GUIDELINES FOR EXPORT OF INDIAN MANGOES TO USA

Agricultural & Processed Food Products Export Development Authority
(Ministry of Commerce, Govt. of India),
3rd Floor, NCUI Building
3, Siri Institutional Area, August Kranti Marg, New Delhi - 110 016
Phone : 91-11-26513204, 26514572, 26534186
Fax : 91-11-26526187
Email: headq@apeda.com

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1. Introduction

1.1. Scope & Purpose:

This document provides the guidance and requirements for the export of commercial shipments of fresh fruits of mango from India to USA in compliance with the phytosanitary requirements of USA.

The purpose of this document is to facilitate commercial export of fresh fruits of mango from India to USA after meeting the obligations covered under international agreements such as WTO-SPS agreement/ IPPC.

1.2. Definition of Terms:

APEDA: Agricultural & Processed Food Products Export Development Authority, Ministry of Commerce & Industry

Dte of PPQS: Directorate of Plant Protection, Quarantine & Storage, Ministry of Agriculture, NH IV, Faridabad.

IPPC: The International Plant Protection Convention, FAO, Rome

Lot: A quantity of fruits sent from a single grower or producer (with a single production unit code) to a packinghouse for processing in a day.

NPPO: National Plant Protection Organization

USDA-APHIS: Animal & Plant Health Inspection Service, US Department of Agriculture

WTO-SPS: WTO Agreement on Application of Sanitary & Phytosanitary Measures

1.3. References:

Framework Equivalence Work Plan between India and USA

Irradiation Operational Work Plan between India and USA

Guidelines for Certification of Irradiation treatment facilities for meeting the phytosanitary requirements, Dte of PPQS, MOA (NPPO)

Guidelines for the use of irradiation as a phytosanitary measure, 2003, ISPM No. 18, FAO, Rome.

Standard Operating Procedures- Irradiation Treatment of Indian Mangoes for export to USA approved by the Dte of PPQS, MOA (NPPO)

Standard Operating Procedures- Packinghouse Facilities for Export of Indian Mangoes to USA approved by the Dte of PPQS, MOA (NPPO)

1.4. APHIS Requirements for Entry of Indian Mangoes into USA

The importation of mangoes from India is regulated under the 'Fruits and Vegetables Quarantine, 7 CFR 305 and 319 [Docket No.APHIS-2006-0121] RIN 0579-AC19, USDA-APHIS.

As a condition of entry into USA, the mangoes must be treated in India with irradiation by receiving a minimum absorbed dosage of 400 Grays.

Importers must secure the USDA-Import Permit at least 30 days in advance of arrival irradiated commodities at the scheduled port of entry to facilitate transmission of the permits to the inspector at the U.S. Port of entry in advance of arrival of shipments.

The mangoes must be given post-harvest hot water fungicidal dipping (Prochloraz at 500 ppm) at 52 C for 3-4 minutes.

Each consignment of mangoes must be inspected jointly by USDA-APHIS and NPPO of India (Dte of PPQS of MOA), as part of the required pre-clearance inspection activities as determined by mutual agreement between USDA-APHIS and NPPO of India.

Each consignment of mangoes must be accompanied by a phytosanitary certificate issued by NPPO of India (Dte of PPQS of MOA) certifying that the fruits received required irradiation treatment. The phytosanitary certificate must also bear the following two additional declarations confirming that:

(1) the mangoes were subjected to post-harvest mitigation options described as above and
(2) the mangoes were inspected during pre-clearance activities and found free of *Cytosphaera mangiferae, Macrophoma mangiferae,* and *Xanthomonas campestris pv. mangiferaeindicae*

The mangoes will be permitted import in commercial consignments only.

2. Guidelines for Export of Mango Fruits to USA

2.1. Orchard Level

2.1.1. Registration of orchards

The orchards involved in the export programme will be registered with a registered packinghouse facility.

The registered orchards will maintain documented record of all operations carried out at the orchard and adopt good agricultural practices for management of mango orchards established by APEDA.

2.1.2. Pre-harvest orchard survey

A pre-harvest orchard survey will be carried out by the registered packinghouse facility to assess the incidence of pests and the fruit production. The survey will involve fruit sampling to determine right stage of harvest of fruits for post-harvest processing.

If any pests are noticed during the survey, the same will be referred to the Dte of PPQS (NPPO) for correct identification of pest and advise appropriate measures to mitigate the pest.

2.1.3. Harvesting/Marking of Fruit Crates.

Mangoes for export by sea will be harvested, when the fruits are at half-maturity stage and for air shipments the fruits will be harvested, when they are fully matured.

Only healthy, good-looking fruits will be harvested with sufficient length of stalk with the help of specially designed harvesters, which have a long stick horizontally fitted with a curved blade at 45^0 angle and smooth net pouch for holding the harvested fruits.

The harvested fruits will be lowered and kept in a clean and disinfected ventilated plastic crates provided with a clean polyurethrene foam cushion and stocked under the shade until transport to a packinghouse facility.

Each crate of fruits will be labeled/marked indicating the name of orchard/locality, production unit code, variety and date/time of harvesting.

Care should be taken to avoid contamination of fruits/crates with soil by keeping them over a clean plastic sheet/kraft paper spread on the ground.

If any immature/scarred fruits are noticed, they will be segregated into a separate crate distinctly marked '**not for export**' to prevent their transportation to packinghouse facility and all damaged/diseased/over-ripened or rotten fruits will be immediately disposed by burying 6" deep under soil in a pit at the orchard.

The workeres will adopt hygienic practices, while handling the fruits during harvesting/segregating/packaging fruits in plastic crates at the orchards.

2.1.4. Transport of mangoes to packinghouse facility

The harvested fruits will be transported from registered orchard to a packinghouse facility in a clean and hygienic transport vehicle. No non-programmed fruits will be loaded and transported other than programmed fruits to the packinghouse facility.

2.2. Packing House Level

2.2.1 Registration of packinghouses

The packinghouses involved with the export of mangoes to USA will be registered with the APEDA (Cooperator).

The registered packinghouses will abide by the Irradiation Operational Work plan and its addenda established between India and USA.

The registered packinghouses will have documented Standard Operating Procedures (SOPs) that are approved by the Dte of PPQS (NPPO), which describes in detail all the process related to desapping, cleaning and washing, hot-water fungicidal dipping, grading, hygienic handling, packing and labeling/marking of mango fruits.

2.2.2. Pre-processing Inspection

Prior to processing, the packinghouses will carry out inspection of fruits received at the facility, to verify that crates of mangoes received at the facility are labeled/marked to ensure that they are from a registered orchard only.

If any mango fruits received from an un-registered orchard, the same may be refused for processing at the facility and will be distinctly marked 'not for export to USA' and stocked physically separated away from the registered orchard lots to prevent commingling and to prevent their export. The packinghouses will ensure that no other fruits or vegetables are processed, while processing mangoes at the facility.

If any damaged/diseased/over-ripen or rotten fruits are noticed, they will be physically segregated into separate crates. The segregated crates will be immediately marked

'rejected' and removed to rejected articles storage area for disposal by burying under 6" deep soil in a pit.

2.2.3. Post-harvest processing

The water used for cleaning/washing of fruits will be of potable quality and mixed with a neutral detergent such as Teepol, Sandovit or Indtron at 0.1% (1 ml of detergent per litre of water).

The processing lines will be physically inspected at the end of each process load to remove all debris collected at the conveyor belt and at fruit scrubbing brushes, rinsed and washed with clean water containing mild soap or detergent such as Teepol to remove any left over organic matter followed by mild scrubbing and second rinsing with clean water.

The processing lines will be cleaned before program fruit is packed and/or after non-program fruit is packed, as stated above.

Disinfestation of mango fruits will be carried out at the packinghouse facility by hot water fungicidal dipping (Sodium hypo chloride at 200 ppm) at 52˚ C for 3-4 minutes.

2.2.4. Packaging/Labeling/Marking

Each individual fruit of mango will be enclosed in a clean, white, soft, expandable and netted type polystyrene sleeve to prevent bruising before packing in a box.

The mangoes must be packed in insect-proof boxes. If ventilated boxes are used, all the ventilator openings of the box should be covered with insect-proof screen of a minimum of 30 meshes per linear inch and all the sides of box should be sealed with adhesive tape to prevent any entry of pests.

Only packing material of food grade should be used for packing mangoes at the pack house facility and the package boxes having dimensions of 370 X 275 X 90 mm should be used for packing export mangoes, as approved by USDA-APHIS.

Each package must be either preprinted or affixed with a label as specified (refer to Addendum-5 of SOPs for packing house facility), which is duly approved by the USDA-APHIS. The label should be are appropriately marked/stamped on left-half side indicating Production Unit Code Number (PUC), Packinghouse Code Number (PHC), Date of Packing, and Lot Number.

2.2.5. Quality inspection of mango fruits

An appropriate sampling of packages of processed lots of mangoes will be carried out to ensure the required quality parameters as specified in the export contract are met with.

2.2.6. Transport of packages of fruits to irradiation treatment facility

Before loading the packages of processed mangoes, the conveyance must be carefully inspected to ensure it is thoroughly clean and free from hitch-hiking pests.

At the completion of loading, the doors of the vehicle will be closed and locked and suitable seal must be affixed to ensure the integrity of processed consignment.

2.3. Treatment Facility Level

2.3.1 Approval & Certification of Treatment Facility

The treatment facility must be approved and certified by USDA-APHIS, PPQ, CPHST to be authorized to apply approved phytosanitary irradiation treatments.

The treatment facility will abide by the Irradiation Operational Work Plan between India and USA and its addenda.

The treatment facility offered for certification must develop and document Standard Operating procedures (SOPs) by each facility that address irradiation of commodities for mitigation of plant pests. These SOPs will be reviewed and approved by the NPPO of India (Dte of PPQS, MOA).

The treatment facility will be initially approved and certified by the Dte of PPQS, MOA (NPPO of India) before offering for certification by USDA-APHIS.

The treatment facility will enter into a compliance agreement with NPPO and APHIS in addition to Cooperative Agreement and the Irradiation Operational Work Plan.

The treatment facility will only accept mango fruits from registered packinghouse facility in insect-proof boxes and that the processed mangoes are only from registered orchards to ensure trace back.

2.3.1 Preclearance Inspection & Sampling

The Dte of PPQS, MOA (NPPO of India) and the inspector of APHIS, will jointly carry out preclearance inspection of mangoes received at the treatment facility just prior to treatment .to confirm that the lot is free from non-target quarantine pests and meet the

requirements for the target pests listed in addendum-2 to Irradiation Operational Work Plan.

For this purpose, a systemic sampling of lots, as specified in Addendum-2 of Irradiation Operational Work Plan, will be carried out using a random number table. The sample size shall include:

- Lot size of 1 to 4 cartons-inspect all cartons; minimum fruit to cut -10 fruits;
- Lot size of 5 to 99 cartons-inspect 5 cartons; minimum fruit to cut –20 fruits;
- Lot size of 100 to 240 cartons-inspect 7 cartons; minimum fruit to cut – 30fruits;
- Lot size of 241 or more cartons-inspect 14 cartons; minimum fruit to cut-30 fruits;

The exterior of selected cartons and fruits will be thoroughly inspected for target and non-target quarantine pests. Thereafter a minimum number of fruits as specified will be cut and examined for internal feeders.

In the event of interception of live pests during inspection the following actions will be undertaken:

- If any targeted pests such as fruit flies (Tephritidae), one or more detected, the entire lot will be rejected for export;
- If any target pests such as internal feeders (weevils), one or more detected, the lots will be cleared for treatment and certified under notification to APHIS IS Area Director.
- If any target external pests are detected in one or more, the lots will be cleared for treatment and certified. However APHIS IS Area Director will be notified.
- If any non-target quarantine pests (e.g., Adults and Pupae of Lepidoptera; fungal/bacterial pathogens, snails or mites), one or more are detected the entire lot will be rejected

2.3.2. Irradiation Treatment of Mango Fruits

The mangoes for export will be irradiated with a minimum absorbed dosage of 400 Grays at the approved and certified irradiation treatment facility using Cobalt-60. The source and equipment used for pest mitigation treatments must be capable of safely and effectively irradiating the commodities to the specifications that are required for that are required for target pests.

2.3.3. Treatment Verification/Marking

Routine dosimetry as well as dose mapping will be carried out by Ceric-Cerous Sulphate (3 mM) dosimeters with a potentiometer read out system ISO/ASTM 51205: 2002 (E), which is calibrated by using Fricke Reference standard E 1026-04 with a spectrometer read out system.

If the absorbed doses fall outside the acceptable limits, the treatment facility will enter the results in the treatment register as "Failed"; mark the rejected articles "Rejected" on the cartons. The particulars of rejected articles will be entered in the product log book. The rejected articles will be immediately removed to rejected article storage area to prevent their shipment to USA. The treatment facility will notify the treatment failure to Dte of PPQS (NPPO of India) and APHIS and further investigate the cause of treatment failure and take preventive measures for such failures.

If the results of dosimetry reveal successful treatment, the particulars of treatment Viz., Treatment Facility Code (TFC), Treatment Identification Number (TIN) and Date of treatment must be marked on the right-half side of the preprinted or affixed RADURA label on each and every box as approved by USDA-APHIS and a treatment certificate will be issued for each treated lot.

The treated lots will be safeguarded in a secured holding room/area, which is distinctly separated from untreated lots storage area by an insect-proof screened partition to prevent any reinfestation of treated commodities by hitchhiking pests

2.3.4. Phytosanitary Certification

After verification of treatment, Dte of PPQS of MOA (NPPO of India) will issue a phytosanitary certificate with the following two additional declarations confirming that:

(1) the mangoes were subjected to post-harvest mitigation options described as above and
(2) the mangoes were inspected during pre-clearance activities and found free of *Cytosphaera mangiferae, Macrophoma mangiferae,* and *Xanthomonas campestris pv. mangiferaeindicae*

The particulars of treatment will be endorsed on the phytosanitary certificate. The USDA-APHIS import permit number will be marked in each of the phytosanitary certificate issued and also the treatment certificate number.

The treated shipments of mangoes will be certified for export by the inspector of APHIS after verifying that all treatment requirements and post treatment security requirements have been met and maintained. The PPQ Form 203 (Foreign Site Certificate of Inspection and/or Treatment) will be completed, signed and issued by the inspector of APHIS and the original copy of the same will accompany the shipment to USA.

2.3.5. Transport of Treated Packages Direct to Airport

The empty trucks or vans will be carefully inspected jointly by the Dte of PPQS of MOA (NPPO of India) and the APHIS to ensure free from pests and plant debris prior to loading with treated packages of mango.

If any pests are found, the empty van or truck should be thoroughly disinfected with a suitable insecticide followed by a second inspection to ensure that the pests are effectively controlled.

While loading, the space between the doors of van and loading area of the facility will be covered by insect-proof screen to prevent entry of hitchhiking pests

At the end of the loading, the doors of the van or truck is closed and secured by a lock and a seal will be affixed.

2.4. Airport level

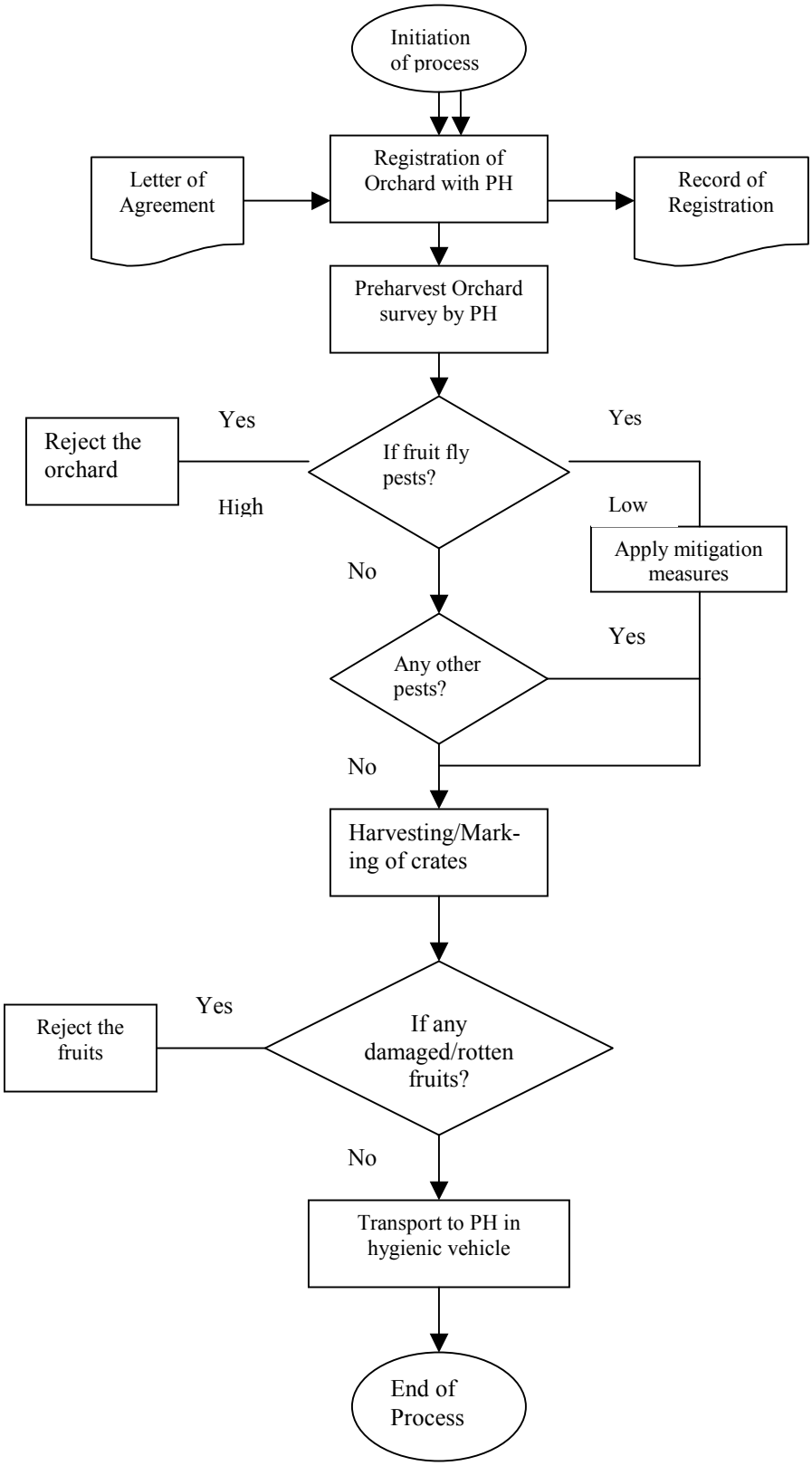
2.4.1. Loading/Sealing of Air Containers

In case of air shipments, the treated packages immediately upon arrival at the perishable air cargo complex at Mumbai Airport, will be X-rayed for security, strapped into small shipping units, loaded into LD-3 or air containers and secured (doors closed/covered completely). The air containers will be immediately sealed by Customs and held at secured area until loaded on the aircraft

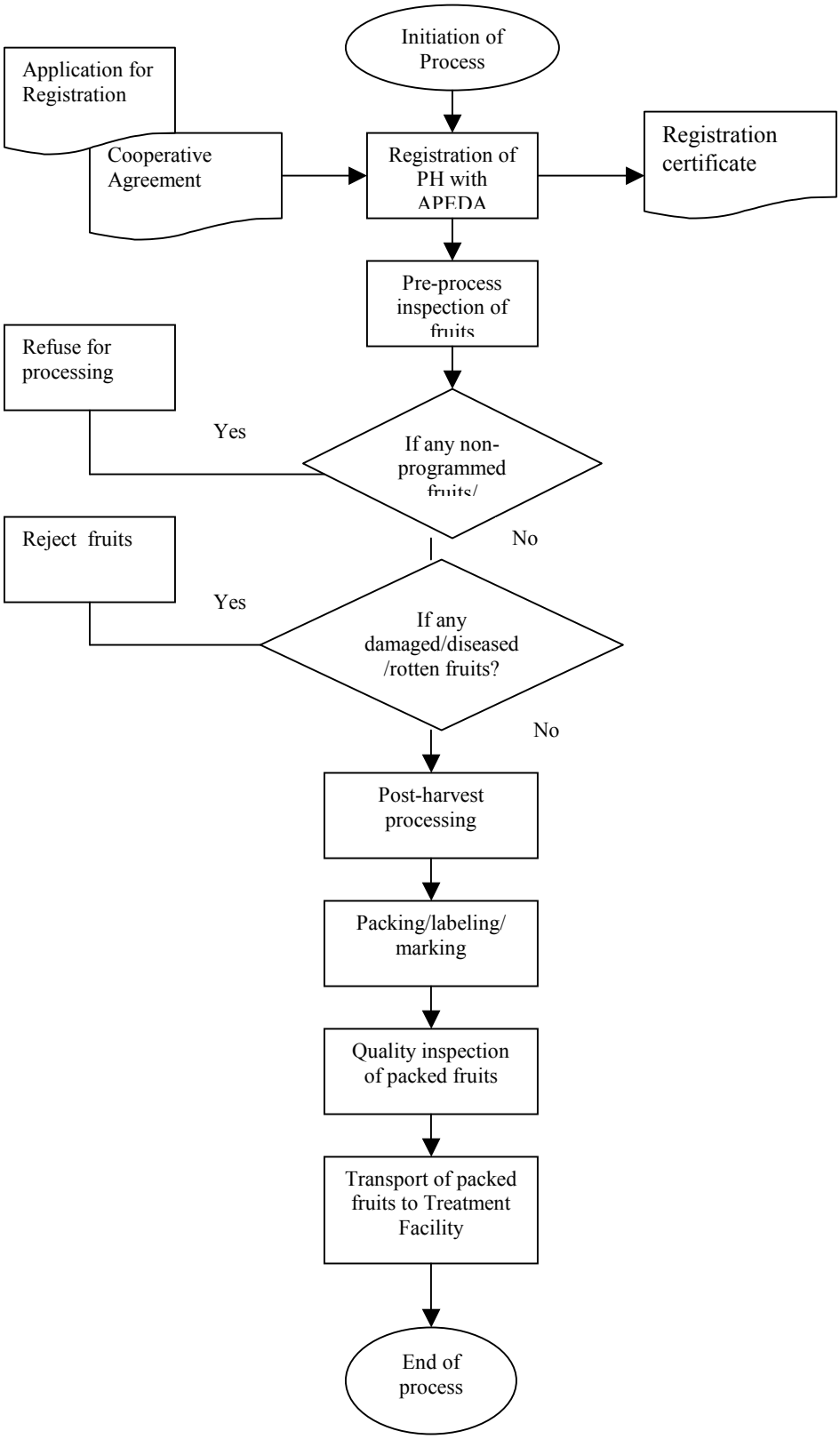
2.4.2. Safeguarding treated packages during storage at Airport

If an air shipment is delayed or the flight is cancelled, the treated packages will be safeguarded in secured cold storage room at the perishable air cargo complex at Mumbai Airport. Care should be undertaken to avoid commingling of treated packages from un treated articles and distinctly segregated from non programme articles to prevent cross-infestation.

Flowchart-Orchards



Flow chart-Packinghouse Facility



Flow chart-Irradiation Treatment Facility