

Different type of Maturity Stages in Tomato

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Introduction:

Tomatoes, scientifically known as *Solanum lycopersicum*, derive their name from the Greek words “lycos” meaning wolf and “persicon” meaning peach. With a diploid chromosome number of $2n=2x=24$, the commercially cultivated tomato species is commonly referred to as *Lycopersicon esculentum*. Initially, there was a debate over the Latin name of the species, but the Linnean name *Solanum lycopersicum* has now replaced the earlier *Lycopersicon esculentum* proposed by Miller in 1768. Tomatoes are a popular vegetable crop grown in India and worldwide, belonging to the Solanaceae family (Nightshade). They are known by various names such as Wolf apple, Vilayati baingan, Love apple, Amorous apple, Apple of Peru, No. 1 processing vegetable, and Poor man’s orange. The region of Peru, Ecuador, and Bolivia in Latin America is considered the center of origin for tomatoes due to the abundance of wild and cultivable species found there.

Harvesting stages of tomato

Harvesting is usually done twice a

week when the plants are around three months old, with fruiting continuing for 1-2 months based on various determinate variety are harvested with the help of machine because determinate variety mature in synchronous ways as compared to indeterminate varieties. Harvesting tomatoes is a crucial step in ensuring their quality and shelf life. Tomatoes ripen on the plant, but they can also ripen after harvesting because tomato is a climetric nature. Artificial ripening involves harvesting at the mature green or turning pink stage and storing the fruits at room temperature to allow ethylene release, which aids in the ripening process. It’s worth noting that fruits ripened on the plant have higher vitamin C content compared to artificially ripened ones. The harvesting stage of tomato depends upon the purpose for which they are used and distance to reach the market. Maturity for harvest of Tomatoes is typically harvested at different stages depending on their intended use. In scientific terms, the stages of tomato maturity can be classified based on physiological and biochemical changes that occur during fruit development.

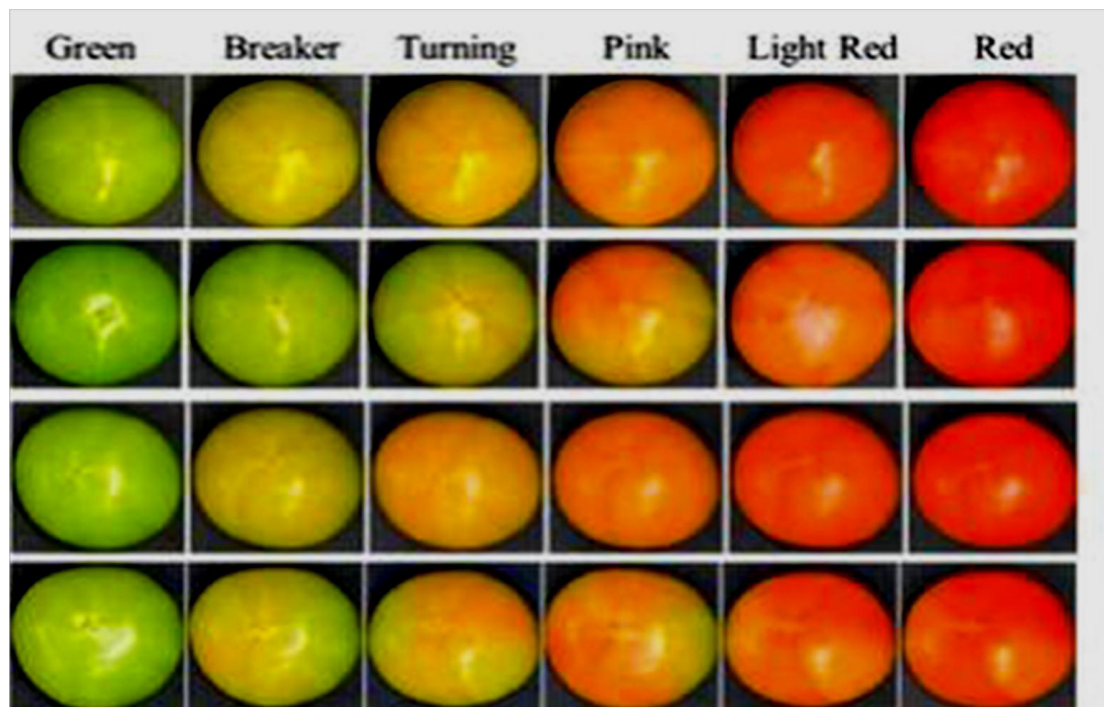
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Here are some key points to consider when determining the maturity of tomatoes. These are some following stages-

1. Immature Stage: At this stage, tomatoes are harvested before the seeds are fully developed and before the jelly-like substances surrounding the seeds are formed. The immature stage is characterized by a firm texture, green colour, and lack of sweetness. According to Lutz 1944 reported on their research immature stage tomato not attained good colour due to fruits passes low Vit C.

At this point, the fruit has reached its full size and has a mature green colour. The seeds are fully developed, but the fruit is still firm and lacks the characteristic red coloration.

3. Breaker Stage: The breaker stage is characterized by the initial appearance of 1/4 yellow or pink coloration on the blossom end of the tomato. This stage marks the beginning of ripening, as the fruit starts to soften and undergo biochemical changes that lead to the development of flavour and aroma. In this stage tomatoes are harvested for



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2. Mature Green Stage: The mature green stage is the earliest stage of physiological maturity in tomatoes. At

distant marketing. In this stage tomato fruits contain 10% lycopene content.

- 4. Pink Stage:** In the pink stage, the tomato develops $\frac{3}{4}$ a pink-reddish coloration on the skin, indicating further ripening. The fruit becomes juicier, softer, and sweeter as it progresses towards full ripeness. In this stage tomato are used for fresh consumption as well as salad purpose, and maximum acidity was found this stage .
- 5. Hard ripe :** In this stage tomato surface attend nearly all red or pink with firm flesh colour. This stage are suitable for local market harvesting.
- 6. Red Stage:** The red stage is considered fully ripe, with the tomato reaching its maximum sweetness, juiciness, and flavour. At this stage, the fruit is soft to the touch and has a deep red colour throughout. This stage is suitable for processing purposes and seed extraction.
- Grading involves removing damaged or rotten fruits and sorting based on appearance and good quality rather than size.
 - Packing can be done in wooden boxes, crates, polythene bags, or baskets, with different packaging methods for local markets and exports.
 - Storage plays a crucial role in extending the shelf life of tomatoes by controlling ripening rates. Ideal storage temperatures range from 12-15°C, with specific temperatures recommended based on fruit maturity. Traditional storage techniques involve storing tomatoes in baskets with layers of charcoal to help preserve their freshness. Proper post-harvest practices are essential to minimize spoilage and ensure the availability of high-quality tomatoes in the market.

By understanding these physiological stages of tomato maturity, growers and producers can make informed decisions about when to harvest tomatoes for optimal quality, flavour, and storage performance.

Post- Harvesting Techniques-

After harvesting, tomatoes undergo post-harvest techniques such as- grading, packing, and storage to maintain their quality.

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