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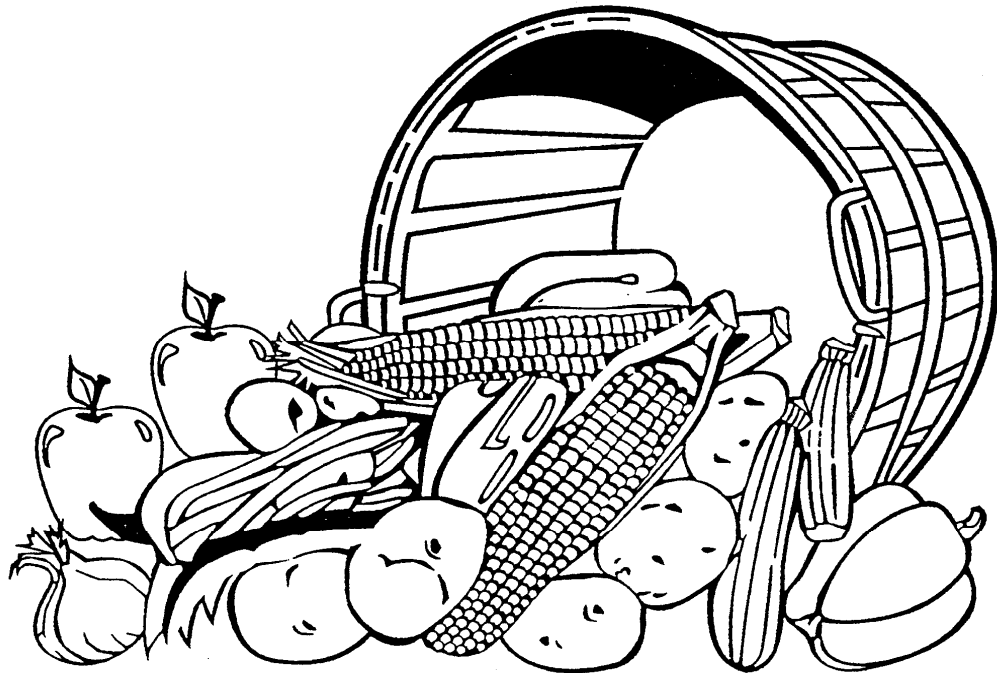
Fruit and
Vegetable
Programs

Fresh Products
Branch

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Brussels Sprouts

Shipping Point and Market Inspection Instructions



Shipping Point and Market Inspection Instructions for Brussels Sprouts

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 Brussels Sprouts, Section 51.2250.

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

August 2005

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This replaces Market Inspection Instructions for Brussels Sprouts dated September 1957.

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 that are not designated do not pertain to either category.

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GENERAL

Brussels sprouts are hardy, slow-growing, long-season vegetables belonging to the cabbage family. In the proper season of the year, they can grow successfully in most areas of the country. U.S. production usually runs from June through January.

The “sprouts” (small heads that resemble miniature cabbage) are produced in the leaf axils, starting at the base of the stem and working upward. Sprouts improve in quality and grow best during cool or even lightly frosty weather. Brussels sprouts require a long growing period, although some newer hybrids are harvested sooner. In all states (except the most northern), summers are usually too warm for production from spring plantings. Plants set out later in spring into early summer grow and mature quality sprouts when the fall weather begins to cool. Hot weather usually results in soft and open sprouts.

REPRESENTATIVE SAMPLING

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

Size of Sample

The tolerances of the U.S. Standards for Grades of Brussels Sprouts are determined by:

§51.2254 Basis for calculating percentages. Percentages shall be calculated on the basis of weight or an equivalent basis.

When the product is loose in cartons or crates, 48 to 50 ounces is usually sufficient for the sample. When the product is in consumer size cups, clam shells, or bags and packed in master containers, the consumer package is your sample and one or two cups or bags should be taken from each master container. Then, depending on whether or not the sample is fairly uniform, the Brussels sprouts must be either weighed or counted out to determine percentages.

Equivalent basis is not defined in the standards. However, Brussels sprouts contained within a sample are considered “fairly uniform” when the size of the smallest

does not vary more than 3/8 inch in diameter from the largest Brussels sprout in the sample. If the Brussels sprouts are within this range, then the equivalent basis has been met and the sample can be based on a 100 count. Regardless of the container, if there is more than a 3/8 inch variance in diameter, then weight must be used to determine percentages.

Number of Samples

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

TOLERANCES AND APPLICATION OF TOLERANCES

§51.2250 U.S. No. 1 and §51.2251 U.S. No. 2...(b) In order to allow for variations incident to proper grading and handling, other than for size, not more than a total of 10 percent, by weight, of the Brussels sprouts in any lot may fail to meet the requirements of the grade: *Provided*, That not more than one-fifth of this amount, or 2 percent, shall be allowed for soft decay. In addition, not more than a total of 5 percent, by weight, of the Brussels sprouts in any lot may be smaller than the specified minimum diameter, and not more than 10 percent may be longer than the specified maximum length.

	<u>Tolerances</u>	
	<u>U.S. No. 1</u>	<u>U.S. No. 2</u>
Total Defects	10%	10%
Including Soft Decay	2%	2%
Undersize (diameter)	5%	5%
Oversize (length)	10%	10%

Application of Tolerances

§51.2253 Application of tolerances. (a) The contents of individual packages in the lot, based on sample inspection, are subject to the following limitations: *Provided*, That the averages for the entire lot are within the tolerances specified for the grade:

(1) For a tolerance of 10 percent or more, individual packages in any lot may contain not more than one and one -- half times the tolerance specified; and,

(2) For a tolerance of less than 10 percent, individual packages in any lot may contain not more than double the tolerance specified, except that at least one defective and one off-size specimen may be permitted in any package.

Application of Tolerances

	<u>U.S. No. 1</u>	<u>U.S. No. 2</u>
A. Total defects	$1\text{-}1/2 \times 10\% = 15\%$	$1\text{-}1/2 \times 10\% = 15\%$
1. Including, Soft Decay, except that one defective and one off size is permitted in a container	$2 \times 2\% = 4\%$	$2 \times 2\% = 4\%$
B. For off-size		
1. Undersize (diameter), except one undersize is permitted in a container	$2 \times 5\% = 10\%$	$2 \times 5\% = 10\%$
2. Oversize (length)	$1\text{-}1/2 \times 10\% = 15\%$	$1\text{-}1/2 \times 10\% = 15\%$

NOTESHEET AND CERTIFICATE

Entries on the notesheet and certificate must be kept in a legible and accurate manner. It is mandatory that all information that 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 and instructions.

Product

“Brussels Sprouts” shall be used to describe this commodity in the “Product” heading.

Number/Type of Containers

The number of containers shall always be reported. The count of large lots certified in a warehouse or on a platform may be reported on the authority of someone other than the inspector. However, the inspector is responsible for assuring that the approximate number of the containers reported in the lot is present. Small lots (100 containers or less) that can be counted with accuracy are to be reported on the inspector’s authority as “Inspector’s count.”

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.

The most commonly used containers for shipping Brussels sprouts are 25 pound cartons and waxed cups for consumer use. Other shipping containers used include 10 pound bulk, 1 pound clam shells (6, 8, or 12 to a carton), 1 pound mesh bags (12 to a carton), and also 24/1 pound netted bags.

Brands/Markings

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

Origin

The inspector should not make a positive statement on their own authority, but when container markings list the state or country of origin, it should be quoted in the appropriate space on notesheets and certificates. This policy is necessary because some firms may use one mark on the same product packed in several states. The inspector can certify only to the marks and has no means of verifying which state or country the Brussels sprouts were grown.

CONDITION OF PACK

The following terms should be used in describing the filling of containers:

Well Filled means that the container is sufficiently filled to prevent the movement of product within the container.

Fairly Well Filled means the pack is not ideal but is between well filled and slack, being tight enough to prevent injury to the product under normal handling conditions.

Slack means that there is free movement of the sprouts in the container and the level of the sprouts is below normal commercial practices. The amount of slackness shall be reported in inches or half inches. When pack ice has melted, containers will be lighter than when originally filled and may also be slack.

Pack Ice

The presence or absence of pack ice can be a very important factor in Brussels sprouts inspections. Crushed ice is generally used in packs of Brussels sprouts, except consumer size containers.

The following terms could be used to describe the amount of ice remaining in the pack:

“No ice” when there is no ice present.

“Practically no ice” should be noted when there is only occasional pieces.

“Small amount crushed ice” when there is ice but less than what would normally fill the container under normal commercial practices.

“Good amount crushed ice” when the normal amount is present.

“Large amount crushed ice” when there is more than the normal amounts considered proper for a good commercial pack.

TEMPERATURE OF PRODUCT

Inspectors would not normally determine or report temperatures at shipping point. However, due to the importance of the pulp temperature of fresh fruits and vegetables when in transit or at destination, it is essential that the inspector accurately determine and report the temperature or range in temperatures on each lot. Pulp temperature should be reported regardless of the location of the product, whether in the

carrier, warehouse, or stacked on the platform. Remember to pre-cool 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, and these must be reported in greater detail specifying location in lot or load.

SIZE

The size requirement is part of the grade for Brussels sprouts.

§51.2250 U.S. No. 1...(a) Unless otherwise specified, the diameter of each Brussels sprout shall be not less than one inch, and the length shall be not more than 2-3/4 inches.

§51.2259 Diameter. “Diameter” means the greatest dimension measured at right angles to a line running from the stem to the apex of the Brussels sprout.

The undersize tolerance for diameter is 5%.

The tolerance for over-length sprouts is 10%.

Those Brussels sprouts, which are smaller than one inch in diameter, shall be scored against the size tolerance, unless some other minimum size is specified.

The measurement for **length** shall be the distance from the apex of the sprout to the point of attachment of the outer leaf to the base; such measurement shall not include the stem. Likewise, sprouts, which are longer than 2-3/4 inches, should be scored against the over-length tolerance, unless some other maximum length is specified.

DEFECTS (QUALITY AND CONDITION)

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

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

Burst (Q)

Brussels sprouts are described as “burst” when they are split, cracked, or broken open. Under unfavorable growing conditions, burst heads can become a problem. Both grades specify: “Not burst.”

Scoring Guide

As a guide, score as burst when the sprout is split, cracked, or broken open against the tolerance for the grade.

Cleanness (Q)

Cleanness refers to dirt or other foreign material on/in the sprouts. The U.S. grades have the following requirements for cleanness:

U.S. No. 1: Free from damage by dirt or other foreign material.

U.S. No. 2: Free from serious damage by dirt or other foreign material.

The following terms should be used in describing cleanness:

Clean means that there is practically no dirt or foreign material present in the sample.

Fairly Clean means that there is an amount of dirt or foreign material present, but not to an extent that it materially affects the appearance.

Slightly Dirty means that there is sufficient dirt or foreign material to materially affect the appearance. This condition does not meet the requirements of the U.S. No. 1 grade and would be considered damaged by dirt or foreign material.

Dirty means that there is sufficient dirt or foreign material to seriously affect the appearance or quality. This condition does not meet the requirements of the U.S. No. 2 grade and would be considered seriously damaged by dirt or foreign material.

Scoring Guide

Score as damage when the appearance is materially affected as defined by “Slightly dirty” and score as serious damage when the appearance is affected to the extent that would be considered as “Dirty.”

Color (Q)

The U.S. No. 1 grade requires the sprouts to be well colored.

§51.2255 Well colored. “Well colored” means that the Brussels sprout has a light green or a darker shade of green color characteristic of well-grown Brussels sprouts.

The U.S. No. 2 grade requires the sprouts to be fairly well colored, which is defined to mean that the sprout shall not be lighter than yellowish-green color.

§51.2260 Fairly well colored. “Fairly well colored” means that the Brussels sprout shall not be lighter than yellowish-green color.

Scoring Guide

Brussels sprouts that do not meet the definitions as stated will be scored as damage and reported as “Not well colored” or serious damage and reported as “Not fairly well colored.”

Discoloration (C)

If at any time there is evidence that discoloration occurred or progressed in transit or storage, such discoloration should be handled as a condition factor. Discoloration should be described descriptively, i.e., yellowing or yellow discoloration; brown or blackened leaf tips, etc.

Scoring Guide

Sprouts should be scored as **damage** when yellow, brown, and black or otherwise discolored leaves detract from the desirable good green color. Score when two or more portions of leaves are affected to an extent that materially detracts from the appearance.

When the discoloration seriously affects the appearance or the edible or shipping quality, score it as **serious damage** when four or more portions of leaves are affected to an extent that seriously detracts from the appearance.

Firmness (Compactness and Solidity) (Q)

The U.S. No. 1 grade requires the sprouts to be firm.

§51.2256 Firm. “Firm” means that the Brussels sprout is of reasonable solidity and is fairly compact but may yield slightly to moderate pressure.

The U.S. No. 2 grade requires the sprouts to be fairly firm.

§51.2261 Fairly firm. “Fairly firm” means that the Brussels sprout is not soft or puffy and is of reasonable weight for its size but may have considerable open spaces between the leaves in the lower portion of the head.

“Soft” means that the sprout is easily compressed or puffy.

Scoring Guide

Sprouts that are not “firm” as defined above, shall be scored as damage. Sprouts that are “soft” shall be scored as serious damage.

Freezing and Freezing Injury (C)

The term “frozen” should only be used when ice crystals are present. Frozen Brussels sprouts or portions of leaves in a frozen state will be darker green and glassy in comparison to the rest of the sprout, with a distinct line of demarcation between the affected and the unaffected portion.

“Freezing injury” is the term that should be used when it is evident that the Brussels sprout has been frozen but is not in a frozen condition at the time of inspection. The Brussels sprout may be limp, flabby and the affected areas may be dark, water-soaked and dull in appearance with a lack of luster.

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

Record the pulp temperatures taken at various locations.

Determine and record extent of the injury in the load.

Determine and record extent of the injury in the containers.

Determine and record degree to which individual specimens are affected.

Describe the pattern of freezing or freezing injury in clear, concise terms.

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

Freshness (C)

Although the standard does not reference freshness, it is an important condition factor for the marketability of Brussels sprouts.

Freshness of Brussels sprouts can be described by the use of such terms as: fresh, fairly fresh, slightly wilted or wilted (droopy or loss of freshness).

Scoring Guide

The sprout should be scored as **damage** if more than two leaves are wilted.

The sprout should be scored as **serious damage** if more than four leaves are wilted.

Insect or Worm Damage (Q or C)

Several types of insects and worms may cause insect damage. The most recognizable insect and the one that is more prevalent at destination is the aphid. Aphids, under favorable conditions, frequently become a serious problem. These insects are very objectionable because it is very difficult to remove them.

§51.2258 Damage. "Damage" means any defect which materially affects the appearance, or the edible or shipping quality of the Brussels sprout. ... (b) Insects when there is more than slight aphid infestation within the compact portion of the head, or when the outer leaves are badly infested by them; or when slugs, worms or worm frass are present, or when the appearance is materially affected by slug or worm injury.

Damage should be reported in accordance with the facts as "insect damage" or "worm damage" or in any other descriptive terms.

Scoring Guide

The requirements in the standard for the U.S. No. 1 and U.S. No. 2 for damage by insects is the same; therefore, all insect damage that can be scored, shall be scored against the total tolerance for the grade applied.

Slight aphid infestation within the compact portion of the head occurs when there are more than two aphids present. Outer leaves are considered badly infested when there are more than four aphids present. When any slug, worm or worm frass is present or when the appearance is materially affected by worm injury, then sprouts shall be scored against the tolerance for the grade applied.

NOTE: Report as condition in transit or at destination, if damage is fresh, or if any live insects or slugs/worms are present or if both live and dead are found. Report as quality when the damage is old or if all insects or worms are dead.

Poorly Trimmed Stems (Long Stem Length) (Q)

Poorly trimmed Brussels sprouts are generally the result of mechanical harvesting in the field.

Scoring Guide

Score any sprout with the stems measuring over 1/4 inch in length (measured from the point of attachment from the first outer leaf at the end of the stalk) or if materially detracting from the appearance of the sprout.

Seedstems (Q)

Brussels sprouts are required to be free from seedstems. Seedstems are a factor of quality for Brussels sprouts.

§51.2257 Seedstems. “Seedstems” means Brussels sprouts that have seedstalks showing or in which the formation of seedstalks has plainly begun.

Scoring Guide

Any sprout in which the seedstalk is showing or in which the formation of seedstalks has plainly begun shall be scored against the grade applied.

Withered Heads (Q)

Brussels sprouts are required to be “Not withered.” “Withered” means that the leaves of the sprout are dried out or dehydrated.

Scoring Guide

Score when more than two leaves or the equivalent of two leaves are dried out or dehydrated. Withered heads shall be scored against the grade applied.

Decay (C)

All grades require that Brussels sprouts be free from soft decay (tissue disintegration); any amount is scored against the 2% tolerance. When the decay is in excess of the tolerance, report the degree of advancement in general terms as: early, moderate or advanced stages.

APPENDIX I - U.S. GRADE STANDARDS

United States Standards for Grades of Brussels Sprouts ¹

Effective January 18, 1954

Grades

51.2250 U.S. No. 1.

51.2251 U.S. No. 2.

Unclassified

51.2252 Unclassified.

Application of Tolerances

51.2253 Application of tolerances.

51.2254 Basis for calculating percentages.

Definitions

51.2255 Well colored.

51.2256 Firm.

51.2257 Seedstems.

51.2258 Damage.

51.2259 Diameter.

51.2260 Fairly well colored.

51.2261 Fairly firm.

51.2262 Serious damage.

Grades

§51.2250 U.S. No. 1.

U.S. No. 1 consists of Brussels sprouts which are well colored, firm, not withered or burst, which are free from soft decay and seedstems, and free from damage caused by discoloration, dirt or other foreign material, freezing, disease, insects, or mechanical or other means.

(a) Unless otherwise specified, the diameter of each Brussels sprout shall be not less than one inch, and the length shall be not more than 2-3/4 inches.

(b) In order to allow for variations incident to proper grading and handling, other than for size, not more than a total of 10 percent, by weight, of the Brussels sprouts in any lot may fail to meet the requirements of the grade: **Provided**, That not more than one-fifth of this amount, or 2 percent, shall be allowed for soft decay. In addition, not more than a total of 5 percent, by weight, of the Brussels sprouts in any lot may be smaller than the specified minimum diameter, and not more than 10 percent may be longer than the specified maximum length.

§51.2251 U.S. No. 2.

U.S. No. 2 consists of Brussels sprouts which are fairly well colored, fairly firm, not withered or burst, which are free from soft decay and seedstems, and free from damage caused by insects, and free from serious damage caused by discoloration, dirt or other foreign material, freezing, disease or mechanical or other means.

(a) Unless otherwise specified, the diameter of each Brussels sprout shall be not less than one inch, and the length shall be not more than 2-3/4 inches.

(b) In order to allow for variations incident to proper grading and handling, other than for size, not more than a total of 10 percent, by weight, of the Brussels sprouts in any lot may fail to meet the requirements of the grade: **Provided**, That not more than one-fifth of this amount, or 2 percent, shall be allowed for soft decay. In addition, not more than a total of 5 percent, by weight, of the Brussels sprouts in any lot may be smaller than the specified minimum diameter, and not more than 10 percent may be longer than the specified maximum length.

¹ 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.

Unclassified

§51.2252 Unclassified.

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

Application of Tolerances

§51.2253 Application of tolerances.

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

(1) For a tolerance of 10 percent or more, individual packages in any lot may contain not more than one and one-half times the tolerance specified; and,

(2) For a tolerance of less than 10 percent, individual packages in any lot may contain not more than double the tolerance specified, except that at least one defective and one off-size specimen may be permitted in any package.

§51.2254 Basis for calculating percentages.

Percentages shall be calculated on the basis of weight or an equivalent basis.

Definitions

§51.2255 Well colored.

"Well colored" means that the Brussels sprout has a light green or a darker shade of green color characteristic of well-grown Brussels sprouts.

§51.2256 Firm.

"Firm" means that the Brussels sprout is of reasonable solidity and is fairly compact but may yield slightly to moderate pressure.

§51.2257 Seedstems.

"Seedstems" means Brussels sprouts which have seedstalks showing or in which the formation of seedstalks has plainly begun.

§51.2258 Damage.

"Damage" means any defect which materially affects the appearance, or the edible or shipping quality of the Brussels sprout. Any one of the following defects, or any combination of defects, the seriousness of which exceeds the maximum allowed for any one defect, shall be considered as damage:

(a) Discoloration when the appearance is materially affected by discolored leaves or parts of leaves; and,

(b) Insects when there is more than slight aphid infestation within the compact portion of the head, or when the outer leaves are badly infested by them; or when slugs, worms or worm frass are present, or when the appearance is materially affected by slug or worm injury.

§51.2259 Diameter.

"Diameter" means the greatest dimension measured at right angles to a line running from the stem to the apex of the Brussels sprout.

§51.2260 Fairly well colored.

"Fairly well colored" means that the Brussels sprout shall not be lighter than yellowish-green color.

§51.2261 Fairly firm.

"Fairly firm" means that the Brussels sprout is not soft or puffy and is of reasonable weight for its size but may have considerable open spaces between the leaves in the lower portion of the head.

§51.2262 Serious damage.

"Serious damage" means any defect which seriously affects the appearance, or the edible or shipping quality of the Brussels sprout.