



## Parameters of Banana at various stages that affects supply chain and value chain

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### ABSTRACT:

Banana is the most cultivated fruit in India. Due its various health benefits it is most important fruit in the World in terms of production and consumption. Testing of banana plays an important role during its ripening stages. It is necessary to standardize the banana quality control and testing by all its stockholders like growers, pickers, marketing companies, warehouses, wholesalers, retailers, online marketplaces and fruit markets and consumers. This paper discusses various parameters which will affect the supply chain and value chain of bananas

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### INTRODUCTION:

Banana is consumed worldwide and is grown in 150 countries across the world in an area of 4.84 million producing 95.5 million tons of fruit [1]. Major countries in the production of banana are India, Brazil, Philippines, Indonesia, China, Ecuador, Cameroon, Mexico, Columbia, and Costa-Rica. However, the countries which are major banana exporters in the world are Ecuador, Costa Rica, Philippines, Columbia, Guatemala, Belgium, USA, Honduras, Thailand, Panama, Cameroon, Germany, Brazil, France, China, and Spain[3]. This difference is because of lack of information about quality of banana and standardize these values with international standards. This study is carried out to get various parameters responsible for defecton banana plant and fruit. Due to this effect banana quality will be directly affected which will have impact on supply chain and value chain [4].

### Banana Supply Chain

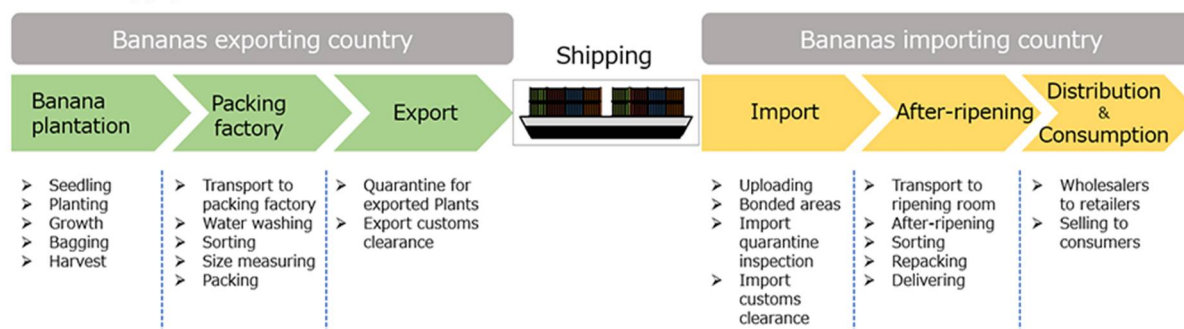


Fig 1: Source Nittsu Research Institute and Consulting, Inc.

### Parameters causing defect on Banana

#### 1) Pests:

During the harvesting the majority pests found on banana plant are Aphids, *Pentalonia nigronervosa f. typica*, Corm Weevil, *Cosmopolites sordidus*, Nematodes, Pseudostem Weevil, *Odiporus longicollis*, Fruit Rust Thrips, Rust Thrips, Castor hairy caterpillar, Cut worm, *Spodoptera litura*, Banana beetle, *Nodostoma subcostatum*, Sprinling white fly, Hard Scale *Aspidiotus destructor*, Scales *Coccus hesperidum*, Fruit and leaf scarring beetle, Colapsis hypochlora, Banana scale moth, white grub, Termites or white ants, etc[2, 3]. As a result, the

topside and downside of banana leaf is turned into dark or yellow border. Sometimes banana leaf surface is dead. Bunches are not developed properly.

**2) Skin Defects:**

Due to pest's banana leaves suffers black end and Brown spots on fruit peel; large brown to black areas; black lesions on green fruit[6]. This will affect the quality of the banana. As a result, pickers, marketing companies will be reluctant to purchase. This will have major effect on supply chain.

**3) Bruising:**

In the later stage of ripeness of banana bruises plays an important role. More the fruit is handled more bruises take place. This will affect the price. With natural enzymatic process a bruised banana in a yellow pigmentation will turn into brown[7]. This will have more impact on value chain as the price becomes negotiable in such cases.

**4) Open Wounds:**

Overhandling and growth issue results in open wounds in banana plant[8]. Once its open insects get direct access to fruit which cause more problems in terms of value chain.

**5) Decay:**

Sigatoka fungus-based disease, black leaf streak and Moko disease cause decay in banana plant. If these diseases are spread more plant appeared as burned.

**6) Mold:**

The open plant leads to mold or fungus. Uncontrolled fungus may damage the entire crop.

**7) Softness:**

At any stage of value chain banana fruit gets damaged if not handled properly and lose its softness[9]. This will lead to price negotiation.

**8) Chemical Stain:**

In Supply chain the banana is cut in unripe stage and stored at temperature. In order to start the ripening process temperature must be adjusted to 58°F to 62°F. With the help of ethylene and increased temperature the ripening process can be increased[8]. Overuse of chemical may cause black or brown spots on banana. These are unsightly to buyers and end customers. This will have more effect on supply chain as majority customers prefer a fruit without any bruise[10, 12]

**9) Peel Tear:**

Packing after ripening or storage is most important. Storing the banana after ripening in low humidity can lead to peel tear. It quickly turns the banana peel into black which affects its quality.

**Common Attributes for banana quality evaluation.**

Along with all above mentioned parameters following parameters also plays an important role while testing the banana quality.

1) Color:

Color of banana varies from green to yellow respectively from unripe to fully ripe. Over ripened banana tends towards brown shed. In case of value chain considering the end consumers prefer yellow color without any spot on it. The Ethylene is more responsible for fruit ripening[11]. In warehouse if the concentration of Ethylene is increased too much banana gets overripened or some cases Black spots occur on peel which also affect the quality of banana.

2) Diameter

3) Length

4) Appearance

**CONCLUSION**

In above literature review mostly supply chain and value chain are considered. Considering the quality of banana plant and fruit which parameters can lead to the defeat of the plant and fruit were studied. To maintain the perfect balance between supply chain and value chain all above mentioned parameters must be thoroughly checked and preventative action must be taken for better results.

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