

Traits and Quality Standards of Horticultural Produce

OBJECTIVES

After studying this chapter, students will be able to:

- Understand the quality standards of horticultural produce.
- Know about grade designation and quality specification of important fruits and vegetables.
- To market their produce more efficiently.
- To start their own business of marketing of fruits and vegetables.

INTRODUCTION

India's diverse climate ensures availability of all varieties of fresh fruits & vegetables. It ranks second in fruits and vegetables production in the world, after China. India is the largest producer of ginger and okra. Amongst vegetables and ranks second in production of potato, onion, cauliflower, brinjal, Cabbage, etc. Amongst fruits, the country ranks first in production of banana, mango and papaya. The vast production base offers India with tremendous opportunities for export. Mango, walnuts, grapes, bananas, pomegranates accounts for larger portion of fruits exported from the country while onions, okra, bitter gourd, green chilles, and potatoes contribute largely to the vegetable export basket. Though India's share in the global market is still nearly 1% only, there is increasing acceptance of horticulture produce from the country. Standing Committee on Fresh Fruits and Vegetables was set up under the Chairmanship of the Agricultural and Processed Food Products Export Development Authority (APEDA) to look into formulation of export standards for fresh fruits and vegetables. In this chapter, the guidelines formulated by AGMARK and APEDA for some important fruits and vegetables are mentioned.

PRODUCE SPECIFICATIONS AND QUALITY STANDARDS FOR FRUITS & VEGETABLES

QUALITY STANDARDS OF MANGO

Mangoes shall be fruits obtained from Varieties (cultivars) of plant *Mangifera indica* L. of Anacardiaceae family.

Minimum requirements

- i. Mangoes shall be:

- whole, firm, sound and fresh in appearance. Produce affected by rotting or deterioration such as to make it unfit for consumption is excluded;
 - clean, practically free of any visible foreign matter;
 - free of black necrotic stains or trails;
 - free of marked bruising;
 - free of abnormal external moisture, excluding condensation following removal from cold storage;
 - free from damage caused by low/or high temperature;
 - free of any foreign smell and/or taste;
 - free of damage caused by pests;
 - sufficiently developed and display satisfactory ripeness;
- ii. When a peduncle is present, it shall not be no longer than 1.0 cm.
- iii. Mangoes shall comply with the residue levels of heavy metals, pesticides and other food safety parameters as laid down by the Codex Alimentarius Commission for exports.

Grade designation and requirements of mango

Extra class

Grade requirement: Mango fruit must be of superior quality. They must be characteristic of the variety. They must be free of defects, with the exception of very slight superficial defects, provided these do not affect the general appearances of the produce, the quality, the keeping quality and presentation in the package.

Grade tolerances: Five per cent by number or weight of mangoes not satisfying the requirements for the grade, but meeting those of Class I or exceptionally, coming within the tolerances of that grade.

Class I

Grade requirement: Mango fruit must be of good quality. They must be characteristic of the variety. Mango fruits may have slight defects in shape, slight skin defects due to rubbing or sunburn, suberized stains due to resin exudation (elongated trails included) and healed bruises not exceeding 2,3,4,5 sq. cm for size groups A, B, C, D respectively, provided these do not affect

the general appearance of the produce, the quality, the keeping quality and presentation in the package.

Grade tolerances: Ten per cent by number or weight of mangoes not satisfying the requirements for the grade, but meeting those of Class II grade or, exceptionally coming within the tolerances of that grade.

Class II

Grade requirement: This grade includes mango fruits which do not qualify for inclusion in the higher grades, but satisfy the minimum requirements. Mangoes may have defects in shape, slight skin defects due to rubbing or sunburn, suberized stains due to resin exudation (elongated trails included) and healed bruises not exceeding 4,5,6,7 sq. cm for size groups A, B, C, D respectively, provided they retain their essential characteristics as regards the quality, keeping quality and presentation.

Grade tolerances: Ten per cent by number or weight of mango not satisfying the requirements of the grade, but meeting the minimum requirements.

Size code	Weight (g)	Maximum permissible difference within the package (g)	Maximum permissible difference between fruit in each package (g)
A	100-200	90-220	50.0
B	201-350	180-425	112.5
C	351-550	251-650	150.0
D	551-800	426-925	187.5

QUALITY STANDARDS OF TABLE GRAPE

Table grapes shall be fruits obtained from varieties of *Vitis vinifera* L.

Minimum requirements

- i. Bunches and berries of table grapes shall be:
 - clean, sound, free of any visible foreign matter
 - free of pests, affecting the general appearance of the produce
 - free of damage caused by pests or diseases
 - free of abnormal external moisture

- free of any foreign smell and/or taste
- free of all visible traces of moulds
- ii. Berries shall be intact, well formed and normally developed.
- iii. Table grapes shall comply with the residue levels of heavy metals, pesticides and other food safety parameters as laid down by the Codex Alimentarius Commission for Exports.
- iv. Table grapes shall have minimum soluble solids of 16 oBrix.
- v. Table grapes shall have minimum sugar/ acid ratio of 20:1.
- vi. Pigmentation due to sun is not a defect.

Grade designation and requirements of grape

Extra class

Grade requirement: Grapes must be of superior quality. The bunches must be typical of variety in shape, development and colouring and have no defects. The berries must be firm, firmly attached to the stalk, evenly spaced along the stalk and have their bloom virtually intact. Size limit for large berries 200 g and for small berries 150 g.

Grade tolerance: Five per cent by weight of bunches not satisfying the requirements for the grade, but meeting those of Class I grade or exceptionally coming within the tolerances of that grade.

Class I

Grade requirement: Grapes must be of good quality. The bunches must be typical of variety in shape, development and colouring. Berries must be firm, firmly attached to the stalk and, as far as possible, have their bloom intact. They may, however, be less evenly spaced along the stalk than in the extra class. Slight defect in shape and colouring may be there, provided these do not affect the general appearance of the produce and keeping quality of the package. Size limit for large berries 150 g and for small berries 100 g.

Grade tolerance: Ten per cent by weight of bunches not satisfying the requirements for the grade, but meeting those of Class II grade or exceptionally coming within the tolerances of that grade.

Class II

Grade requirement: The bunches may show defects in shape, development and colouring provided these do not impair the essential characteristics of the variety. The berries must be

sufficiently firm and sufficiently attached. They may be less evenly spaced along the stalk than Class I grade. Defects in shape, colouring, slight sun scorch affecting the skin only, slight bruising, may be there, provided these do not affect the general appearance of the produce and keeping quality of the package.

Grade tolerance: 10% by weight of bunches and satisfying the requirements of the grade, but meeting the minimum requirements.

QUALITY STANDARDS OF TOMATO

Tomatoes shall be fruits obtained from varieties of *Lycopersicon esculentum* Mill of the Solanaceae family. Tomatoes may be classified into four commercial types i.e., round, ribbed, oblong or elongated and cherry tomatoes (including cocktail tomatoes)

Minimum requirements

- i. Tomatoes shall be:
 - whole, sound and fresh in appearance
 - clean, free of any visible foreign matter
 - free of pests affecting the general appearance of the produce
 - free of damage caused by pests
 - free of abnormal moisture excluding condensation following removal from cold storage
 - free of any foreign smell and/or taste
- ii. In the case of trusses of tomatoes, the stalk must be fresh, healthy, clean and free from all leaves and any visible foreign matter.
- iii. Tomatoes shall comply with the residue levels of heavy metals, Pesticides and other food safety parameters as laid down by the Codex Alimentarius Commission for exports.

Grade designation and requirements of tomato

Extra class

Grade requirement: Tomatoes shall be of superior quality. They shall have firm fresh and must be characteristic of the variety as regards to shape, appearance and development. They must be free of green backs and other defects. Very slight superficial defects may be there

provided these do not affect the general appearance of the produce, the quality, the keeping quality and presentation in the package.

Grade tolerance: Five per cent by number or weight of tomatoes not satisfying the requirements of the grade, but meeting those of Class I or exceptionally, coming within the tolerances of that grade.

Class I

Grade requirement: Tomatoes shall be of good quality. They shall have reasonably firm flesh and shall be characteristics of the variety as regards shape, appearance and development. They must be free of cracks and visible green back. The slight defects like a slight defect in shape and development, colouring, skin defects, very slight bruises, ribbed tomatoes may be there provide these do not affect the general appearance of the produce, the quality, the keeping quality and presentation in the package: slight superficial defects may be there provided these do not affect the general appearance of the produce, the quality, the keeping quality and presentation in the package.

Grade tolerance: Ten per cent by number or weight of tomatoes not satisfying the requirements of the grade, but meeting those of Class II or, exceptionally, coming within the tolerances of that grade.

Class II

Grade requirement: Tomatoes shall be reasonably firm flesh and shall be character (but may be slightly less firm than in class I) and must not show unhealed cracks. The defects like defects in shape, development and colouring, skin defects or bruises, provided the fruit is not seriously affected, healed cracks not more than 3 cm. in length may be there provided the tomatoes retain their essential characteristics as regards the quality and keeping quality and presentation.

Grade tolerance: Ten per cent by number or weight not satisfying the requirements of the grade but meeting the minimum requirements. In case of trusses of tomatoes, 10% by number or weight of tomatoes detached from the stalk.

Provisions concerning sizing: Sizing is determined by the maximum diameter of the equatorial section in accordance with following table. The provisions shall not apply to "cherry" tomatoes. The minimum size is set at 35 mm for "round and "ribbed" tomatoes and 30 mm for "oblong" tomatoes:

Size code	Diameter (mm)	
	Minimum	Maximum
1	30	34
2	35	39
3	40	46
4	47	56
5	57	66
6	67	81
7	82	101
8	102	Above 102

Provision concerning tomato colour: Following terms may be used in the description of the colour as an indication of the storage and brightness of any lot and matured tomatoes.

Mature green: when the tomatoes present a yellow colour;

Green: when the surface of the tomato is completely green varying from light to dark green.

Breakers: when there is a definite break in colour from green to tannish - yellow, pink or red on not more than 10% of the surface.

Mottled: When yellow, rose or red are present in more than 10% but no more than 30% of the fruits.

Rose: when rose or red colour are present in more than 30% but less than 60% of the fruit.

Red: When more than 60% but no more than 90% of the fruits are rose or red colour.

Mature red: when more than 90% of the surface of the fruit shows red colour.

ACTIVITY/EXERCISE

1. Visit fruit orchard or vegetable garden during harvesting and find out the methods of handling of horticultural produce.
2. Visit fruit orchard or vegetable garden during harvesting and find out the size grading at farm carried out by the farmers.
3. Visit fruit and vegetable markets in your locality. Try to differentiate between extra class, class I and class II mango, grape and tomato fruits.

4. Visit vegetable markets in your locality. Try to differentiate tomato fruits on the basis of colour development.

CHECK YOUR PROGRESS

- 1) Enumerate the quality standards of tomato and mango.
- 2) Give details of grades designated in grape. Also give information on grade tolerance in each class.
- 3) Enlist different grades identified in case of mango and tomato.
- 4) Give details of quality standards for extra class mango and grape.

FILL IN THE BLANKS

1. APEDA stands for
2. AGMARK stands for
3. Extra class grapes have size of for large berries andfor small berries
4. Fruit weight of Class 'A' mangoes range between and
5. Table grapes shall be fruits obtained from varieties of

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