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Grapes for Processing and Freezing

Inspection Instructions



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

INSPECTION INSTRUCTIONS
FOR
GRAPES FOR PROCESSING AND FREEZING 1/

General

These instructions are developed by the Fresh Products Branch (1)
to assist officially licensed inspectors in the interpretation
and application of the U.S. Standards for Grades of Grapes for
Processing and Freezing-CFR sections 2851. 2150-2161 and the
U.S. Standards for American (Eastern Type) Bunch Grapes for
Processing and Freezing-CFR sections 2851. 4400-4406. They do
not establish any new or revised substantive rule and
supersede instructions dated April 1978.

These instructions are intended to assist the inspector in the (2)
inspection of grapes for processing and freezing. They cover
all types of grapes; hand-picked, mechanically harvested or
still on the vine.

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- (3) Grape processors contract for grapes on the basis of the U.S. Standards, contract specifications, or combinations thereof. If the processor makes variations in the standards, it is permissible to certify as to grade provided that the variations do not lower the requirements of the grade that you are certifying.
- (4) Processors usually base their per ton payment to growers on percent soluble solids with penalties for quality factors or foreign material if they exceed certain restricted tolerances. Therefore, the determination of quality factors and foreign material are important to the processor.
- (5) Generally all contracts contain rejection clauses. However, the Inspection Service has no authority to reject loads of grapes that fail to meet grade or contract specifications. The inspectors' duty is to determine various factors as they pertain to the grade or contract and issue certificates showing these facts. It is the responsibility of the applicant or their representative to reject or accept loads.

SAMPLING

- (6) Selection of the sample is of primary importance in any inspection. If the sample is not representative of a lot, the grading results are incorrect regardless of how accurately factors have been interpreted.

Under certain conditions it may be impossible for the (7)
inspector to draw representative samples. In this case it
will be permissible to have some specifically designated and
properly instructed person do the sampling. However, the
inspector is still responsible to see that representative
samples are selected. Remember, the inspector must ensure
every precaution necessary is taken so that samples are
properly drawn.

SAMPLING FOR SOLUBLE SOLIDS AND QUALITY ANALYSIS.

In most cases the following procedure will apply for (8)
"hand-picked" grapes that are delivered in crates:

Select a minimum of 100 bunches, making sure that you select (9)
them from various crates and locations in the load. From
these bunches take 20 bunches (approximately 4 or 5 lbs.)
which will be used to run the quality analysis. The remaining
bunches are to be macerated and used for determination of the
soluble solids.

If your inspection is being based on the requirements (10)
contained in the U.S. Standards For American (Eastern Type)
Bunch Grapes For Processing and Freezing it will not be
necessary to take a 100 bunch sample. A minimum of 20 bunches
should be sufficient for most normal size loads.

- (11) However, if the applicant wants you to determine the soluble solids, you will have to increase your sample size to at least 100 bunches.
- (12) Grapes delivered in bins (hand-picked or mechanically harvested) will be probe sampled by a sampling device approved by the Inspection Service. Some processors may not have a sampling probe suitable for use on hand-picked grapes in bins. If this happens you would select your sample by hand, restricting it to that portion of the bin that you sample. The sample obtained from each bin, mechanically or hand-picked, shall be accumulated in a bucket to form a composite sample.
- (13) At times, mechanically harvested grapes already stemmed and crushed will be delivered in tank trucks. A sufficient number of probes should be made in order to obtain a representative sample to run a soluble solids analysis. Because of the composition of the grapes, it is impossible to detect and identify any defects present. A quality analysis will not be determined on stemmed and crushed grapes delivered in tank trucks.
- (14) The procedure for sampling a bin is as follows:
- (15) The closed probe must be inserted in nearly a vertical position to the full depth of the bin with the side that opens facing away from the sampler. The probe handler must then open the probe making sure that it fills to the height of the grapes and juice within the bin. Then the probe must be closed prior to removal.

The sample collected is emptied into a bucket. When sampling hand-picked grapes in bins it is not necessary to have the side of the probe that opens facing away from the sampler. When all bins on a load have been sampled, the bucket(s) containing the composite sample shall be carried to a sample splitter for dividing. (16)

DIVIDING SAMPLES

Each composite sample shall be divided in a sample splitter (See Figure 1 Page 41). Sample dividing is necessary to obtain a sample small enough in size, yet representative of the composite sample, to analyze. It is very doubtful that the splitter can be used for hand-picked grapes. If not, just select enough bunches to run your quality analysis and use the remainder for your soluble solids analysis. The procedure for dividing samples with the splitter is as follows: (17)

1. A clean and dry bucket is placed directly under the juice pan spout. (A in Figure 1). (18)
2. The flow control valve (B in Figure 1) should be completely closed while a sample is being dumped into the splitter hopper (C in Figure 1). After the sample is emptied into the hopper, the flow control valve shall be completely opened. (19)
3. Juice and grapes which are captured in a sample tray (E in Figure 1) will be used for quality analysis. (20)

Juice and grapes not captured in the sample tray will flow out the juice pan spout into a bucket. This portion of the sample will be used for a soluble solids determination.

(21) It is extremely important that the weight of the grapes in the portion of the sample used for quality analysis be not more than 550 grams nor less than 300 grams. Depending on the number of bins on a load, it may be necessary to split a composite sample two or three times to obtain a 550 gram size sample. The sample dividing procedure, by load size, is as follows:

(22) Loads containing 8 bins or less
(Usually should require only one sample divide).
Place only one sample tray (with basket) in one of the four tray slots (See 1, 2, 3, and 4 in Figure 1).
Then follow procedures outlined in DIVIDING SAMPLES.

(23) About one-fourth of the original sample will be collected in the tray and used for quality analysis. The other portion collected in a bucket below the juice pan spout will be used for a soluble solids determination.

(24) Loads containing more than 8 bins
Place two sample trays (without baskets) in two of the four tray slots. Also make sure a clean and dry bucket is positioned below the juice drain spout.
Then perform the first sample divide following procedures outlined in DIVIDING SAMPLES.

When the sample division is completed, empty contents of both trays into the splitter hopper. (25)

Make sure control valve is closed. Then place one sample tray with basket in one of the tray slots and open the control valve. That portion of juice and grapes collected in the tray will be used for a quality analysis. Juice and grapes collected in bucket will be used for a soluble solids determination. (26)

If a third sample divide is needed to reduce the original sample to a size small enough for quality analysis, follow this procedure: (27)

1. First divide: Place two sample trays (without baskets) in two of four slots of sample splitter. (Make sure a clean and dry bucket is positioned below the juice drain spout.) Perform first sample divide. Empty contents of both sample trays into splitter hopper. (Make sure control valve is closed before sample is emptied into hopper.) (28)
2. Second divide: Place two sample trays (without baskets) in two of the four tray slots. (Make sure bucket is still positioned under juice drain spout. Note: The bucket must contain juice and grapes from first split.) Perform second sample divide. (29)

- (30) Empty contents of both sample trays into splitter hopper. (Control Valve must be closed). Place one tray with basket in a tray slot.
- (31) Perform third sample divide. Juice and grapes collected in the tray become the sample for quality analysis. Juice and grapes (from three divides) collected in the bucket are used for soluble solids testing.

SOLUBLE SOLIDS TESTING

- (32) The percentage of soluble solids determined for a lot is usually the basis of a processor's per ton payment to the grape producer. Therefore, it is extremely important that each inspector carefully follow these instructions.
1. Preparing the Sample
 - (33) a. The maceration period of the composite sample must be at least one minute but no more than two minutes. An interval timer (or other timer) should be used for timing of the maceration period. Note: There should be a large number of free floating seeds, which indicates good subdivision and freeing of the skins from the grape pulps without ripping of the seeds or disintegrating the pulps.

- b. Turn the macerator (blender) off.
 - c. See procedure for reading and recording soluble solids.
 - d. Cleaning of the macerator will be done periodically.
2. Reading and Recording the Soluble Solids.
- a. A tablespoon of the material is placed inside a folded filter paper. The filter is squeezed gently. The first four or five drops of clean filtrate are discarded.
 - b. Two drops of filtrate are placed on the rear edge of the measuring prism of the refractometer.
 - c. Prism is closed. The soluble solids are read immediately on scale to nearest 0.1% (16.0, 16.1, 16.2 etc.) An external light source may be used if the internal light in the instrument does not function or if a Goldberg instrument is used.
 - d. No temperature correction is needed, because this instrument has an internal, automatic temperature compensator for ambient temperatures above 60°F.
 - e. The reading is recorded on a notesheet or Solids Reader Log. Solids Reader Log should be prepared in duplicate.
 - f. After the first reading, another separate sample of material is removed from the hopper after the macerator has been started up and run for about 15 seconds. The second reading is also recorded on the notesheet or Solids Reader Log.

- g. If a third reading is necessary (refer to (2) and (3) another separate sample of material is removed from the hopper after the macerator has been started and run for 15 seconds.
- h. Averaging the final soluble solids reading.
- (1) If the second reading is within or at 0.2% either way from the first reading, average the two readings and record this average to the nearest tenth.

Examples:

1st reading	16.2	16.1	17.0
2nd reading	16.3	16.3	16.9
Average	16.25	16.2	16.95
Report	16.3	16.2	17.0

- (2) If the second reading differs from the first reading by more than 0.2%, take a third reading. Average the two closer readings if these differ within or at 0.2%. If the three readings differ by exactly 0.2% of each other (equidistant) average all three readings.

EXAMPLES

Equidistant Readings (Average all three readings)

1st reading	16.8	16.1
2nd reading	17.2	16.5
3rd reading	17.0	16.3
Average	17.0	16.3
Report	17.0	16.3

Average the ** two closer readings

1st reading	17.0	**17.5	16.5
2nd reading	**17.3	18.0	**16.0
3rd reading	**17.4	**17.3	**16.1
Average	17.35	17.4	16.05
Report	17.4	17.4	16.1

- (3) If the third reading differs by more than 0.2% from both (35)
of the first two readings, void the three readings by drawing a line through them and re-enter the inspection ticket number indicating re-check in the column headed "Remarks" on solids reader log, if you are using a Solids Reader Log.
- (a) Clean the refractometer thoroughly and check it for zero reading with distilled water.
 - (b) Take two more readings, using the same sample material and record the readings as usual. However, be sure that you run the macerator for at least 15 seconds before removing the material for each reading. If these two readings do not vary more than 0.4%, average them and report the results.
 - (c) If these two readings vary more than 0.4% call your supervisor for assistance. No further readings will be taken unless a different refractometer is used. The inspector shall enter results of the soluble solids determination on the inspection ticket in both numerical and written form.

Example: 16.8%; sixteen-eight tenths.

- (a) The first two copies are to be given to the grower or grower representative. The third copy is to be retained by Inspection Service.

Quality Analysis

- (36) This section will cover the procedures an inspector shall follow once the sample for quality analysis is obtained. Juice and grapes will be collected in the sample tray and are part of the total sample and should be handled as follows:
- (37) 1. Juice from grapes in the basket insert (F in Figure 1) shall be drained and collected in the sample tray (E in Figure 1).
- (38) 2. Grapes from the sample tray basket shall be dumped on the scale pan and weighed. (Record weights to the nearest gram).
- (39) 3. All juice in the sample tray shall be poured into a graduated flask. The graduations or lines on the flask shall be used for measuring volume of juice as follows:
- (a) Read level of juice on flask. (If juice level in the flask falls between two lines, choose the line which indicates greater volume.)
- (b) Once volume of juice is determined, take the figure, for example, 600 ml. and convert it to a gram weight using the gram conversion chart (see pages 39 & 40.)

- (c) Add weight of grapes to weight of juice to obtain total sample weight. Record it on the notesheet.
 - (d) Discard juice according to instructions issued by the processor.
4. Segregate all quality factors and foreign material. (40)
Weigh each separately and record their weight on the notesheet.

Remember, percentages in both the U.S. Standards For Grades of Grapes For Processing and Freezing and U.S. Standards For American (Eastern Type) Bunch Grapes for Processing and Freezing are determined by weight. However, for grapes that have been picked by hand, count per pound is predetermined and used for grading purposes. This often is necessary because some grading stations are not equipped with scales suitable for weighing hand-picked grapes. If the station is equipped with suitable scales, percentages should be determined by weighing. Counts per pound should be checked at the beginning of the season, and frequently thereafter to make sure the predetermined estimates are as accurate as possible. Such checks should be made with a postal scale, or some other reliable method. It is generally considered proper to record the counts per pound by each one-sixteenth inch variation in grape size to establish the figures to be used in determining percentages. (41)

Factors Affecting Quality

- (42) The following are considered quality factors. However, they are not always applied or determined the same way. For this reason you must be completely familiar with the contents of both grade standards.
- (43) Maturity: One of the basic requirements in the U.S. NO.1 grade in both standards is that the grapes be mature.
- (44) In the U.S. Standards For American (Eastern Type) Bunch Grapes For Processing and Freezing, grapes are considered mature if they are juicy, palatable, and have reached the stage of development at which the skin of the berry easily separates from the pulp. Whereas, in the U.S. Standards For Grades of Grapes For Processing and Freezing, grapes are mature if a representative sample of grapes and juice in a lot shall test not less than 15.5 percent soluble solids, unless otherwise specified, as determined by an approved refractometer. More than or less than 15.5 percent soluble solids may be specified in connection with the grade.
- (45) There are no maturity requirements for the U.S. No. 2 grade in the U.S. Standards for American (Eastern Type) Bunch Grapes For Processing and Freezing. The U.S. No. 2 grade in the U.S. Standards For Grapes For Processing and Freezing requires grapes to be fairly well matured.

- Fairly well matured means that representative samples of grapes and juice in a lot shall not test less than 14.5 percent soluble solids, unless otherwise specified. More or less than a 14.5 percent soluble solids may be specified. (46)
- Immature berries: Immature berries are scored against both grades in both standards. Berries which are hard, green and generally small are considered immature berries. (47)
- Dried berries: Dried berries are light in weight and it takes a large number to exceed the tolerances for the grades in their respective standards. (48)
- Dried berries are berries that are dried and shriveled to the extent that practically no moisture is present. All suspect berries are to be squeezed to determine if they are dry. If no juice drips from them they are to be considered dried berries. (49)
- In the standards for American (Eastern Type) Bunch Grapes For Processing and Freezing, dried berries are scored against the restricted tolerance of 2 percent in the No. 1 grade whereas in the other standard, the No. 1 grade allows 10 percent. (50)

Crushed Berries: Berries may become crushed from rough handling in picking, packing or in transit. Certain varieties are thin skinned and unless considerable care is exercised in handling, the berries split or crush easily.

Crushed berries or split berries are a factor in either grade in the Standards For Grades of Grapes For Processing and Freezing. This is so even if the grapes have been hand-picked. However, berries that have split while on the vine or become crushed from handling often develop decay or mold in the cracks. Cracked or crushed berries having mold or decay are to be scored against the decay and mold tolerance contained in both standards.

In the Standards for American (Eastern Type) Bunch Grapes for Processing and Freezing split or cracked berries are scored against the 15 percent tolerance and crushed berries are scored against the 6 percent tolerance contained in the grades.

Color: Grapes in the U.S. Standards For American (Eastern Type) Bunch Grapes for Processing and Freezing have to be Well Colored (U.S. No. 1); Fairly Well Colored (U.S. No. 2). Color is not a factor in the U. S. Standards For Grades of Grapes For Processing and Freezing.

Mealy Bug injury or Honeydew secretion: Concord grapes, (55)
especially those grown in Washington State, as well as other
varieties, are often affected by the Mealy Bug. The Mealy Bug
does not penetrate the flesh of the grape but it does leave a
sticky deposit of excrement (honeydew) on the grapes.

This excrement should be scored against the 6% tolerance for (56)
serious damage in the grades contained in both standards when
deposits have a black sooty appearance and the aggregate area
of the deposits exceed a circle 1/4 inch in diameter.

Honeydew deposits have a tendency to promote mold growth after (57)
they acquire the black sooty appearance. If mold is present
on these deposits, the berries are to be scored against the 3%
tolerance for mold, regardless of the area affected.

Grapes are also affected by other types of insects such as (58)
Berry Moth, Leafhopper etc., which are scoreable if the insect
is attached to the berry or it has penetrated the flesh of the
berry. The U.S. Standards For Grades of Grapes For Processing
and Freezing allow only 1/2 of 1% in the No. 1 grade and 1% in
the No.2 grade for this type of insect injury.

- (59) However, berry moth is scored against the restricted 2% and 3% tolerances in the No.1 and No.2 grades in the U.S. Standards For American (Eastern Type) Bunch Grapes For Processing and Freezing. All other types of insect injury in this standard are scored against the 6% serious damage tolerance.
- (60) Sunburn: Sunburned berries are caused by berries being directly exposed to the sun's rays. Berries that have been affected by sunburn will have discolored dried areas on the skin that at times penetrate into the flesh.
- (61) Pulp discoloration: Freezing and oxidation are two factors causing discoloration which an inspector may encounter. Discoloration from oxidation on hand-picked grapes is seldom, if ever, a factor.
- (62) Grapes that have been mechanically harvested will oxidize if left exposed to the air for prolonged periods of time.
- (63) Oxidation discoloration is generally located in the upper portions of the bins and is not scored unless it is darker than plate GRP-PL-2. However, some processors like to know when they are receiving grapes that have berries showing initial signs of oxidation. Arrangements should be made with the processor as to how this information is shown.

Freezing: Both standards require grapes to be free from serious damage by freezing. Eastern type grapes that are injured by freezing become shriveled and usually show a milky opaque condition of the pulp. (64)

Black varieties undergo no color change in the skin but red and green varieties may show a light browning of the skin. (65)

Berries that have been frozen usually show a thickening of the liquid area between the skin and the pulp. It thickens to a consistency of paste. (66)

European or Vinifera type grapes that are injured by freezing have a dull appearance and are soft and flabby. After a severe freeze they turn brown and become wet and sticky. (67)

Any pulp discoloration resulting from freezing injury or from berries that have been frozen will be scored when it is as dark or darker than plate GRP-PL-2. (68)

Dissimilar Varieties: Dissimilar varieties are to be scored against all grades in both standards. The No. 1 grade in the U.S. Standards For Grades of Grapes For Processing and Freezing has a restricted tolerance of 1/2 of 1%. Whereas, in the U.S. Standards For Grades of American (Eastern Type) Bunch Grapes For Processing and Freezing 15% is allowed provided there are no other defects. (69)

(70) When inspecting grapes that have been mechanically harvested the skins are often separated from the pulp. Therefore, when scoring berries account of being dissimilar, or any other defect, always include the skin as well as the pulp when weighing.

(71) The following are some of the leading varieties of grapes used for processing.

Eastern	<u>Varieties</u>	<u>Color</u>
	Concord	Black-Blue
	Worden	Black
	Moore	Black
	Champion	Black
	Niagara	White
	Catawaba	Red
	Delaware	Red
European	Burgundy	Black
	Cabernet Sauvignon	Black
	Mission	Black
	Olivette Blanche	White
European	Riesling	White
	Sauvignon	White
	Zinfandel	Black

Hail: Hail injury is not scored as a defect in the U.S. Standards For Grades of Grapes For Processing and Freezing unless the berries have become dried. If this happens they are scored as dried berries. In the U.S. Standards For American (Eastern Type) Bunch Grapes For Processing and Freezing berries are scored if the skin has been broken by hail and as being seriously damaged. (72)

Unattached Petioles: Unattached petioles are petioles that are completely devoid of their leaves and they are never scored against any grade. (See Figure 3, Page 42) (73)

Foreign Material: Foreign material means sticks, stones, leaves, petioles, other plant parts or other extraneous materials. (74)

Stems, main, lateral and cap stems are not to be considered as foreign material. (75)

Foreign material is seldom a factor when inspecting grapes that have been hand-picked. If it is encountered in excessive amounts, bring it to the attention of the processor. (76)

VINEYARD "GRAPEMOBILE" INSPECTION

GENERAL

- (77) Vineyard inspections allow a quality determination of grapes prior to harvest. This type of inspection has many advantages over platform inspection. It provides both the grower and processor with advance information as to quality and sugar content of the grapes in the vineyard. It enables growers to take corrective action on vineyards that do not pass inspection before any harvesting costs are involved.
- (78) For example, if the vineyard was rejected on account of low soluble solids, the grower could postpone harvest and wait for a solids increase. If rejected because of poor color or some other grade factor, the grower can hand-pick selectively.
- (79) These instructions apply primarily to trellised grapes (as opposed to bush type or "spur" cultivation). For bush type or "spur" cultivation, certain adaptations of this procedure must be made. When this is the case supervisors should contact the Washington Office.

EQUIPMENT

It is the responsibility of the processor to notify the Inspection Service in advance as to the size, location, and owner of the vineyard. It is also their responsibility to furnish necessary equipment for vineyard inspection. The "Grapemobile" ideally should be an entirely self-contained, mobile inspection unit. It may be a trailer that is towed by car, or a small delivery van (the kind used by laundries). (In the Pacific Northwest, motor bikes were used in the vineyard.) It should contain all of the equipment needed to make an "on-the -spot" determination of the quality and sugar content of the grapes in the vineyard. An artist's sketch of a fully equipped grapemobile is shown on the following page. It contains the following items. (80)

1. Electricity.
2. Water.
3. Electric blender.
4. Refractometer.
5. Tractor (about 10 h.p.) or other adequate vehicle.
6. Ramp for loading and unloading tractor.
7. Plastic bags.

Unfortunately, processors have not seen fit to furnish the Service with a fully equipped unit. However, without the complete unit the inspection operation is not as efficient as it could be and may result in higher inspection costs. (81)

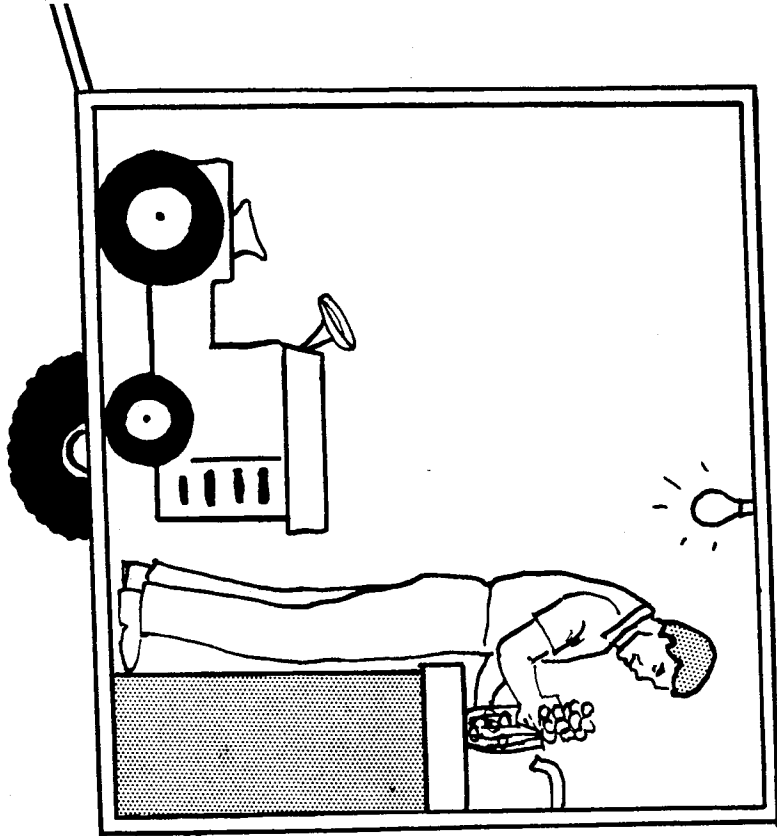
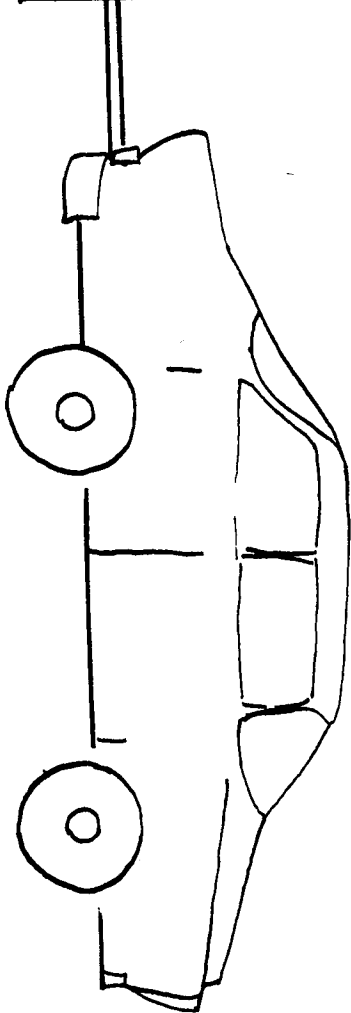


ILLUSTRATION 1

“Grapemobile”



Although all of the above items may not be included in the grapemobile, Federal Supervisors must insist on items 5 and 6. No attempt shall be made to inspect grapes in the vineyard by walking. (82)

The refractometer and blender are not a necessary part of the "Grapemobile". If the processor chooses not to install these items in the unit, then the plant facilities will have to be used to determine soluble solids content. In certain cases, where the processor makes arrangements with the grower, the inspector may determine soluble solids on the grower's premises if a refractometer and blender are furnished. (83)

INSPECTION PROCEDURE

Each inspector assigned to vineyard work will be issued a deck of 15 sampling cards. Except for the number of rows in the vineyard and grading instructions, the cards will furnish all the information needed to sample bunches for quality and soluble solids determination. Starting rows, quarters of the row and bunches for soluble solids have all been randomly selected by computer to eliminate as much sampling bias as possible. (84)

SAMPLING CARDS

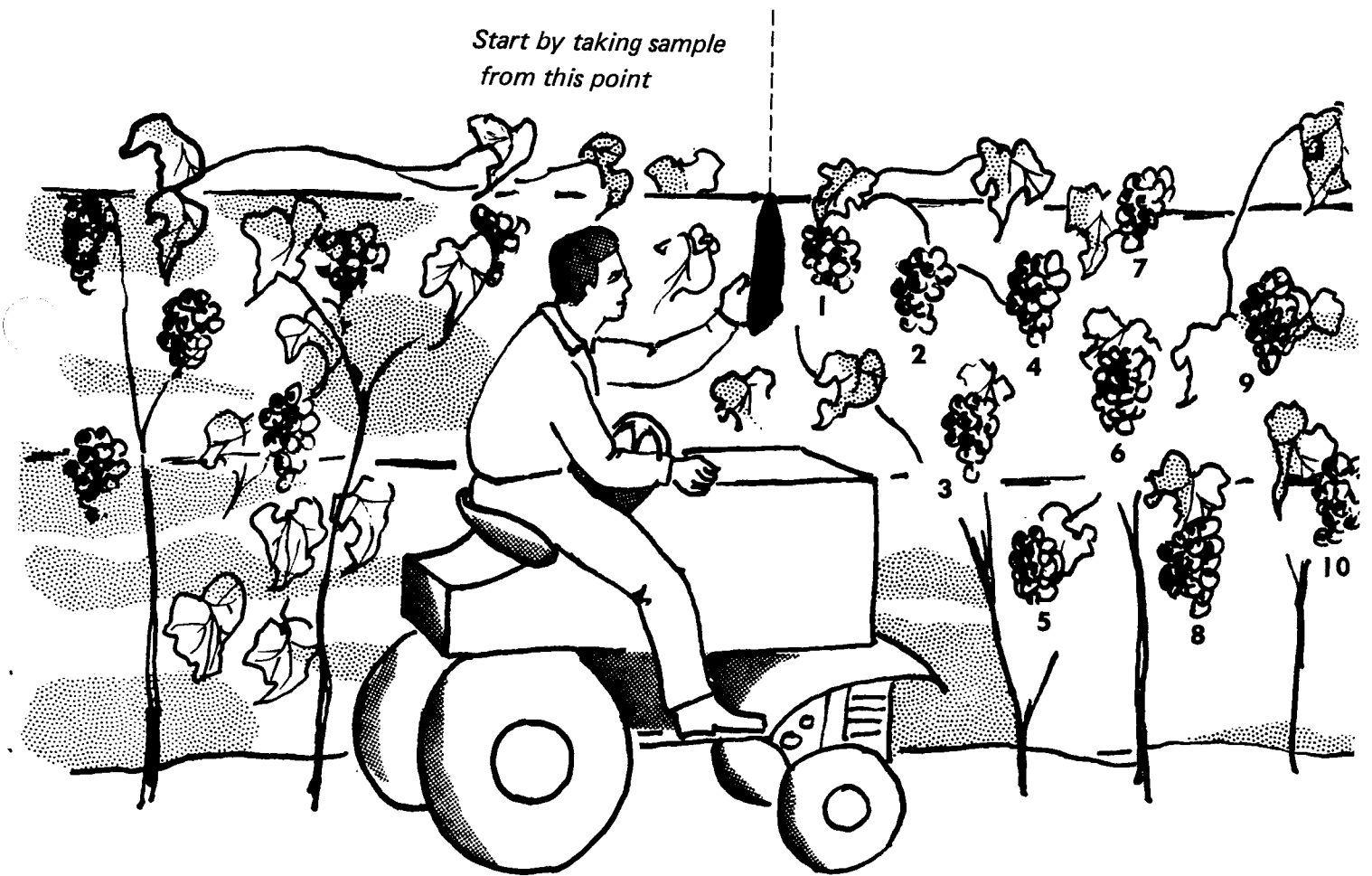
- (85) There are 15 cards in a complete deck, each bearing an identification number located at the top of the card (1-15). This number is to be recorded on the inspection memo issued for the vineyard. The cards should be handled as follows:
- (86)
1. At the beginning of the season count the cards to make sure the set is complete (15 cards).
 2. Turn the cards face down.
 3. Draw the top card for each vineyard to be inspected, placing this card at the bottom of the deck after the inspection is completed. Continue this rotation system. The cards do not have to be in numerical order to start with, but it is important that they be rotated.

SAMPLING

- (87) For Quality. At each stop indicated on the sampling card (see page 33), a 10 bunch sample will be examined for defects and the percentage of defects (decay, berry moth, etc.) shall be recorded on the note sheet. The bunches shall be selected on a consecutive basis, starting at the point of the first stop within a designated quarter.

ILLUSTRATION II

Start by taking sample
from this point



- (88) For Soluble Solids. A soluble solids determination is made only upon request of the applicant. If a soluble solids determination is requested, select one bunch of grapes-- out of the 10 bunches examined at each stop-- for testing purposes. Cut the bunch from the vine and place it in the film bag provided for that purpose. The bunches collected from all stops in a vineyard are then used to determine the percentage of soluble solids for the vineyard.
- (89) Soluble solids testing shall be done at the processor's plant if the grapemobile is not equipped with a blender and refractometer . The film bags which contain the soluble solids sample should be properly tagged or otherwise identified to prevent any mix-up of grower's lots. It will not be necessary to return to the plant after completing inspection of each vineyard. Just identify each bag and let them accumulate until the end of the day. This procedure may vary depending on the arrangements made between the processor and the Inspection Service. Your supervisor may issue additional instructions on this matter.

GENERAL EXAMPLES OF VINEYARD INSPECTION

- (90) The following examples illustrate, from start to finish, the entire procedure for inspection of grapes in the vineyard. Slight variations may occur because of different conditions existing in each area.

Step 1

The processor (or field supervisor) arranges to meet the inspector at the plant each weekday morning. At this time the inspector is given a list of the vineyards to be inspected that day. For each vineyard the following information should be given:

(91)

1. Grower's name.
2. Location and Size of vineyard. The grower will provide a map showing the location of all contracted acreage (including size of blocks) or individual vineyards.
3. Inspection unit. Quite often the grower will have the vineyard divided into "blocks". This is generally a section of the vineyard separated by roadways or ditches. The unit of inspection may be either the whole vineyard or one or more blocks within the vineyard. As a guide, blocks which are contiguous-- near each other-- may be considered a vineyard. But blocks which are separated by appreciable distance should be considered as separate units or vineyards.
4. The number of rows - if known.

(92)

Step 2

Upon arriving at the first vineyard on the list and before entering it, record the following information on the inspection memo:

(93)

1. Grower's name.
2. Location of vineyard (grower block number).
3. Date and time entering vineyard.
4. Number of sampling card used.

(94) On each vineyard sampling card there are 12 stops. In order to conserve time and maintain accuracy of inspection, the following number of stops shall be made depending on the size of the vineyard (number of acres):

(95)	Size of Vineyard (Acres)	Number of Stops
	1 thru 5	5
	over 5 thru 25	8
	over 25	12

(96) (In areas or vineyards where conditions or quality are extremely variable, additional stops and samples may be authorized by the supervisor.)

(97) Only one sample of 10 bunches is to be examined in any row. Since practically all vineyards consist of more than eight rows, it will be necessary to establish a row interval as well as to select a starting row. To do this one needs to know the total number of rows in the vineyard.

To determine the starting row and the row interval, it will be necessary to count the number of rows in the vineyard. This can be done by making a pass across one end of the vineyard before starting the inspection (see illustration 111 on page 32). (98)

After determining the number of rows in the vineyard, divide the total rows by the number of stops (5,8, or 12 depending on vineyard size) to obtain the quotient-row interval. (99)

Example:

1. A 4 acre vineyard with 15 rows; 15 divided by 5 will give a row interval of 3. (100)
2. A 20 acre vineyard with 72 rows; 72 divided by 8 will give a row interval of 9.
3. A 40 acre vineyard with 120 rows; 120 divided by 12 will give a row interval of 10.

If the number of rows is not exactly divisible by the number of stops (5,8 or 12), drop back to the next lowest figure to obtain a row interval. (101)

Let us take a look at the above example 3. Assume the card on top of the deck is card number 1 (see example on page 32), go across the line for "ROW INTERVAL" until you reach 10. (102)

EXAMPLE

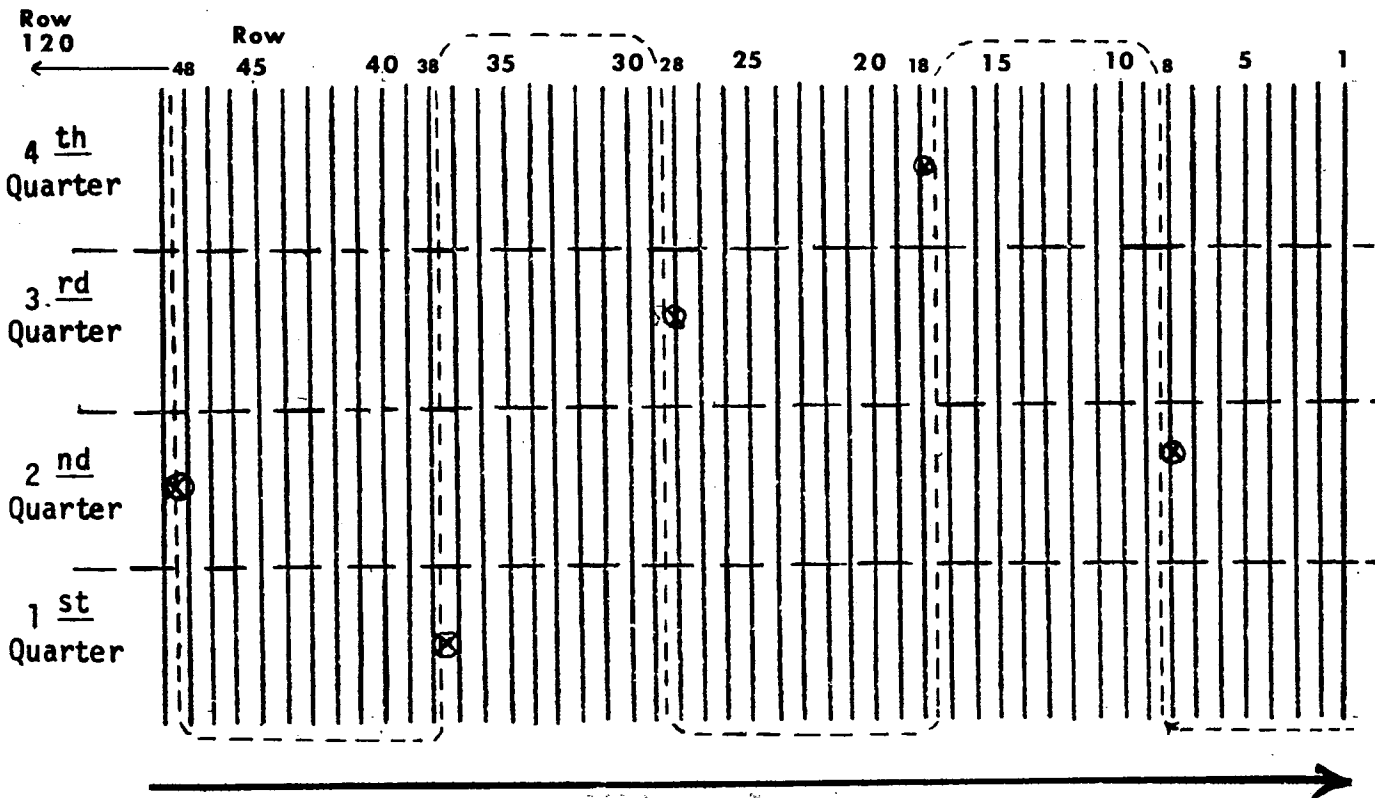
CARD NUMBER 1

LEFT

RANDOM CARD FOR VINEYARD SAMPLING

ROW INTERVAL	2	3	4	5	6	7	8	9	10	11	12	13
STARTING ROW	2	2	1	5	2	1	7	3	8	3	3	6
ROW INTERVAL	14	15	16	17	18	19	20	21	22	23	24	25
STARTING ROW	2	13	7	1	15	1	2	2	13	17	23	9
STOP	1	2	3	4	5	6	7	8	9	10	11	12
QUARTER OF ROW	2	4	3	1	2	1	4	2	3	4	1	1
BUNCH	10	9	2	3	6	10	2	5	3	1	8	10

ILLUSTRATION III



MAKE PASS COUNTING ROWS

Directly below 10 will be the number of the row you would start in (row 8). So the rows to be sampled would be rows 8, 18, 28, 38, and every 10 rows thereafter until 12 stops are made. Only one bunch, for soluble solids determination, is taken from any row. The random card indicates, under "STOP" and to the right of "BUNCH", which bunch to take for solids testing. To determine bunch number in the the vineyard see example on page 27. (103)

To the left and slightly below each card number is the word "RIGHT" or "LEFT". This indicates the side of the row to be inspected or sampled. In the example it would be the left side. The side of the row will always be determined as you face the row just before entering it (see illustration II on page 27). (104)

DISTRIBUTION OF INSPECTION MEMORANDUM COPIES

Distribution of vineyard inspection memorandum copies will depend on arrangements made by the Inspection Service with the processor. Your Supervisor will instruct you as to the procedure to be followed. Since this will vary from one State to another, no attempt is made in this handbook to outline distribution policy. Regardless of the policy decided upon, a definite system should be set up so that each vineyard inspection certificate can be properly cross-referenced with the corresponding inspection certificates issued when the grapes are delivered to the plant. (105)

APPEAL INSPECTION

When accuracy of scoring is questioned, an appeal inspection should be made.

- (107) When either the grower or processor questions the correctness of an inspector's scoring of samples, it will usually be desirable to have an appeal inspection. The inspector should explain to the grower or processor that they are entitled to have an appeal inspection made whenever they doubt the accuracy of the results or the inspector's judgment.
- (108) In many instances, the complainant may be satisfied if the original inspector will draw additional samples and show the dissatisfied party how samples are scored and why. Frequently, growers are not well informed as to the grade terminology or meaning. However, if after such an explanation the party is still not satisfied with the inspector's interpretations, the supervisor should be called in. The supervisor will either personally inspect a new sample or assign another inspector to make the appeal inspection.

Grapemobile Appeal Inspections:

- (109) Although no official policy has been provided for appeal inspections as such, there will be instances when grower or processor may question the accuracy of your results.

In such cases your supervisor should be notified. The procedure to be followed will be left to his or her discretion. As a guide, however, there are 2 ways in which this situation could be handled. (110)

1. If the solids test is questioned, resample the vineyard, using a different sampling card. In this case it will not be necessary to make a quality determination at every stop. Simply collect bunches for another solids test. Average the results of both tests and record on the inspection memorandum. Also record the number of the second sampling card used. (111)

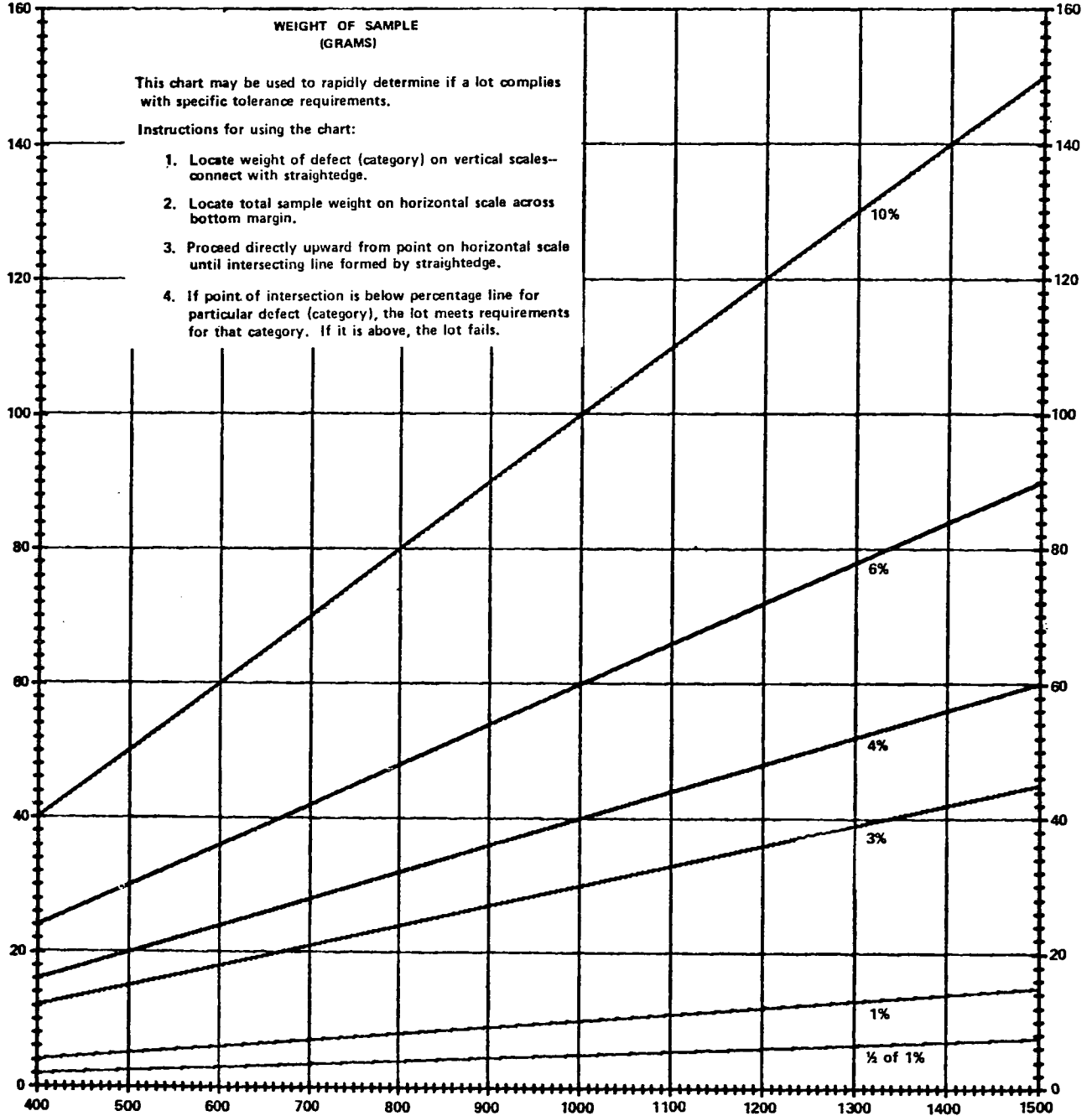
2. If the grade of the vineyard is in question, the supervisor should make the second inspection. Select another sampling card, but instead of making the usual number of stops listed on the card intermediate stops should also be made. For example (still using card No. 1) a 40 acre vineyard with 120 rows, stops would be made at rows 8, 13, 23, 28, 33, 38, 43, 48, 53, 58, 63, 68, and so on. This will approximately double the number of stops made on the original inspection. (112)

(113)

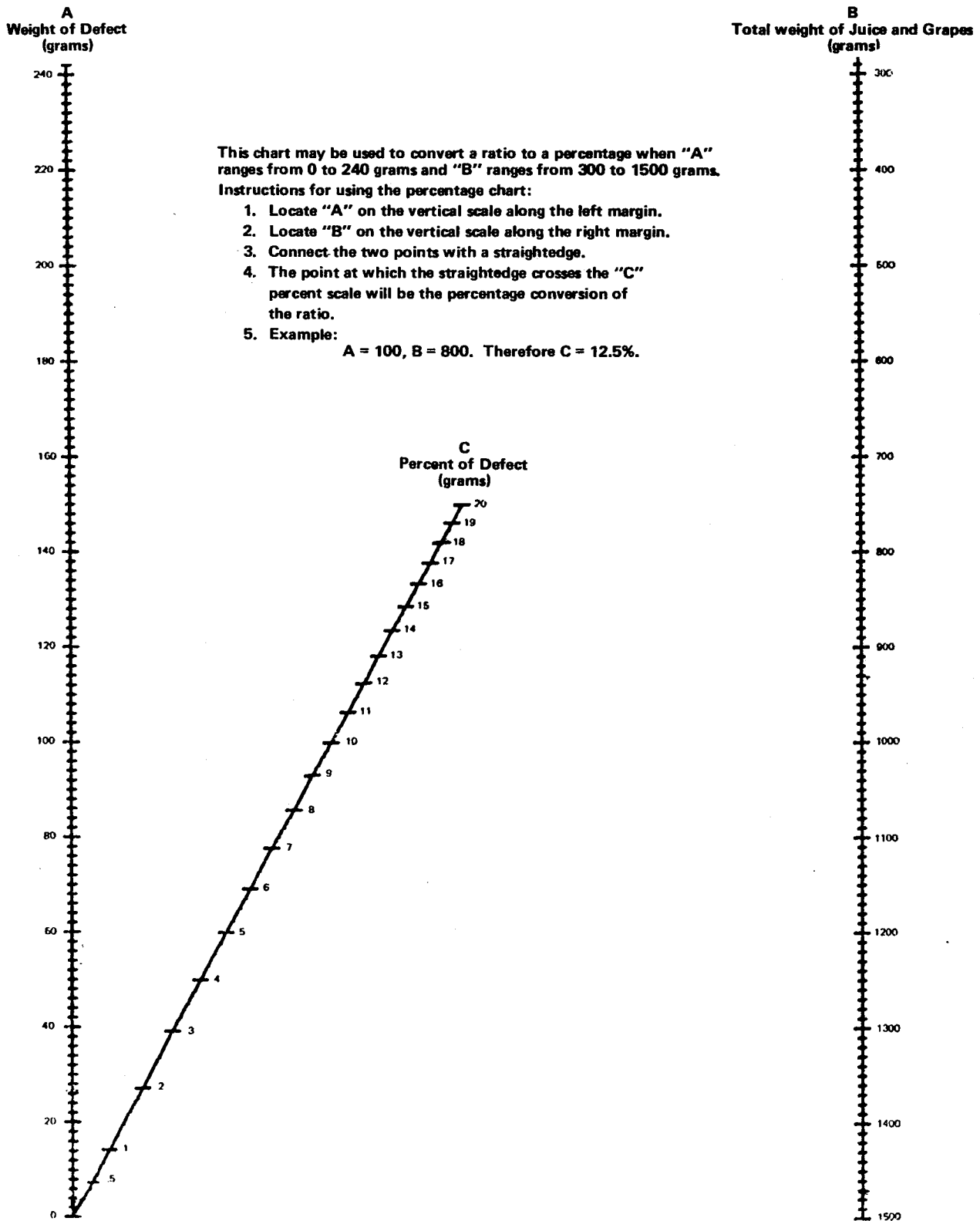
(When making over 12 stops in a vineyard, quarter of rows in which to stop and bunches selected for soluble solids should be obtained from the next card in the deck.) The results of the second inspection should be considered final. A memo covering the second inspection should be issued and the original memo should be voided.

WEIGHT OF DEFECTS
(GRAMS)

WEIGHT OF DEFECTS
(GRAMS)



PERCENTAGE COMPUTATION CHART FOR MECHANICALLY HARVESTED GRAPES



GRAPE JUICE CONVERSION TABLE FOR MECHANICALLY HARVESTED GRAPES
Milliliters to Grams

<u>Mls.</u>	<u>Gms.</u>	<u>Mls.</u>	<u>Gms.</u>
100	107	300	320
105	112	305	326
110	117	310	331
115	123	315	336
120	128	320	342
125	133	325	347
130	139	330	352
135	144	335	358
140	149	340	363
145	155	345	368
150	160	350	374
155	165	355	379
160	171	360	384
165	176	365	390
170	181	370	395
175	187	375	400
180	192	380	406
185	198	385	411
190	203	390	416
195	208	395	422
200	214	400	427
205	219	405	432
210	224	410	438
215	230	415	443
220	235	420	448
225	240	425	454
230	246	430	459
235	251	435	464
240	256	440	470
245	262	445	475
250	267	450	480
255	272	455	486
260	278	460	491
265	283	465	496
270	288	470	502
275	294	475	507
280	299	480	512
285	304	485	518
290	310	490	523
295	315	495	528

Conversion ratio: Milliliters X 1.06759 (equivalent to specific gravity of juice with soluble solids of 16.5 percent.)

GRAPE JUICE CONVERSION TABLE FOR MECHANICALLY HARVESTED GRAPES
Milliliters to Grams

<u>Mls.</u>	<u>Gms.</u>	<u>Mls.</u>	<u>Gms.</u>
500	534	700	747
505	539	705	753
510	544	710	758
515	550	715	763
520	555	720	769
525	560	725	774
530	566	730	779
535	571	735	785
540	576	740	790
545	582	745	795
550	587	750	801
555	593	755	806
560	598	760	811
565	603	765	817
570	609	770	822
575	614	775	827
580	619	780	833
585	625	785	838
590	630	790	843
595	635	795	849
600	641	800	854
605	646	805	859
610	651	810	864
615	657	815	870
620	662	820	875
625	667	825	881
630	673	830	886
635	678	835	891
640	683	840	897
645	689	845	902
650	694	850	907
655	699	855	913
660	705	860	918
665	710	865	923
670	715	870	929
675	721	875	934
680	726	880	939
685	731	885	945
690	737	890	950
695	742	895	955

Conversion ratio: Milliliters X 1.06759 (equivalent to specific gravity of juice with soluble solids of 16.5 percent.)

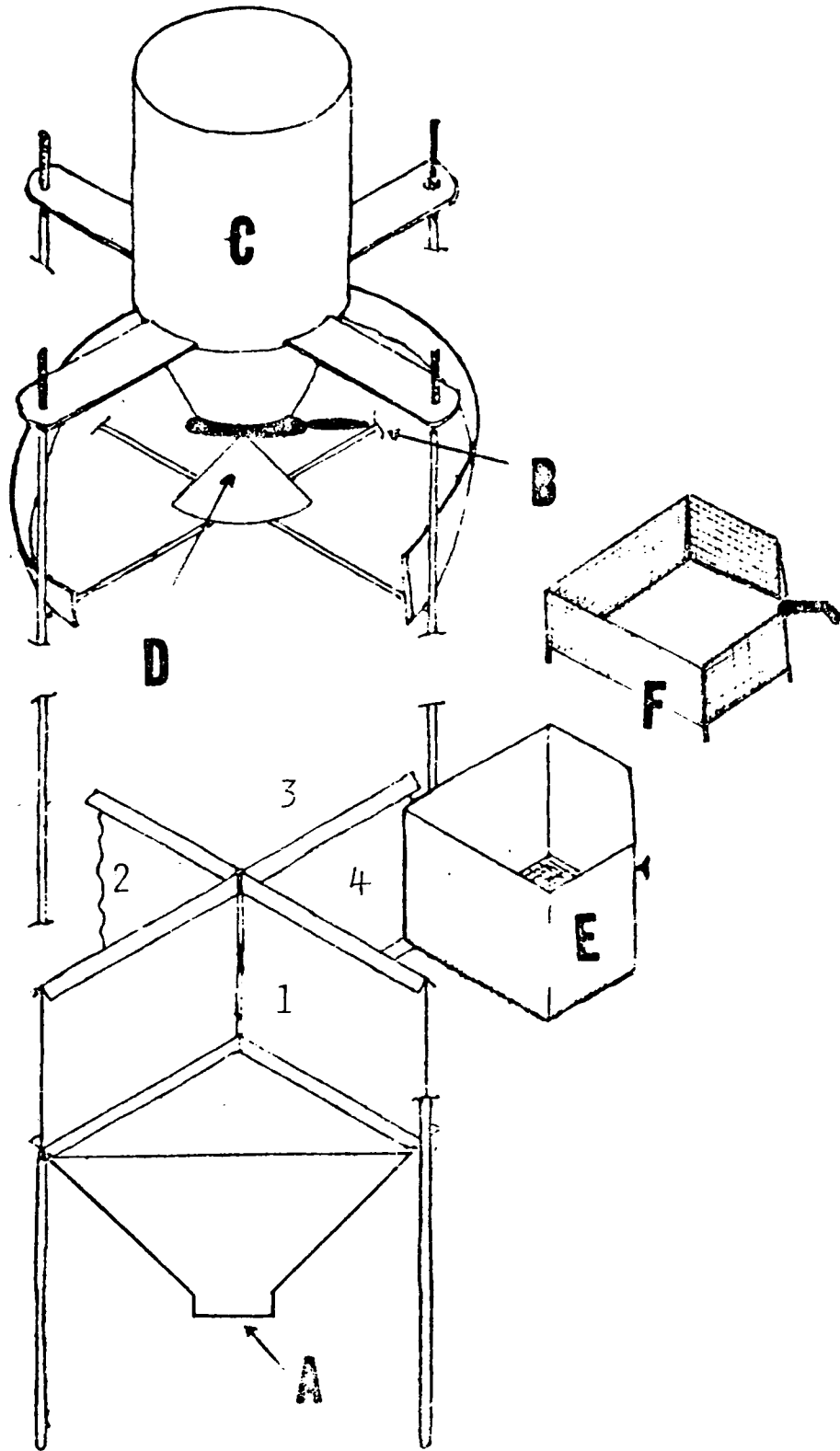
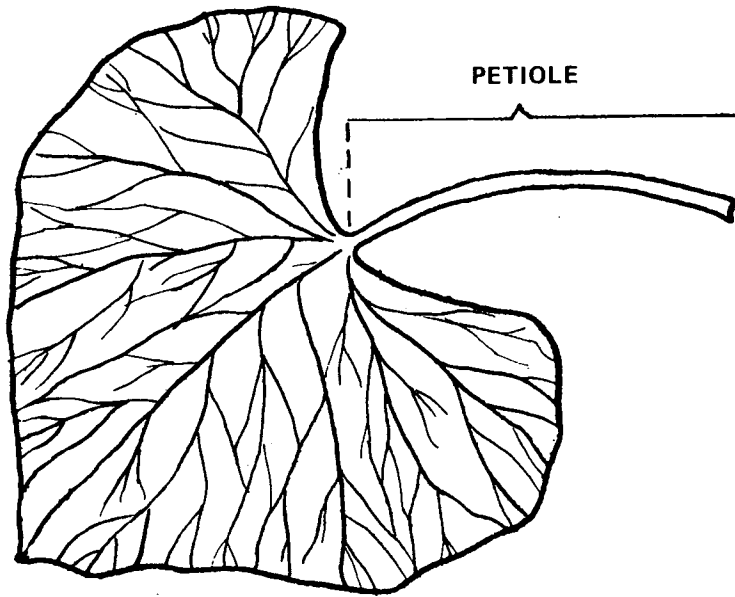
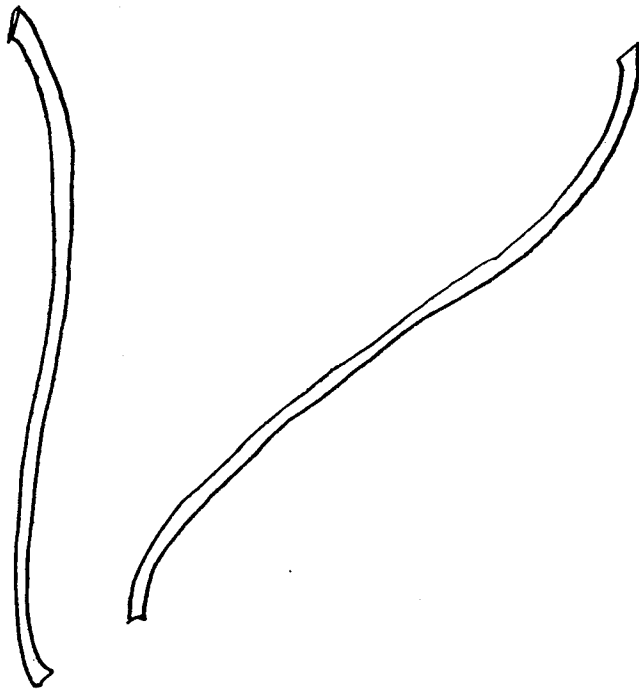


Figure 1



PETIOLE WITH LEAF ATTACHED

Figure 2.

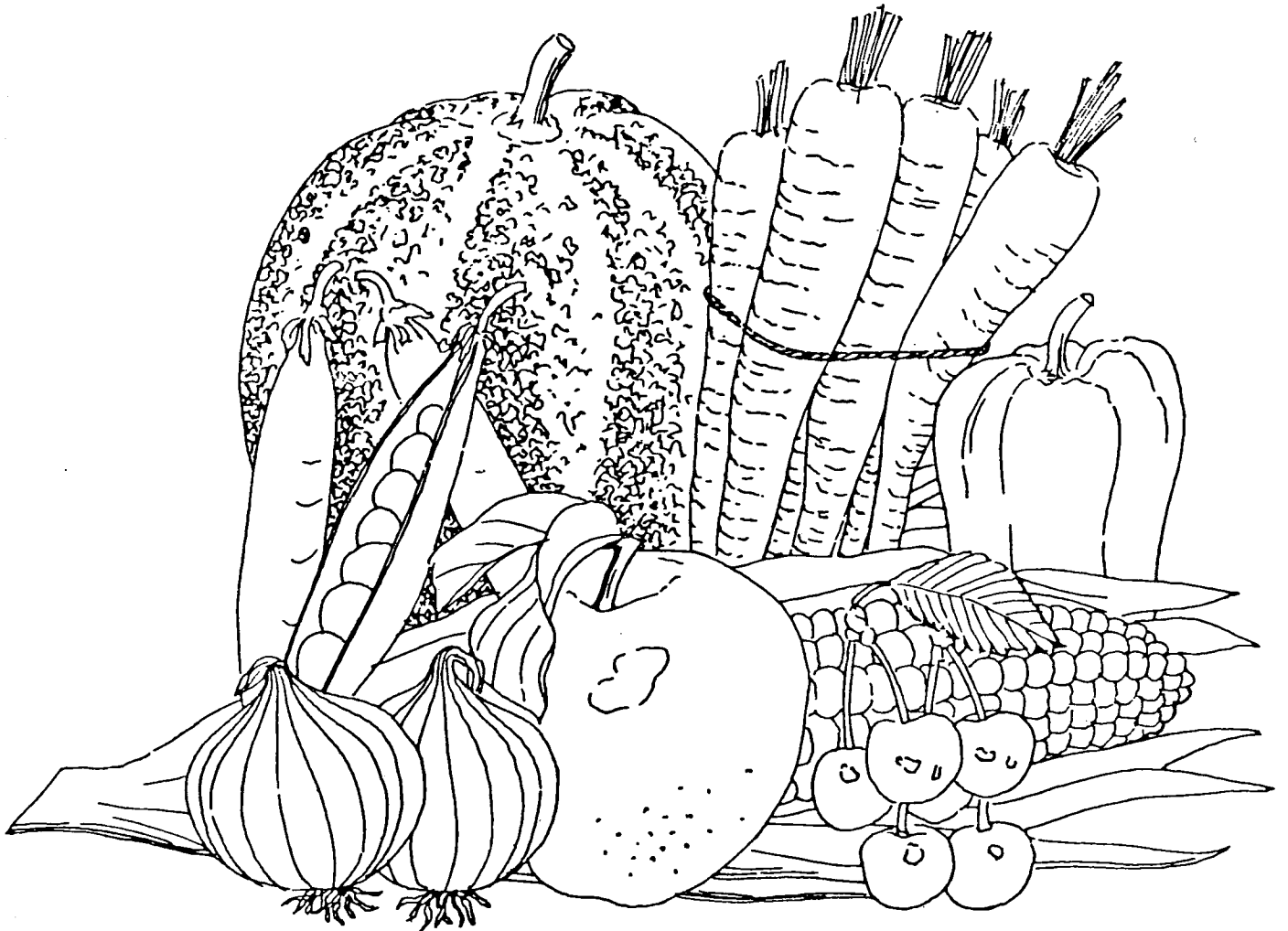


UNATTACHED PETIOLE

Figure 3.

Appendix I

United States Standards



**UNITED STATES STANDARDS FOR GRADES OF
GRAPES FOR PROCESSING AND FREEZING ¹**

SOURCE: 40 FR 15381, Apr. 7, 1975, unless
otherwise noted. Redesignated at 42 FR
32514, June 27, 1977 and at 46 FR 63203,
Dec. 31, 1981.

Effective September 1, 1977

Sec. **GENERAL**
51.2150 General.

GRADES

51.2151 U.S. No. 1.
51.2152 U.S. No. 2.

TOLERANCES

51.2153 Tolerances.

DEFINITIONS

51.2154 Mature.
51.2155 Fairly well matured.
51.2156 Foreign material.
51.2157 Similar varietal characteristics.
51.2158 Unattached petioles.
51.2159 Damage.
51.2160 Serious damage.
51.2161 Classification of defects.

AUTHORITY: Secs. 203, 205, 60 Stat. 1087,
as amended, 1090 as amended; 7 U.S.C. 1622,
1624.

GENERAL

§ 51.2150 General.

(a) These standards apply to all types of grapes, hand-picked or mechanically harvested, which are to be processed.

(b) The grade of a lot of grapes shall be determined on the basis of a composite sample.

GRADES

§ 51.2151 U.S. No. 1.

“U.S. Grade No. 1” consists of grapes and juice which meet the following requirements:

- (a) Basic requirements:
(1) Mature; and,
(2) Similar varietal characteristics.

(b) Free from:

- (1) Decay;
(2) Visible mold;
(3) Immature berries;
(4) Sunburn;
(5) Freezing;
(6) Attached insects or insect injury;
and,
(7) Foreign material.
(c) Free from damage by any cause.
(See § 51.2159.)
(d) For tolerances, see § 51.2153.

§ 51.2152 U.S. No. 2.

“U.S. No. 2” consists of grapes and juice which meet the requirements of the U.S. No. 1 grade except:

- (a) Berries shall be at least fairly well matured; and,
(b) Increased tolerances for defects and foreign material. (See § 51.2153.)

TOLERANCES

§ 51.2153 Tolerances.

(a) No tolerance is provided in these standards for grapes which fail to meet the maturity requirement.

(b) In order to allow for variations incident to proper culture, harvesting and handling in each of the foregoing grades, tolerances, by weight, other than for maturity, are set forth in Table I.

¹Compliance with 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.

TABLE I

	U.S. No. 1 (pct by weight)	U.S. No. 2 (pct by weight)
A. Total defects.....	10.....	10.
1. Serious damage (included in "A").	6.....	6.
(a) Berries affected by mold or decay (included in "1").	3.....	3.
(b) Dissimilar varieties (included in "1").	½ of 1.....	½ of 1.
(c) Berry moth, attached insects or other insect injury (included in "1").	½ of 1.....	1.
B. Foreign material.....	3.....	4.
(a) Leaves, petioles, or other plant parts, except for unattached petioles (included in "B").	3.....	4.
(b) All other foreign material (included in "B").	½ of 1.....	½ of 1.

DEFINITIONS

§ 51.2154 Mature.

"Mature" means that representative samples of grapes and juice from containers in a lot shall test, unless otherwise specified, not less than 15.5 percent soluble solids, as determined by an approved refractometer.

§ 51.2155 Fairly well matured.

"Fairly well matured" means that representative samples of grapes and juice from containers in a lot shall test, unless otherwise specified, not less than 14.5 percent soluble solids, as determined by an approved refractometer.

§ 51.2156 Foreign material.

"Foreign material" means sticks, stones, leaves, petioles or other plant parts or other extraneous material.

§ 51.2157 Similar varietal characteristics.

"Similar varietal characteristics" means grapes having same characteristic skin and pulp color.

§ 51.2158 Unattached petioles.

"Unattached petioles" means petioles that are completely devoid of their leaf.

§ 51.2159 Damage.

"Damage" means any specific defect described in § 51.2161, Table II; or an equally objectionable variation of any one of these defects, any other defect, or any combination of defects, which materially detracts from the processing quality of the grapes.

§ 51.2160 Serious damage.

"Serious damage" means any specific defect described in § 51.2161, Table II; or an equally objectionable variation of any one of these defects, any other defect, or any combination of defects, which seriously detracts from the processing quality of the grapes.

§ 51.2161 Classification of defects.

TABLE II

Defects	Damage	Serious damage
Dried berries.....	When berries are dry and shrivelled to the extent that practically no moisture is present within the berries.	
Discoloration.....	See serious damage.	When darker than plate 7.5 RP ¼ in the Munsell Book of Color. ¹
Sunburn.....	See serious damage.	When sunken, discolored, and dried area caused by sunburn affects the skin or flesh of the grape.
Decay or mold.....	See serious damage.	Any visible decay or mold on the grape skin or penetrating the flesh.
Insects or insect injury.	See serious damage.	Any insect injury penetrating the flesh or any insect attached to the grape.
Immature berries...	See serious damage.	When berries are hard and green and generally small.

¹This color plate may be purchased from the Munsell Color Co., 2441 North Calvert St., Baltimore, Md. 21218.

Dated: August 16, 1977.

ROBERT ANGELOTTI,
Administrator.

[FR Doc.77-24401 Filed 8-22-77;8:45 am]

