



United States
Department of
Agriculture

Agricultural
Marketing
Service

Fruit and
Vegetable
Division

Fresh Products
Branch

Washington, D.C.

SHELLED PECANS

SHIPPING POINT AND MARKET INSPECTION INSTRUCTIONS

July 1969

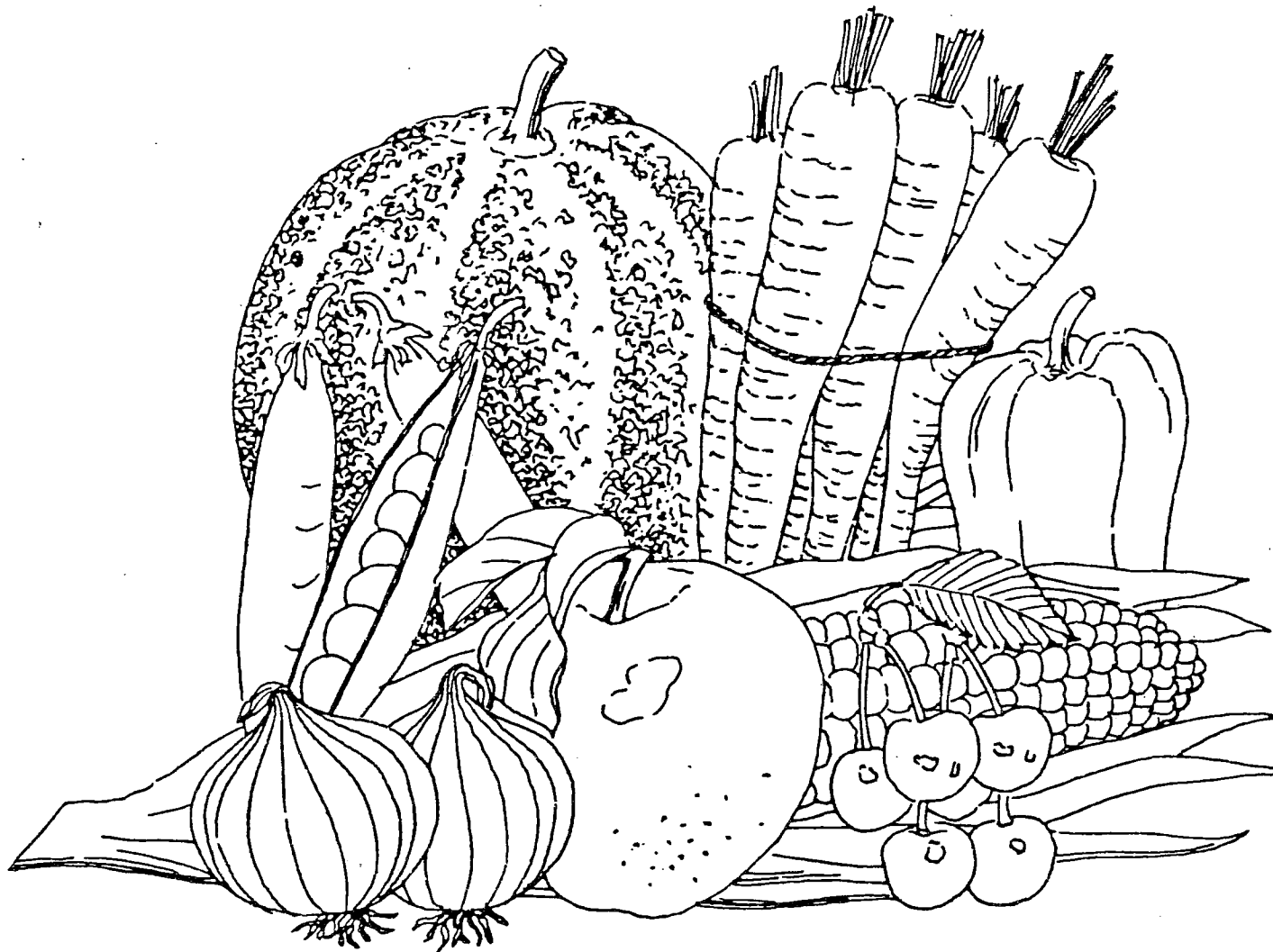


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UNITED STATES DEPARTMENT OF AGRICULTURE
AGRICULTURAL MARKETING SERVICE
FRUIT AND VEGETABLE DIVISION
FRESH PRODUCTS BRANCH

SHIPPING POINT AND MARKET INSPECTION
SHELLED PECANS 1/

INTRODUCTION

There are two general classes of pecans - native or "seedling" (1)
pecans, and named varieties which are commonly called "improved varieties" or "papershells." Pecans of the improved varieties are generally larger than seedlings, the shells are usually thinner, and the meats are generally somewhat darker in color, particularly late in the season. Native pecans are produced principally in Texas, Oklahoma and the lower Mississippi River Valley, and practically all are shelled commercially. Production of the improved varieties is largely concentrated in the Southeastern states of Georgia, Alabama, Mississippi, Florida and South Carolina. The proportion of the production of improved varieties which is shelled commercially varies from year to year, depending upon several factors, including the demand for "in-shell" pecans and the supply of seedlings available for shelling.

Pecan shelling plants are located throughout the important producing areas and in several large cities, including St. Louis, Chicago, San Antonio, Dallas and Birmingham. When local supplies are adequate, the plants in the Southeastern states shell improved varieties and the Texas and Oklahoma plants shell native pecans. However, in order to operate efficiently it is often necessary for shellers to buy pecans from other areas so that most plants, at one time or another, shell both improved varieties and seedlings. (2)

Prior to being shelled, the pecans are "conditioned" by soaking in tanks or vats of warm water or by being steamed. This process makes the shells and kernels less brittle and less likely to break during cracking and sizing operations. The pecans are cracked by machine and then pass through specialized equipment which by centrifugal force, vacuum, shaking and other means separates the meats from the shells. The meats are then sized by being passed over vibrating screens which segregate the various sizes of halves and pieces. The meats are then dried, usually by forced currents of warm air. Defective kernels and foreign material are removed by electronic sorters or hand picking from belts before the nuts are packaged. (3)

1/ These instructions supersede Inspection of Shelled Pecans issued April 1953, reissued August 1955.

(4)

INSPECTION EQUIPMENT

The following equipment is needed for the inspection of shelled pecans:

1. Gram scales (Torsion Balance or Triple-Beam Balance).
2. Set of sieves with round openings ranging from 1/16 inch to 8/16 inch in diameter. Screens measure 9-3/16 x 9-3/16 inches and each set requires a holder made from two tin pans with the bottoms cut out. The sieves are available in the market offices most likely to be called upon to make inspection of shelled pecans.
3. Sheet of paper or cardboard ruled into 100 rectangles measuring 1 x 1-1/2 inches, for use in selecting 10 smallest and 10 largest halves per 100.
4. A pair of tweezers will be useful in making inspections of the smallest pieces.

SAMPLING

(5)

Importance of Proper Sampling. Representative sampling is just as important as accurate grade interpretation. It is essential that samples be obtained from all parts of the lot, whether it is located in a warehouse, freight car or truck. In the event that certain portions of the lot are not accessible for sampling and the applicant is unwilling to furnish assistance to make it accessible, the inspector should issue a certificate restricted to the accessible portion of the load.

(6)

Number of Containers to be Sampled.

<u>Number of Containers in lot</u>	<u>Number to be Sampled</u>
5 or less	All containers
6 to 49	5 or more containers
50 to 100	10 containers
101 or more	10 percent of containers

(7)

When small packages, such as film bags, tin cans or glass jars, are packed in shipping cases, the number of containers to be sampled shall be based on the number of shipping cases or "master containers" in the lot.

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Method of Sampling. When packed in large cartons or bags, draw one or more handfuls from each container selected for sampling. (8)
Take approximately the same amount from each container, depending on the size of sample needed for analysis. Make samples representative by varying the location of sampling from one container to the next. Observe the general appearance of the entire contents of each container sampled. If the pecans in any container or number of containers are of decidedly different quality or size from those in most containers and the containers can be separated by use of non-identical distinguishing marks, each lot should be sampled and analyzed separately. When distinguishing marks are identical, the lots should be sampled and analyzed as one lot, but a "REMARKS" statement should indicate that the quality of the lot is variable. The above sampling instructions would also apply when loose insects or unusual amounts of foreign material are found in the containers sampled. The presence of loose insects should be reported according to directions under "Insect Injury" given later in these instructions.

Lots of pecans in consumer packages such as films bags or metal cans packed in master containers shall be sampled by drawing one consumer package from each case selected for sampling. Take some from lower as well as from upper layers within the master container. (9)
The inspector should have an extra case to use for "plugging" the empty places in the master containers sampled. If there are two or more clearly distinguishable, plainly marked sizes or grades of nut meats, they shall be handled as two distinct lots.

Size of Sample. The quantity of pecans taken for inspection should be at least twice as large as the amount required for grading. This will provide a check sample (See par. 74), equal in size to the graded sample, to be held for a period of thirty days. Pecans are a relatively high-priced commodity, and the inspector should be careful to draw only the necessary amount, thus avoiding possible criticism. (10)

When inspecting HALVES, the minimum size of sample to be drawn and analyzed should be as follows: (11)

<u>Size of Lot Sampled</u>	<u>Composite Sample Drawn (Grams)</u>	<u>Sample Analyzed (Grams)</u>
500 lbs. or less	1,000	500
501 to 1,500 lbs.	2,000	1,000
Over 1,500 lbs.	4,000	2,000

When inspecting PIECES, one-half of the above amounts should be drawn and analyzed.

- (12) When a shipment contains different sizes of halves or pieces, in separate containers, each size lot should be sampled and analyzed separately, but all may be reported on the same certificate.
- (13) Mixing the Sample. The composite sample should be thoroughly mixed on a table top or desk, and divided into two equal parts. A peanut sample divider, if available, may be used for mixing and dividing the sample. The bottoms of the drawers should be padded with cheesecloth or other material to avoid the possibility of breakage.
- (14) Sample For Analysis by Another Inspection Office. Inspection may be requested on lots of shelled pecans at points which have not been furnished with equipment for inspecting pecans. A sample may be drawn by any duly authorized inspector, and delivered or shipped to a designated inspection office for analysis and certification. The inspector who draws the sample shall prepare a memo containing a complete description of the lot, and shall place a copy in the package with the sample. Notice of Sampling form FV-187 may be used for this purpose, although it is designed for peanuts. Be sure to show the name and address of the applicant, number and description of packages, markings, place where sampled, date and name of sampler. If no sampling certificates are available, this information may be placed on a plain sheet of paper, and a carbon copy retained by the inspector who drew the sample.
- (15) In order to be sure that the official sample will be large enough for all possible needs, it should consist of approximately 2-1/4 times the quantity necessary for sizing and grading (See paragraph 11). The shipping container should be completely filled so that there will be as little movement as possible within the container. The sides and ends of the shipping container should be well padded with crumpled newspaper or shredded paper such as that used in packing bananas. The package should be plainly marked "Fragile." Such precautions will minimize breakage in transit.
- (16) Inspectors analyzing officially drawn samples should show under "Remarks", "The sample covered by this certificate was officially drawn by Federal inspector _____ on _____ 19__ at _____, and mailed to _____ for analysis."

UNOFFICIAL SAMPLES

- (17) Samples of shelled pecans which are brought or mailed to an inspection office by persons other than an inspector should be inspected in the same way as an officially drawn sample. Certificates issued on such samples should not connect them with carlot or other shipment.

The statement under "Products Inspected and Distinguishing Marks" should give the quantity inspected and all distinguishing marks on the package. The regular lot fee may be charged for such inspections, or the fee calculated on the basis of the hourly rate, whichever is more equitable.

INSPECTION PROCEDURE

Determining Size and Count Per Pound (18)

After a portion of the composite sample has been weighed to be analyzed, size and count shall be determined as follows:

HALVES:

1. Screen over 2/16 inch sieve to remove "particles and dust." (19)
2. Remove pieces of shell, center wall and foreign material from the sample, including any adhering to the kernels. Do not mistake particles of shriveled kernel for center wall. (20)
3. Weigh particles and dust and record weight. (21)
4. Sort out all broken kernels (everything which is less than 7/8 of a complete half kernel) and weigh; add weight of particles and dust and record total. Sort from broken kernels all material which is less than 50 percent of a complete half kernel, weigh, add weight of particles and dust and record. This is the total of broken kernels and particles which are less than one-half of a complete half-kernel. (22)
5. The rest of the sample consists of "halves", all of which are at least 7/8 of a complete half-kernel. Weigh 2 half-pound lots, count the halves in each lot, and add the two counts to determine the number per pound. If the count falls slightly above or below the range required for the size classification specified, an additional pound should be counted and the count of the two pounds averaged to determine the count to be reported. (There are 226.8 grams in one-half pound.) (23)
6. If specified as U. S. No. 1 Halves, mix the halves and select, at random, 100 halves. Arrange these in rows, flat side down, using the sheet ruled into rectangles. Use of this sheet will facilitate the selection of the 10 smallest halves and the 10 largest halves in the 100 nut sample. Weigh the 10 largest and the 10 smallest halves. Record these weights. The lot is considered fairly uniform in size if the weight of the 10 smallest halves is not less than one-half the weight of the 10 largest. U. S. Commercial Halves are not required to be fairly uniform in size. (24)

PIECES

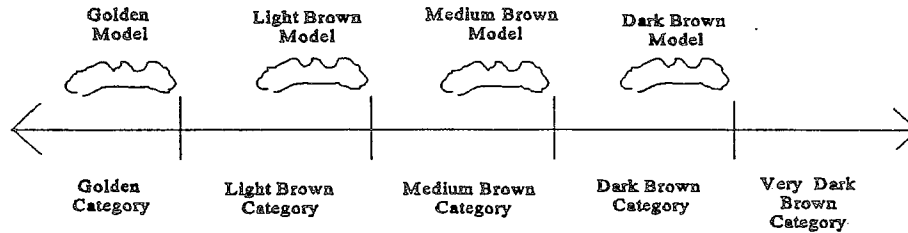
1. Screen the sample over a sieve having round holes of the maximum diameter specified, if any. Segregate the pieces which do not pass through this sieve. When screening, combine a circular or sidewise movement of the screen with a bouncing, up-and-down motion, so as to enable the elongated pieces to pass through. Not more than 100 grams should be placed on the screen at one time to permit free movement of the pieces. This will make it necessary to screen the sample in several separate batches. Shake the screen intermittently until no more pieces pass through.
2. After removing the oversize pieces (if any), screen the sample over a sieve having holes of the minimum diameter specified. Segregate the pieces which pass through this sieve. If the specified minimum diameter is larger than 2/16 inch, all material passing through a screen of that specified size should be screened again over the 2/16 inch sieve, and the material passing through the latter sieve segregated from the remainder of the undersize. If the specified minimum diameter is smaller than 2/16 inch, use the screen size opening specified instead of the 2/16.
3. Remove pieces of shell, center wall and foreign material from each of the separated sizes of kernels, including any adhering to the kernels. Do not mistake particles of shriveled kernel for center wall.
4. Weigh each size category and record weights. If there is a maximum size requirement for the lot being graded, report the percentage oversize. Also report the percentage of undersize. If two minimum sizes are involved such as 5/16 inch and 2/16 inch, report the total percent passing through the 5/16 opening. Also report the percent passing through the 2/16 opening, as follows: "including passing through 2/16 opening _____ grams ____%".

Reporting Weights, Percentages and Count Per Pound

Weights should be reported to one decimal place, thus: 7.5 grams. All percentages should be reported to two decimal places, thus: 0.08 percent. Count per pound of halves should be reported to the nearest whole number. When reporting whole numbers, decimals of .5 or more should be raised to the next higher number and decimals of less than .5 dropped to the next lower number.

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APPLICATION OF VISUAL AID FOR SKIN COLOR CATEGORIES (Pecan Kernel Color Standards, Pec-mc-1-1968)



REQUIREMENTS FOR PECAN SKIN COLOR CLASSIFICATIONS

Color Classifications

Color Categories

	Light	Light Amber	Amber	Dark Amber
Golden	Minimum 55% (required to be mostly golden color)			
Light Brown	not more than 25%	More than 25%		
Medium Brown	None allowed	Not more than 25%	More than 25%	
Dark Brown	None allowed	None allowed	Not more than 25%	More than 25%
Very Dark Brown (or Blackish-Brown Discoloration)	None allowed	None allowed	None allowed	Not more than 25%

BLANK

Determining Quality

After all factors of size and/or count have been determined and recorded, the quality shall be determined as follows: (30)

Shell and Foreign Material. The shell, center wall and foreign material have already been removed from the kernels before the size determinations are made. All are weighed together and reported as one percentage. (31)

Cleanness. The Pecan kernels frequently have very small particles of meat or chaff attached to their surfaces. Usually this is not even noticeable, or at most not objectionable. If the kernel has dirt or a large amount of chaff attached to the surface, making its appearance conspicuous and objectionable, the kernel shall be scored as damaged. Only if a kernel is extremely dirty or black grease coated shall it be scored as seriously damaged. (32)

Skin Color. U.S. No. 1 Halves are required to be "fairly uniform in color." A statement should be made relative to this factor when reporting on an inspection of Halves. Other grades do not require fairly uniform color, but it is desirable to describe the general color of the kernels in lots intended to meet other grades. This can be done by the use of the color classification terms in the standards. (33)

Determining Color. Plastic models (Pec-MC-1-1968) illustrate the shades of color that are allowed for the golden, light brown, medium brown, and dark brown categories. As indicated in the label on top of the outer case of this visual aid, each plastic model represents the **maximum** shade of color allowed for each category. For example, the category "medium brown" would be any shade of brown color just darker than the "light brown" model and up to and including the "medium brown" model. Once it is determined which color categories are present on an individual kernel, and to what extent, this will be used to determine the color classification of that kernel (light, light amber, amber, and dark amber). An individual pecan kernel may show more than one color category but will only fall under one color classification. (See chart on page 6a) **** (34)

Fairly Uniform in Color. This term means that at least 90 percent, by weight, of the kernels are in one color classification bracket or not more than two color classifications. For example, the kernels could range generally in color from the lightest shade in the "light amber" class to the darkest in the "amber" class, and the lot could be described as fairly uniform in color. If a total of more than 10 percent of the kernels in a lot are lighter and/or darker than the limits of such a range in color, the lot should not be considered fairly uniform. (35)

Excepting U.S. No. 1 Halves grade, all other grades do not require the kernels to be fairly uniform in color. A lot may be quite irregular in color, and still meet the grade, provided that the percentages of defective kernels are within tolerance. (36)

- (37) Dark Amber. Kernels in this color class are considered as "damaged" and scored as grade defects against the tolerances listed in the standards. Such kernels shall not be included with the "serious damage".
- (38) Dark Skin Discoloration. Kernels with more than one-fourth of the surface area darker than the minimum shade of "dark amber" are very objectionable, and are classed as "seriously damaged". They are scored against the restricted tolerance along with mold, rancid, insect injury etc. In estimating the percentage of the surface of a kernel which has dark discoloration, base the estimate on the total surface area of the kernel including any portions of the surface which may be without skin.
- (39) Scoring Skin Color Defects. Kernels classed as damaged because of "dark amber" color should be kept separate from other damaged kernels. This is because both the U. S. No. 1 grades and the U. S. Commercial grades have separate tolerances for damage by skin color. The No. 1 grades permit any unused portion of the general defects tolerance to be applied to increase the tolerance for damage by skin color. The U. S. Commercial grades do not include this feature, and the tolerance for kernels damaged by skin discoloration may not be increased.
- (40) Development (Plumpness) of Kernel. All grades require kernels to be "fairly well developed" or better. This term is defined, and also it is illustrated in cross section sketches in the standards. Kernels classed as "poorly developed" are considered to be damaged and shall be scored as grade defects. Kernels classed as "undeveloped" are scored as serious damage. This development factor primarily affects the Halves grades, but it may also have some effect on the grading of lots made up of pieces. In judging kernels for degree of development, make allowance for the thickness of the half or piece in relation to its width and length. A small half or piece may be considerably thinner in cross section than a large one, and still be classed as "fairly well developed".
- (41) Shriveled Kernel. Shriveling as such should not be classed as a grade defect unless the surface of the kernel is "very conspicuously wrinkled." Most kernels which are materially shriveled will be examined critically on the basis of development, and either passed or scored in that category. Generally speaking, the shrivel factor will apply only to halves or large pieces.
- (42) Well Dried. It is unlikely that this factor will ever be a problem to an inspector. The possibility of mold developing on uncured kernels is too great for a sheller to risk packing pecans before they

are sufficiently dry. However, kernels which are not "well dried" as defined shall be scored as damaged.

Kernel Spots. The definitions of what constitutes "damage" or "serious damage" are very specific as to the size, number or aggregate area of spots. The word "dark" in the definitions means that only those spots which are definitely contrasting in color should be considered when deciding whether to score a kernel. (43)

Adhering Material. This is a fuzzy or velvety substance from the inside of the shell which occasionally remains on the part of the kernel which was next to the shell. It is likely to be found on kernels which are not as well developed as would be desired. When more than one-fourth of the surface on one side of the kernel is covered, the kernel is classed as seriously damaged. Consider only one side of the kernel when judging it for this factor. If the kernel also has a more serious type of defect, score it for that factor rather than for adhering material. (44)

Internal flesh discoloration. This defect is believed to be caused by a breakdown of the cells. It usually starts near the sprout-end of the kernel, causing gray, brown or black discoloration of the meat beneath or near the center ridge. Although it is widely known as "embryo rot," the name is misleading because it is apparently not associated with any mold or bacteria. In most but not all cases, there is some slight indication of the presence of internal discoloration on the outer surface of the center ridge. It is most likely to be found in kernels which are not well developed. (45)

To look for this defect, cut the kernel with a sharp knife, making the cut along the center ridge lengthwise of the kernel or the ridge line. In judging whether to score and how to score internal flesh discoloration, it falls into four classes: (46)

1. Light shades of discoloration do not materially affect the kernel, and shall not be classed as damage, regardless of the length of the affected area. (47)
2. Medium shades of gray or brown discoloration extending more than one-fourth the length of the half-kernel or piece shall be classed as damage. Unless the medium shade of discoloration extends more than one-fourth the length of the kernel, it shall not be scored. On the other hand, even if the medium shade extends the full length of the kernel, it shall be scored only as damage, not as serious damage. (48)

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- (49) 3. Dark shades of discoloration (dark gray, dark brown or black) which affect the appearance to an equal or greater extent than the medium shade described above, but which extend less than one-third the length of the kernel, shall be scored as damaged, not as serious damage.
- (50) 4. Dark shades of discoloration extending more than one-third the length of the kernel shall be scored as serious damage. Do not score a kernel as seriously damaged unless the discoloration is unquestionably dark in more than one-third the length of the kernel.
- (51) Mold. Score a kernel as seriously damaged if it shows any plainly visible mold. A very slight growth of mold which is not plainly visible and is scarcely noticeable shall not be classed as a defect.
- (52) Rancidity. A rancid kernel is scored as serious damage. It is often impossible to positively identify rancidity just by the appearance of the flesh. However, a rancid kernel is likely to have flesh which is abnormally oily in appearance or somewhat discolored. Kernels with a distinct off-flavor must not be confused with or classed as rancidity but should be considered as damage under the general definition as not being of good edible quality.
- (53) Decay. When any part of a kernel is decomposed or rotten, the kernel is scored as seriously damaged.
- (54) Insect Injury. Any distinct evidence of insect activity on the kernel shall class it as seriously damaged. This includes web, frass or the insect itself attached to the kernel. It also includes holes or depressions which are plainly and positively identifiable as being caused by insect feeding.
- (55) Live or dead insects or insect fragments present in the sample for analysis, but not attached to kernels (loose insects) shall be considered foreign material and included in the .05% tolerance. In addition, when such insects are scattered in the container in sufficient amounts, their presence could seriously detract from the appearance, edible, or marketing quality of the lot as a whole. The entire contents of the container should be observed during sampling. When insects are observed in several containers, inspectors should take note of the number of insects in each container and the number of containers affected. The Grading Section in Washington, D.C. should be notified, through normal supervisory channels, when the insect infestation is sufficient to seriously affect the lot.

Application of Standards

- (56) The grade of a lot is determined on the basis of a composite sample, because it is impractical to analyze samples from individual containers.

Therefore, the size and grade designation reported for a lot shall be that determined by analysis of a portion of the sample. However, groups of containers shall be sampled and graded separately if obviously distinct differences are noted as mentioned in paragraphs 8 and 12.

TOLERANCES

Tolerances which apply to size or count are completely separate (57)
from those which apply to quality, and from those which apply to shell and foreign material. Some kernels which are scored against the tolerance for undersize may have to be scored also against the tolerance for grade defects. For example, a piece which passes through the minimum size screen would be weighed with the undersize. Later, the same piece might be picked out because of being dark amber color, and would be scored as damaged by skin color.

Both the U. S. No. 1 grades and the U. S. Commercial grades provide (58)
separate tolerances for kernels damaged by dark amber skin color and for those having other grade defects. The U. S. No. 1 tolerances for defects of a general nature are fixed at 3 percent, including not more than 0.5 percent for serious damage. The tolerance for damage by skin color ("dark amber") is also 3 percent. Any unused portion of the 3 percent tolerance for general defects may be used to increase the tolerance for damage by skin color, but the total tolerance in this case may not exceed 6 percent. The tolerance for general types of defects may not be increased by any unused portion of the tolerance for damage by skin color.

In the U. S. Commercial grades, neither the 8 percent tolerance (59)
for general defects nor the separate 25 percent tolerance for damage by skin color may be increased by any unused portion of the other tolerance.

THE CERTIFICATE

Only those parts of the certificate which need special mention as (60)
they apply to shelled pecans will be discussed here. Those parts which apply uniformly to all commodities are covered in the general shipping point and market handbooks.

Date, Time and Place of Inspection. Report both the time the samp- (61)
ling operation was begun and the time of starting the sampling analyses.

"Sample drawn Nov. 20, 1969, 10: a.m.
Sample analyzed Nov. 20, 1969, 1:30 p.m."

(62) Where Inspected. Report place where the sample was drawn. If the sample is sent to some other inspection office for analysis, also show the place and time that the analysis was made.

(63) Product and Distinguishing Marks. Always give four kinds of information under this heading:

1. Class of kernels.
2. Type of containers.
3. Marks.
4. Quantity.

Examples:

1. SHELLED PECAN PIECES in plastic-lined fiberboard cartons stenciled "30 pounds net, U. S. No. 1 Extra Large Pieces, Dixie Pecan Co., Mobile, Alabama". Applicant's count 400 cartons.
2. SHELLED PECAN HALVES in transparent plastic bags printed "Southern Maid Selected Pecan Halves, net weight 8 ounces, Dixie Shelling Co., Mobile, Alabama." Packed in 36-count master containers. Applicant's count 1,200 cartons.

(64) Pack. All packages are filled on a weight basis, so the degree of fill is not of great importance. However, if bulk cartons are involved, show whether they are well filled, slightly slack or slack a certain distance in terms of inches.

(65) If requested to determine the net weights of packages, you should report the finding under this heading. Report both the range and the average based upon a large number of individual package weights.

(66) Size. Report adequate information to justify, if possible, classifying the lot in one of the size designations provided in the standards. Even if the lot is too irregular in size to meet any established size designation, a fairly detailed description of the lot will be helpful to interested parties. Examples:

(67) Lots intended for "Halves" grades:

1. Average count 372 per pound. Ten smallest halves weigh more than half the weight of 10 largest per 100 halves. 12% pieces, including 4% smaller than one-half of a half-kernel, and .04% particles. (Report this lot under "Grade" as "extra large halves".)

2. Average count 720 per pound, fairly uniform in size. 10% pieces, including 1.5% smaller than one-half of a half-kernel and 0.5% particles.
(Report this lot under "Grade" as "small halves".)
3. Average count of halves 327 per pound; fairly uniform in size. 31% pieces, including 8% which pass through 5/16 round opening and 0.07% particles.
(Report this lot under "Grade" as "halves and pieces".)
4. Average count 467 per pound. 10 smallest halves weigh only 38% of weight of 10 largest per hundred. 14% pieces, including 3% smaller than one-half of a half-kernel and 0.06% particles. (Report under "Grade" as "halves 467 count, irregular size.")

Lots intended for "Halves and Pieces" grades

(68)

1. Halves average 526 per pound. 43% pieces, including 13% which pass through 5/16 round opening and 0.03% particles.
(Report under "Grade" as "halves and pieces".)
2. Halves average 632 per pound. 57% pieces, including 13% which pass through 9/16 round opening and 0.09% particles.
(Report under "Grade" either as "fails to meet halves and pieces size", or as "mammoth pieces".)
3. Halves average 565 per pound. 38% pieces, including 18% which pass through 5/16 round opening and 1.30% particles.
(Report under "Grade" as "fails to meet halves and pieces classification account undersize".)

Lots intended for "Pieces" grades

(69)

1. Mostly between 5/16 and 8/16 inch diameter. Oversize and under-size total 12%, including 0.06% particles.
(Report under "Grade" as "large pieces".)
2. Mostly between 2/16 and 6/16 inch diameter. 2% over 6/16, and 20% under 3/16 inch, including 8% under 2/16 inch and 0.02% particles. (Report under "Grade" as "pieces 2/16 to 6/16".)
3. Generally between 1/16 and 3/16 inch diameter. 6% over 3/16 and 1.12% particles under 1/16 inch.
(Report under "Grade" as "midget pieces".)

4. Mostly 9/16 inch or larger in diameter. 12% under 9/16, including 0.04% particles.
(Report under "Grade" as "mammoth pieces.")
5. Mostly 3/16 inch to 6/16 inch in diameter. 2% over 6/16 inch and 17% under 3/16 inch, including 0.07% particles.

(Report under "Grade" as "fails to meet requirements for medium size account of percentage of off-size.")

(70)

Quality. Under this heading, report any facts intended to describe the general appearance of the lot, and also the percentages of defective kernels. Examples:

1. Generally light and fairly uniform color, well developed and well dried. Of approximately 2,000 grams sample drawn, 1,000 grams analyzed contain the following:

	<u>Grams</u>	<u>Percent</u>
Total defective kernels (mostly adhering material and skin discoloration)	19.8	1.98
Including serious damage	.1	.01
Center wall	.2	.02

(Report under "Grade" as "U. S. No. 1, Light")

2. Irregular color, mostly light amber to amber, well to fairly well developed and well dried. Of approximately 1,100 grams sample drawn, 500 grams analyzed contain the following:

	<u>Grams</u>	<u>Percent</u>
Dark amber kernels	91.6	18.32
Other grade defects (mostly poorly developed and internal discoloration)	25.7	5.14
Including serious damage	3.1	.62
Shell and Center wall	.1	.02

(Report under "Grade" as "U. S. Commercial")

3. Generally light amber to amber and fairly uniform color, well to fairly well developed and well dried. Of approximately 5,000 grams sample drawn, 2,000 grams analyzed contain the following:

	<u>Grams</u>	<u>Percent</u>
Dark amber kernels	85.2	4.26
Other grade defects (mostly internal discoloration)	19.6	.98
Including serious damage	.8	.04
Shell or center wall	.4	.02
(Report under "Grade" as "U. S. No. 1")		

4. Generally light to amber and irregular in color, well to fairly well developed and well dried. Of approximately 2,500 grams sample drawn, 1,000 grams analyzed contain the following:

	<u>Grams</u>	<u>Percent</u>
Dark amber kernels	180.1	18.01
Other grade defects	92.3	9.23
Including serious damage (Internal discoloration and dark skin discoloration)	18.2	1.82
Shell or center wall	.3	.03
(Report under "Grade" as "Fails to grade U. S. Commercial account defects in excess of tolerance").		

Grade. Under this heading should be reported the size classification, as well as the grade of the lot. In some cases, when a lot will meet a color classification, or when a color determination has been requested, color also should be reported here on the basis of statements shown under the "Quality" heading. Examples: (71)

1. "U. S. No. 1 Extra Large Halves".
2. "U. S. Commercial Medium Size, Light Halves".
3. "Fails to grade U. S. Commercial Large Halves account defects in excess of tolerance."
4. "U. S. No. 1 grade, but fails to meet requirements for Medium Halves account irregular size."

5. "U. S. No. 1 Midget Pieces."

6. "U. S. No. 1 Light Amber Halves and Pieces".

(72)

Remarks. It may occasionally be appropriate to mention that the lot was graded on the basis of some particular size classification or color classification at the applicant's request. If the sample has been drawn by an inspector and then sent to another market for grading, the facts should be reported. Also, any restriction of sampling should be noted here.

Examples:

1. "The sample covered by this certificate was drawn by Federal inspector John Doe of Big City on Oct. 20, 1969, and was mailed to Chicago for analysis."
2. "This inspection and certificate is restricted to the accessible portion of the load consisting of the last three stacks of cartons at the rear of the truck."

(73)

HOLDING SAMPLES

After the analysis is completed, place the off-size and each class of grade defects in separate small bags or envelopes. Place these inside the container with the analysis sample, mark the container for identification, and hold the sample for at least two weeks for reference.

(74)

Check Sample. A portion of the original sample equal in size to the analysis sample shall be kept in a separate, well marked container. Hold this sample for a period of 30 days to have it available in case of question or protest.

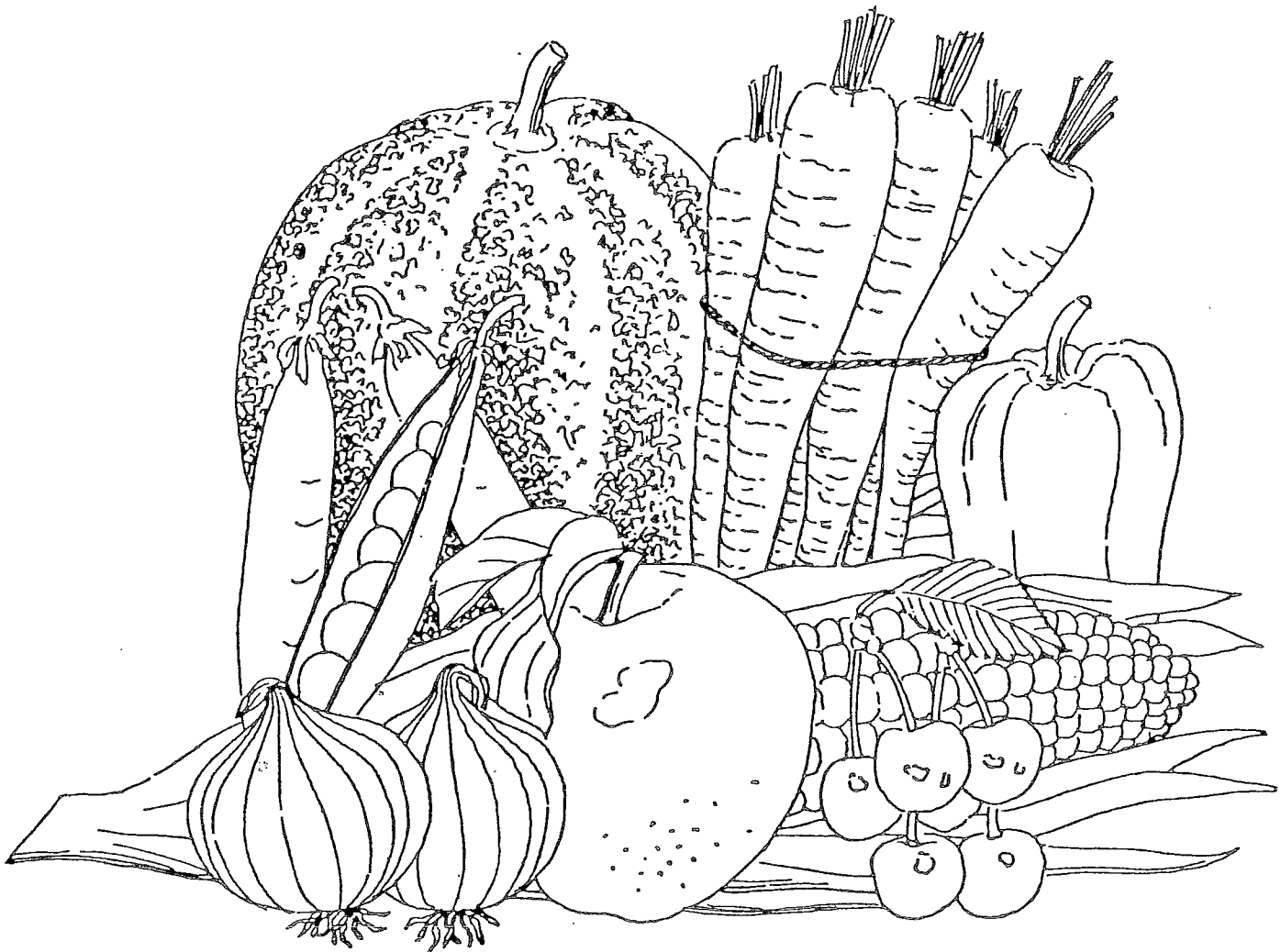
(75)

APPEAL INSPECTIONS

When reinspection is requested because of questioning the grade reported from the first inspection, an appeal inspection may be required. In such cases, follow the usual procedure of extra sampling, analyzing of a larger sample, preferably by two inspectors, and referring results to the Washington office for decisions. The check sample might be used as the basis for an appeal inspection if the lot is not available for resampling, and if instructions for this procedure are issued by the Washington office.

Appendix I

United States Standards



UNITED STATES STANDARDS FOR GRADES OF SHELLED PECANS ^{1/}

(34 F. R. 9377)

Effective July 15, 1969

GRADES	
Sec.	
51.1430	U.S. No. 1 Halves.
51.1431	U.S. No. 1 Halves and Pieces.
51.1432	U.S. No. 1 Pieces.
51.1433	U.S. Commercial Halves.
51.1434	U.S. Commercial Halves and Pieces.
51.1435	U.S. Commercial Pieces.
COLOR CLASSIFICATIONS	
51.1436	Color classifications.
SIZE CLASSIFICATIONS	
51.1437	Size classifications for halves.
51.1438	Size classifications for pieces.
TOLERANCES FOR DEFECTS	
51.1439	Tolerances for defects.
APPLICATION OF STANDARDS	
51.1440	Application of standards.
DEFINITIONS	
51.1441	Half-kernel.
51.1442	Piece.
51.1443	Particles and dust.
51.1444	Well dried.
51.1445	Fairly well developed.
51.1446	Poorly developed.
51.1447	Fairly uniform in color.
51.1448	Fairly uniform in size.
51.1449	Damage.
51.1450	Serious damage.
METRIC CONVERSION TABLE	
51.1451	Metric conversion table.
AUTHORITY: The provisions of this subpart issued under secs. 203, 60 Stat. 1087, as amended; 1090 as amended; 7 U.S.C. 1622, 1624.	
GRADES	
§ 51.1430 U.S. No. 1 Halves.	
"U.S. No. 1 Halves" consists of pecan half-kernels which meet the following requirements:	
(a) For quality:	
(1) Well dried;	
(2) Fairly well developed;	
(3) Fairly uniform in color;	
(4) Not darker than "amber" skin color;	
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 or with applicable State laws and regulations.	
(5) Free from damage or serious damage by any cause;	
(6) Free from pieces of shell, center wall and foreign material; and,	
(7) Comply with tolerances for defects (see § 51.1439); and,	
(b) For size:	
(1) Halves are fairly uniform in size;	
(2) Halves conform to size classification or count specified; and,	
(3) Comply with tolerances for pieces, particles, and dust (see § 51.1437).	
§ 51.1431 U.S. No. 1 Halves and Pieces.	
The requirements for this grade are the same as those for U.S. No. 1 Halves except:	
(a) For size:	
(1) At least 50 percent, by weight, are half-kernels;	
(2) Both halves and pieces will not pass through a $\frac{5}{16}$ -inch round opening; and,	
(3) Comply with tolerances for under-size. (See Table III.)	
§ 51.1432 U.S. No. 1 Pieces.	
The requirements for this grade are the same as those for U.S. No. 1 Halves except:	
(a) For quality:	
(1) No requirement for uniformity of color; and,	
(b) For size:	
(1) No requirement for percentage of half-kernels;	
(2) Conform to any size classification or other size description specified; and,	
(3) Comply with applicable tolerances for off-size. (See Table III.)	
§ 51.1433 U.S. Commercial Halves.	
The requirements for this grade are the same as those for U.S. No. 1 Halves except:	
(a) For quality:	
(1) No requirement for uniformity of color; and,	
(2) Increased tolerances for defects (see § 51.1439); and,	
(b) For size:	
(1) No requirement for uniformity of size.	

§ 51.1434 U.S. Commercial Halves and Pieces.

The requirements for this grade are the same as those for U.S. No. 1 Halves and Pieces except:

(a) For quality:

(1) No requirement for uniformity of color; and,

(2) Increased tolerances for defects. (See § 51.1439.)

§ 51.1435 U.S. Commercial Pieces.

The requirements for this grade are the same as those for U.S. No. 1 Pieces except for:

(a) Increased tolerances for defects. (See § 51.1439.)

COLOR CLASSIFICATIONS

§ 51.1436 Color classifications.

(a) The skin color of pecan kernels may be described in terms of the color classifications provided in this section. When the color of kernels in a lot generally conforms to the "light" or "light amber" classification, that color classification may be used to describe the lot in connection with the grade.

(1) "Light" means that the kernel is mostly golden color or lighter, with not more than 25 percent of the surface darker than golden, and none of the surface darker than light brown.

(2) "Light amber" means that the kernel has more than 25 percent of its surface light brown, but not more than 25 percent of the surface darker than light brown, and none of the surface darker than medium brown.

(3) "Amber" means that the kernel has more than 25 percent of the surface medium brown, but not more than 25 percent of the surface darker than medium brown, and none of the surface darker than dark brown (very dark-brown or blackish-brown discoloration).

(4) "Dark amber" means that the kernel has more than 25 percent of the surface dark brown, but not more than 25 percent of the surface darker than dark brown (very dark-brown or blackish-brown discoloration).

(b) U.S. Department of Agriculture kernel color standards, PEC-MC-1, consisting of plastic models of pecan kernels, illustrate the color intensities implied by the terms "golden," "light brown," "medium brown," and "dark brown" referred to in paragraph (a) of this section. These color standards may be examined in the Fruit and Vegetable Division, AMS, U.S. Department of Agri-

culture, South Building, Washington, D.C. 20250; in any field office of the Fresh Fruit and Vegetable Inspection Service; or upon request of any authorized inspector of such Service. Duplicates of the color standards may be purchased from NASCO, Fort Atkinson, Wis. 53538.

SIZE CLASSIFICATIONS

§ 51.1437 Size classifications for halves.

The size of pecan halves in a lot may be specified in accordance with one of the size classifications shown in Table I:

TABLE I

<i>Size classifications for halves</i>	<i>Number of halves per pound</i>
Mammoth -----	250 or less.
Junior mammoth -----	251-300.
Jumbo -----	301-350.
Extra large -----	351-450.
Large -----	451-550.
Medium -----	551-650.
Small (topper) -----	651-750.
Midget -----	751 or more.

(a) The number of halves per pound shall be based upon the weight of half-kernels after all pieces, particles and dust, shell, center wall, and foreign material have been removed.

(b) In lieu of the size classifications in Table I, the size of pecan halves in a lot may be specified in terms of the number of halves or a range of numbers of halves per pound. For example, "400" or "600-700".

(c) Tolerance for count per pound: In order to allow for variations incident to proper sizing, a tolerance shall be permitted as follows:

(1) When an exact number of halves per pound is specified, the actual count per pound may vary not more than 5 percent from the specified number; and,

(2) When any size classification shown in Table I or a range in count per pound is specified, no tolerance shall be allowed for counts outside of the specified range.

(d) *Tolerances for pieces, particles, and dust.* In order to allow for variations incident to proper sizing and handling, not more than 15 percent, by weight, of any lot may consist of pieces, particles, and dust: *Provided*, That not more than one-third of this amount, or 5 percent, shall be allowed for portions less than

one-half of a complete half-kernel, including not more than 1 percent for particles and dust.

§ 51.1438 Size classifications for pieces.

The size of pecan pieces in a lot may be specified in accordance with one of the size classifications shown in Table II.

TABLE II

Size classification	Maximum diameter (will pass through round opening of following diameter)	Minimum diameter (will not pass through round opening of following diameter)
Mammoth pieces.....	No limitation.....	Inch
Extra large pieces.....	$\frac{3}{16}$ inch.....	$\frac{3}{16}$
Halves and pieces.....	No limitation.....	$\frac{7}{16}$
Large pieces.....	$\frac{3}{16}$ inch.....	$\frac{5}{16}$
Medium pieces.....	$\frac{3}{16}$ inch.....	$\frac{3}{16}$
Small pieces.....	$\frac{3}{16}$ inch.....	$\frac{2}{16}$
Midget pieces.....	$\frac{3}{16}$ inch.....	$\frac{2}{16}$
Granules.....	$\frac{3}{16}$ inch.....	$\frac{1}{16}$

(a) In lieu of the size classifications in Table II, the size of pieces in a lot may be specified in terms of minimum diameter, or as a range described in terms of minimum and maximum diameters expressed in sixteenths or sixty-fourths of an inch.

(b) Tolerances for size of pieces: In order to allow for variations incident to proper sizing, tolerances are provided for pieces in a lot which fail to meet the requirements of any size specified. The tolerances, by weight, are shown in Table III.

TABLE III

Size classification	Total tolerance for offsize pieces	Tolerance (included in total tolerance) for pieces smaller than	
		$\frac{3}{16}$ inch	$\frac{1}{16}$ inch
	Percent	Percent	Percent
Mammoth pieces.....	15	1	-----
Extra large pieces.....	15	1	-----
Halves and pieces.....	15	1	-----
Large pieces.....	15	1	-----
Medium pieces.....	15	2	-----
Small pieces.....	15	2	-----
Midget pieces.....	15	-----	2
Granules.....	15	-----	5
Other specified size.....	15	1	-----

TOLERANCES FOR DEFECTS

§ 51.1439 Tolerances for defects.

In order to allow for variations incident to proper grading and handling in each of the foregoing grades, the following tolerances, by weight, are provided as specified:

(a) U.S. No. 1 Halves, U.S. No. 1 Halves and Pieces, and U.S. No. 1 Pieces grades:

(1) 0.05 percent for shell, center wall, and foreign material;

(2) 3 percent for portions of kernels which are "dark amber" or darker color, or darker than any specified lighter color classification but which are not otherwise defective; and,

(3) 3 percent for portions of kernels which fail to meet the remaining requirements of the grade, including therein not more than 0.50 percent for defects causing serious damage: *Provided*, That any unused portion of this tolerance may be applied to increase the tolerance for kernels which are "dark amber" or darker color, or darker than any specified lighter color classification.

(b) U.S. Commercial Halves, U.S. Commercial Halves and Pieces, and U.S. Commercial Pieces grades:

(1) 0.15 percent for shell, center wall, and foreign material;

(2) 25 percent for portions of kernels which are "dark amber" or darker color, or darker than any specified lighter color classification, but which are not otherwise defective; and,

(3) 8 percent for portions of kernels which fail to meet the remaining requirements of the grade, including therein not more than 1 percent for defects causing serious damage.

APPLICATION OF STANDARDS

§ 51.1440 Application of standards.

The grade of a lot of shelled pecans shall be determined on the basis of a composite sample drawn at random from containers in various locations in the lot. However, any identifiable container or number of containers in which the pecans are obviously of a quality or size materially different from that in the majority of containers, shall be considered as a separate lot, and shall be sampled and graded separately.

DEFINITIONS

§ 51.1441 Half-kernel.

"Half-kernel" means one of the separated halves of an entire pecan kernel with not more than one-eighth of its original volume missing, exclusive of the portion which formerly connected the two halves of the kernel.

§ 51.1442 Piece.

"Piece" means a portion of a kernel which is less than seven-eighths of a half-kernel, but which will not pass through a round opening two-sixteenths inch in diameter.

§ 51.1443 Particles and dust.

"Particles and dust" means, for all size designations except "midget pieces" and "granules," fragments of kernels which will pass through a round opening two-sixteenths inch in diameter.

§ 51.1444 Well dried.

"Well dried" means that the portion of kernel is firm and crisp, not pliable or leathery.

§ 51.1445 Fairly well developed.

"Fairly well developed" means that the kernel has at least a moderate amount of meat in proportion to its width and length. (See Figure I.)

Figure 1

CROSS SECTION ILLUSTRATION



1. WELL DEVELOPED

Lower limit. Kernels having less meat content than these are not considered well developed.



2. FAIRLY WELL DEVELOPED

Lower limit for U. S. No. 1 grade. Kernels having less meat content than these are not considered fairly well developed and are classed as damaged.



3. POORLY DEVELOPED

Lower limit, damaged but not seriously damaged. Kernels having less meat content than these are considered undeveloped and are classed as seriously damaged.

§ 51.1446 Poorly developed.

"Poorly developed" means that the kernel has a small amount of meat in proportion to its width and length. (See Figure I.)

§ 51.1447 Fairly uniform in color.

"Fairly uniform in color" means that 90 percent or more of the kernels in the lot have skin color within the range of one or two color classifications.

§ 51.1448 Fairly uniform in size.

"Fairly uniform in size" means that, in a representative sample of 100 halves, the 10 smallest halves weigh not less than one-half as much as the 10 largest halves.

§ 51.1449 Damage.

"Damage" means any specific defect described in this section; or an equally objectionable variation of any one of these defects, or any other defect, or any combination of defects, which materially detracts from the appearance or the edible or marketing quality of the individual portion of the kernel or of the lot as a whole. The following defects should be considered as damage:

(a) Adhering material from inside the shell when attached to more than one-fourth of the surface on one side of the half-kernel or piece;

(b) Dust or dirt adhering to the kernel when conspicuous;

(c) Kernel which is not well dried;

(d) Kernel which is "dark amber" or darker color;

(e) Kernel having more than one dark kernel spot, or one dark kernel spot more than one-eighth inch in greatest dimension;

(f) Shriveling when the surface of the kernel is very conspicuously wrinkled;

(g) Internal flesh discoloration of a medium shade of gray or brown extending more than one-fourth the length of the half-kernel or piece, or lesser areas of dark discoloration affecting the appearance to an equal or greater extent; and,

(h) Poorly developed kernel. (See Figure I.)

§ 51.1450 Serious damage.

"Serious damage" means any specific defect described in this section; or an equally objectionable variation of any one of these defects, or any other defect, or any combination of defects, which

seriously detracts from the appearance or the edible or marketing quality of the individual portion of kernel or of the lot as a whole. The following defects shall be considered as serious damage:

(a) Any plainly visible mold;

(b) Rancidity when the kernel is distinctly rancid to the taste. Staleness of flavor shall not be classed as rancidity;

(c) Decay affecting any portion of the kernel;

(d) Insects, web, or frass or any distinct evidence of insect feeding on the kernel;

(e) Internal discoloration which is dark gray, dark brown, or black and extends more than one-third the length of the half-kernel or piece;

(f) Adhering material from inside the shell when attached to more than one-half of the surface on one side of the half-kernel or piece;

(g) Dark kernel spots when more than three are on the kernel, or when any dark kernel spot or the aggregate of two or more spots affect an area of more than 10 percent of the surface of the half-kernel or piece;

(h) Dark skin discoloration, darker than "dark brown," when covering more than one-fourth of the surface of the half-kernel or piece; and,

(i) Undeveloped kernel. (See Figure I.)

METRIC CONVERSION TABLE

§ 51.1451 Metric conversion table.

Inches	Millimeters (mm)
$\frac{1}{16}$	12.7
$\frac{1}{8}$	11.1
$\frac{3}{16}$	9.5
$\frac{1}{4}$	7.9
$\frac{5}{16}$	6.4
$\frac{3}{8}$	4.8
$\frac{1}{2}$	3.2
$\frac{5}{8}$	2.4
$\frac{3}{4}$	2.0
$\frac{7}{8}$	1.6

These standards shall become effective on July 15, 1969, and will thereupon supersede the U.S. Standards for Shelled Pecans which have been in effect since October 19, 1952 (7 CFR, § 51.1430-51.1453).

Dated: June 10, 1969.

JOHN E. TROMER,
Acting Deputy Administrator,
Marketing Services.

[F.R. Doc. 69-7052; Filed, June 13, 1969;
8:48 a.m.]