting, such as is characteristic of frost injury." Much of the russeting of this type, which shows as a contrasting blemish on pears of these varieties, would not be readily apparent on characteristically russeted varieties such as Hardy or Bosc. Accordingly, the limitation on such varieties is less severe, as indicated by the omission of the word "slightly" in the definition. Since russeting is considered only as an appearance factor, it is not intended to be restrictive unless it actually is a blemish which "injures" or "damages" or "seriously damages" the appearance, according to the grade in question.

Fairly Smooth and Not Thick Russeting

In the U.S. No. 2 grade, russeting characteristic of frost injury which is fairly smooth and not thick may be allowed on that portion of the calyx end not visible for more than 1/2 inch along the contour of the pear when it is placed calyx end down on a flat surface. Note that this applies to the U.S. No. 2 grade only, and is in addition to the 15% of the surface of frost type russeting allowed in the U.S. No. 2 grade.

Excessively Rough Russeting

Excessively rough russeting (russeting which shows "frogging" or slight cracking) is specifically restricted in all grades for all varieties.

Characteristic Russeting Permitted

It will be noted that, in the U.S. Standards for Winter Pears, all restrictions on smooth net-like and smooth solid russeting are modified by the exception that "in addition, any amount of characteristic smooth russeting shall be permitted on that portion of the calyx end not visible for more than one-half inch along the contour of the pear, when it is placed calyx end down on a flat surface." (It does not apply to Bartlett and other smooth skinned varieties.) Asterisks indicate this exception where it applies in the following tabulation:

Amount of Russeting Permitted Under U.S. Grades

	Smooth Netlike	Smooth Solid	Slightly Rough or Thick	Rough or Thick	Excessively Rough
Summer and Fall U.S. No. 1					
Bartlett and other smooth varieties	15% of surface		3/4”	---	1/2”
Hardy, Sand and other similar varieties	---	---	---	3/4”	1/2”
U.S. No. 2					
All varieties	---	---	---	15% of surface	3/4”
Winter U.S. Extra No. 1					
Comice*	One-third of surface		1/2”	---	None Allowed
Anjou and other smooth and skinned varieties	15% of surface	1/2”	1/2”	---	None Allowed
Bosc and other similar varieties	---	---	---	1/2”	None Allowed
U.S. No. 1					
Anjou*	One-third of surface		3/4”	---	1/2”
Other smooth skinned varieties*	15% of surface		3/4”	---	1/2”
Comice, Bosc & Other similar varieties**	---	---	---	3/4”	1/2”
	Smooth Netlike	**Smooth Solid**	**Slightly Rough or Thick**	**Rough or Thick**	**Excessively Rough**
U.S. No. 2					
Anjou**	2/3 of surface		---	15% of surface	3/4”
Other smooth skinned varieties**	---	---	---	15% of surface	3/4”
Comice, Bosc & other russeted varieties***	---	---	----	15% of surface	3/4”

* In addition any amount of characteristic smooth russeting permitted on portion of calyx end not visible for more than 1/2” along the contour of the pear when placed calyx end down on a flat surface.

** In addition any amount of characteristic smooth russeting and fairly smooth but not thick frost russeting permitted on portion of calyx end not visible for more than 1/2 inch along contour of the pear when placed calyx end down on a flat surface.

*** On any of these varieties any amount of characteristic russeting permitted.

Russeting Permitted Under the Washington State Standards for Bartlett and Other Summer and Fall Pears

The Washington State standards and grades for summer and fall pears are similar to the requirements of the U.S. Grades for russeting. There are some important differences however, so the inspector should refer to the State grades and definitions of damage and serious damage when inspecting on the basis of these grades.

San Jose and Other Scales (Q)

The amount of scale permitted in the various grades is not defined in the Standards. Ordinarily, a few small inconspicuous scales, which are gray, and have not caused distinct red spots, are disregarded and not considered as damage.

The method of scoring scale against the U.S. grades is based on the number of distinctly red spots caused by the scale, whether the scale insect is present or not, and how they affect the appearance of the pear.

Score as injury against the U.S. Extra No. 1 grade when more than one (1) distinctly red spot is present.

Score as damage against the U.S. No. 1 grade when more than two (2) red spots are present.

Score as serious damage against the U.S. No. 2 grade when more than six (6) red spots are present.

Scab (Q)

Scab lesions first occur on the calyx end and later on the side of the fruit. As the spots expand and coalesce, large, dark brown to black patches develop. Scab will often cause fruit to become misshapen. Infections appearing five to seven weeks after fruit set are small (2-5 mm in diameter), circular, dark, velvety spots. Darker, pinpoint spots with few fungal spores may develop as the fruit mature or after the fruit are placed in cold storage.

Score as damage against the U.S. No. 1 grade when the spots are black and aggregate more than the area of a circle 1/4 inch in diameter.

Score as serious damage against the U.S. No. 2 grade when the spots are black and affect an aggregate area larger than the area of a circle 1/2 inch in diameter.

Scab also occurs as rough areas, in which the skin is cracked. Russet type scab should be scored under the definitions of russeting. The measurements for diameter should be taken on the contour of the pear, and from the edge of the crater to the opposite edge.

Scald (C)

Scald falls into two general categories. Each of which are a free from defect in all grades.

Anjou Scald (Superficial Scald)

This is one of the more common physiological (no bacteria or fungi are found associated with it) skin diseases, and occurs on Anjou and Packham's Truimph varieties. It appears as a brown discoloration and is restricted to the skin. The skin does not soften and slough off, and is not accompanied by unpleasant odors. Spraying or dipping with the proper scald-inhibiting chemical or with impregnated wraps can prevent this disorder. Oiled paper wraps usually control the disease satisfactorily only until early March.

Common Scald (Senescent Scald)

This is another physiological (no bacteria or fungi are found associated with it) skin disease of pears. Common Scald occurs when the fruit becomes senescent (matures or ages during storage). It first appears as a brown to black skin discoloration, but progresses rapidly into the flesh at moderate to high temperatures. In late stages, the skin weakens and sloughs off readily. Affected pears have a characteristic disagreeable odor and taste. The disorder is more severe on immature fruits than on mature fruits. Bartlett and Bosc are particularly susceptible to this disorder. This disease can be reduced by harvesting the fruit at proper maturity and by prompt storage at 30 - 31° F.

Shape (Form) (Q)

The shape of pears should be considered from the standpoint of the characteristic shape of the variety being inspected. Characteristic shape of various varieties of pears shows a wide variation, and many have characteristics that make them outstanding with reference to shape. The Bosc, for example, is generally extremely long, whereas the Anjou is short and plump. Characteristic shapes of some varieties also vary considerably in the same variety. Inspectors should study the official models illustrating shapes of pears.

The following terms should be used in describing shape of pears according to the Washington, Oregon, or U.S. Grades:

Minimum Shape Requirements	Grade	Summer and Fall	Winter
Well Formed	U.S. Extra No. 1		X
	Oregon Extra Fancy		X
	Wash. Extra Fancy	X	X
Fairly Well Formed	U.S. No. 1	X	X
	Oregon Extra Fancy	X	
Not Seriously Misshapen	U.S. No. 2	X	X
	Oregon Fancy	X	X
	Wash. Fancy	X	X
Not Very Seriously Misshapen	Wash. 3rd Grade		X
Not so excessively elongated or flattened as to preclude the cutting of 1 good half	Washington C Grade	X	

Well Formed - This means having the shape characteristic of the variety. When there are slight irregularities of shape from type which do not appreciably detract from the general appearance of the fruit, shall be considered well formed. "Well formed" meets the requirements of all grades.

Fairly Well Formed - In the U.S. No. 1 grade means that the pears may be slightly abnormal in shape but not to an extent which detracts materially from the appearance of the fruit. Pears that have one side so flattened that the core is definitely off-center or pears that are excessively rough or angular are not considered "fairly well formed" in the grade. Refer to the models on shape for the interpretation of this term.

Slightly Misshapen - This describes the shape of pears which are "not seriously misshapen" but are not good enough to be classed as "fairly well formed" as defined in the U.S. Standards. This term may be used to describe shapes that are acceptable in the U.S. No. 2, Washington and Oregon Fancy grades for both summer and fall and winter pears.

Seriously Misshapen (Badly Misshapen) - This means that the pear is excessively flattened, or elongated for the variety, 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. Seriously misshapen pears should be scored as grade defects against the U.S. No. 2 and Washington Fancy grades as well as the Oregon Fancy grade.

Very Seriously Misshapen - This is a term sometimes used in marketing orders but is not used in the U.S. grades. It means that the pear is so excessively flattened, elongated for variety, constricted or deformed that it will only cut one good half. The good half must be free from injury as defined in the U.S. Standards.

In the State of Washington, Third Grade for winter pears, "very seriously misshapen" is defined as being so excessively flattened, elongated for the variety or constricted or deformed that it will only cut one good half or two fairly uniform quarters.

Shriveling (C)

Pears in storage late in the season sometimes develop shriveling. This may be due to several causes, the most common of which are (a) harvesting the pears when they are in borderline stages for maturity and (b) the loss of moisture in storage, probably due to low humidity.

Shriveling usually starts around the stem and spreads over the cheeks of the pears as it develops. Slight shriveling occurring only around the stem should be disregarded. Pronounced shriveling around the stem or any shriveling elsewhere on the pear (5% of the surface of the fruit) should be scored as damage. Shriveling that is deep or affects large areas (10% of the surface of the fruit) should be scored as serious damage.

Skin Breaks/Stem Punctures (Q)

All U.S. grades and Oregon and Washington Extra Fancy and Fancy State grades require pears to be free from damage by broken skins. Stem punctures should be included under this heading. Damage by broken skins or a skin break is defined in the following paragraphs.

In these grades, pears showing one or more skin breaks in excess of 3/16 inch in diameter or depth should be scored as defective. Pears showing two or more skin breaks between 1/8 and 3/16 inch in diameter or depth should be scored as defective against these grades. Diameter should be computed as aggregate areas.

Under the definition of damage by skin breaks, there is provision that not more than 15% of the pears in any container may have one skin break 1/8 to 3/16 inch including diameter or depth. It is important to remember that the application of 1-1/2 times the tolerance does not apply to this 15% of pears which may show one skin break

from 1/8 to 3/16 inch in diameter or depth in any container because the application of tolerances does not apply to the amount allowed under the definition of damage.

Pears showing one skin break from 1/8 to 3/16 inch in diameter or depth should be scored in a separate column on the notesheet.

Any container that shows more than 15% of these skin breaks is damaged and out of grade. In other words, it is not permissible to average the lot in grade when one or more boxes show more than 15% of pears with one skin break from 1/8 to 3/16 inch in diameter or depth. **The lot as a whole is out of grade; but, the entire box should be used as the sample.**

Pears showing skin breaks less than 1/8 inch in diameter or depth should not be scored as grade defects.

Punctures in State Grades (Q)

In most State grades, punctures and other skin breaks are scored on the same basis as they are in the U.S. grades.

In the Washington State grade for summer and fall pears, the “C” grade allows broken skins up to 1/4 inch in diameter.

Sooty Blotch (Q)

Sooty Blotch is marked by sooty patches or spots, usually very small but sometimes very irregular in size and shape, which may occur on any part of the fruit. They are easily removed by scraping with the fingernail or knife. On Kieffer pears, a zone of russet often surrounds the blotches.

Score as damage against the U.S. No. 1 grade when the spots are thinly scattered over more than 5% of the surface, or when dark, heavily concentrated spots affect an area larger than the area of a circle 3/8 inch in diameter.

Score as serious damage against the U.S. No. 2 grade when thinly scattered over more than 15% of the surface, or when dark, heavily concentrated spots affect an area greater than the area of a circle 3/4 inch in diameter.

Sprayburn or Sunburn (Q)

A strong application of certain kinds of sprays may cause sprayburn, while unusual exposure to sunlight may cause sunburn.

Score as injury against the U.S. Extra No. 1 grade when:

- The normal color of the fruit has been materially changed;

- The skin is blistered or cracked; or,
- The flesh is softened or discolored.

Score as damage against the U.S. No. 1 grade when:

- The skin of the pear is blistered, cracked or shows light tan or brown color;
- Shape is appreciably flattened; or,
- The flesh is appreciably softened or changed in color.

Score as serious damage against the U.S. No. 2 grade when:

- The skin is blistered or cracked or shows brownish color;
- When the pear is materially flattened; or,
- The flesh is softened or is materially changed in color.

Sprayburn of a russet character shall be considered under the definition of russeting.

Stings (Q)

Stings are caused by insects such as the Codling Moth starting to enter the fruit through the skin but for one reason or another never complete the entry. The point of attack usually forms a hard brown scar that is surrounded by a slightly sunken area and an encircling green ring. When measuring the diameter of a sting, the encircling green ring should be included in the measurement.

Score against the U.S. Extra No. 1 grade when:

- There are more than two healed slight insect stings or depressions; or,
- There are any insect stings which materially affect the general appearance of the fruit.

Score as damage against the U.S. No. 1 grade and the Oregon Extra Fancy grade for summer and fall pears when:

- There are more than 2 healed Codling Moth stings; or,
- Any insect sting which is over 3/32 inch in diameter; or,
- Other insect stings that affect the appearance to an equal extent.

Score as serious damage against the U.S. No. 2 grade and the Oregon Fancy Grade for summer and fall pears when:

- There are more than 3 healed Codling Moth stings, or more than 2 are over 3/32 inch in diameter; or,
- Other insect stings affecting the appearance to an equal extent.

Stony Pit (Q)

Stony Pit has been found to occur chiefly on Bosc pears but also affects Anjous. On Bosc, the symptoms are deep pits and deformed fruit. The pits are caused by the cessation of growth of the affected tissue early in the development of the pear. The borders of the deformed areas sometimes are dark green resembling a halo. The tissue at the base of the pits becomes necrotic or corky. Fruits bearing several pits become gnarled and so woody that they are difficult to cut with a knife. Trees producing affected fruit frequently have “oak bark” condition of the branches.

Stony Pit on Anjous closely resembles Cork Spot and is often confused with it. The affected tissues provide little resistance when cut (unlike the masses of stone cells of Stony Pit). There are well defined pits that are distinctly different from the uneven, bumpy surface associated with Cork Spot.

On Bosc, score 2 small or one large pit as damage and 3 small or 2 fairly large or one very large pit as serious damage.

On Anjous, score on same basis as Anjou Cork Spot.

Storage Scab (Q or C)

Pear scab lesions present on fruit (when picked), frequently enlarge as much as 1/4 inch in diameter during the normal storage period, and the fungus on the spots becomes black and more easily seen. The greatest change found in scab during storage is often in appearance of new lesions. Such lesions are initiated during long, wet periods in the latter part of the summer, but are not visible at picking time. Sometimes these new lesions are readily distinguishable from old lesions of small size. Both become jet black, and often both produce a low tuft of fungus growth in the center of the lesion. Unlike those appearing in the orchard, some of the storage lesions do not break through the cuticle at all but develop in the cells beneath producing black shiny spots. This characteristic and the small size of the lesions are helpful in identifying Storage Scab. Corky tissue occurs in the center of the orchard lesions, but is not present in the storage spots. However, cork is not easily identified in small lesions. There is no evidence that scab spreads from one fruit to another in storage. Slight variations in humidity and temperature of the storage room have little effect on the development of scab. New lesions may appear earlier on fruit in common storage than on fruit in storage at 31-32° F, but eventually similar fruit in cold storage will show as heavy an infection.

In scoring scab on lots in storage, score with other defects all pears that show corked-over spots that exceed the areas permitted by the grade. The other type (with

no signs of cork), which exceeds the amount permitted by the grade and develops in storage, should be counted as condition defects.

Sunscald (Q)

Sunscald is found occasionally as small to large, tan colored to brown, slightly shriveled spots, especially on pears formerly protected, but suddenly exposed to the sun, as inside fruit that might lie unprotected in the tops of picking boxes for some time in bright sunlight.

Score as damage against the U.S. No. 1 grade when:

- The skin is discolored tan or brown; or,
- The skin is soft or shriveled.

Score as serious damage against the U.S. No. 2 grade when:

- Discolored areas on the skin are large or dark; or,
- The skin is shriveled; or,
- The flesh is softening.

Decay (C)

The presence or absence of decay is very important and is frequently the factor that decides when and how pears are sold. For this reason, a statement showing the presence or absence of decay is always necessary. When decay apparently follows stem punctures, calyx injury, etc., the facts should be stated.

When decay is found, it should be reported in percentages even though small in amounts, for example: "Less that 1/2 of 1% decay" or "Less than 1% decay." Describe the degree of advancement as early, moderate or advanced stages.

Refer to *Agriculture Handbook No. 376, Market Diseases of Apples, Pears and Quinces* and General Shipping Point or the General Market Inspection Instructions for additional instructions.

GRADE

When the load inspected consists of different lots, part of which is up to grade and part of which fails to meet the grade requirements, it will be necessary to make separate statements for the different lots. In all such cases, indicate the grade for each lot and avoid grade statements that are indefinite, or that tend to contradict what has been reported under the previous headings of the certificate. Remember that the grade statement is an interpretation of the facts previously given. Whenever any lot is

reported as failing to meet the requirements of a certain grade, the reason for its failure to grade must be given.

If a lot of pears show grade defects in excess of the tolerance, and also decay or other deterioration, each should be reported under the appropriate heading. The lot will simply be reported as failing to meet the requirements of the grade. No mention of the condition factors should be made in the grade statement in this case.

Defects Which Develop After Packing

In the U.S., Washington, and Oregon grades decay, scald, or other deterioration that may have developed after the pears have been stored or in transit shall be considered as affecting condition and not the grade. The correct grade statement when decay and/or other condition defects are in excess of the tolerance is illustrated in the following example: U.S. Extra No. 1 (or Washington Extra Fancy or Oregon Extra Fancy) decay, Scald, etc., being factors of Condition.

Progressive defects of pears such as: decay, scald, and cork spot are to be considered as affecting grade within a seven day storage period, provided they have not been in transit.

U.S. Combination Grade

There is no provision for a combination of U.S. Extra No. 1 and U.S. No. 1. The Combination Grade applies only to U.S. No. 1 and U.S. No. 2. Therefore, it would not be permissible to certify Combination U.S. Extra No. 1 and U.S. No. 1.

The second paragraph under “Tolerances” in the U.S. Standards specifies that when applying the foregoing tolerances to the Combination Grade, no part of any tolerance shall be used to reduce the percentage of U.S. No. 1 pears required in the combination (50%) but individual containers may have not more than 10% less than the percentage of U.S. No. 1 required provided that the entire lot averages within the percentage specified (50% or higher percentage reported). This means that when a percentage of U.S. No. 1 Quality is specified in the grade statement, as “U.S. Combination, approximately 60% U.S. No. 1 Quality,” then individual containers cannot have more than 10% less U.S. No. 1 Quality than the percentage as shown in the grade statement. This policy does not apply to Washington State Combination Grades, but does apply to State of Oregon Combination Grades.

If it is found that the averages for a lot meet the requirements of U.S. Combination Grade but some containers have more than 10% below the average of U.S. No. 1 pears in the lot, such a lot may be reported as “Fails to meet U.S. Combination, averaging U.S. No. 1 Quality” or, in lieu of this statement, the range and average percent of U.S. No. 1 quality may be reported in connection with the Combination Grade. For example, pear lots that meets the requirements of U.S. Combination and has an average of 70% U.S. No. 1 pears, but includes individual

containers with only 45% U.S. No. 1 pears shall be reported: "U.S. Combination, ranging from 45% to 85%, averaging approximately 70% U.S. No. 1 quality."

Since the U.S. Combination Grade requires an average of at least 50% U.S. No. 1 quality, with no sample showing more than 10% less, any lot with one or more samples having less than 40% U.S. No. 1 quality would not meet these basic requirements. In this case, the range and average should not be stated, as was done in the previous paragraph for lots with higher percentages of U.S. No. 1 quality.

Reporting the Percentage of Pears Meeting the Higher Grade Requirements in Combination Grades

Except when the applicant requests the percentage of the higher grade, report the lot as grading U.S. Combination or State Combination without any further reference to the percentage of the higher grade. When lots are sold to contain a larger percentage of the higher grade than the Combination requires, it will be satisfactory to report the grade followed with the statement of the percentage of higher grade. When reporting the percentage of a higher grade, it should be reported under the "Grade" heading; thus: "U.S. Combination, approximately 65% U.S. No. 1 quality."

Percentage of U.S. No. 1 Quality

In percentage loads, the size is not a grade requirement and so pears which are smaller that the size marked on the package cannot be included with the defects and deducted from the percentage of U.S. No. 1 quality, except that when the percentage of U.S. No. 1 quality is to be followed with the size statement as, "Approximately 75% U.S. No. 1 quality, 2-1/2 inch minimum," the percentage under 2-1/2 inches should also be subtracted from 100. Likewise, when both the minimum and maximum sizes are reported with the percentage of U.S. No. 1 quality, both undersize and oversize must be subtracted from 100.

More complete grade statements on percentage cars, decay and other serious defects of a progressive nature need not be mentioned under grade when they are within the grade tolerance. The following procedure applies only when a percentage of U.S. No. 1 quality is shown without a definite grade statement: For example, when a lot is reported as U.S. No. 2 with an approximate average percentage of U.S. No. 1 quality, it will not be necessary to show the percentage of decay or other serious defects of a progressive nature since they are within the tolerance permitted by the U.S. No. 2 grade. However, if the percentage of U.S. No. 1 quality is to be shown without a definite grade statement, the percentage of decay and other serious defects of a progressive character must be reported in connection with this percentage statement under "Grade" heading, providing either exceeded the grade tolerance.

Factors that should be considered of a serious progressive character are as follows: Decay and Internal Breakdown.

U.S. STANDARDS AND OREGON STATE STANDARDS

The Oregon State Standards for Pears, with the exception of the Oregon Commercial grade, are identical with the U.S. Standards in definitions but not in names, as follows:

Summer and Fall Pears		
Oregon Extra Fancy	=	U.S. No. 1
Oregon Fancy	=	U.S. No. 2
Oregon Combination	=	U.S. Combination
Winter Pears		
Oregon Extra Fancy	=	U.S. Extra No. 1
Oregon Fancy	=	U.S. No. 2
Oregon Commercial	=	
U.S. Combination except that broken skins and skin punctures that do not exceed three-sixteenths (3/16) inch in diameter shall not be considered a defect of this grade.		

SUMMER AND WINTER PEAR GRADES COMPARISON

U.S. No. 1		
	Summer Pears	**Winter Pears**
Fairly well formed	Slightly abnormal shape.	Same
Hard end	Protruding yellow, smooth dry flesh at calyx.	Same
Skin breaks	3/16”, 1/8”, 15%	Same
RUSSETING:		
Excessively rough	1/2 inch	Same
Slightly rough or thick on Bartletts	3/4 inch	Same-Anjous
Rough or thick on Hardys, Sands, etc.	3/4 inch	Same-other Winter
Smooth solid or net on Bartletts	15% surface	1/3 surface on Anjous, 15% on other smooth varieties
Russet at calyx	None	1/2” on flat surface
Characteristic on Sands, etc.	Any amount	Same on Bosc, Comice, etc.
LIMB RUBS:		
Cracked, soft depressed	None	Same
Black discoloration	3/8 inch	Same
Dark brown or extra rough	1/2 inch	Same
Light color, slightly rough	3/4 inch	Same
Light color, smooth	1 inch	Same
Cork Spot	Not found	Same
Hail Marks	3/8 inch	Same
Drought Spot	1 or 3/8 inch	Same
Sunburn	Light tan	Same
Stings	2 or over 3/32	Same
Blister mite	3/8 inch	Same
Scab, black	1/4 inch	Same
Sooty Blotch	5% or 3/8 inch	Same

The only difference between the requirements for summer pears and winter pears in the **U.S. No. 1** grade is:

- Bartlett pears permit 15% of the surface to be affected with smooth solid or smooth net-like russeting. Anjou pears may have 1/3 of the surface affected.

- Bartlett pears and other smooth skinned varieties may have no additional smooth russeting at the calyx end. Anjou pears and other smooth skinned winter varieties may have 1/2 inch of such russeting visible at the calyx end when the pear is placed calyx end down on a flat surface.

U.S. No. 2

The requirements for summer and winter pears in the U.S. No. 2 grade are identical in all factors, except:

Anjou pears limit smooth solid or smooth net-like russeting to 2/3 of the surface in U.S. No. 2. There are no restrictions on this type of russeting for other varieties, either summer or winter, in the U.S. No. 2 grade.

Points to Remember When Inspecting U.S. and State Grades

Winter Pears

In the U.S. Standards, Oregon State and Washington State Standards for Winter Pears, the U.S. Extra No. 1, Oregon Extra Fancy, and Washington Extra Fancy grades have the same requirements as to grade defects. This also applies to the U.S. No. 2, Oregon Fancy and Washington Fancy grades.

Summer/Fall Pears

The Washington State Standards for Summer and Fall Pears differ substantially from the U.S. Standards in some respects. Before inspecting summer and fall pears from Washington, inspectors should review the Washington State Standards for their terminology and definitions.

APPENDIX I - U.S. GRADE STANDARDS

United States Standards for Grades of Summer and Fall Pears [1]

Effective August 20, 1955

General

§51.1260 General.

These standards apply to varieties such as Bartlett, Hardy and other similar varieties.

Grades

§51.1261 U.S. No. 1.

"U.S. No. 1" consists of pears of one variety which are mature, but not overripe, carefully hand-picked, clean, fairly well formed, free from decay, internal breakdown, scald, freezing injury, worm holes, black end, and from damage caused by hard end, bruises, broken skins, russeting, limb rubs, hail, scars, drought spot, sunburn, sprayburn, stings or other insect injury, disease, or mechanical or other means. (See §§51.1265 and 51.1268.)

§51.1262 U.S. Combination.

A combination of U.S. No. 1 and U.S. No. 2 may be packed. When such a combination is packed, at least 50 percent of the pears in any container shall meet the requirements of U.S. No. 1. (See §§51.1265 and 51.1268.)

[1] Packing of the product in conformity with the requirements of these standards shall not excuse failure to comply with the provisions of the Federal Food, Drug, and Cosmetic Act.

§51.1263 U.S. No. 2.

"U.S. No. 2" consists of pears of one variety which are mature, but not overripe, carefully hand-picked, clean, not seriously misshapen, free from decay, internal breakdown, scald, freezing injury, worm holes, black end, and from damage caused by hard end, or broken skins. The pears shall also be free from serious damage caused by bruises, russeting, limbrubs, hail, scars, drought spot, sunburn, sprayburn, stings or other insect injury, disease, or mechanical or other means. (See §§51.1265 and 51.1268.)

Unclassified

§51.1264 Unclassified.

"Unclassified" consists of pears which have not been classified in accordance with any of the foregoing grades. The term "unclassified'' is not a grade within the meaning of these standards, but is provided as a designation to show that no grade has been applied to the lot.

Tolerances

§51.1265 Tolerances.

(a) In order to allow for variations incident to proper grading and handling, not more than a total of 10 percent of the pears in any lot may fail to meet the requirements of grade: **Provided**, That not more than 5 percent shall be seriously damaged by insects, and not more than 1 percent shall be allowed for decay or internal breakdown.

(b) When applying the foregoing tolerances to the combination grade no part of any tolerance shall be used to reduce the percentage of U.S. No. 1 pears required in the combination, but individual containers may have not more than 10 percent less than the percentage of U.S. No. 1 required: **Provided**, That the entire lot averages within the percentage specified.

Application of Tolerances

§51.1266 Application of tolerances.

(a) The contents of individual packages in the lot, based on sample inspection, are subject to the following limitations, provided the averages for the entire lot are within the tolerances specified for the grade:

(1) For packages which contain more than 10 pounds, and a tolerance of 10 percent or more is provided individual packages in any lot shall have not more than one and one-half times the tolerance specified. For packages which contain more than 10 pounds and a tolerance of less than 10 percent is provided, individual packages in any lot shall 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.

(2) 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.

Basis for Calculating Percentages

§51.1267 Basis for calculating percentages.

(a) When the numerical count is marked on the container or when pears are packed in a container to weigh 5 pounds or less, percentages shall be calculated on the basis of count.

(b) When the minimum diameter or minimum and maximum diameters are marked on a container packed to weigh more than 5 pounds or when the pears are jumbled in a container packed to weigh more than 5 pounds, percentages shall be calculated on the basis of weight or an equivalent basis.

Condition After Storage or Transit

§51.1268 Condition after storage or transit.

Decay, scald, or other deterioration which may have developed on pears after they have been in storage or transit shall be considered as affecting condition and not grade.

Standard Pack

§51.1269 Sizing.

(a) The numerical count, or the minimum size of the pears packed in closed containers shall be indicated on the package. The number of pears in the box shall not vary more than 3 from the number indicated on the box.

(b) When the numerical count is marked on western standard pear boxes the pears shall not vary more than three-eighths inch in their transverse diameter for counts 120 or less; one-fourth inch for counts 135 to 180, inclusive; and three-sixteenths inch for counts 193 or more.

(c) When the numerical count is marked on western standard half boxes or special half boxes packed three tiers deep, the pears shall not vary more than three-eighths inch for counts 75 or less; one-fourths inch for counts 80 to 110, inclusive; and three-sixteenths inch for counts 115 or more.
(d) When the numerical count is marked on western standard half boxes or special half boxes packed two tiers deep, the pears shall not vary more than three-eighths inch for counts 50 or less; one-fourth inch for counts 55 to 70, inclusive; and three-sixteenths inch for counts 80 or more.
(e) When the numerical count is not shown, the minimum size shall be plainly stamped, stenciled or otherwise marked on the container in terms of whole inches, whole and half inches, whole and quarter inches, or whole and eighth inches, as 2-1/2 inches minimum, 2-1/4 inches minimum, or 2-5/8 inches minimum, in accordance with the facts. It is suggested that both minimum and maximum sizes be marked on the container, as 2-1/4 to 2-3/4 inches, 2-1/2 to 2-3/4 inches, as such marking is especially desirable for pears marketed in the export trade.
(f) "Size" means the greatest transverse diameter of the pear taken at right angles to a line running from the stem to the blossom end.

§51.1270 Packing.

(a) Each package shall be packed so that the pears in the shown face shall be reasonably representative in size and quality of the contents of the package.
(b) Pears packed in any container shall be tightly packed. All packages shall be well filled but the contents shall not show excessive or unnecessary bruising because of overfilled packages.
(c) Pears packed in boxes shall be arranged in containers according to the approved and recognized methods with the pears packed lengthwise. A bridge shall not be allowed in any standard pack. When wrapped, each pear shall be fairly well enclosed by its individual wrapper.
(d) Pears packed in round stave bushel baskets, tubs or in barrels shall be ring faced.

§51.1271 Tolerances for standard pack.

(a) In order to allow for variations incident to proper sizing, not more than 5 percent of the pears in any lot may fail to meet the size requirements: **Provided**, That when the maximum and minimum sizes are both stated, an additional 10 percent tolerance shall be allowed for pears which are larger than the maximum size stated.
(b) In order to allow for variations incident to proper packing, not more than 10 percent of the containers in any lot may fail to meet these requirements, but no part of this tolerance shall be allowed for bridge packs, or for packs with different sizes and arrangements such as layers of 195 size and arrangement, and layers of 180 size and arrangement packed in the same box.

Definitions

§51.1272 Mature.

(a) "Mature" means that the pear has reached the stage of maturity which will insure the proper completion of the ripening process.
(b) Before a mature pear becomes overripe it will show varying degrees of firmness, depending upon the stage of the ripening process. Therefore, a statement of firmness should be given in order to indicate the stage of the ripening process. A description of the ground color should also be given.
(1) The following terms should be used for describing the ground color: "Green," "Light Green," "Yellowish Green," and "Yellow."
(2) The following terms should be used for describing the firmness of pears:
(i) "Hard" means that the flesh of the pear is solid and does not yield appreciably even to considerable pressure.
(ii) "Firm" means that the flesh of the pear is fairly solid but yields somewhat to moderate pressure.
(iii) "Firm ripe" means that the flesh of the pear yields readily to moderate pressure.
(iv) "Ripe" means that the pear is at the stage where it is in its most desirable condition for eating.

§51.1273 Overripe.

"Overripe" means dead ripe, very mealy or soft, past commercial utility.

§51.1274 Carefully hand-picked.

"Carefully hand-picked" means that the pears do not show evidence of rough handling or of having been on the ground.

§51.1275 Clean.

"Clean" means free from excessive dirt, dust, spray residue or other foreign material.

§51.1276 Black end.
"Black end" is evidenced by an abnormally deep green color around the calyx, or black spots usually occurring on the one-third of the surface nearest to the calyx, or by an abnormally shallow calyx cavity.
§51.1277 Fairly well formed.
"Fairly well formed" means that the pear may be slightly abnormal in shape but not to an extent which detracts materially from the appearance of the fruit.
§51.1278 Damage.
"Damage" means any injury or defect which materially affects the appearance, or the edible or shipping quality.
(a) Hard end shall be considered as damage if the pear shows a distinctly constricted protrusion at the blossom end, or an abnormally yellow color at the blossom end, or an abnormally smooth rounded base with little or no depression at the calyx, or if the flesh near the calyx is abnormally dry and tough or woody.
(b) Slight handling bruises and package bruises such as are incident to good commercial handling in the preparation of a tight pack shall not be considered damage.
(c) Any pear with one skin break larger than three-sixteenths inch in diameter or depth, or with more than one skin break one-eighth inch or larger in diameter or depth shall be considered damaged, and scored against the grade tolerance.[2]
(1) Small inconspicuous skin breaks, less than one-eighth inch in diameter or depth, shall not be considered damage. In addition, not more than 15 percent of the pears in any container may have not more than one skin break from one-eighth inch to three-sixteenths inch, inclusive, in diameter or depth.[2]
(d) Russeting which exceeds the following shall be considered as damage:
(1) On all varieties excessively rough russeting (russeting which shows "frogging'' or slight cracking) when the aggregate area exceeds one-half inch in diameter.[2]
(2) On Bartlett and other smooth-skinned varieties, slightly rough russeting, or thick russeting such as is characteristic of frost injury, when the aggregate area exceeds three-fourths inch in diameter.[2]
(3) On Bartlett and other smooth-skinned varieties, smooth solid or smooth netlike russeting when the aggregate area exceeds 15 percent of the surface.
(4) On Hardy, Sand and other similar varieties, rough or thick russeting such as is characteristic of frost injury, when the aggregate area exceeds three-fourths inch in diameter. On any of these varieties any amount of characteristic russeting is permitted whether due to natural causes such as weather or stimulated by artificial means; leaf whips or light limbrubs which resemble and blend into russeted areas shall be considered as russet.[2]
(e) Any one of the following defects or any combination thereof, the seriousness of which exceeds the maximum allowed for any one defect, shall be considered as damage:
(1) Any limbrubs which are cracked, softened, or more than slightly depressed.
(2) Black discoloration caused by limbrubs, which exceeds an aggregate area of three-eighths inch in diameter.[2]
(3) Dark brown discoloration or excessive roughness caused by limbrubs which exceeds an aggregate area of one-half inch in diameter.[2]
(4) Slightly rough, light colored discoloration caused by limbrubs which exceeds an aggregate area of three-fourths inch in diameter.[2]
(5) Smooth, light colored discoloration caused by limbrubs which exceeds an aggregate area of 1 inch in diameter.[2]
(6) Hail marks or other similar depressions or scars which are not shallow or superficial, or where the injury affects an aggregate area of more than three-eighths inch in diameter.[2]
(7) Drought spot when more than one in number, or when the external injury exceeds an aggregate area of three-eighths inch in diameter, or when the appearance of the flesh is materially affected by corky tissue or brownish discoloration.[2]
(8) Sunburn or sprayburn where the skin is blistered, cracked, or shows any light tan or brownish color, or the shape of the pear is appreciably flattened, or the flesh is appreciably softened or changed in color, except that sprayburn of a russet character shall be considered under the definition of russeting.

[2] The area refers to that of a circle of the specified diameter.

(9) Insects:
(i) More than two healed codling moth stings, or any insect sting which is over three thirty-seconds of an inch in diameter, or other insect stings affecting the appearance to an equal extent.[2]
(ii) Blister mite or canker worm injury which is not shallow or superficial, or where the injury affects an aggregate area of more than three-eighths inch in diameter.[2]
(10) Disease:
(i) Scab spots which are black and which cover an aggregate area of more than one-fourth inch in diameter except that scab spots of a russet character shall be considered under the definition of russeting.
(ii) Sooty blotch which is thinly scattered over more than 5 percent of the surface, or dark, heavily concentrated spots which affect an area of more than three-eighths inch in diameter.[2]

§51.1279 Seriously misshapen.

"Seriously misshapen" means that the pear is excessively flattened or elongated for the variety, 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.

§51.1280 Serious damage.

"Serious damage" means any injury or defect which seriously affects the appearance, or the edible or shipping quality.
(a) Russeting which in the aggregate exceeds the following shall be considered as serious damage:
(1) On all varieties, excessively rough russeting (russeting which shows "frogging'' or slight cracking) when the aggregate area exceeds three-fourths inch in diameter.[2]
(2) On all varieties, thick russeting such as is characteristic of frost injury, 15 percent of the surface.
(b) Any one of the following defects or combination thereof, the seriousness of which exceeds the maximum allowed for any one defect, shall be considered as serious damage:
(1) Limbrubs which are more than slightly cracked, or excessively rough limbrubs or dark brown or black discoloration caused by limbrubs which exceeds an aggregate area of three-fourths inch in diameter. Other limbrubs which affect an aggregate area of more than one-tenth of the surface.[2]
(2) Hail marks or other similar depressions or scars which affect an aggregate area of more than three-fourths inch in diameter, or which materially deform or disfigure the fruit.[2]
(3) Drought spot when more than two in number, or where the external injury affects an aggregate area of more than three-fourths inch in diameter, or when the appearance of the flesh is seriously affected by corky tissue or brownish discoloration.[2]
(4) Sunburn or sprayburn where the skin is blistered, cracked or shows any brownish color, or where the shape of the pear is materially flattened, or the flesh is softened or materially changed in color, except that sprayburn of a russet character shall be considered under the definition of russeting.
(5) Insects:
(i) Worm holes. More than three healed codling moth stings, of which not more than two may be over three thirty-seconds of an inch in diameter, or other insect stings affecting the appearance to an equal extent.[2]
(ii) Blister mite or canker worm injury which affects an aggregate area of more than three-fourths inch in diameter or which materially deforms or disfigures the fruit.[2]
(6) Disease:
(i) Scab spots which are black and which cover an aggregate area of more than one-half inch in diameter, except that scab spots of a russet character shall be considered under the definition of russeting.[2]
(ii) Sooty blotch which is thinly scattered over more than 15 percent of the surface, or dark, heavily concentrated spots which affect an area of more than three-fourths inch in diameter.[2]

[2] The area refers to that of a circle of the specified diameter.

United States Standards for Grades of Winter Pears [1]

Effective September 10, 1955

General

§51.1300 General.

These standards apply to varieties such as Anjou, Bosc, Winter Nelis, Comice, Flemish Beauty and other similar varieties.

Grades

§51.1301 U.S. Extra No. 1.

"U.S. Extra No. 1" consists of pears of one variety which are mature, but not overripe, carefully hand-picked, clean, well formed, free from decay, internal breakdown, scald, freezing injury, worm holes, black end, hard end, drought spot, and free from injury caused by russeting, limbrubs, hail, scars, cork spot, sunburn, sprayburn, stings or other insect injury, or mechanical or other means, except that they shall be free from damage caused by bruises, broken skins, or disease. (See §§51.1306 and 51.1309.)

§51.1302 U.S. No. 1.

"U.S. No. 1" consists of pears of one variety which are mature, but not over-ripe, carefully hand-picked, clean, fairly well formed, free from decay, internal breakdown, scald, freezing injury, worm holes, black end, and from damage caused by hard end, bruises, broken skins, russeting, limbrubs, hail, scars, cork

[1] Packing of the product in conformity with the requirements of these standards shall not excuse failure to comply with the provisions of the Federal Food, Drug, and Cosmetic Act.

spot, drought spot, sunburn, sprayburn, stings or other insect injury, disease, or mechanical or other means. (See §§51.1306 and 51.1309.)

§51.1303 U.S. Combination.

A combination of U.S. No. 1 and U.S. No. 2 may be packed. When such a combination is packed, at least 50 percent of the pears in any container shall meet the requirements of U.S. No. 1. (See §§51.1306 and 51.1309.)

§51.1304 U.S. No. 2.

"U.S. No. 2" consists of pears of one variety which are mature, but not overripe, carefully hand-picked, clean, not seriously misshapen, free from decay, internal breakdown, scald, freezing injury, worm holes, black end, and from damage caused by hard end, or broken skins. The pears shall also be free from serious damage caused by bruises, russeting, limbrubs, hail, scars, cork spot, drought spot, sunburn, sprayburn, stings or other insect injury, disease, or mechanical or other means. (See §§51.1306 and 51.1309.)

Unclassified

§51.1305 Unclassified.

"Unclassified" consists of pears which have not been classified in accordance with any of the foregoing grades. The term "unclassified'' is not a grade within the meaning of these standards, but is provided as a designation to show that no grade has been applied to the lot.

Tolerances

§51.1306 Tolerances.

(a) In order to allow for variations incident to proper grading and handling, not more than a total of 10 percent of the pears in any lot may fail to meet the requirements of grade: **Provided**, That not more than 5 percent shall be seriously damaged by insects, and not more than 1 percent shall be allowed for decay or internal breakdown.

(b) When applying the foregoing tolerances to the combination grade no part of any tolerance shall be used to reduce the percentage of U.S. No. 1 pears required in the combination, but individual containers may have not more than 10 percent less than the percentage of U.S. No. 1 required: **Provided**, That the entire lot averages within the percentage specified.

Application of Tolerances

§51.1307 Application of tolerances.

(a) The contents of individual packages in the lot, based on sample inspection, are subject to the following limitations, provided the averages for the entire lot are within the tolerances specified for the grade:

(1) For packages which contain more than 10 pounds, and a tolerance of 10 percent or more is provided, individual packages in any lot shall have not more than one and one-half times the tolerance specified. For packages which contain more than 10 pounds and a tolerance of less than 10 percent is provided, individual packages in any lot shall 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.

(2) 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.

Basis for Calculating Percentages

§51.1308 Basis for calculating percentages.

(a) When the numerical count is marked in the container or when pears are packed in a container to weigh 5 pounds or less, percentages shall be calculated on the basis of count.

(b) When the minimum diameter or minimum and maximum diameters are marked on a container packed to weigh more than 5 pounds or when the pears are jumbled in a container packed to weigh more than 5 pounds, percentages shall be calculated on the basis of weight or an equivalent basis.

Condition After Storage or Transit

§51.1309 Condition after storage or transit.

Decay, scald or other deterioration which may have developed on pears after they have been in storage or transit shall be considered as affecting condition and not the grade.

Standard Pack

§51.1310 Sizing.

(a) The numerical count, or the minimum size of the pears packed in closed containers shall be indicated on the package. The number of pears in the box shall not vary more than 3 from the number indicated on the box.

(b) When the numerical count is marked on western standard pear boxes the pears shall not vary more than three-eighths inch in their transverse diameter for counts 120 or less; one-fourth inch for counts 135 to 180, inclusive; and three-sixteenths inch for counts 193 or more.

(c) When the numerical count is marked on western standard half boxes or special half boxes packed three tiers deep, the pears shall not vary more than three-eighths inch for counts 75 or less; one-fourth inch for counts 80 to 110, inclusive; and three-sixteenths inch for counts 115 or more.

(d) When the numerical count is marked on western standard half boxes or special half boxes packed two tiers deep, the pears shall not vary more than three-eighths inch for counts 50 or less; one-fourth inch for counts 55 to 70, inclusive; and three-sixteenths inch for counts 80 or more.

(e) When the numerical count is not shown, the minimum size shall be plainly stamped, stenciled or otherwise marked on the container in terms of whole inches, whole and half inches, whole and quarter inches, or whole and eighth inches, as 2-1/2 inches minimum, 2-1/4 inches minimum, or 2-5/8 inches minimum, in accordance with the facts. It is suggested that both minimum and maximum sizes be marked on the container, as 2-1/4 to 2-3/4 inches, 2-1/2 to 2-3/4 inches, as such marking is especially desirable for pears marketed in the export trade.

(f) "Size" means the greatest transverse diameter of the pear taken at right angles to a line running from the stem to the blossom end.

§51.1311 Packing.

(a) Each package shall be packed so that the pears in the shown face shall be reasonably representative in size and quality of the contents of the package.

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

(c) Pears packed in boxes shall be arranged in containers according to the approved and recognized methods with the pears packed lengthwise. A bridge shall not be allowed in any standard pack. When wrapped, each pear shall be fairly well enclosed by its individual wrapper.

(d) Pears packed in round stave bushel baskets, tubs, or in barrels shall be ring faced.

§51.1312 Tolerances for standard pack.

(a) In order to allow for variations incident to proper sizing, not more than 5 percent of the pears in any lot may fail to meet the size requirements: **Provided**, That when the maximum and minimum sizes are both stated, an additional 10 percent tolerance shall be allowed for pears which are larger than the maximum size stated.

(b) In order to allow for variations incident to proper packing, not more than 10 percent of the containers in any lot may fail to meet these requirements but no part of this tolerance shall be allowed for bridge packs, or for packs with different sizes and arrangements such as layers of 195 size and arrangement, and layers of 180 size and arrangement packed in the same box.

Definitions

§51.1313 Mature.

(a) "Mature" means that the pear has reached the stage of maturity which will insure the proper completion of the ripening process.

(b) Before a mature pear becomes overripe it will show varying degrees of firmness depending upon the stage of the ripening process. Therefore, a statement of firmness should be given in order to indicate the stage of the ripening process. A description of the ground color should also be given.

(1) The following terms should be used for describing the ground color: "Green," "Light Green," "Yellowish Green," and "Yellow."

(2) The following terms should be used for describing the firmness of pears:

(i) "Hard" means that the flesh of the pear is solid and does not yield appreciably even to considerable pressure.

(ii) "Firm" means that the flesh of the pear is fairly solid but yields somewhat to moderate pressure.

(ii) "Firm ripe" means that the flesh of the pear yields readily to moderate pressure.

(iv) "Ripe" means that the pear is at the stage where it is in its most desirable condition for eating.

§51.1314 Overripe.
"Overripe" means dead ripe, very mealy or soft, past commercial utility.
§51.1315 Carefully hand-picked.
"Carefully hand-picked" means that the pears do not show evidence of rough handling or of having been on the ground.
§51.1316 Clean.
"Clean" means free from excessive dirt, dust, spray residue or other foreign material.
§51.1317 Well formed.
"Well formed" means having the shape characteristic of the variety. Slight irregularities of shape from type which do not appreciably detract from the general appearance of the fruit shall be considered well formed.
§51.1318 Black end.
"Black end" is evidenced by an abnormally deep green color around the calyx, or black spots usually occurring on the one-third of the surface nearest to the calyx, or by an abnormally shallow calyx cavity.
§51.1319 Injury.
"Injury" means any blemish or defect, that more than slightly affects the appearance, or the edible or shipping quality. The following shall be considered as injury:
(a) Russeting which exceeds the following shall be considered as injury:
(1) On all varieties any excessively rough russeting (russeting which shows "frogging'' or slight cracking).
(2) On Comice, and on Anjou and other smooth-skinned varieties, slightly rough russeting, or thick russeting, such as is characteristic of frost injury, when the aggregate area exceeds one-half inch in diameter.[1]
(3) On Anjou and other smooth-skinned varieties, smooth solid russeting when the aggregate area exceeds one-half inch in diameter and smooth net-like russeting when the aggregate area exceeds 15 percent of the surface, and on Comice, smooth solid or smooth netlike russeting when the aggregate area exceeds one-third of the surface, except that, in addition, on these and similar varieties, any amount of characteristic smooth russeting shall be permitted on that portion of the calyx end not visible for more than one-half inch along the contour of the pear, when it is placed calyx end down on a flat surface.[2]
(4) On any of the following and other similar varieties, rough or thick russeting such as is characteristic of frost injury when the aggregate area exceeds one-half inch in diameter.[2] On any of these varieties any amount of characteristic russeting is permitted whether due to natural causes such as weather or stimulated by artificial means; leaf whips or light limbrubs which resemble and blend into russeted areas shall be considered as russet:

Bosc.	Pound.
Clairgeau.	Seckel.
Easter Beurre.	Sheldon.
Flemish Beauty.	Winter Nelis,
Kieffer.	and other
P. Barry.	similar varieties.

(b) Any one of the following defects or any combination thereof, the seriousness of which exceeds the maximum allowed for any one defect, shall be considered as injury:
(1) Limbrubs which are cracked, softened, more than very slightly depressed, not light in color, or exceeding an aggregate area of three-fourths inch in diameter.[2]
(2) Hail marks or other similar depressions or scars which are not very shallow or superficial, or which affect an aggregate area of more than one-fourth inch in diameter.[2]
(3) Cork spot when a pear shows depressions or the flesh of the pear is more than slightly affected.
(4) Sunburn or sprayburn if the normal color of the fruit has been materially changed, or if the skin is blistered or cracked, or the flesh softened or discolored.
(5) More than two healed slight stings or depressions, or any stings which materially affect the general appearance of the fruit.
(6) Blister mite or canker worm injury which is not very shallow and superficial or where the injury affects an aggregate area of more than one-fourth inch.[2]

[2] The area refers to that of a circle of the specified diameter.

§51.1320 Fairly well formed.

"Fairly well formed" means that the pear may be slightly abnormal in shape but not to an extent which detracts materially from the appearance of the fruit. Winter Nelis pears with characteristic slight sutures or with slight flattening on one side and/or other slight irregularities which do not materially detract from the general appearance of the pear shall be considered fairly well formed.

§51.1321 Damage.

"Damage" means any injury or defect which materially affects the appearance, or the edible or shipping quality.

(a) Hard end shall be considered as damage if the pear shows an abnormally yellow color at the blossom end, or an abnormally smooth rounded base with little or no depression at the calyx, or if the flesh near the calyx is abnormally dry and tough or woody.

(b) Slight handling bruises and package bruises such as are incident to good commercial handling in the preparation of a tight pack shall not be considered damage.

(c) Any pear with one skin break larger than three-sixteenths inch in diameter of depth, or with more than one skin break one-eighth inch or larger in diameter or depth, shall be considered damaged, and scored against the grade tolerance.[2]

(1) Small inconspicuous skin breaks, less than one-eighth inch in diameter or depth, shall not be considered damage. In addition, not more than 15 percent of the pears in any container may have not more than one skin break from one-eighth inch to three-sixteenths inch, inclusive, in diameter or depth.[2]

(d) Russeting which exceeds the following shall be considered as damage:

(1) On all varieties excessively rough russeting (russeting which shows "frogging'' or slight cracking) when the aggregate area exceeds one-half inch in diameter.[2]

(2) On Anjou and other smooth-skinned varieties, slightly rough russeting, or thick russeting such as is characteristic of frost injury, when the aggregate area exceeds three-fourths inch in diameter.[2]

(3) On Anjou, smooth solid or smooth netlike russeting when the aggregate area exceeds one-third of the surface, and on other smooth-skinned varieties, 15 percent of the surface, except that, in addition, on Anjou and other smooth-skinned varieties, any amount of characteristic smooth russeting shall be permitted on that portion of the calyx end not visible for more than one-half inch along the contour of the pear, when it is placed calyx end down on a flat surface.

(4) On any of the following and other similar varieties, rough or thick russeting such as is characteristic of frost injury, when the aggregate area exceeds three-fourths inch in diameter.[2] On any of these varieties any amount of characteristic russeting is permitted whether due to natural causes such as weather or stimulated by artificial means; leaf whips or light limbrubs which resemble and blend into russeted areas shall be considered as russet:

Bosc.	Pound.
Clairgeau.	Seckel.
Comice.	Sheldon.
Easter Beurre.	Winter Nelis,
Flemish Beauty.	and other
Kieffer.	similar varieties.
P. Barry.	

(e) Any one of the following defects or any combination thereof, the seriousness of which exceeds the maximum allowed for any one defect, shall be considered as damage:

(1) Any limbrubs which are cracked, softened, or more than slightly depressed.

(2) Black discoloration caused by limbrubs which exceeds an aggregate area of three-eighths inch in diameter.[2]

(3) Dark brown discoloration or excessive roughness caused by limbrubs which exceeds an aggregate area of one-half inch in diameter.[2]

(4) Slightly rough, light colored discoloration caused by limbrubs which exceeds an aggregate area of three-fourths inch in diameter.[2]

(5) Smooth, light colored discoloration caused by limbrubs which exceeds an aggregate area of 1 inch in diameter.[2]

(6) Hail marks or other similar depressions or scars which are not shallow or superficial, or where the injury affects an aggregate area of more than three-eighths inch in diameter.[2]

[2] The area refers to that of a circle of the specified diameter.

(7) Cork spot when more than one in number is visible externally or when the flesh is materially affected.
(8) Drought spot when more than one in number, or when the external injury exceeds an aggregate area of three-eighths inch in diameter, or when the appearance of the flesh is materially affected by corky tissue or brownish discoloration.[2]
(9) Sunburn or sprayburn where the skin is blistered, cracked, or shows any light tan or brownish color, or the shape of the pear is appreciably flattened, or the flesh is appreciably softened or changed in color, except that sprayburn of a russet character shall be considered under the definition of russeting.
(10) Insects:
(i) More than two healed codling moth stings, or any insect sting which is over three thirty-seconds of an inch in diameter, or other insect stings affecting the appearance to an equal extent.[2]
(ii) Blister mite or canker worm injury which is not shallow or superficial, or where the injury affects an aggregate area of more than three-eighths inch in diameter.[2]
(11) Disease:
(i) Scab spots which are black and which cover an aggregate area of more than one-fourth inch in diameter, except that scab spots of a russet character shall be considered under the definition of russeting.[2]
(ii) Sooty blotch which is thinly scattered over more than 5 percent of the surface, or dark, heavily concentrated spots which affect an area of more than three-eighths inch in diameter.[2]

§51.1322 Seriously misshapen.

"Seriously misshapen" means that the pear is excessively flattened or elongated for the variety, 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.

§51.1323 Serious damage.

"Serious damage" means any injury or defect which seriously affects the appearance, or the edible or shipping quality.
(a) Russeting which in the aggregate exceeds the following shall be considered as serious damage:
(1) On all varieties, excessively rough russeting (russeting which shows "frogging'' or slight cracking) when the aggregate area exceeds three-fourths inch in diameter.[2]
(2) On all varieties, thick russeting such as is characteristic of frost injury, 15 percent of the surface.
(3) On Anjou, smooth solid or smooth netlike russeting when the aggregate area exceeds two-thirds of the surface, except that, in addition, any amount of characteristic smooth russeting shall be permitted on that portion of the calyx end not visible for more than one-half inch along the contour of the pear, when it is placed calyx end down on a flat surface. On Flemish Beauty smooth russeting shall be permitted on the entire surface.
(b) Any one of the following defects or combination thereof, the seriousness of which exceeds the maximum allowed for any one defect, shall be considered as serious damage:
(1) Limbrubs which are more than slightly cracked, or excessively rough limbrubs or dark brown or black discoloration caused by limbrubs which exceeds an aggregate area of three-fourths inch in diameter.[2]
(2) Other limbrubs which affect an aggregate area of more than one-tenth of the surface.
(3) Hail marks or other similar depressions or scars which affect an aggregate area of more than three-fourths inch in diameter, or which materially deform or disfigure the fruit.[2]
(4) Cork spot when more than two in number are visible externally or when the flesh is seriously affected.
(5) Drought spot when more than two in number, or where the external injury affects an aggregate area of more than three-fourths inch in diameter, or when the appearance of the flesh is seriously affected by corky tissue or brownish discoloration.[2]
(6) Sunburn or sprayburn where the skin is blistered, cracked or shows any brownish color, or where the shape of the pear is materially flattened, or the flesh is softened or materially changed in color, except that sprayburn of a russet character shall be considered under the definition of russeting.
(7) Insects:
(i) Worm holes. More than three healed codling moth stings, of which not more than two may be over three thirty-seconds of an inch in diameter, or other insect stings affecting the appearance to an equal extent.[2]
(ii) Blister mite or canker worm injury which affects an aggregate area of more than three-fourths inch in diameter or which materially deforms or disfigures the fruit.[2]
(8) Disease:

(i) Scab spots which are black, and which cover an aggregate area of more than one-half inch in diameter, except that scab spots of a russet character shall be considered under the definition of russeting.[2]
(ii) Sooty blotch which is thinly scattered over more than 15 percent of the surface, or dark heavily concentrated spots which affect an area of more than three-fourths inch in diameter.[2]

[2] The area refers to that of a circle of the specified diameter.