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

## Blueberries

 Shipping Point and Market Inspection InstructionsFresh Products
Branch
October 2002
Previously May
1998


# Shipping Point and Market Inspection Instructions for Blueberries 

These inspection instructions are specifically developed and designed by the Fresh Products Branch to assist officially licensed inspectors in the interpretation and application of the U.S. Standards for Grades of Blueberries, Section 51.3475.

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 General Inspection Instructions for additional information pertaining to date, inspection point, carrier, condition of carrier, lading, etc. not covered in these instructions. (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 a section number such as $51 .---$ and followed with bold print is material copied directly from the U.S. standards. The U.S. Standards for Grades Blueberries are printed in the appendix of this instruction. All of the U.S. standards are available on the Internet under the USDA homepage.

## October 2002

This replaces instructions dated June 1966.
Previously May 1998

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Factors noted with $(\mathbf{Q})$ are considered quality only. Factors noted with (C) are considered condition at market. Factors noted with (Q or $\mathbf{C}$ ) may be quality or condition depending on the circumstances.

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## Broken Skins



Broken Skins - allow a $1 / 8^{\prime \prime}$ inch circle at the stem scar. if the skin is torn outside this allowable area, score as damage. if the broken skin is not well healed, score as serious damage

## GENERAL

The U.S. Standards for Grades of Blueberries applies to blueberries produced under cultivation; varieties of the highbush and rabbiteye. The standards do not apply to lowbush or "wild" blueberries.

Lowbush or "wild" blueberries are generally grown in the State of Maine and parts of Canada. The lowbush (wild) blueberries may be distinguished from the highbush (cultivated) blueberries, in that the plants are usually 6 to 18 inches high and spread into large colonies by means of underground shoots called rhizomes. The lowbush (wild) berries are generally smaller in size than the cultivated berries and the lowbush berries may vary in color.

Containers that are marked "wild" blueberries, shall be restricted to condition only inspections. Inspection procedures for "wild" blueberries shall be the same as described in the following pages for "cultivated" blueberries. The condition factors shall be described and not reported as damage or serious damage. The lot may be inspected on the basis of the Maine Marketing Order at applicant's request. A copy of the Maine Marketing Order may be obtained from the Maine Department of Agriculture. (See Appendix I)

## 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 load.

## Size of Sample

The tolerances in the U.S. Standards for Grades of Blueberries are determined on the basis of count. Before an inspector opens a container that is to be sampled, the inspector shall predetermine from what area in the container to take the sample. A minimum of $\mathbf{1 0 0}$ berries or the entire container (when less than 100 berries) shall be examined. Whenever a load or lot is out of grade because defects in a sample exceed the sample tolerance or lot tolerance, at least double (200 berries) or the entire container (when less than 200 berries) shall be examined.

When two or more berries are attached together by stems they are to be counted as one berry when obtaining the sample.

When the size of the samples are not uniform, the percentage shall be determined for each sample. All percentages must be totaled and divided by the
number of samples examined, in order to determine the average percentages for the lot.

When the size of the samples are uniform, the total number of defects shall be divided by the total number blueberries sampled.


#### Abstract

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 3 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.

As a guide, for a full load of blueberries the inspector shall sample the equivalent of two master containers and obtain one sample from each master container. For example, the blueberries are packed in 12-1-pint flats. The inspector shall sample a minimum of 24-1-pint containers, and obtain one pint from 24 different flats.


## TOLERANCES AND APPLICATION OF TOLERANCES

§51.3478 Tolerances...(a) For defects at shipping point. Ten percent for blueberries which have attached stems. Additionally, not more than 8 percent of the blueberries may be below the remaining requirements of the grade: Provided, that included in this amount not more than 4 percent shall be allowed for defects causing serious damage, including in this latter amount not more than 1 percent for blueberries which are affected by mold or decay.
(b) For defects en route or at destination. Ten percent for blueberries which have attached stems. Additionally, not more than 12 percent of the blueberries may be below the remaining requirements of the grade: Provided, that included in this amount not more than the following percentages shall be allowed for defects listed: (1) 8 percent for blueberries which fail to meet the requirements for this grade because of permanent defects; or, (2) 6 percent for blueberries which are seriously damaged, including therein not more than 4 percent for blueberries which are seriously damaged by permanent defects and not more than 2 percent for blueberries which are affected by mold or decay.
(c) Off-size: When size is designated according to one or more of the size classifications in $\S 51.3477$, not more than 10 percent of the samples in any lot or one sample, whichever is the greater number, may fail to meet the range in count specified.

SUMMARY OF TOLERANCES

| FACTORS | At Shipping Point ${ }^{1}$ | En Route or <br> At Destination |
| :--- | :---: | :---: |
| A. Attached Stems | $10 \%$ | $10 \%$ |
| B. Defects other than <br> attached stems | $8 \%$ | $12 \%$ |
| 1. Damage by <br> Permanent Defects <br> (included in "B") | ---- | $8 \%$ |
| 2. Serious Damage <br> (included in "B") | $4 \%$ | $6 \%$ |
| a. Serious Damage by |  |  |
| Permanent Defects |  |  |
| (included in "1" and "2") |  |  |

${ }^{I}$ Shipping point, as used in these standards, means the point of origin of the shipment in the producing area or at port of loading for ship stores or overseas shipment, or, in the case of shipments from outside the continental United States, the port of entry into the United States.

Off-size. Not more than 10\% of the samples in any lot or one sample, whichever is greater, may fail to meet the range in count specified.

Note: "Permanent" and "Quality" defects are used interchangeably.

Application of Tolerances
§51.3479 Application of Tolerances...Individual samples are subject to the following limitations: Provided, that the averages for the entire lot are within the tolerances specified for the grade:
(a) For tolerances of 10 percent or more, individual samples may contain not more than one and one-half times the specified tolerances.
(b) For a tolerance of less than 10 percent, individual samples may contain not more than double the specified tolerance.

SUMMARY OF APPLICATION OF TOLERANCES

| FACTORS | At Shipping Point ${ }^{1}$ | En Route or <br> At Destination |
| :--- | :---: | :---: |
| A. Attached Stems | $15 \%$ | $15 \%$ |
| B. Defects other than <br> attached stems | $16 \%$ | $18 \%$ |
| 1. Damage by <br> Permanent Defects <br> (included in "B") | ---- | $16 \%$ |
| 2. Serious Damage <br> (included in "B") | $8 \%$ | $12 \%$ |
| a. Serious Damage by <br> Permanent Defects <br> (included in "1" and "2") | ---- | $8 \%$ |
| b. Mold or Decay <br> (included in "2") | $2 \%$ | $4 \%$ |

${ }^{1}$ Shipping point, as used in these standards, means the point of origin of the shipment in the producing area or at port of loading for ship stores or overseas shipment, or, in the case of shipments from outside the continental United States, the port of entry into the United States.

Note: "Permanent" and "Quality" defects are used interchangeably.

## NOTESHEET AND CERTIFICATE

Entries on the notesheet and certificate 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.

Detail 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. Additional information and instructions may be given by your supervisor.

## Product

"Blueberries" shall be used to describe this commodity in the "Product" heading. Type may be reported in conjunction with "Blueberries" or may be reported in the "Product/Variety" section on the shipping point inspection certificates or in the "Lot ID" section on market notesheet and certificate.

When containers are marked with the name of the variety, it shall be quoted rather than a positive statement, as to the variety. If the applicant requests variety certification only, the inspection shall be declined with an explanation that the law under which the Inspection Service operates does not cover variety.

## 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.

Blueberries are most commonly packed in film wrapped consumer packages or plastic, "clam-shell" type containers within master containers. Occasionally, blueberries may be packed in bulk 5 or 10 pound cartons. The type of container shall always be reported under this heading.

## Brands/Markings

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

## Origin

The 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 the notesheet and the certificate. If origin is not marked, it is the inspectors responsibility to make an effort to obtain this information for the applicant. 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 what state or country the blueberries are grown.

## CONDITION OF PACK

The following terms shall be used to describe pack:
Excessively filled: This means that the containers are filled over 3/4 inches above the top of the rim of the container and some berries are bruised or crushed.

Well filled: Berries are at least $1 / 4$ and as much as $3 / 4$ inch above rim of container.

Fairly well filled: The containers are at least level full.
Slightly slack: When berries are slightly below top of container.
Slack: When berries are decidedly below the top of the container. Always report "slack" in fractions of inch increments.

## TEMPERATURE OF PRODUCT

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

§51.3475 General...(b) Because of the size difference between varieties and the difference in size preference in various markets, there are no size requirements in the grade. Therefore, size will not be determined unless specifically requested by the applicant. If requested, size may be specified as provided in $\S 51.3477$.
§51.3477 Size classifications...The following size classifications may be used in specifying size of blueberries: (a) Extra Large. Less than 90 berries per cup; (b) Large. 90 to 129 berries per cup; (c) Medium. 130 to 189 berries per cup; and, (d) Small. 190 to 250 berries per cup. (e) For tolerances see $\S 51.3478$.

Cup equals 237 ml, $\mathbf{1 / 2}$ pint, or $\mathbf{2}$ gills.
Size is not part of the basic requirements for the grade. Therefore, a lot of blueberries could fail to meet size requirements and still meet the requirements for the grade.

Size will not be determined unless specifically requested by the applicant. The applicant may specify the size in terms of small, medium, large, extra large or any combination thereof; small to medium, small to large, etc. or in terms of number of berries per cup; 100 to 120 berries per cup. If the applicant requests that size be determined, the inspector must use a cup container.

A cup container used for size determination is equivalent to $237 \mathbf{~ m l}$, $\mathbf{1 / 2}$ pint, or $\mathbf{2}$ gills. These containers may be obtained from a hardware or grocery store. Fill the cup level full; meaning the berries in the cup should not be heaping over the rim, and no open spaces below the rim. The inspector must then count the number of berries in a cup for each sample. The number of berries found per cup will indicate the size of berries; for example: 1 cup $=132$ berries, this means that they are medium blueberries for that sample. Determine the count for each sample and report the size either by size classification or count.

If a size or sizes are marked on the container or specifically designated by the applicant, the inspector must size the berries according to the size(s) specified. If more than 10 percent of the samples in any lot or one sample, whichever is greater, fails to meet the range in count specified, the load or lot will fail to meet size.

When size is marked on the container, report the size in conjunction with the grade. For example: "U.S. No. 1 Large" OR "Fails to meet U.S. No. 1 Large account $\qquad$ ." Additionally, report the overall size in the "Description of Product" section on shipping point certificates and in the "Other" section on market certificates.

When the applicant specifies a particular size, then the inspector will determine whether the lot meets the specified size. For example: The applicant requests a "Small to Medium" size. Report in the "Grade" section: "U.S. No. 1" OR "Fails to grade U.S. No. 1 account $\qquad$ ." Report "Description Of Product" section on the shipping point certificate or in the "Other" section on market the range and whether it meets or fails to meet size as specified. For example: "Range 127 to 255 berries per cup, fails to meet size as specified" OR "Range 134 to 210 berries per cup, meets size as specified. " Also, report under "Remarks": "Size based on Small to Medium size, at applicant's request."

If size is not marked on the container and the applicant does not request size, state on the notesheet, "Size not determined."

## 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 $(\mathbf{Q})$ 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.

## Attached Stems (Q)

Blueberries are attached to the bushes by their stems. Often times while harvesting the stem adheres to the blueberry and the stem remains there as they are packed. Some varieties are more susceptible to attached stems than other varieties. The stem may vary in length from $1 / 8$ of an inch to more than $1 / 2$ inch in length.

Blueberries with attached stems are a "free from" defect; any length of stem is scored as a quality defect against the separate 10 percent tolerance for attached stems. Do not report as serious damage.
§51.3478 Tolerances...Ten percent for blueberries which have attached stems.

Blueberries may be scored twice if affected by attached stems and another defect because there are separate tolerances for attached stems and "other" defects. At shipping point, there is a $10 \%$ tolerance for attached stems and an $8 \%$ total tolerance for other defects, including $4 \%$ for serious damage, including $1 \%$ for mold or decay. At market, there is a 10\% tolerance for attached stems and a $12 \%$ total tolerance for other defects, including 8\% permanent defects, including 6\% for serious damage, including $4 \%$ for serious damage by permanent defects, including $2 \%$ for mold or decay.

For example: If a berry had an attached stem and a scoreable scar, it would be scored twice, once for the attached stem and once for the scar. If the berry had an attached stem and decay, it would be scored twice, once for the attached stem and once for decay (provided that the inspector could determine that there was an attached stem).

If the berry is scored twice under separate tolerances, the defects shall be cross referenced on the certificate. For example: "6\% defects, including $2 \%$ above as attached stems."

If there are two berries attached together by stems, with no defects on the berries, score as one entity (one berry), as an attached stem. If the two berries also have defects, score the berry once for attached stem and once for the other tolerance most affected. If there are three or more capstems with at least one berry attached it will be treated as a "cluster" (see section on "Clusters").

## Broken Skins (Q or C)

Broken skins are generally caused by stems adhering to the berry and when they are pulled out, cause a tear in the skin; often called a pulled stem. Occasionally, berries may receive a broken skin when a berry with a stem attached punctures the wall of another berry or they may be caused by bird pecks.

At market, broken skins that are "fresh" or not well healed will be scored as a condition factor against the serious damage tolerance. Broken skins that are "old" or well healed will be scored as a quality factor when it is readily noticeable, except for an allowable area within a 1/8 inch circle centered at the stem scar. Score the quality defect against the tolerance for damage by permanent defects.

At shipping point, broken skins that are not well healed will be scored against the serious damage tolerance. Broken skins that are well healed will be scored as damage against the total tolerance for the grade when readily noticeable, except for an allowable area within a $1 / 8$ inch circle centered at the stem scar.
§51.3484 Damage...(d) Broken skins when not well healed or when well healed and readily noticeable, except for an allowable area within a $1 / 8$ inch ( 3.2 mm ) circle centered at the stem scar;

## §51.3485 Serious Damage...(g) Broken skins when not well healed.

To determine whether a blueberry is damaged by a "pulled stem" (reported as "broken skin"), place the $1 / 8$ inch circle from the Plexiglas area gauge approximately over the center of the stem scar of the blueberry. If any amount of broken skin is outside of that $1 / 8$ inch circle, the blueberry shall be scored as damage by broken skins.

## Clean (Q)

## §51.3481 Definitions..."Clean" means that the individual berry is practically free from dirt, frass, or other foreign material.

Blueberries are generally clean due to the fact that they are grown on bushes above the ground and may be washed before packing. However, leaves and other foreign material may be encountered. Therefore, if the berries show only a slight amount of dirt or an occasional leaf, the lot will still be considered clean. However, if the amount of dirt, frass or other foreign material is such that it is readily apparent and objectionable, it shall be scored as "not clean." At shipping point, score against the total tolerance for the grade. At market, score against the tolerance for damage by permanent defects.

Freshly harvested berries normally have a "bloom." Bloom is a white frosty looking film which can be easily removed from a berry by handling. It is felt that bloom indicates good quality and is very eye appealing. However, with more growers harvesting blueberries mechanically, and using mechanical sorting and grading equipment, bloom is not as evident as it once was. If requested by applicant to report the presence or absence of bloom it will be permissible to do so, but do not score it as a defect; report it at applicant's request, not affecting grade. If not requested, make no mention on the certificate.

## Clusters (Q)

Blueberries are attached to the bushes by stems and often grow in "clusters." During harvesting, the stem adheres to the blueberry and the berries are picked as a "cluster" rather than individual berries. If the blueberries are field packed and placed directly into their marketing containers, the clusters of berries will be seen more frequently than those blueberries that are harvested and transported to a packing line. The berries from a packing line are normally sorted for quality and most of the clusters will be eliminated.

Clusters are a "free from" defect; any amount is scoreable. Clusters are considered a quality defect. At shipping point, score as damage against the total tolerance for the grade. At market, score against the tolerance for damage by permanent defects.

## §51.3484 Damage...(b) Clusters when there are three or more joined capstems with at least one berry attached.

"Clusters" are treated as a single berry (entity, unit), even though there may be more than one berry attached to the cluster. Report this defect as "clusters" and score as such. At shipping point, if one or more of the berries are affected by a defect of a more serious nature (decay, mold, crushed, split, or other serious damage defects), score it as one berry (entity, unit) as a serious defect (decay, mold, etc.) and not a cluster. At market, if one or more of the berries are affected by a condition defect (decay, mold, crushed, split, etc.), score it as a berry (entity, unit) against the condition defect (decay, mold, etc.) and as a cluster. These defects shall be cross referenced on the certificate. For example: "4\% decay, including 2\% reported above as quality defect (clusters)."

If there are two berries attached together by stems, with no defects on the berries, score as one entity (one berry), as an attached stem. If the two berries also have defects, score the berry once for attached stem and once for the other tolerance most affected. If there are three or more capstems with at least one berry attached it will be treated as a "cluster."

## Crushed, Split, or Leaking (C)

Blueberries may be crushed, split or leaking due to either rough handling while harvesting, packing or shipping; or the blueberries are ripe and have been held in storage for too long.

Mechanical harvesters could cause blueberries to be crushed, split or leaking. These berries are generally eliminated when they are packed on a mechanized packing line. However, the packing line could cause berries to be crushed or split. If the blueberries are field packed and placed directly into their marketing containers, crushed, split or leaking berries may be at the bottom of the container. If there are ripe berries on the bottom of the containers, they too may become split, crushed or leaking due to the weight of the other berries. A large amount of rain prior to harvest or excessive heat could cause blueberries to split and leak. Finally, rough handling due to crushed boxes, shifted loads, etc. will cause crushed, split or leaking berries.

## §51.3485 Serious Damage...(d) Crushed, split or leaking berries.

Score crushed, split or leaking berries as a condition factor against the restricted tolerance for serious damage.

## Firmness (C)

Firmness should be described with care as buyers and shippers may depend upon such descriptions to determine the condition in which the fruit arrived and the length of time it will remain in good condition.

The following terms shall be used in describing the degree of firmness of blueberries:

Firm - means that the berry yields very slightly to moderate pressure.
Ripe - means that the berry yields very readily to slight pressure. The flesh is firm, not soft or mushy and has reached the best eating condition. This condition meets the grade requirements.

Overripe - this condition does not meet the grade requirements.

## §51.3483 Definitions..."Overripe" means that the individual berry

 is dead ripe, the flesh is soft and mushy, and past commercial utility.
## §51.3485 Serious damage...(c) Overripe berries.

The requirement for the grade is "not overripe." Overripe berries are a condition defect, scored as serious damage against the restricted tolerance for serious damage. Do not confuse overripe berries with berries that are "ripe." Ripe berries will yield readily to slight pressure over the whole berry, but the flesh of the berry will still be firm. Only consider the berry as "overripe" when the berry is soft and the flesh is soft and mushy - past the best eating condition.

## Green Berries (Q)

While blueberries are being harvested, various colors of berries may be on the same bush at the same time. Green berries may inadvertently be harvested at the same time that the blue, bluish-purple, purple, bluish-red, or bluish-black berries are harvested. Generally the green berries are sorted out before packing, unless they are harvested into packing containers, in which case they are not sorted and green berries may be present in the container.
§51.3484 Damage...(f) Green berries when one-half or more of the berry is green.

If the berry has one-half or more of its surface with green color, score as damage, and report as "green berries." At shipping point, score against the total tolerance for the grade. At market, score against the tolerance for damage by permanent defects. If the berry has more than one-half of its surface that is not blue,
bluish-purple, purple, bluish-red, or bluish-black in color, report as "not well colored." At shipping point, score against the total tolerance for the grade. At market, score against the tolerance for damage by permanent defects. Do not score as serious damage. (See "Well Colored" section.)

## Insects or Insect Injury (Q or C)

Various types of insects may affect blueberries. Regardless of the type of insect, if there is any visible evidence of the insect, insect larva, feeding, webbing or frass, it will be scored as serious damage against the serious damage tolerance (at market, score as serious damage by permanent defects tolerance when a quality factor [see below]).
§51.3485 Serious Damage...(f) Insects or when there is any visible evidence of the presence of insects, including but not limited to an insect, the insect larva, feeding, webbing or frass.

At market, if the insects are live or there is evidence of fresh frass or feeding that occurred during transit, treat as a condition factor. If the insects are dead or the insect feeding or frass is old, treat as a quality factor. If both live and dead insects are present, treat as a condition factor.

Various regions in the United States are susceptible to an insect called Blueberry Maggot. This insect is difficult to see with the naked eye and may require a special test to detect it. If the applicant specifically requests this test see the procedures in Appendix II for details.

## Mummified Berries (Q)

While blueberries are being harvested, various stages of maturity may be on the same bush, including mummified berries. Mummified berries are those berries that have been affected by a fungus; the berry dries up, withers, or shrinks. Mummified berries may inadvertently be harvested at the same time that the other berries are harvested. Generally the mummified berries are sorted out before packing, unless they are harvested directly into marketing containers, in which case they are not sorted and may be in the container.

## §51.3485 Serious Damage...(e) Mummified berries when the individual berry is dried up, withered or shrunken.

Score mummified berries as a quality factor. At shipping point, score against the restricted tolerance for serious damage. At market, score against the serious damage by permanent defects tolerance.

Do not confuse mummified berries with shriveled berries. Shriveling generally affects a specific area of the blueberry. Mummified berries are different than shriveled berries in that the shriveling, withering, drying, etc. affects the entire berry, whereas shriveling usually affects only a portion of the berry. (See "Shriveling" section.)

Scars (Q)
Scars generally consist of brownish corky tissue formed on the surface of the blueberry. Scars are caused when the blueberry is injured by the branches of the blueberry bush while it is growing and the injury heals over resulting in a scar.

## §51.3484 Damage...(e) Scars when affecting more than 20 percent of the surface of the individual berry;

## §51.3485 Serious damage...(h) Scars when affecting more than 50 percent of the surface of the individual berry.

At market, score as damage by scars against the 8\% tolerance for damage by permanent defects. When scored as serious damage by scars score it against the $4 \%$ tolerance for serious damage by permanent defects.

At shipping point, score damage by scars against the total tolerance for the grade. For serious damage by scars score it against the serious damage tolerance.

## Shriveling (C)

Shriveling or wrinkling generally affects a specific area and not the entire surface of the berry. If the entire berry is withered, shrunken and dried up it may be considered mummified and not shriveled (see "mummified berries" section). Mummified berries are those berries that have been affected by a fungus; the berries are dried up, withered, or shrunken.

## §51.3484 Damage...(c) Shriveling when the wrinkling is readily noticeable.

Score damage by shriveling when readily noticeable. "Readily noticeable" means that when inspecting blueberries and rolling the blueberries around on a flat surface or passing them back and forth in your hands, the inspector observes shriveling or wrinkling on a berry. However, if the inspector has to closely examine or "study" the berry, there is not a sufficient amount of shriveling and shall not be scored as a defect.

Score shriveling as serious damage when seriously detracting from the appearance of the berry.

## Similar Varietal Characteristics (Q)

§51.3480 Definitions..."Similar varietal characteristics" means that the berries are similar in color and shape.

The Inspection Service does not certify variety. When variety is in question, the inspector shall inform interested parties that only type may be certified. It may also be pointed out that when type is a factor in a load or lot of blueberries, such as distinctly different colors or shapes, it will be considered a defect. The defect shall be reported as dissimilar varietal characteristics and score as a quality defect. At shipping point, score against the total tolerance for the grade. At market, score against the tolerance for damage by permanent defects.

Do not confuse this with green berries or berries that are not well colored. See sections for Well Colored and Green Berries for further descriptions.

## Well Colored (Q)

Blueberries, when growing on the bush, begin as green berries. As they grow and develop they start to turn color; usually a pink to red color at first, which becomes blue, bluish-purple, purple or bluish-black, depending upon the variety.
§51.3482 Definitions..."Well colored" means that more than onehalf of the surface of the individual berry is blue, bluish-purple, purple, bluish-red, or bluish-black.

When more than one-half of the berry is not blue, bluish-purple, purple, bluish-red, or bluish-black in color, report as "not well colored. " At shipping point, score against the total tolerance for the grade. At market, score against the tolerance for damage by permanent defects. Do not score as serious damage.

## §51.3484 Damage...(f) Green berries when one-half or more of the berry is green.

If the berry has one-half or more of its surface with green color score as damage, and report as "green berries." At shipping point, score against the total tolerance for the grade. At market, score against the tolerance for damage by permanent defects (see "Green Berries" section). Do not score as serious damage.

[^0]Blueberries that are wet from juice due to crushed, leaking or decayed berries will be sticky because of the sugar content of the berry. Score these berries as damage.
§51.3484 Damage...(a) Wet berries when the individual berry is wet from juice from crushed, leaking, or decayed berries, but not due to condensation.

Score as a condition factor against the total tolerance for the grade. Report as "Wet Berries."

## Decay or Mold (C)

Decay or mold are "free from" defects; any amount is scored as serious damage against the restricted tolerance for mold or decay.
§51.3485 Serious damage...(a) decay;
§51.3485 Serious damage...(b) moldy berries.
The most common types of decay that affect blueberries include, Gray Mold Rot, Alternaria Rot, and Rhizopus Rot. However, inspectors do not have to identify the type of decay. At market, a description of the stages of decay is all that is needed; early, moderate or advanced stages.

## Appendix I - Inspection of "Wild" Blueberries in the Market

Maine is apparently the only place in the country currently packing and inspecting "wild" blueberries. Inspection at shipping point is based on a Maine marketing order. Therefore, when containers are marked "wild" blueberries the U.S. Standards for Grades of Blueberries does not apply. The U.S. standards apply to varieties of the highbush and rabbiteye. Wild blueberries are a lowbush variety.

When containers are marked "wild" blueberries the inspection shall be restricted to condition only or inspected on the basis of the Maine marketing order at applicant's request. When the inspection is restricted to condition only, the condition factors shall be described and reported only in the "AVERAGE DEFECTS" column on the FV-300; do not report damage or serious damage. The inspection procedures previously described shall be used for condition only inspections. When the inspection is requested to be based on the Maine Marketing Order, copies may be obtained from Maine Department of Agriculture.

## Appendix II - Maggot Test

The maggot test will only be done at applicant's request, if certification is required by a State or local law, and if the inspection office has the necessary equipment. This test is entirely separate from determining the quality and condition of the lot, as previously outlined in these inspection instructions. For example: A lot could meet quality and condition requirements, but would fail to grade U.S. No. 1 account of the maggot test.

While this procedure is not specifically detailed in the grade standards, the tolerance for the number of maggots found in the "maggot test" is based on the definition for serious damage by insects against the serious damage tolerance. Therefore, if 4 or less maggots are found in the composite sample, the lot would meet the requirements for the U.S. No. 1 grade. However, if 5 or more maggots are found in the composite sample, the lot would fail to meet the requirements for the U.S. No. 1 grade.

Maggots will be considered a quality factor at shipping point. However, due to the process of "cooking" it is difficult to tell whether the maggots were alive before cooking, therefore at the market score maggots as a condition factor.

Grade statements shall indicate that the lot failed account of maggots. For example: At shipping point, "Fails to grade U.S. No. 1 account quality (maggots)." At market, "Fails to grade U.S. No. 1 account condition (maggots)."

Remember to state under remarks, for both shipping point and market certificates, "Maggot test performed at applicant's request."

## Necessary Equipment

- Container for cooking the sample.
- Heating apparatus for cooking the sample.
- Round pan 2 to 3 inches in depth, 12 inches in diameter (bottom painted black).
- $1 / 8$ to1/4 inch mesh sieve, approximately 6 inches in diameter by 3 inches in depth.
- Fresh water available at all times.
- Trash can.


## Procedure

Weigh or measure out a composite one pound sample from the containers that were sampled. Put the one pound of blueberries in the container for cooking and mash them, making a thin liquid by adding fresh water. Heat the container until the blueberries have reached a hot "rolling" boil. Pour contents through sieve into a pan about 12 inches in diameter and 2 inches deep, having a black bottom. Before removing sieve from pan, wash skins and pulp with fresh water, almost filling pan. Empty skins and pulp into trash can. It will be necessary to let the pan stand a while as the contents at first will be cloudy. When the contents clear, slowly pour water and some of the finer pulp out of the pan until there is about one-half inch of water left. Repeat this process by adding fresh water and pouring off until solution in pan is practically clear. Then the pan should be placed on a flat surface. Stir the solution in a circular motion. If maggots are present, they will settle toward the center of the pan and will be readily apparent as small white objects against the black surface of the pan.

## Appendix III - U. S. Grade Standards

## United States Standards for Grades of Blueberries

Effective March 20, 1995

## General

51.3475 General.

Grade
51.3476 U.S. No. 1.

Size Classifications
51.3477 Size classifications.

Tolerances
51.3478 Tolerances.

Application of Tolerances
51.3479 Application of tolerances.

Definitions
51.3480 Similar varietal characteristics.
51.3481 Clean.
51.3482 Well colored.
51.3483 Overripe.
51.3484 Damage.
51.3485 Serious damage.

General

## §51.3475 General.

(a) These standards apply only to selected and hybrid varieties of the highbush (Vaccinium australe Small and Vaccinium corymbosum L.) and rabbiteye (Vaccinium ashei Reade) blueberries produced under cultivation, but not to other species of the genus Vaccinium nor to the true huckleberries of the genus Gaylussacia.
(b) Because of the size differences between varieties and the difference in size preference in various markets, there are no size requirements in the grade. Therefore, size will not be determined unless specifically requested by the applicant. If requested, size may be specified as provided in $\S 51.3477$.

## Grade

§51.3476 U.S. No. 1.
"U.S. No. 1" consists of blueberries which meet the following requirements:
(a) Basic Requirements:
(1) Similar varietal characteristics;
(2) Clean;
(3) Well colored;
(4) Not overripe;
(5) Not crushed, split, or leaking; and,
(6) Not wet.
(b) Free From:
(1) Attached stems;
(2) Mold;
(3) Decay;
(4) Insects or when there is visible evidence of the presence of insects;
(5) Mummified berries; and,
(6) Clusters.
(c) Free From Damage Caused By:
(1) Shriveling;
(2) Broken skins;
(3) Scars;
(4) Green berries; and,
(5) Other means.
(d) Tolerances as specified in $\S 51.3478$ (a) and (b) and applied pursuant to $\S 51.3479$.

Size Classifications
§51.3477 Size classifications.
The following size classifications may be used in specifying size of blueberries:
(a) Extra large. Less than 90 berries per cup ${ }^{1}$;
(b) Large. 90 to 129 berries per cup ${ }^{1}$;
(c) Medium. 130 to 189 berries per cup ${ }^{1}$; and,
(d) Small. 190 to 250 berries per cup ${ }^{1}$.
(e) For tolerances see $\S 51.3478$.

## Tolerances

§51.3478 Tolerances.
In order to allow for variations incident to proper grading and handling, based on sample inspection, the following tolerances, by count, shall be allowed:
(a) For defects at shipping point ${ }^{2}$. Ten percent for blueberries which have attached stems. Additionally, not more than 8 percent of the blueberries may be below the remaining requirements of the grade:
Provided, that included in this amount not more than 4 percent shall be allowed for defects causing serious damage, including in this latter amount not more than 1 percent for blueberries which are affected by mold or decay.
(b) For defects en route or at destination. Ten percent for blueberries which have attached stems. Additionally, not more than 12 percent of the blueberries may be below the remaining requirements of the grade: Provided, that included in this amount not more than the following percentages shall be allowed for defects listed:
(1) 8 percent for blueberries which fail to meet the requirements for this grade because of permanent defects; or,
(2) 6 percent for blueberries which are seriously damaged, including therein not more than 4 percent for blueberries which are seriously damaged by permanent defects and not more than 2 percent for blueberries which are affected by mold or decay.
(c) Off-size. When size is designated according to one or more of the size classifications in 51.3477, not more than 10 percent of the samples in any lot or one sample, whichever is the greater number, may fail to meet the range in count specified.

## Application of Tolerances

51.3479 Application of tolerances.

Individual samples are subject to the following limitations: Provided, that the averages for the entire lot are within the tolerances specified for the grade:
(a) For a tolerance of 10 percent or more, individual samples may contain not more than one and one-half times the tolerance specified.
(b) For a tolerance of less than 10 percent, individual samples may contain not more than double the tolerance specified.

## Definitions

§51.3480 Similar varietal characteristics.
"Similar varietal characteristics" means that the berries are similar in color and shape.

## §51.3481 Clean.

"Clean" means that the individual berry is practically free from dirt, frass, or other foreign material. §51.3482 Well colored.
"Well colored" means that more than one-half of the surface of the individual berry is blue, bluish-purple, purple, bluish-red, or bluish-black.

## §51.3483 Overripe.

${ }^{1}$ Cup equals $237 \mathrm{ml}, 1 / 2$ pint, or 2 gills.
${ }^{2}$ Shipping point, as used in these standards, means the point of origin of the shipment in the producing area or at port of loading for ship stores or overseas shipment, or, in the case of shipments from outside the continental United States, the port of entry into the United States.
"Overripe" means that the individual berry is dead ripe, the flesh is soft and mushy, and past commercial utility.

## §51.3484 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 the edible or marketing quality of the blueberries. The following specific defects shall be considered as damage:
(a) Wet berries when the individual berry is wet from juice from crushed, leaking, or decayed berries, but not due to condensation;
(b) Clusters when there are three or more joined capstems with at least one berry attached;
(c) Shriveling when the wrinkling is readily noticeable;
(d) Broken skins when not well healed or when well healed and readily noticeable, except for an allowable area within a $1 / 8$ inch ( 3.2 mm ) circle centered at the stem scar;
(e) Scars when affecting more than 20 percent of the surface of the individual berry; and,
(f) Green berries when one-half or more of the berry is green.

## §51.3485 Serious damage.

"Serious 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 seriously detracts from the appearance, or the edible or marketing quality of the blueberries. The following specific defects shall be considered as serious damage:
(a) Decay;
(b) Moldy berries;
(c) Overripe berries;
(d) Crushed, split, or leaking berries;
(e) Mummified berries when the individual berry is dried up, withered or shrunken;
(f) Insects or when there is any visible evidence of the presence of insects, including but not limited to an insect, the insect larva, feeding, webbing or frass;
(g) Broken skins when not well healed; and,
(h) Scars when affecting more than 50 percent of the surface of the individual berry.

## Appendix IV - Examples

## Example 1 - Inspection Notesheet



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## Example 2 - Inspection Certificate

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Example 3A - Inspection Notesheet


## Example 3B - Inspection Notesheet



## Example 3A - Inspection Scoresheet




Example 3B - Inspection Scoresheet



Example 3B - Inspection Certificate


## Example 4 - Inspection Notesheet



Example 4 - Inspection Scoresheet




[^0]:    Wet (C)
    Blueberries may become wet due to condensation by taking berries from a cool storage into warm, humid outside air, or when unloaded from a refrigerated trailer during hot, humid weather or rain. Do not score blueberries that are wet from condensation.

