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Agriculture

Agricultural  
Marketing  
Service

Fruit and  
Vegetable  
Programs

Fresh Products  
Branch

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# Lemons

## Shipping Point and Market Inspection Instructions



# Shipping Point and Market Inspection Instructions for Lemons

These inspection instructions are specifically developed by the Fresh Products Branch to assist officially licensed inspectors in the interpretation and application of the U.S. Standards for Grades of Lemons, Section 51.2795.

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 Lemons are printed in the appendix of this handbook. All U.S. standards are available on the Internet under the USDA homepage.

**March 2005**

*This replaces the Lemon sections of the Citrus, California and Arizona Shipping Point and Market Inspection Instructions, dated August 2001.*

**This publication may be duplicated without authorization from USDA.**

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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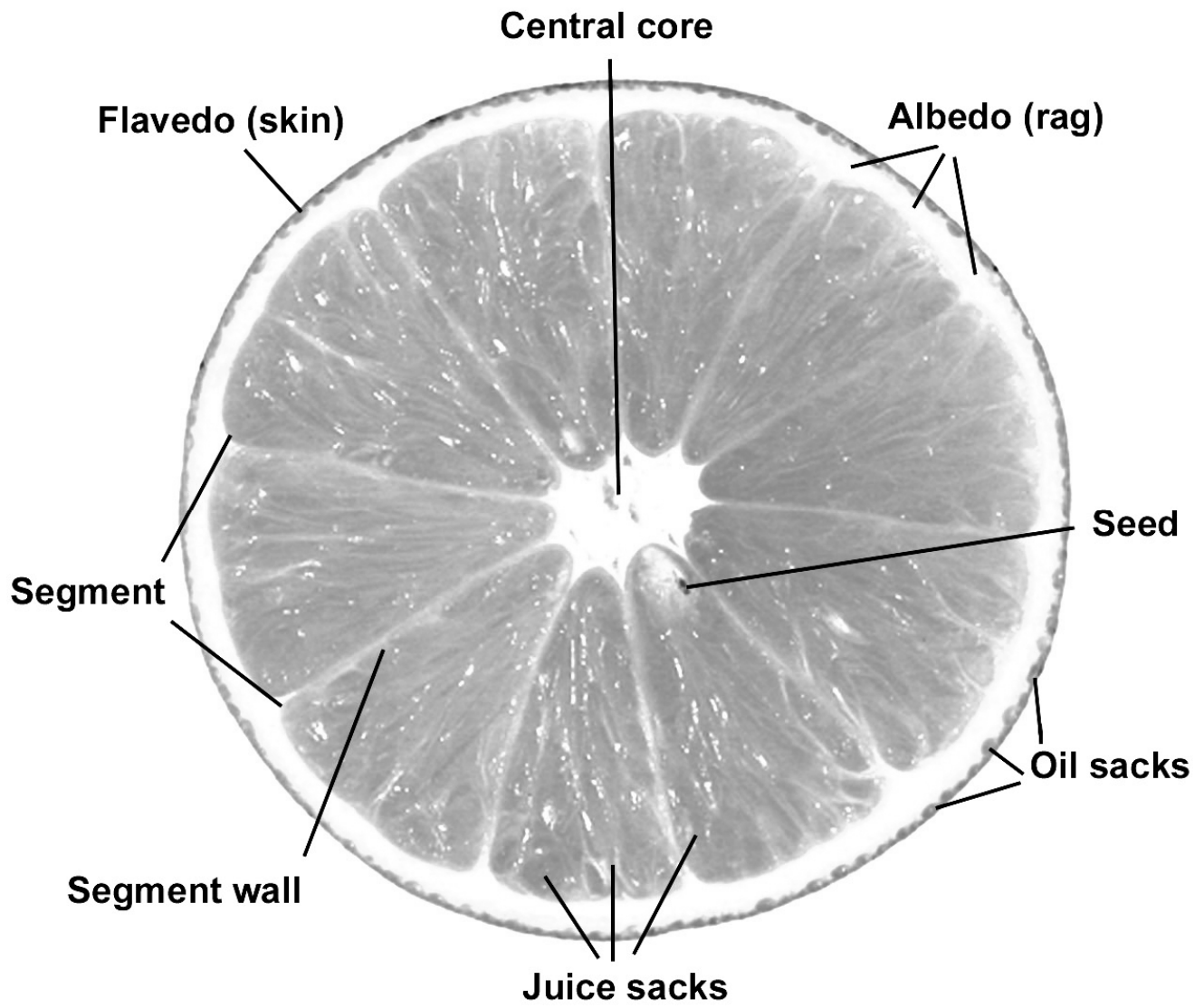
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## PARTS OF A LEMON



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## GENERAL

The lemons produced throughout the year in the United States are shipped from California, Arizona and Florida. There are also imports from Chile and Spain from April through August.

The U.S. Standards for Grades of Lemons are generic standards and can be applied to all lemons, foreign or domestic.

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## 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 shall 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.

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### Size of Sample

The tolerances in the U.S. Standards for Grades of Lemons are determined on the basis of count.

The sample size for grade and size determination on lemons shall be a **minimum of 25 fruit for each sample**, regardless of container size.

### SHIPPING POINT

**In-line Certification** - Each sample shall consist of at least 25 fruit. If containers have less than 25 fruit, a composite sample of 25 fruit shall be examined. If sample tolerances are exceeded, examine 50 fruit when containers contain 50 or more fruit; if containers contain more than 25 fruit, but less than 50 fruit, examine the entire contents. The lot average must never exceed the lot tolerance.

The first sample examined must meet **all** lot tolerances. If three consecutive samples in a lot exceed a lot tolerance, a corrective action must be taken on the packed containers that are represented by the third sample.

**Stationary Lots** - Sampling for all lots shall consist of at least 25 fruit. If containers have less than 25 fruit, a composite sample of 25 fruit or more shall be examined. A minimum of 3 samples must be examined to certify a lot.

If a **lot** tolerance is exceeded, double the sample size for containers containing 50 fruit or more, except for composite samples. If a **sample** tolerance is exceeded,

examine the entire contents of the container, except for bulk lots or bulk bins. Sample size for bulk lots or bulk bins shall be limited to a maximum of 100 fruit.

## **MARKET**

For packages containing 25 fruit or more, a minimum of 25 fruit shall be examined. When any **sample** tolerance is exceeded, the entire contents of at least one package which exceeded the sample tolerance must be examined. If impractical to run the entire contents, (i.e., extremely large numbers of fruit such as 165 size lemons, and bulk lots), examine a minimum of 100 fruit.

For packages containing less than 25 fruit, a sufficient number of adjoining packages must be opened to obtain a minimum of 25 fruit. The entire contents shall be used for the sample when opening an adjoining package. If a sample tolerance is exceeded using this method, **do not** double the sample size. The lot is out of grade because of the sample tolerance being exceeded.

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## **Sampling Bulk Loads**

Bulk loads (volume-filled trailers, pallet boxes, bulk bins, etc.) may contain up to 60,000 pounds of fruit. The method of reporting defective fruit in bulk shipments is identical to fruit packed in containers.

When determining the minimum number of samples drawn from a bulk shipment, divide the approximate net weight by the appropriate “packed net weight” of the fruit (lemons – 40 pounds). This calculation provides a 4/5 bushel equivalent. Use the calculated carton equivalent as a guide when determining the number of samples to be examined. Example: Net weight of a lemon load is approximately 40,000 pounds;  $40,000 \div 40$  (packed net weight) = 1000 cartons.

Examine a minimum of 25 contiguous fruit per sample. When a sample tolerance is exceeded, the sample size must be at least doubled. Report range and averages in the appropriate sections on the certificate.

When determining size, measure the largest and smallest fruit in each sample and record the range on the notesheet. On the certificate, report the range and, if needed, include a “mostly” statement.

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## **Number of Samples**

Due to potential variations in size, quality and condition, a specific number of samples per load or lot cannot be provided. It is the inspector’s responsibility to examine a sufficient number of samples to ensure that a complete and accurate depiction of the load or lot is obtained.

The following information should be used for sampling guidelines:

## SHIPPING POINT

**In-line Certification** - A **minimum** of one sample for every 200 containers packed with at least 3 samples per lot, or 1/2 of 1% of the total containers packed, whichever is greater, is the recommended sampling rate.

**Stationary Lots** - A **minimum** of 1 percent of the packages within a load or lot is recommended with a minimum of three samples examined on any lot.

## MARKET

A **minimum** of 1 percent of the packages within a load or lot is recommended. For small lots, a minimum of three samples must be examined.

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### Sampling for Internal Defects

The following plans are designed to provide efficient and accurate methods to sample for internal defects in lemons. These defects include dryness-mushy condition (freezing injury), granulation (tree dryness), sprouted seeds, or any other defect that cannot be detected or determined without cutting the fruit (bruising).

There are two specific cutting plans. **Plan A** is used when internal defects are almost certain to be present (e.g., immediately following a freeze or in late spring and summer months when granulation [tree dryness] is known to be a factor). **Plan B** is used when internal defects are suspected. Plan B detects internal defects while destroying a minimum amount of fruit. Both plans are based on the initial sample size of 25 fruit.

**Plan A.** After the sample has been examined for external defects, select the 10 most suspicious fruit without regard to external defects and cut these for internal defects. If no defects are found, do not cut any other specimens from that sample. Continue to cut 10 fruit per sample provided no internal defects are found. If one or more internal defects are found, cut the remaining fruit in the sample to determine the percentage of internal defects. At **Market**, if sample tolerances are exceeded, the sample size must be at least doubled except for composite samples (50 fruit or entire contents if less than 50 fruit in the container). Continue to cut all fruit in each sample until a sample is found free from internal defects. Revert to cutting 10 fruit per sample when no internal defects are found. This does not apply to bagged lots because the entire contents of the bag have already been cut. At **Shipping Point**, do not deviate from the in-line certification sampling size.

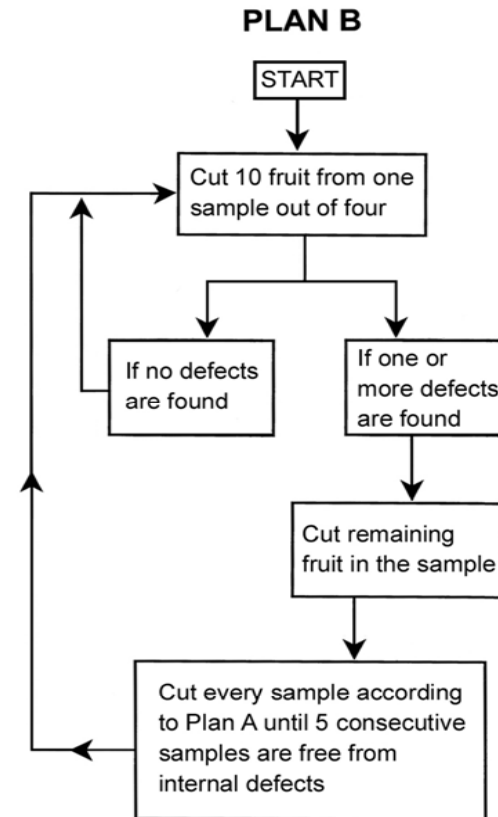
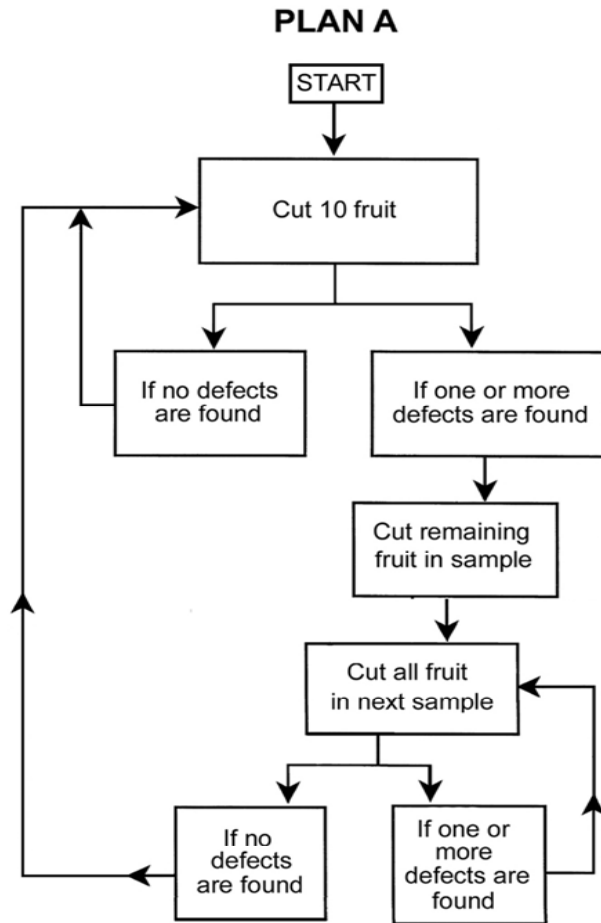
**Plan B** is similar to Plan A, the only difference is that if no internal defects are found, Plan B requires cutting 10 fruit from every **fourth** sample. Cutting should start with the first sample and continue with every **fourth** sample thereafter.

Select the 10 most suspicious fruit without regard to external defects from every fourth sample and cut them for internal defects. If no internal defects are found in the



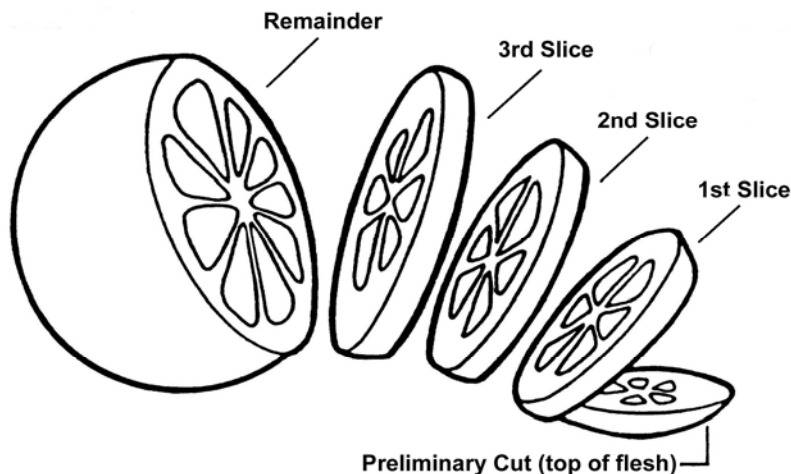
10 fruit, continue to cut the 10 most suspicious fruit from every fourth sample. If one or more defects are found, cut the remaining fruit in the sample (25), unless the sample tolerances are exceeded. When exceeded, increase sample size to 50 fruit or entire contents if containing less than 50 fruit, and begin using Plan A (not applicable to bagged lots). Cut either 10 fruit or all fruit in the sample according to Plan A until 5 consecutive samples are free from internal defects. Revert to cutting 10 fruit from every fourth sample at this point. At **Market**, if sample tolerances are exceeded, the sample size must be at least doubled (50 fruit or entire contents). At **Shipping Point**, do not deviate from the in-line certification sample size.

# CUTTING PLANS FOR INTERNAL DEFECTS



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## Cutting Instructions and Scoring Guide for Dryness-Mushy Condition



**Preliminary Cut:** This cut is intended to remove only the rind down to the fleshy portion of the fruit under the stem button and will vary in depth depending on rind thickness.

**1<sup>st</sup> Slice:** 1/4 inch. This slice may be totally dry or from mushy to dry in all segments. This is the maximum amount permitted in the U.S. No. 1 grade. If the total volume of **this** slice is affected, any dryness-mushy condition in the remaining portion of the fruit will be considered as **damage**.

**2<sup>nd</sup> Slice:** 1/4 inch. This slice, plus the first slice (totaling 1/2 inch) may be totally dry or from mushy to dry in all segments. This represents the maximum volume permitted in the U.S. No. 2 grade. If the total volume of **this** slice is affected, any dryness-mushy condition in the remaining portion of the fruit will be considered **serious damage**.

If any portion of the segments in the slice are **not** mushy or affected by dryness-mushy condition, additional mushiness or dryness may be allowed in other portions of the fruit, but the total amount must not exceed the equivalent volume permitted. If this is encountered, it will be necessary to cut several 1/4 inch slices to determine the total amount of dryness-mushiness present in the fruit.

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# TOLERANCES

## §51.2800 (a) U.S. No 1.

(1) For defects at shipping point. Not more than 10 percent, by count, of the lemons in any lot may fail to meet the requirements relating to color. In addition, not more than 10 percent, by count, of the lemons in any lot may fail to meet the remaining requirements of the specified grade, included in this amount not more than 5 percent shall be allowed for defects causing serious damage, included in this latter amount not more than 1 percent for decay.

(2) For defects en route or at destination. Not more than 10 percent, by count, of the lemons in any lot may fail to meet the requirements relating to color. In addition, not more than 12 percent, by count, of the lemons in any lot may fail to meet the remaining requirements of the grade: Provided, That included in this amount not more than the following percentages shall be allowed for defects listed: 10 percent for fruit having permanent defects; or 7 percent for defects causing serious damage, including therein not more than 5 percent for serious damage by permanent defects and not more than 3 percent for decay.

### Summary of lot tolerances for U.S. No. 1

	SPI (percent)	MKT (percent)
A. Failing color requirements	10	10
B. Defects other than color, including	10	12
1. Permanent defects, (included in B)	10	10
2. Serious damage, (included in B and 1)	5	7
a. Serious damage by permanent defects, (included in 1 and 2)	5	5
b. Decay (included in 2)	1	3

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## APPLICATION OF TOLERANCES

**§ 51.2802 Application of Tolerances.** Individual samples, based on a minimum 25 count, are subject to the following limitations, unless otherwise specified. Individual samples shall have not more than one and one-half times a specified tolerance of 10 percent or more, and not more than double a specified tolerance of less than 10 percent: Provided, That at least one decayed fruit may be permitted in any sample: And provided further, that the averages for the entire lot are within the tolerances specified for the grade.

### Summary of sample tolerances for U.S. No. 1

	SPI (percent)	MKT (percent)
A. Failing color requirements	15	15
B. Defects other than color, including	15	18
1. Permanent defects, (included in B)	15	15
2. Serious damage, (included in B and 1)	10	14
a. Serious damage by permanent defects, (included in 1 and 2)	10	10
b. Decay (included in 2)	2*	6*

\* Provided, That at least one decayed fruit may be permitted in any sample: and provided further, that the averages for the entire lot are within the tolerances specified for the grade.

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## STANDARDS FOR EXPORT

Lemons destined for export shipments are occasionally certified using the tolerances listed in the "Standards for Export" section of the grade standard. Do not apply them unless requested by the applicant.

**§51.2805 Condition standards for export. (a) Not more than a total of 10 percent, by count, of the lemons in any sample may be soft, affected by decay or contact spot, or have broken skins which are not healed, growth cracks, internal evidence of Alternaria development, internal decline (endoxerosis), or serious damage by membranous stain or other internal discoloration, or dryness or**

**mushy condition, except that not more than the following percentages of the defects enumerated shall be allowed:**

- (1) One-half of 1 percent for decay;**
- (2) 3 percent for contact spot;**
- (3) 3 percent for broken skins which are not healed;**
- (4) 3 percent for growth cracks;**
- (5) 3 percent for internal evidence of Alternaria development;**
- (6) 3 percent for internal decline (endoxerosis);**
- (7) 5 percent for soft;**
- (8) 5 percent for serious damage by membranous stain or other internal discoloration; and,**
- (9) 5 percent for serious damage by dryness or mushy condition.**

**(b) Any lot of lemons shall be considered as meeting the condition standards for export if not more than a total of 10 percent, by count, of the lemons in any sample have defects enumerated in the condition standards for export: Provided, That no sample shall have more than double the percentage specified for any one of the defects enumerated.**

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## **NOTESHEET AND CERTIFICATE**

Entries on notesheets and certificates must be kept in a legible and accurate manner. It is mandatory that all information which appears on the certificate 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 the General Inspection Instructions. Your supervisor may give you additional information.

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**Product**

The common name, "Lemons" shall be used to describe the commodity in the "PRODUCT" heading. The type or variety may be used in connection with the products listed above on the FV-184, or may be reported in the appropriate heading on the FV-300 or the FV-E300.

If containers are marked with the variety name, that name shall be listed in quotes rather than positively stated. Inspectors are not authorized to identify specific varieties.

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**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 (e.g., numerous pallets with mixed product).

At shipping point locations for "days-run" certification the applicant generally provides a manifest for count and it is acceptable to use this for the number of containers.

Fresh lemons are usually packed and shipped in either 42 lb. 4/5 bushel cartons, 38-lb. cartons (Arizona and California) or 36-lb. cartons/crates (Chile and Spain). The container type shall always be reported under this heading.

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**Brands/Markings**

At shipping point, the brand, size, PLI and other important information appearing on the container shall be reported on the notesheet and certificate in the appropriate section.

At market, the brand, variety, size, count, point of origin and other important information appearing on the container shall be reported on the notesheet in the "BRANDS/MARKINGS" section. Only the brand name and other pertinent information shall appear in this section on the certificate.

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**Origin**

The inspector, on their own authority, must not make a positive statement as to product origin. When container markings contain origin information, it should be quoted

in the appropriate location on notesheets and certificates. This policy is necessary because firms may use one mark on the same product packed in several states. If packages are not marked, or citrus is in bulk, refer to the *General Inspection Instructions* for more information.

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## CONDITION OF PACK

Condition of pack pertains to the fill of containers, tightness of fruit in place-packed containers and net weight certification.

Lemons may be packed in a variety of ways: volume-filled containers or consumer bags. Please refer to the *General Inspection Instructions* for information on reporting condition of pack.

If the applicant requests count of consumer bags per master container, report the findings in the "OTHER" section on the FV-300 with a reference under "REMARKS" that this factor was "determined and reported at applicant's request."

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## Net Weight

If requested to certify a specified or marked net weight on a stationary lot sampling or in-line sampling, follow the procedures described in the *General Inspection Instructions*. If none of the containers are under marked weight (in-line sampling), marked weight is met. However, if **any** package is under marked weight, the markings must be corrected on that package (**shipping point only**). At **Market**, refer to the *General Inspection Instructions* for specific information pertaining to "reasonable shortage limit."

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## STANDARD PACK

The standard contains "standard pack" requirements, which basically correlates to size and arrangement of fruit in place-packed containers. A citrus lot may meet the requirements of the U.S. grades and not meet standard pack requirements, and vice versa. Standard pack is certified only at the request of the applicant and referenced under the Grade heading in connection with the grade statement.

**Example:** U.S. No. 1, Standard Pack.

**§51.2803 Standard pack. (a) Lemons shall be fairly uniform in size and shall be packed in boxes or cartons and arranged according to the approved and recognized methods.**

**(b) All such containers shall be tightly packed and well filled but the contents shall not show excessive or unnecessary bruising because of overfilled containers.**



Not more than 5 percent of the samples in any lot may fail to meet standard pack requirements. If standard pack is in question, please refer to the respective standard for additional information.

Jumble-pack and volume-filled containers cannot be certified under Standard Pack requirements (refer to following section).

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## STANDARD SIZING AND FILL

When specifically requested, pack arrangements **other than** place-packed may be certified under the following specifications:

### **§51.2804 Standard sizing and fill.**

**(a) Boxes or cartons in which lemons are not packed according to a definite pattern do not meet the requirements of standard pack, but may be certified as meeting the requirements of standard sizing and fill: Provided, That the lemons in the container are fairly uniform in size as defined in §51.2803: And provided further, that the contents have been properly shaken down and the container is at least level full at time of packing.**

**(b) In order to allow for variations incident to proper packing, not more than 5 percent of the samples in any lot may fail to meet the requirements of standard sizing and fill.**

Standard sizing and fill, like standard pack, is certified only at the request of the applicant and referenced under the Grade heading in connection with the grade statement. **Example:** U.S. No.1, Standard Sizing and Fill.

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## 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 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 temperatures 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 true 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. These additional temperatures must be reported in greater detail specifying location within the lot or load.

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## SIZE

Conformance to size requirements is generally not a problem unless the pack is slack or fruit in the container appears irregularly sized. Use the term “fairly uniform” if a lot meets size requirements, “irregular” if size requirements are not met. Do not use the term “uniform” when describing size since it is not defined. The definition of fairly uniform is specified in the Standard Pack section of each standard and also listed at the end of this handbook section.

When determining size, (e.g., 165 size lemons, etc.), report a range and average diameter. To meet the requirements of fairly uniform, the smallest and largest fruit in a sample must be measured using a rigid-jaw caliper. To determine diameter, the greatest dimension measured at right angles to a line from stem to blossom end shall be used. Rotate fruit in the caliper to obtain the greatest dimension. Do not use pliable fruit that is squeezed out of shape due to tight pack for this measurement.

Size on bulk shipments and fruit in consumer bags should be reported as fairly uniform or irregular based on the facts. Traditional size markings (64, 113, 165, etc.) do not apply in these instances. When reporting size on these lots, state the diameter range in inches.

**§51.2803 Standard pack...(c) “Fairly uniform in size” means that when lemons are packed for 165 carton count or smaller size, or equivalent sizes when packed in other containers, not less than 90 percent, by count, of the lemons in any container shall be within a diameter range of four-sixteenths inch; when packed for sizes larger than 165 carton count, or equivalent sizes packed in other containers, not less than 90 percent, by count, of the lemons in any container shall be within a diameter range of six-sixteenths inch.**

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## DEFECTS (QUALITY AND CONDITION)

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

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

Factors noted with **(C)** shall be reported as **CONDITION** on market certificates. **Condition defects** are defects which 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. Factors without designation do not pertain to either category.

**Note:** All references in this standard to area, aggregating area, or length are based on a lemon 2 inches in diameter, allowing proportionately greater areas on larger fruit and lesser areas on smaller fruit.

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### **Alternaria (Q or C)**

Alternaria, when **inactive**, appears very similar to scars; gray to brown circular spots. Score as a “scar” using the scar guideline (refer to the Scar section). When appearing as described above, report this defect as a quality factor at the market.

Alternaria, in its **active** stage, also appears similar to scars. However, the affected area also includes a halo on the outer edges of the “scar.” The center portion of the scar may give the appearance of being easily removed or pulled out. If active Alternaria is found at the market, score as a serious damage condition factor and describe the appearance. Do **not** report as “Alternaria.” If the active Alternaria extends into the flesh of the fruit, score as decay.

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### **Broken Skins (Q or C)**

Broken skins may be caused by several factors, such as: stems puncturing the fruit wall, mechanical damage during packing or harvesting, as well as cuts, hail, thorn scratches, etc.

If the flesh is exposed on “unhealed” skin breaks, any amount is scorable. If “healed” skin breaks do not expose the flesh, but the rind is torn or punctured, score as:

**Damage** - When affecting more than the aggregate area of a circle 3/16 inch in diameter.

**Serious damage** - When affecting more than the aggregate area of a circle 1/4 inch in diameter.

At shipping point, score any unhealed skin break as **serious damage**. Score healed skin breaks as damage or serious damage based on the above guidelines.

At the market, score any unhealed skin break as a condition factor (**serious damage**). Healed skin breaks will be considered a quality factor and scored as damage or serious damage based on the above guidelines.

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## Bruises (C)

Bruises generally occur because of movement in slack packs, pressure from a tight pack or weight from adjacent cartons. Bruises will have soft areas that, when cut, contain mushy areas in the underlying flesh. Affected fruit may be flattened on two or more sides. If the underlying flesh is not affected, these flattened areas may regain their shape. Do not score flattened areas unless the underlying flesh is mushy.

**§51.2814 Damage. (h) Bruising when segment walls are collapsed, or albedo and juice sacs are ruptured.**

**§51.2820 Serious damage. (j) Bruising when fruit has been split open, peel is badly watersoaked following bruising or albedo is ruptured causing a mushy condition affecting all segments more than 1/2 inch at the bruised area or the equivalent of this amount, by volume, when affecting more than one area on the fruit.**

**Note:** When judging fruit for mushy condition (**serious damage**), apply the cutting procedures described by the *Cutting Instructions and Scoring Guide for Dryness-Mushy Condition* diagram.

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## Color (Q)

“Color” refers to the degree of external greenish-yellow and yellow, and not to discoloration caused by rust mite, speck type melanose, and smooth-fairly smooth superficial scars. When determining color, judge only that part of the fruit not affected by discoloration.

Examine fruit in normal daylight when making color determinations. Fruit appears greener in poor lighting conditions or under “artificial” light.

The U.S. No. 1 and U.S. No. 2 grades require fairly well colored fruit and the U.S. Export No. 1 grade requires moderately well colored. Fruit not meeting these requirements are scored against the separate 10 percent tolerance for fruit failing to meet the color requirements. At market, keep a separate column on the notesheet for fruit not meeting the color requirement. Refer to the official color comparator designated PL-1 for an example of “moderately well colored.”

**§51.2816 “Well colored” means that the fruit is yellow in color with not more than a trace of green color. Fruit of a decided bronze color shall not be considered well colored.**

**§51.2815 “Fairly well colored” means that the area of yellow color exceeds the area of green color on the fruit.**

**§51.2821 “Moderately well colored” means that the area of greenish-yellow or yellow color exceeds the area of green color on the fruit.**

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## Contact Spot (C)

Any size area on a lemon that shows evidence of having been in contact with decay or mold is scorable as contact spot. Any amount is scorable as serious damage in all grades. If the affected tissues exhibit decay characteristics (e.g., disintegration, mushiness, mold growth, etc.), score the fruit as decay.

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## Dirt and Other Foreign Matter (Q or C)

Cleanness will seldom be a factor due to the washing process prior to packing. Large amounts of dirt, adhering foreign material or residue on the fruit are scorable when they more than materially or seriously affect the appearance, edible or shipping quality of the fruit.

Dirt is a quality factor; wax residue is a condition factor. Wax coatings may not be evenly distributed over the fruit surface. Wax residue is scored when it is clumped, or covers a substantial portion of the surface and detracts from the appearance. This fact may not be readily noticeable at the time of packing, because the normally clear wax can discolor over time, hence the condition designation.

**Damage** - when aggregating more than a circle 5/8 inch in diameter.

**Serious Damage** - when aggregating more than 1-1/4 inch in diameter.

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## Firmness (C)

The U.S. No. 1 and U.S. Export No. 1 grades require fruit to be firm. The U.S. No. 2 grade requires fruit to be fairly firm.

When testing for firmness, place the fruit in the palm of your hand and squeeze gently. If the fruit “bounces back,” it is considered firm. Fruit with thin skin may feel soft or spongy and still be considered firm. Do not score fruit as soft if only a particular area is affected (refer to the Bruising section). Report as “not firm, not fairly firm or soft” based on the grade that is being certified.

**§51.2806 “Firm” means that the fruit does not yield more than slightly to moderate pressure.**

**§51.2817 “Fairly firm” means that the fruit may yield to moderate pressure but is not soft.**

Fruit not meeting these requirements are scored against the total grade tolerance. Soft fruit shall be scored as serious damage.

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## Freezing Injury (Q or C)

Fruit that is affected by freezing injury may exhibit the following characteristics:

1. Segment walls have buckled at a cross section cut near the stem end;
2. Watersoaked condition of the core;
3. Mushy condition of segments or portions of segments;
4. Dry portions of segments; and,
5. Open spaces in the pulp.

If frozen citrus is examined several days after thawing, it will usually have a white or colorless crystalline compound (hesperidin) on the membrane that separates the pulp segments. These crystals may be visible within a few hours of freezing. Several weeks after freezing, the crystals may not be as numerous or conspicuous. When freezing injury is encountered, use the same procedures and scoring guidelines as outlined for dryness or mushy condition.

Dryness from freezing differs from granulation dryness that is attributed to tree dryness. After freezing, affected juice sacs collapse, having been emptied of juice. During granulation, juice sacs do not collapse; they become filled with gelatinous or solid matter.

To accurately sample and determine percentages of this defect, use the procedures outlined in the sections; *Cutting for Dryness or Mushy Condition* and *Sampling To Determine Internal Defects*.

If a significant freeze occurs, inspectors will be notified, via a memorandum from Washington, D.C., to score freezing injury as a *condition* defect at the market. When it is felt that practically no additional change to the fruit will occur in transit, a second notification will be issued, instructing inspectors to score freezing injury as a *quality* defect at the market.

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## Granulation (Tree Dryness) (Q)

Granulation can be either a varietal peculiarity or the result of growing conditions. Citrus that is harvested late in the season, or from young trees during early or mid-season after a drought, may have granulation, particularly in larger sizes. In some instances, granulation may occur in larger sizes, while occurring in smaller sizes at other times. It may also be more prevalent at the blossom-end rather than the stem end.

The granulated condition may appear throughout the pulp of affected fruit, or more often, affecting only the stem end portion. Use the procedures and scoring

guidelines for dryness-mushy condition, but score granulation as a quality factor against the applicable tolerance for permanent defects.

Juice sacs of granulated fruit remain swollen and do not separate from each other or the segment walls. In such cases, the juice is displaced by yellow to grayish-white solid matter. Affected fruit will generally feel firm, but very light in weight.

Frequently, granulation will occur in larger sizes with very little or none in smaller sizes. In such instances, report according to sizes, or by the percentage found in large sizes versus those that do not have granulation. If certain sizes fail to grade, report them separately from the lots that grade.

Granulation cannot be detected with any degree of accuracy by external indication alone; therefore, inspectors should cut any suspected fruit in the lot to determine the presence of granulation. For positive verification and percentage calculation, follow the procedures outlined in the section *Cutting for Dryness or Mushy Condition*.

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### **Internal Decline (Endoxerosis) (C)**

This condition usually occurs at the styler-end and is frequently accompanied or followed by *Alternaria* rot. Symptoms of this disease include a breaking down or drying of internal tissue of the styler end and can be accompanied by a pinkish to brownish gummy mass. Gum formation in the core and in or next to the peel is also common. Any amount is scorable in all grades.

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### **Maturity (Q)**

All lemons must be mature. This means that the fruit is sufficiently ripened to be marketed commercially. Mature lemons have well developed juice sacks and well developed seeds. Lemons may exhibit some areas of green color and still be considered mature. There are no soluble solids/acid ratio requirements regarding maturity on lemons.

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### **Membranous Stain (C)**

This defect is an internal breakdown of lemons and develops in storage. The membranes between the segments develop irregular brown to black areas and the central core tissues may also be affected. There are no external symptoms, although peteca may accompany it because conditions are usually favorable for both defects. In the U.S. No. 2 grade, this defect is scored when it seriously affects the appearance of the cut fruit. In all other grades any amount is scorable.

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## **Oil Spots or Similar injuries (Q)**

Oil spots (“Oleocellosis”) are likely to occur on green fruit when handled roughly during wet conditions. Pressure on green fruit during picking and handling can also cause this defect.

The most common symptom of oil spots is irregularly-shaped yellow, light green, or brown spots where the oil glands are conspicuous. The severity of this defect depends upon the amount of oil released. Yellow spots will develop on fully colored, mature fruit; light green spots on fruit that was green when picked. Light to dark brown spots are a later or older stage of spots that were originally light green or more severely injured. Refer to the official color photographs designated ORG-CP-2-A and B for examples of oil spotting.

**§51.2814 Damage...(c) Oil spots (Oleocellosis or similar injuries) which are more than slightly depressed, soft, or which have an aggregate area exceeding that of a circle one-half inch in diameter;**

**§51.2820 Serious damage...(d) Oil spots (Oleocellosis or similar injuries) which are soft, or which have an aggregate area exceeding that of a circle 1 inch in diameter;**

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## **Peteca (C)**

Peteca is a deep, sharply defined pitting or sinking of the surface of the rind usually occurring after harvesting. The tissues underneath the pitted areas in the albedo are dry and shrunken, turning a darker color with age. No organism appears to be associated with this defect. Peteca formation can occur as a result of low temperatures, heavy oil spraying, waxing, and forced curing of the fruit.

**§51.2814 Damage...(g) when more than two spots or when having an aggregate area exceeding that of a circle one-fourth inch in diameter.**

**§51.2820 Serious damage...(h) when more than five small spots, or when having an aggregate area exceeding that of a circle three-fourths inch in diameter;**

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## **Red Blotch (C)**

Red blotch is an external staining with a scald-like appearance that develops only after harvesting. It starts as a superficial, reddish-brown discoloration while in storage, particularly if picked during cold weather. Any amount is scorable in all grades.



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## Scale (Q)

Citrus is susceptible to several types of scale, most commonly purple and red scale. Purple scale has a brownish-purple covering and is roughly the shape of an oyster shell. Red scale has a reddish color and is circular shaped.

Although rare on lemons, either type may be found. It is not necessary to identify the type of scale; report only as "scale." Refer to the official models designated No. 1 through No. 5 and No. 7 through No. 11 for examples of scale.

**§51.2814 Damage... (d) Scale when more than ten medium to large California red or purple scale adjacent to button at stem end or scattered over fruit or any scale which affects the appearance of the fruit to a greater extent;**

**§51.2820 Serious Damage... (e) Scale when California red or purple scale is concentrated as a ring or blotch, or more than thinly scattered over the fruit surface, or any scale which affects the appearance of the fruit to a greater extent;**

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## Scars (Q)

Citrus is very susceptible to scarring. This factor is most important when determining grade at shipping point. This defect can be caused by many factors while still on the tree (thrips and other insects, wind, hail, thorn scratches, mechanical injuries, etc.). Scars are judged on color, depth and smoothness. Refer to the official color comparator designated PL-1 for examples of scar colors.

**§51.2814 Damage...(b) Scars (including sprayburn and fumigation injury) which exceed the following aggregate areas of different types of scars, or a combination of two or more types of scars the seriousness of which exceeds the maximum allowed for any one type:**

**(1) Scars which are very dark and which have an aggregate area exceeding that of a circle one-fourth inch in diameter;**

**(2) Scars which are dark, rough or deep and which have an aggregate area exceeding that of a circle one-half inch in diameter;**

**(3) Scars which are fairly light in color, slightly rough, or with slight depth and which have an aggregate area exceeding that of a circle 1 inch in diameter; and,**

**(4) Scars which are light in color, fairly smooth, with no depth and which have an aggregate area of more than 20 percent of the fruit surface;**

**§51.2820 Serious Damage...(c) Scars (including sprayburn and fumigation injury) which exceed the following aggregate area of different types of scars, or a combination of two or more types of scars the seriousness of which exceeds the maximum allowed for any one type:**

**(1) Scars which are very dark and which have an aggregate area of more than 5 percent of the fruit surface;**

**(2) Scars which are dark, rough or deep, and which have an aggregate area of more than 10 percent of the fruit surface;**

**(3) Scars which are fairly light in color, slightly rough or of slight depth, and which have an aggregate area of more than 25 percent of the fruit surface; and,**

**(4) Scars which are light in color, fairly smooth, with no depth, and which have an aggregate area of more than 50 percent of the fruit surface;**

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## **Shape (Q)**

The normal shape for the variety must be considered when determining the correct term(s) used to describe shape. Fruit of a particular shape may be “well formed” for one variety and “fairly well formed” for another.

The U.S. No. 1 and U.S. Export No. 1 grades require fairly well formed fruit. The U.S. No. 2 grade requires reasonably well formed fruit. Fruit not meeting these requirements are scored against the total grade tolerance at shipping point and the permanent defects tolerance at market. Refer to the official models designated No. 1 through No. 18 for examples of shape.

**§51.2808 “Well formed” means that the fruit is typically normal in shape with well centered stem and styler ends.**

**§51.2807 “Fairly well formed” means that the fruit shows normal characteristic lemon shape and is not materially flattened on one side. Lemons having moderately thickened necks at the stem end shall be considered as fairly well formed unless the appearance is materially affected.**

**§51.2818 “Reasonably well formed” means that the fruit is not decidedly flattened, does not have a very long or large neck and is not otherwise decidedly misshapen.**

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### **Skin Breakdown (C)**

This defect category represents several factors that result in a similar-looking effect. Fruit can be affected by drying, darkening, or sinking of the oil cells near the stem end or other portions of the fruit. Stem end breakdown is a physiological condition caused by a loss of fruit moisture. Pitting is a physiological breakdown of the rind on the fruit shoulder. This contrasts with breakdown associated with aging, which occurs at the stem end. Storage pitting is another type of skin injury affecting citrus. When these, or other similar-appearing injuries occur, they shall be described on the notesheet and certificate as “skin breakdown.” Refer to the official color photographs designated C-1, CIT-(FLA&TX) 2-IDENT-A, B and CIT-(FLA&TX) 3-IDENT-A, B for examples of skin breakdown.

**§51.2814 Damage...(i)...when exceeding that of a circle 1/4 inch in diameter.**

**§51.2820 Serious Damage...(k)...when exceeding that of a circle 1/2 inch in diameter.**

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### **Stem Buttons and Attached Stems and/or Leaves**

Stem buttons and attached stems and/or leaves are not defects and should not be mentioned on the certificate unless specifically requested by the applicant. Upon request, the inspector may determine the percentage of fruit with stem buttons attached/missing or with attached/missing stems and/or leaves. Report the findings in percentages or general terms in the “DESCRIPTION OF PRODUCTS” on the FV-184 or in the “OTHER” section of the FV-300 or the FV-E300. Reference the applicant’s request of these factors under “REMARKS.”

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### **Sunburn (Q)**

This defect appears as a toughened area of the rind caused by exposure to intense sunlight. The area will usually have a bleached appearance or a deep yellow color and definite flattening of the fruit surface in that area. The yellow surface may have a brown or gray center where surface cells have died. Flesh under the affected area will be dried out, containing little or no juice.

Certain varieties may have a small amount of externally-visible sunburn but can exhibit a great deal more when cut.

**§51.2814 Damage...(e)...which causes appreciable flattening of the fruit, drying of the skin, material change in the color of the skin, appreciable drying of the flesh underneath the affected area or affects more than 25 percent of the fruit surface;**

**§51.2820 Serious Damage...(f)...which causes decided flattening of the fruit, marked drying or dark discoloration of the skin, material drying of the flesh underneath the affected area, or which affects more than one-third of the fruit surface;**

If specimens are not scorable based on the amount of external surface affected by sunburn, fruit may be scored when the amount of internal dryness materially, seriously or very seriously detracts from the appearance, edible or marketing quality of the fruit. To accurately determine the extent of dryness caused by sunburn, follow the procedures outlined in the section *Cutting for Dryness or Mushy Condition*.

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### **Texture (Q)**

“Texture” refers to smoothness or roughness of the skin. This factor will vary considerably with the size and variety of fruit. Larger sizes are normally rougher than smaller sizes of the same variety. When reporting texture, the size and variety must be considered when determining the proper descriptive term.

The U.S. No. 1 and U.S. Export No. 1 grades require fairly smooth texture. The U.S. No. 2 grade requires reasonably smooth texture. Fruit not meeting these requirements are scored against the total grade tolerance at shipping point and the permanent defects tolerance at market. Refer to the official models designated No. 19, No. 20, No. 22 through No. 26 for examples of texture and smoothness.

**§51.2810 “Smooth” means that the skin is of fairly fine grain and that there are no more than slight furrows radiating from the stem end.**

**§51.2809 “Fairly smooth” means that the appearance of the lemon is not materially affected by protrusions or lumpiness of the skin or by grooves or furrows. Coarse pebbling is an indication of good keeping quality and is not objectionable.**

**§51.2819 “Reasonably smooth” means that the skin is not badly folded, badly ridged, or very decidedly lumpy.**

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### **Decay (C)**

Decay is a “free from” defect and any amount is scorable. The most common types affecting citrus include : Green Mold Rot, Blue Mold Rot, Brown Rot, Sour Rot and Stem End Rot.

The type of decay shall not be reported on the certificate. When the decay is in excess of the tolerance, report the degree of advancement as: early, moderate or advanced stages.

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# APPENDIX I U.S. GRADE STANDARDS

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## United States Standards for Grades of Lemons<sup>1</sup>

Effective December 27, 1999

### Grades

51.2795 U.S. No. 1.

51.2796 U.S. Export No. 1.

51.2797 U.S. Combination.

51.2798 U.S. No. 2.

51.2799 [Reserved].

### Tolerances

51.2800 Tolerances.

51.2801 [Reserved].

### Application of Tolerances

51.2802 Application of tolerances.

### Standard Pack

51.2803 Standard pack.

### Standard Sizing and Fill

51.2804 Standard sizing and fill.

### Condition Standards for Export

51.2805 Condition standards for export.

### Definitions

51.2806 Firm.

51.2807 Fairly well formed.

51.2808 Well formed.

51.2809 Fairly smooth.

51.2810 Smooth.

51.2811 Contact spot.

51.2812 Internal evidence of Alternaria development.

51.2813 Membranous stain.

51.2814 Damage.

51.2815 Fairly well colored.

51.2816 Well colored.

51.2817 Fairly firm.

51.2818 Reasonably well formed.

51.2819 Reasonably smooth.

51.2820 Serious damage.

51.2821 Moderately well colored.

### Grades

#### §51.2795 U.S. No. 1.

“U.S. No. 1” consists of lemons which are mature, firm, fairly well formed, fairly smooth, which are free from decay, contact spot, internal evidence of Alternaria development, unhealed broken skins, hard or dry skins, exanthema, growth cracks, internal decline (endoxerosis), red blotch, membranous stain or other internal discoloration, and free from damage caused by bruises, dry or mushy condition, scars, oil spots, scale, sunburn, hollow core, peteca, scab, skin breakdown, melanose, dirt, or other foreign material, other disease, insects or other means. (See §51.2800.)

(a) Color: Lemons are fairly well colored.

#### §51.2796 U.S. Export No. 1.

“U.S. Export No. 1” consists of lemons which are mature, firm, fairly well formed, fairly smooth and which are free from decay, contact spot, internal evidence of Alternaria development, unhealed broken skins,

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<sup>1</sup> Compliance with the provisions 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.

exanthema, growth cracks, internal discoloration and free from damage caused by bruises and dryness or mushy condition.

(a) At least 50 percent of the lemons are free from damage caused by scars, oil spots, scale, sunburn, peteca, scab, skin breakdown, melanose, dirt or other foreign material, other disease, insects or other means, and the remainder of the lemons are free from serious damage by any cause. (See §51.2800.)

(b) Color: Lemons are moderately well colored.

**§51.2797 U.S. Combination.**

"U.S. Combination" consists of a combination of U.S. No. 1 and U.S. No. 2 lemons: **Provided**, That at least 40 percent, by count, of the lemons in each lot meet the requirements of U.S. No. 1 grade. (See §51.2800.)

(a) Color: Lemons are fairly well colored.

**§51.2798 U.S. No. 2.**

"U.S. No. 2" consists of lemons which are mature, fairly firm, which are reasonably well formed and reasonably smooth, which are free from decay, contact spot, internal evidence of Alternaria development, unhealed broken skins, hard or dry skins, exanthema, internal decline (endoxerosis), and red blotch, and free from serious damage caused by bruises, membranous stain or other internal discoloration, dryness or mushy condition, scars, oil spots, scale, sunburn, hollow core, peteca, growth cracks, scab, skin breakdown, melanose, dirt or other foreign material, other diseases, insects or other means. (See §51.2800.)

(a) Color: Lemons are fairly well colored.

**§51.2799 [Reserved].**

**Tolerances**

**§51.2800 Tolerances.**

In order to allow for variations incident to proper grading and handling in each of the foregoing grades, the following tolerances, by count, based on a minimum 25 count sample, are provided as specified:

(a) **U.S. No. 1 grade --**

(1) **For defects at shipping point.** Not more than 10 percent, by count, of the lemons in any lot may fail to meet the requirements relating to color. In addition, not more than 10 percent, by count, of the lemons in any lot may fail to meet the remaining requirements of the grade, included in this amount not more than 5 percent shall be allowed for defects causing serious damage, included in this latter amount not more than 1 percent for decay.

(2) **For defects en route or at destination.** Not more than 10 percent, by count, of the lemons in any lot may fail to meet the requirements relating to color. In addition, not more than 12 percent, by count, of the lemons in any lot may fail to meet the remaining requirements of the grade: **Provided**, That included in this amount not more than the following percentages shall be allowed for defects listed: 10 percent for fruit having permanent defects; or 7 percent for defects causing serious damage, including therein not more than 5 percent for serious damage by permanent defects and not more than 3 percent for decay.

(b) **U.S. No. 2 grade --**

(1) **For defects at shipping point.** Not more than 10 percent, by count, of the lemons in any lot may fail to meet the requirements relating to color. In addition, not more than 10 percent, by count, of the lemons in any lot may fail to meet the remaining requirements of the grade, included in this amount not more than 5 percent shall be allowed for decay, contact spot, internal evidence of Alternaria development, and internal decline (endoxerosis), included in this latter amount not more than 1 percent for decay.

(2) **For defects en route or at destination.** Not more than 10 percent, by count, of the lemons in any lot may fail to meet the requirements relating to color. In addition, not more than 12 percent, by count, of the lemons in any lot may fail to meet the remaining requirements of the grade: **Provided**, That included in this amount not more than the following percentages shall be allowed for defects listed: 10 percent for fruit having permanent defects; or not more than 7 percent shall be allowed for decay, contact spot, internal evidence of Alternaria development, and internal decline (endoxerosis), included in this latter amount, not more than 3 percent for decay.

(c) **U.S. Combination grade --**

(1) **For defects at shipping point.** Not more than 10 percent, by count, of the lemons in any lot may fail to meet the requirements of the U.S. No. 2 grade relating to color. In addition, not more than 10 percent, by count, of the lemons in any lot may fail to meet the remaining requirements of the U.S. No. 2 grade, included in this amount not more than 5 percent shall be allowed for decay, contact spot, internal evidence of Alternaria development, and internal decline (endoxerosis), included in this latter amount not more than 1 percent for decay.

(2) **For defects en route or at destination.** Not more than 10 percent, by count, of the lemons in any lot may fail to meet the requirements of the U.S. No. 2 grade relating to color. In addition, not more than 12 percent, by count, of the lemons in any lot may fail to meet the remaining requirements of the U.S. No. 2

grade: **Provided**, That included in this amount not more than the following percentages shall be allowed for defects listed: 10 percent for fruit having permanent defects; or not more than 7 percent shall be allowed for decay, contact spot, internal evidence of *Alternaria* development, and internal decline (endoxerosis), included in this latter amount, not more than 3 percent for decay.

(3) **For defects at shipping point and en route or at destination.** No part of any tolerance shall be allowed to reduce for the lot as a whole, the 40 percent of U.S. No. 1 lemons required in the U.S. Combination grade, but individual samples may have not less than 30 percent of U.S. No. 1 required: **Provided**, That the entire lot averages within the percentage required.

(d) **U.S. Export No. 1 --**

(1) **For defects.** 10 percent for lemons which fail to meet the requirements of the grade: **Provided**, That not more than the following percentages of the defects enumerated shall be allowed:

1 percent for decay;

3 percent for contact spot;

3 percent for broken skins which are not healed;

3 percent for growth cracks;

3 percent for internal evidence of *Alternaria* development;

3 percent for internal discoloration;

5 percent for soft; and,

5 percent for damage by dryness or mushy condition.

(2) **For color.** 10 percent for lemons which fail to meet the requirements relating to color.

(3) The contents of samples may have not more than 10 percentage points less than the percentage specified to meet the requirements in the "U.S. Export No. 1 grade:" **Provided**, That no sample shall have more than double the percentage specified for any one of the defects enumerated in U.S. Export No. 1 tolerances for defects section above.

**§51.2801 [Reserved].**

**Application of Tolerances**

**§51.2802 Application of tolerances.**

Individual samples, based on a minimum 25 count sample, are subject to the following limitations, unless otherwise specified. Individual samples shall have not more than one and one-half times a specified tolerance of 10 percent or more, and not more than double a specified tolerance of less than 10 percent:

**Provided**, That at least one decayed fruit may be permitted in any sample: **And provided further**, that the averages for the entire lot are within the tolerances specified for the grade.

**Standard Pack**

**§51.2803 Standard pack.**

(a) Lemons shall be fairly uniform in size and shall be packed in boxes or cartons and arranged according to the approved and recognized methods.

(b) All such containers shall be tightly packed and well filled but the contents shall not show excessive or unnecessary bruising because of overfilled containers. When packed in cartons each container shall be at least level full at time of packing.

(c) "Fairly uniform in size" means that when lemons are packed for 165 carton count or smaller size, or equivalent sizes when packed in other containers, not less than 90 percent, by count, of the lemons in any container shall be within a diameter range of four-sixteenths inch; when packed for sizes larger than 165 carton count, or equivalent sizes packed in other containers, not less than 90 percent, by count, of the lemons in any container shall be within a diameter range of six-sixteenths inch.

(1) "Diameter" means the greatest dimension measured at right angles to a line from stem to blossom end of the fruit.

(d) In order to allow for variations incident to proper packing the following tolerances are provided:

(1) 5 percent for samples in any lot which fail to meet the requirements for standard pack.

**Standard Sizing and Fill**

**§51.2804 Standard sizing and fill.**

(a) Boxes or cartons in which lemons are not packed according to a definite pattern do not meet the requirements of standard pack, but may be certified as meeting the requirements of standard sizing and fill: **Provided**, That the lemons in the containers are fairly uniform in size as defined in §51.2803: **And provided further**, that the contents have been properly shaken down and the container is at least level full at time of packing.

(b) In order to allow for variations incident to proper packing, not more than 5 percent of the samples in any lot may fail to meet the requirements of standard sizing and fill.

**Condition Standards for Export**

**§51.2805 Condition standards for export.**



(a) Not more than a total of 10 percent, by count, of the lemons in any sample may be soft, affected by decay or contact spot, or have broken skins which are not healed, growth cracks, internal evidence of Alternaria development, internal decline (endoxerosis), or serious damage by membranous stain or other internal discoloration, or dryness or mushy condition, except that not more than the following percentages of the defects enumerated shall be allowed:

- (1) One-half of 1 percent for decay;
- (2) 3 percent for contact spot;
- (3) 3 percent for broken skins which are not healed;
- (4) 3 percent for growth cracks;
- (5) 3 percent for internal evidence of Alternaria development;
- (6) 3 percent for internal decline (endoxerosis);
- (7) 5 percent for soft;
- (8) 5 percent for serious damage by membranous stain or other internal discoloration; and,
- (9) 5 percent for serious damage by dryness or mushy condition.

(b) Any lot of lemons shall be considered as meeting the condition standards for export if not more than a total of 10 percent, by count, of the lemons in any sample have defects enumerated in the condition standards for export: **Provided**, That no sample shall have more than double the percentage specified for any one of the defects enumerated.

#### **Definitions**

##### **§51.2806 Firm.**

"Firm" means that the fruit does not yield more than slightly to moderate pressure.

##### **§51.2807 Fairly well formed.**

"Fairly well formed" means that the fruit shows normal characteristic lemon shape and is not materially flattened on one side. Lemons having moderately thickened necks at the stem end shall be considered as fairly well formed unless the appearance is materially affected.

##### **§51.2808 Well formed.**

"Well formed" means that the fruit is typically normal in shape with well centered stem and stylar ends.

##### **§51.2809 Fairly smooth.**

"Fairly smooth" means that the appearance of the lemon is not materially affected by protrusions or lumpiness of the skin or by grooves or furrows. Coarse pebbling is an indication of good keeping quality and is not objectionable.

##### **§51.2810 Smooth.**

"Smooth" means that the skin is of fairly fine grain and that there are no more than slight furrows radiating from the stem end.

##### **§51.2811 Contact spot.**

"Contact spot" means an area on the lemon which bears evidence of having been in contact with decay or mold.

##### **§51.2812 Internal evidence of Alternaria development.**

"Internal evidence of Alternaria development" includes red or brown staining of the tissue under the button in the core, or in the fibro-vascular bundles.

##### **§51.2813 Membranous stain.**

"Membranous stain" is a brown or dark discoloration of the walls of the fruit segment.

##### **§51.2814 Damage.**

"Damage" means any specific defect described in this section; or an equally objectionable variation of any one of these defects, any other defect, or any combination of defects, which materially detracts from the appearance, or edible or shipping quality of the fruit. The following specific defects shall be considered as damage:

- (a) Dryness or mushy condition when affecting all segments of the fruit more than one-fourth inch at the stem end, or more than the equivalent of this amount, by volume, when occurring in other portions of the fruit;
- (b) Scars (including sprayburn and fumigation injury) which exceed the following aggregate areas of different types of scars, or a combination of two or more types of scars the seriousness of which exceeds the maximum allowed for any one type:
  - (1) Scars which are very dark and which have an aggregate area exceeding that of a circle one-fourth inch in diameter;
  - (2) Scars which are dark, rough or deep and which have an aggregate area exceeding that of a circle one-half inch in diameter;
  - (3) Scars which are fairly light in color, slightly rough, or with slight depth and which have an aggregate area exceeding that of a circle 1 inch in diameter; and,

- (4) Scars which are light in color, fairly smooth, with no depth and which have an aggregate area of more than 20 percent of the fruit surface;
- (c) Oil spots (Oleocellosis or similar injuries) which are more than slightly depressed, soft, or which have an aggregate area exceeding that of a circle one-half inch in diameter;
- (d) Scale when more than ten medium to large California red or purple scale adjacent to button at stem end or scattered over fruit or any scale which affects the appearance of the fruit to a greater extent;
- (e) Sunburn which causes appreciable flattening of the fruit, drying of the skin, material change in the color of the skin, appreciable drying of the flesh underneath the affected area or affects more than 25 percent of the fruit surface;
- (f) Hollow core which causes the fruit to feel distinctly spongy; and,
- (g) Peteca when more than two spots or when having an aggregate area exceeding that of a circle one-fourth inch in diameter.
- (h) Bruising when segment walls are collapsed, or albedo and juice sacs are ruptured.
- (i) Skin breakdown when exceeding that of a circle 1/4 inch in diameter.

**§51.2815 Fairly well colored.**

“Fairly well colored” means that the area of yellow color exceeds the area of green color on the fruit.

**§51.2816 Well colored.**

“Well colored” means that the fruit is yellow in color with not more than a trace of green color. Fruit of a decided bronze color shall not be considered well colored.

**§51.2817 Fairly firm.**

“Fairly firm” means that the fruit may yield to moderate pressure but is not soft.

**§51.2818 Reasonably well formed.**

“Reasonably well formed” means that the fruit is not decidedly flattened, does not have a very long or large neck and is not otherwise decidedly misshapen.

**§51.2819 Reasonably smooth.**

“Reasonably smooth” means that the skin is not badly folded, badly ridged, or very decidedly lumpy.

**§51.2820 Serious damage.**

“Serious damage” means any specific defect described in this section; or an equally objectionable variation of any of these defects, any other defect, or any combination of defects, which seriously detracts from the appearance, or the edible or shipping quality of the fruit. The following specific defects shall be considered as serious damage:

- (a) Membranous stain, or other internal discoloration which seriously affects the appearance of the cut fruit;
- (b) Dryness or mushy condition when affecting all segments of the fruit more than one-half inch at the stem end or more than the equivalent of this amount, by volume, when occurring in other portions of the fruit;
- (c) Scars (including sprayburn and fumigation injury) which exceed the following aggregate area of different types of scars, or a combination of two or more types of scars the seriousness of which exceeds the maximum allowed for any one type:
  - (1) Scars which are very dark and which have an aggregate area of more than 5 percent of the fruit surface;
  - (2) Scars which are dark, rough or deep, and which have an aggregate area of more than 10 percent of the fruit surface;
  - (3) Scars which are fairly light in color, slightly rough or of slight depth, and which have an aggregate area of more than 25 percent of the fruit surface; and,
  - (4) Scars which are light in color, fairly smooth, with no depth, and which have an aggregate area of more than 50 percent of the fruit surface;
- (d) Oil spots (Oleocellosis or similar injuries) which are soft, or which have an aggregate area exceeding that of a circle 1 inch in diameter;
- (e) Scale when California red or purple scale is concentrated as a ring or blotch, or more than thinly scattered over the fruit surface, or any scale which affects the appearance of the fruit to a greater extent;
- (f) Sunburn which causes decided flattening of the fruit, marked drying or dark discoloration of the skin, material drying of the flesh underneath the affected area, or which affects more than one-third of the fruit surface;
- (g) Hollow core which causes the fruit to feel excessively spongy;
- (h) Peteca when more than five small spots, or when having an aggregate area exceeding that of a circle three-fourths inch in diameter; and,
- (i) Growth cracks that are leaking, gummy or not well healed.

(j) Bruising when fruit has been split open, peel is badly watersoaked following bruising or albedo is ruptured causing a mushy condition affecting all segments more than 1/2 inch at the bruised area or the equivalent of this amount, by volume, when affecting more than one area on the fruit.

(k) Skin breakdown when exceeding that of a circle 1/2 inch in diameter.

**§51.2821 Moderately well colored.**

“Moderately well colored” means that the area of greenish-yellow or yellow color exceeds the area of green color on the fruit.

**Note:** All references in this standard to area, aggregating area, or length are based on a lemon 2 inches in diameter, allowing proportionately greater areas on larger fruit and lesser areas on smaller fruit.

# APPENDIX II

## Directive on Certifying Various Varieties of Citrus

United States Department of Agriculture  
Agricultural Marketing Service  
Fruit and Vegetable Programs

### *Fresh Products Branch Directive*

FPB-618  
12/10/98

#### CERTIFYING VARIOUS VARIETIES OF CITRUS

##### *I. PURPOSE*

This directive is to set forth and standardize Branch policy when inspecting varieties of citrus.

##### *II. BACKGROUND*

There is a considerable amount of confusion as to which grade standards apply to certain varieties of citrus, this directive should alleviate the confusion. This supersedes the Administrative Letter dated January 23, 1984, and any other references to certifying varieties of citrus.

##### *III. POLICY*

To maintain uniformity of inspection procedures and results, the Branch policy is as follows:

The headings in the following chart indicate how the fruit shall be certified and what standard they shall be certified under. For varieties in the "ORANGES" column, report as "ORANGES" in the product heading on the certificate, except for "TANGELOS" report as "TANGELOS" and apply the U.S. Standards for Oranges (based on the State in which the fruit is grown). For varieties in the "TANGERINES" column, report as "TANGERINES" in the product heading on the certificate and apply the U.S. Standards for Tangerines (based on the State in which the fruit is grown). For varieties in the "CITRUS FRUIT" column, report as "CITRUS FRUIT" in the product heading on the certificate. For the varieties with one asterisk apply the U.S. Standards for Oranges (based on the State in which the fruit is grown). For varieties with two asterisks apply the U.S. Standards for Tangerines (based on the State in which the fruit is grown). For the varieties with three asterisks do not apply any standards (no established U.S. grade).

ORANGES	TANGERINES	CITRUS FRUIT
Blood (Sanguina)	Dancy	*King Oranges
Navel	Sunburst	*Page
Temple(Royal Mandarin)	Robinson	*Lee
Parson Brown	Algerian	*Sour Orange
Hamlin	Fairchild	*K-Early
Valencia	Honey Tangerine (Murcott)	*Seminole
Lue Gim Gongs	Fallglo	*Satsumas or Emerald
		*Apply the orange standards

Distribution: HQ, FM, FS, CM, EM

Originating Office: Standardization

File Maintenance Instructions: File in Directive Binder and replace  
FPB Directive dated 11/14/96 with this version.

(continued from previous page)

ORANGES		CITRUS FRUIT
Boone's Early Conner's Seedless Hurds Walker's Early Jaffa Red Navel Queen Ruby Seedling Star Calyx Pineapple Pope Summer Homosassa Rhodes Red Lamb's Late Ambersweet		**Clementines **Osceola **Wilking **Kara **Kinnow **Ponkan **Apply the tangerine standards  ***Melogold ***Pummelos ***Homli ***No established U.S. grade
<b>TANGELOS</b>		
Nova Orlando Minneola		

This list is not inclusive. Whenever a new variety is encountered it will be classified as to what the fruit most closely resembles. Tangerines are generally smaller than oranges, and the rind and fruit sections are loosely adherent. Therefore, when fruit is small and the rind and fruit sections are loosely adherent, the fruit shall be inspected based on the tangerine standards. If the fruit does not meet these criteria, it shall be inspected based upon the orange standards. Grapefruit are generally easier to identify.

For import requirement certification at **port of entry** use the following: for **grapefruit**, apply the U.S. Standards for Grades of Florida Grapefruit and the Florida State maturity requirements; and, for **oranges**, apply the U.S. Standards for Grades of Oranges (Texas and States other than Florida, California and Arizona) and the Texas State maturity requirements, except for navel oranges, in which case apply the U.S. Standards for Grades of Oranges (California and Arizona) and the Texas State maturity requirements.

Inspections requested for non-domestic (imported) fruit other than at port of entry or when import requirements are not in effect, the fruit shall be inspected based on the standards that the fruit most closely resemble; this is in regard to texture, thickness of skin, discoloration and scarring. If a quality and condition inspection is requested, the maturity standards for the U.S. Standards being used shall apply.

*Kenneth R. Myelle*  
Acting Branch Chief

## Comparasion of Area of Circles Having Different Diameters

DIAMETER	1/16"	1/8"	1/4"	3/8"	1/2"	5/8"	3/4"	7/8"	1"
1/16"	1	4	16	36	63	99	143	194	253
1/8"		1	4	9	16	25	36	49	64
1/4"			1	2-1/4	4	6-1/4	9	12-1/4	16
3/8"				1	1-3/4	2-3/4	4	5-1/2	7
1/2"					1	1-2/5	2-1/4	3	4
5/8"						1	1-2/5	2	2-1/2
3/4"							1	1-1/3	1-3/4
7/8"								1	1-2/3
1"									1

To compare the area of a small circle with a largers one, select the diameter of the small circle from the vertical list on the left side. Follow the horizontal row beside this diameter to the right and stop under the diameter of the larger circle to be compared. This will show the area of the number of small circles needed to equal the area of the larger circle.

Examples:

It takes nine circles 1/8" in diameter to equal the area of a circle 3/8" in diameter;  
or,

It takes 1-2/5 circles 1/2 inch in diameter to equal the area of a circle 5/8" in diameter; or,

It takes 4 circles 3/8" in diameter to equal the area of a circle 3/4" in diameter.

# APPENDIX III

## Inspection Notesheet

QUALITY FULL: <input type="checkbox"/> COQD HALF: <input type="checkbox"/> COQD FULL: <input type="checkbox"/> COQD HALF: <input type="checkbox"/> LOT SCHED: <input type="checkbox"/> O.T. (hrs): <input type="checkbox"/> MILES: <input type="checkbox"/> O.T. (mi): <input type="checkbox"/> OTHER: <input type="checkbox"/>	APPLICANT NUMBER: <b>21 1234567</b>	D: NUMBER SIZE UNIT Sun. GRADE ACCOUNT <b>FN1 C</b>	C: NUMBER SIZE UNIT Sun. GRADE ACCOUNT <b>3 VAR C</b>	B: NUMBER SIZE UNIT Sun. GRADE ACCOUNT <b>6 VAR C</b>	A: NUMBER SIZE UNIT Sun. GRADE ACCOUNT <b>4 CON C</b>	DEFECT COVERS <b>SC R</b> <b>CS P</b> <b>DE K</b> <b>SUM</b>	DEFECT COVERS <b>SC R</b> <b>CS P</b> <b>DE K</b> <b>SUM</b>	DEFECT COVERS <b>SC R</b> <b>CS P</b> <b>DE K</b> <b>SUM</b>	DEFECT COVERS <b>SC R</b> <b>CS P</b> <b>DE K</b> <b>SUM</b>
CARRIER or LOT IDENTIFICATION: <b>Lot 1237</b>		LOADING: Loaded - LO Pkg Unload - PU Unloaded - UL Lot Inspn - LI <b>UL</b>		INSPECTION NOTESHEET U.S. DEPARTMENT OF AGRICULTURE AGRICULTURAL MARKETING SERVICE FRUIT & VEGETABLE DIVISION		CERTIFICATE NUMBER: <b>EXAMPLE 1</b>			
PREFIX NUMBER STATE		Carrier No. Stated by: <b>APPLICANT</b>		INSPECTION STARTED: m m d d y y Hour Min. A/P <b>1 0 1 0 0 1 0 7:00 A M</b>		Inspection Completed: m m d d y y Hour Min. A/P <b>1 0 1 0 0 1 0 9:10 A M</b>			
Additional Lot ID.:		Carrier Type / Name:		Refrigeration Unit: <input type="checkbox"/> ON <input type="checkbox"/> OFF <input type="checkbox"/> OPEN <input type="checkbox"/>		Doors: <input type="checkbox"/> OPEN <input type="checkbox"/>		APPLICANT: <b>CITRUS SELLERZ</b>	
Condition of Carrier:		Inspection Site: <b>APPLICANTS' WHSE</b>		Address: <b>Bridgeport, CT</b>		SHIPPER: <b>Lemon King Inc</b>		Address: <b>Riversedge, CA</b>	
A: PRODUCT: <b>Lemons</b>		NUMBER of CONTAINERS: <b>40 MASTER CARTONS</b>		INSP. COUNT: <b>Y</b>		TEMPERATURES: <b>40-41°F</b>		BRANDS / MARKS: <b>open mesh sacks labeled: "Merique" Lemon King Inc, Riversedge, CA Net wt 2 Lbs (32oz) in master CTNS printed: 18 1/2 Lb bags, produce of USA.</b>	
B: PRODUCT: <b>Lemons</b>		NUMBER of CONTAINERS: <b>220 CARTONS</b>		INSP. COUNT: <b>Y</b>		TEMPERATURES: <b>42-46°F</b>		"Lemon King" Lemon King Inc, Riversedge CA, produce of USA and stamped 75 count or 95 count.	
C: PRODUCT: <b>LEMONS</b>		NUMBER of CONTAINERS: <b>55 cartons</b>		INSP. COUNT: <b>Y</b>		TEMPERATURES: <b>40-42°F</b>		"Lemon Queen" Lemon King Inc Riversedge, CA, produce of USA stamped 115 count.	
D: PRODUCT:		NUMBER of CONTAINERS:		INSP. COUNT:		TEMPERATURES:			
<b>EACH LOT:</b>									
Condition of Load & Containers: <input checked="" type="checkbox"/> STACKED ON PALLETS AT ABOVE LOCATION <input type="checkbox"/> INTACT THROUGH LOAD <input type="checkbox"/> PARTLY UNLOADED									



# Inspection Scoresheet

EXAMPLE 1

A		B		C		D	
PACK: _____		PACK: <b>WF</b>		PACK: <b>WF</b>		PACK: _____	
SIZE: <b>FV</b>		SIZE: <b>FV</b>		SIZE: <b>FV</b>		SIZE: _____	

SCORESHEET				Q	DK	CSF			
PLI Number	Other I.D.	TEMP.	Sample CT	SCR %	Adv %	%			
<b>NONE</b>		40	30	0	1	3	2	7	2 sacks
"		41	30	2	0		0		15 fruit/sack
"		40	32	1	1	3	3	9	2 sacks 16/sack
"		-	28	1	1	4	2	7	2 sacks 14/sack
				<b>4%</b>					
				<b>3%</b>					
				<b>6%</b>					
				scr %	DK %		Pet %		
<b>none</b>	75	42	50	1	0		3	6	
"	75	42	50	0	0		0		
"	75	46	75	2	4	5	0		
"	95	-	96	0	5	5	0		
"	95	45	50	1	0		3	6	
"	95	44	50	1	1	2	0		
				<b>2%</b>					
				<b>2%</b>					
				<b>2%</b>					
				Q SCR %	DK %		CSF %		Pet %
<b>none</b>	115	40	50	0	0		0		3
"	115	42	115	3	9	8	2	2	0
"	115	40	50	0	1	2	1	2	0
				<b>1%</b>					
				<b>3%</b>					
				<b>1%</b>					
				<b>2%</b>					

*mod Adv*

REMARKS / RESTRICTIONS / SPI

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CARLOT Basis : _____	REPORTED TO: <b>Applicant</b>	INSPECTED BY: <b>Emma Blue</b>
HOURLY Basis : _____	DATE: <b>10/10/01</b> TIME: <b>9:10 A</b>	ASSISTED BY: _____
TRAVEL Time : _____	REQUESTED BY: _____	DATE: _____ TIME: _____
EXPENSES : _____		
EST. TOTAL : _____		

CARRIER OR LOT IDENTIFICATION <b>Lot 1237</b>		Loading: Loaded: <b>UL</b> Ply. Unit: <b>UL</b> Unloaded: <b>UL</b> Lot Insp: <b>UL</b>	Applicant: <b>Citrus Sellerz</b>	U.S. DEPARTMENT OF AGRICULTURE AGRICULTURAL MARKETING SERVICE <b>INSPECTION CERTIFICATE</b> <b>K- EXAMPLE 1</b>
PREFIX: <b>APPLICANT</b>	NUMBER: <b>APPLICANT</b>	STATE: <b>CT</b>	Address: <b>Bridgeport, CT</b>	
Carrier / Lot ID Stated: <b>APPLICANT</b>		Additional Lot ID:	Shipper: <b>Lemon King Inc</b>	Inspection Started: m. m. d. y. hour min. A/P <b>10 10 01 07 00 A M</b>
Carrier Type / Name:			Address: <b>Riversedge, CA</b>	
Refrigeration Unit: <input checked="" type="checkbox"/> On <input type="checkbox"/> Off	Doors: <input type="checkbox"/> Open <input checked="" type="checkbox"/> Closed	Insp. Site: <b>APPLICANT'S WASE</b>		

LOT	TEMPERATURES	Product	Brand / Markings	Origin	Lot ID	Number of Containers	Insp. count
A:	40 to 41 °F	LEMONS	"Meringue" 2 Lbs (32oz)	CA	18 1/2 LB	40 MASTER CARTONS	Y
B:	42 to 46 °F	LEMONS	"Lemon King"	CA	75ct, 95ct	220 CARTONS	Y
C:	40 to 42 °F	LEMONS	"Lemon Queen"	CA	115ct	55 CARTONS	Y
D:							

LOT	AVERAGE DEFECTS	including DAMAGE SER. DAM	including SER. DAM	OFFSIZE / DEFECTS	OTHER
A	04	00	/	Quality defects - scars	Lots A, B+C: Generally firm.
	06	06	/	Contact spot (0-9%)	
	03	03	/	decay	
	13	09	/	checksum	
B	02	00	/	Quality defects - scars, oil spot	Lot C: decay in moderate to advanced stages
	02	00	/	Peteca	
	02	02	/	decay	
	06	02	/	checksum	
C	02	00	/	Poorly colored	
	01	00	/	other quality defects - scars	
	01	01	/	Contact spot	
	03	03	/	decay (0-8%)	
	07	04	/	checksum	

GRADE: **Lot A: fails to grade U.S. No. 1 only account of Condition Lot B: U.S. No. 1**  
**Lot C: fails to grade U.S. No. 1 only account of Condition in many samples.**

REMARKS:

<b>WARNING:</b> Any person who knowingly shall falsely make, issue, alter, forge, or counterfeit this certificate, or participate in any such actions, is subject to a fine of not more than \$1,000 or imprisonment for not more than one year, or both.	I, the undersigned, a duly authorized inspector of the United States Department of Agriculture, do hereby certify that at the request of the applicant and on the date indicated, samples of the herein described product were inspected and the quality and/or condition as shown by said samples were as herein stated.		ESTIMATED TOTAL
	Inspector's Signature: <b>Emma Blue</b>	Market Office: <b>Everett, MA</b>	\$