

MINISTRY OF AGRICULTURE, LIVESTOCK AND FOOD SUPPLY - MAPA
SECRETARIAT OF ANIMAL AND PLANT HEALTH AND INSPECTION - SDA
PLANT HEALTH DEPARTMENT – DSV

MANUAL OF PROCEDURES FOR EXPORTATION OF MANGOES
FROM BRAZIL TO JAPAN

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1. INTRODUCTION

The exportation of high quality mangoes from Brazil to the Japanese market started in 2004 in the states of Bahia and Pernambuco, according to bilateral agreement between the two countries. The program is concentrated in the Northeast, along the São Francisco River Valley. This activity presents advantages for Japan as well as for Brazil. The Japanese consumer benefits from the availability of tropical fruits at competitive prices and begins to have access to trusted sources of high quality fruits and Brazil with the increment of its agribusiness. To operationalize the Brazil-Japan agreement it is necessary to harmonize the procedures related to the inspection and certification works, carried out by Ministry of Agriculture, Livestock and Food Supply - MAPA, Plant Protection Division/Ministry of Agriculture, Forestry and Fisheries - PPD/MAFF, the Federal Inspectors, OEDSV – State Body of Plant Health, Inspectors from MAFF, Japan and exporters during the exportation process.

2. PARTICIPANTS

- **Ministry of Agriculture, Livestock and Food Supply - MAPA – BRAZIL**
- **Ministry of Agriculture, Forestry and Fisheries - MAFF - JAPAN**
- **EXPORTERS**

The Plant Health Department – MAPA and the Plant Protection Division - PPD/MAFF are National Plant Protection Organizations, respectively from Brazil and from Japan, in charge of coordinating the development of the program, defining the technical aspects, inspect and certify the exportation of mangoes to Japan.

3. OF THE RESPONSABILITIES

3.1 MAPA

- Analyze and forward to **PPD/MAFF** requests from exporters to participate in the program as well as to confirm the intensive control of pests in these areas;
- Registration of the establishments, of the Hydrothermal Treatment and packing facilities and implementation of the inspections to these facilities as well as to the data recording;
- Preliminary inspection of the Hydrothermal Treatment and packing facilities
- Observation and instruction of the Hydrothermal Treatment
- The exportation inspection and Issuance of Phytosanitary Certificates;
- Contact and coordination with **PPD/MAFF** and the inspector from **MAFF**.

3.2 MAFF

- In order to confirm that it is properly carried out exports to JAPAN, the inspector from MAFF conducts a system audit of once per year (in the exportation period) in principle for the following;
 - a) Pre-operational inspection of the hydrothermal treatment and packing facilities
 - b) Hydrothermal treatment
 - c) Exportation Inspection

3.3 EXPORTERS

- Maintain an intensive pest control program in the production areas of mangoes to be exported to Japan;
- Request the registration of the Hydrothermal Treatment and packing facilities. Implement the inspections of these facilities as well as protocol the disinfection plan together with **MAPA**;
- Manage the recordings of the inspections related to the registration of the facility, Hydrothermal Treatment and exportation inspection;
- Facilitate and operationalize the guidelines of the Manual of Procedures for exportation of mangoes to Japan;
- Facilitate all the costs with the displacement, translators and stay of the inspectors from **MAFF** referent to the operationalization of the Manual of Procedures for exportation of mangoes;
- Forward to the Operational Unit from **MAPA** the weekly Schedule of the Hydrothermal Treatment, Packing and Certification until Thursday of the previous week.

4. PLAN FOR PRE-OPERATIONAL INSPECTION OF THE HYDROTHERMAL TREATMENT AND PACKING FACILITIES:

4.1 MAPA

- Forward a letter with the Work Plan of the **EXPORTER** to the director of **PPD/MAFF**.
- **MAPA** must coordinate the Work Plan chronogram of the **EXPORTER** in order to facilitate and conclude the pre-use inspection of the exportation activities in the disinfection treatment and packing facilities.

4.2 EXPORTER

- Submit Work Plan to **MAPA**.
- Request to **MAPA** inspection of the facilities to certify if these fulfill the importation conditions from Japan, in order to be registered 90 days prior to the beginning of the exportation period.

5. PRE-OPERATIONAL INSPECTION OF THE HYDROTHERMAL TREATMENT AND PACKING FACILITIES:

5.1 INSPECTION OF THE FACILITY

5.1.1 MAPA

- Coordinate the Work Plan of the **EXPORTER** and conduct the inspection in the Hydrothermal Treatment and Packing facilities which have requested the registration as mentioned in item 4.1.
- To confirm the Hydrothermal Treatment and exportation inspection, **MAPA** must inspect the Hydrothermal Treatment and Packing facilities to ensure that these fulfill the required requirements, contained in item 9.1 and item 10.
- In case any irregularity is observed the **EXPORTER** will be notified to perform the appropriate correction. **MAPA** must re-inspect these facilities to confirm the appropriate correction.

5.1.2 EXPORTER

- If there is no problem with the inspection of item 5.1, the **EXPORTER** requests the approval of the Hydrothermal Treatment and Packing facilities to **MAPA**.

5.2 SIMULATION TEST OF THE TEMPERATURE RECORDING SENSORS OF THE HYDROTHERMAL TREATMENT FACILITY:

- The Simulation Test of the temperature sensors must be performed by the **EXPORTER** or a responsible person following the instruction from **MAPA** in accordance with item 9.2.

5.2.1 MAPA

- **MAPA** must observe the Simulation Test and confirm if the calibration is being conducted properly;
- **MAPA** must observe the Simulation Test of temperature sensors of each facility at least once a year, in the exportation period.

5.2.2 EXPORTER

- The **EXPORTER** must communicate **MAPA** about the Simulation Test with minimum antecedence of 05 working days, so it can be monitored by **MAPA**;
- The temperature recording sensors of the Hydrothermal Treatment facility must be calibrated once a month after the inspection of the facility;
- The **EXPORTER** must keep the records for a minimum period of one year;

5.3 SIMULATION TEST of HYDROTHERMAL TREATMENT

- The Simulation Test must be performed by the **EXPORTER** or a responsible person following the instruction from **MAPA** in accordance with item 9.3.

5.3.1 MAPA

- **MAPA** must observe the Simulation Test and confirm if the calibration is being conducted properly;
- **MAPA** must observe the Simulation Test of Hydrothermal Treatment of each facility at least once a year, in the exportation period.

5.3.2 EXPORTER

- The **EXPORTER** must communicate **MAPA** about the Simulation Test with minimum antecedence of 05 working days, so it can be monitored by **MAPA**;
- The **EXPORTER** must keep the records of the Simulation Test of Hydrothermal Treatment for a minimum period of one year.

6. HYDROTHERMAL TREATMENT

6.1 BEGINNING OF THE HYDROTHERMAL TREATMENT

6.1.1 EXPORTER

- The **EXPORTER** must submit the Hydrothermal Treatment Chronogram of fresh mangoes for exportation to Japan to **MAPA** until three working days prior to the beginning of the Hydrothermal Treatment. The Treatment Chronogram must contemplate the name of the Hydrothermal Treatment facility, the variety of the mangoes, location of the production, estimated quantity of mangoes to be treated, and the start and end dates of the treatments;

6.1.2 MAPA

- Prior to beginning the Hydrothermal Treatment, **MAPA** must confirm the following:
 - a) The temperature sensors are calibrated properly;
 - b) The amount of mango to be disinfested is the one described in the Hydrothermal Treatment Chronogram;
 - c) The amount of mangoes to be disinfested will be inferior or equal to the amount confirmed in the Simulation Test;
 - d) The cage containing fruits will be immersed in the same tank where the Simulation Test was performed;
 - e) The location for adjusting the temperature sensor of the Hydrothermal Treatment must be the location where there was the slowest water temperature increase in the Simulation Test;
 - f) The temperature sensors of fruits must be allocated in three points of the cage (in the superior, mid and inferior parts), placed in the center of the container (plastic box);
 - g) The temperature sensor is inserted in the nucleus (center) of the fruit (not in the seed). OBS.: Take the cautions for the complete sealing of the sensor insertion point.
 - h) The temperature sensor must be inserted in the largest mangoes to be treated;
 - i) The water temperature of 47°C must be confirmed prior to the immersion of the fruits in the cage.
 - j) The printer must also be checked and have no problems since the beginning of Hydrothermal Treatment.
- **MAPA** must authorize that the **EXPORTER** begins the Hydrothermal Treatment in accordance with item 11 only if no problems are found in the Simulation Test. The setup of the cages and containers of the treatment must be the same used in the Simulation Test;
- In case the Federal Inspector from **MAPA** has to be absent after the beginning of the Hydrothermal Treatment, this inspector must seal the quarantine area, certify if the temperature is being recorded and adopt preventive measures in relation to records forgery, being necessary to return prior to the conclusion of this treatment.

6.2 CONCLUSION OF THE HYDROTHERMAL TREATMENT

6.2.1 MAPA

- a. **MAPA** must admit the conclusion of the Hydrothermal Treatment, when the same was conducted without any problems. In case any abnormality appears, such as: improper temperature records and/or improper location for adjustment of the fruit temperature sensor, **MAPA** will not allow the exportation of such treated fruits to Japan;

- b. When the Federal Inspector from **MAPA** was absent after beginning of the Hydrothermal Treatment, this inspector must confirm that the quarantine area was not violated and that the preventive measures against temperature records forgery were maintained;
- c. In case any occurrence happens during the Hydrothermal Treatment, **MAPA** must not allow the exportation of the treated fruits to Japan, requiring that the **EXPORTER** detects the cause of the problem and applies the corrective measures for subsequent release of this exportation;
- d. If there is a problem in item 6.2.1 b. above, **MAPA** must notify the fact immediately to **PPD/MAFF** and paralyze the Hydrothermal Treatment at this infestations facility until the cause is cleared out and measures against the problem are adopted. Then, **MAPA** is to consult with **PPD/MAFF** before resuming the Hydrothermal Treatment;

6.2.2 EXPORTER

- a. The **EXPORTER** must prepare a Hydrothermal Treatment records report, containing the identification number, the name of the facility, the variety of mango, location of production, quantity of treated mangoes, and the start and end dates of the Hydrothermal Treatment. The temperature records reports and the records graphs must be signed by the **EXPORTER** and by the Federal Inspector from **MAPA**.
- b. The **EXPORTER** must keep the report for a minimum period of one year.

7. EXPORTATION INSPECTION OF THE MANGO AFTER THE HYDROTHERMAL TREATMENT

7.1 MAPA

- (1) **MAPA** must confirm that there are no mangoes destined to other countries, besides Japan, in the packing facility and that the exported quantity is equal or inferior to the quantity of treated fruits.
- (2) **MAPA**, after that, will proceed to the sampling of five percent of the total number of packages (containers) to analyze the incidence of quarantine pests, especially the Mediterranean fruit fly (*Ceratitis capitata*), *Anastrepha fraterculus*, *A. obliqua* and *A. striata*.
- (3) When inspecting the packing procedure of mangoes to Japan, **MAPA** must confirm the following:
 - a. When the package has vent holes, one of the following procedures must be adopted:
 - In case the package has vent holes, this hole must be protected with a screen with a mesh equal or inferior to 1.6 mm of diameter;

- The set of packages (pallets) will be covered by a screen with a mesh equal or inferior to 1.6 mm of diameter.

b. The indication for the conclusion of exportation inspection which is agreed between Brazil and Japan is indicated properly: expression “**PRODUTO FISCALIZADO**” (“PRODUCT INSPECTED”) and “**FOR JAPAN**” (in uppercase and **FOR JAPAN** in the Japanese ideogram) will be printed on the boxes;

c. Each package or set of packages is sealed (seal) by **MAPA**;

(4) In case an adult of the Mediterranean fruit fly (*Ceratitis capitata*), *Anastrepha fraterculus*, *A. obliqua* and *A. striata* are found in the packing facility, **MAPA** must suspend the exportation to Japan from the packing facility and notify **PPD/MAFF** about this incident. The suspension must continue until **MAPA** clear out causes and adopt the corrective measures.

(5) **MAPA** will issue the Phytosanitary Certificate when no quarantine pests are found (Additional Declaration according to Bilateral agreement), and there are no irregularities with the mango destined to Japan in the exportation inspections. Due to the issuance of the Phytosanitary Certificate, **MAPA** must confirm that the quantity to be exported is equal or inferior to the quantity inspected for exportation and the specified declaration is on the Additional Declaration (This is further to certify that the mango fruits covered by this certificate are free from the Mediterranean fruit fly (*Ceratitis capitata*), *Anastrepha fraterculus*, *A. obliqua* and *A. striata*) and the Disinfestation Treatment of the Phytosanitary Certificate.

(6) If quarantine pests are detected in the exportation inspection, **MAPA** will not authorize the exportation of such consignments to Japan.

(7) If non-conformities are found, throughout the process of exportation of mango destined to Japan, **MAPA** will only issue the Phytosanitary Certificate after the proper corrections.

7.2 EXPORTER

(1) The **EXPORTER** must present the Request for Inspection of exportation to **MAPA**, contemplating the following data: the Hydrothermal Treatment number, the variety of the mango, location of production, quantity to be exported, the name of the ship or airplane, estimated exportation date, import and export ports and airports, importer and exporter. The application must be submitted until three days prior to the inspection.

(2) The **EXPORTER** must prepare a exportation inspection report including the disinfestation treatment number, the product (variety of mango), location of production, the exported quantity of mangoes, name of the loaded ship or plane, estimated exportation date, import and export ports or airports and, importer and exporter. The report must be signed by the **EXPORTER** and by **MAPA**.

8. SYSTEM AUDIT BY THE INSPECTOR FROM MAFF

8.1 MAPA

- **MAPA**, once a year, must contact the **EXPORTER** to arrange a schedule for the system audit by the inspector from **MAFF** in the exportation period. Then, **MAPA** must request the system audit to **PPD/MAFF** by one month prior to the audit.
- The schedule of the system audit will be included the presence of the pre-operational inspection of the hydrothermal treatment and packing facilities, hydrothermal treatment and exportation inspection of the mango after the hydrothermal treatment.
- To be confirmed by the inspector from **MAFF**, **MAPA** must prepare in advance the reports of the Hydrothermal Treatment records, the result of the exportation inspection of mango, the temperature records graph and the copy of Phytosanitary Certificate. Those reports must include records that have been kept since the previous audit.
- **MAPA** must require the inspector from **MAFF** to be present at the pre-operational inspection of facility, the Hydrothermal Treatment and exportation inspection once a year.
- When it is recognized that there is a problem, **MAPA** must suspend the exportation to Japan from that packing facility and notify **PPD/MAFF** about this incident. The suspension must be continued until **MAPA** clear up the causes of problems and adopt the corrective measures. Then, **MAPA** is to consult with **PPD/MAFF** before resuming the exportation to Japan from the packing facility.

8.2 EXPORTER

- The **EXPORTER** must provide the necessary transportation for the inspector from **MAFF**, in order to perform the system audit. The **EXPORTER** must guarantee the safety related to the transportation of the inspector.

8.3 MAFF

- In order to confirm that the program of exportation for Japan is properly carried out, the inspector from **MAFF** is present at the pre-operational inspection of the hydrothermal treatment and packing facilities, the hydrothermal treatment and exportation inspection of the mango after the hydrothermal treatment once a year in principle.

- The inspector from **MAFF** confirms reports of the Hydrothermal Treatment records, result of the mango inspection, the temperature records graph and the copy of Phytosanitary Certificate. Those reports must include records that have been recorded since the previous audit.

9. PRE-USE INSPECTION OF A HYDROTHERMAL TREATMENT FACILITY:

9.1 INSPECTION OF THE FACILITY

- The hydrothermal treatment facilities must fulfill completely the following conditions:
 - (1) The facilities have an automatic device for recording temperature;
 - (2) The temperature sensors can measure the temperature of the hot water and the fruit nucleus in the upper, mid and lower parts of containers piled in a cage in hot water;
 - (3) The facility has hydrothermal treatment tank which can maintain the temperature of the fruit nucleus at a given temperature.

9.2 SIMULATION TEST OF TEMPERATURE SENSORS

- Confirm if the temperature sensors are at a proper temperature and calibrated in the Hydrothermal Treatment facility according to the following procedures:
 - (1) The temperature in the treatment tank is adjusted to 47 ° C;
 - (2) Standard Thermometer (which must be inspected by an organization with a recognition certificate from ILAC and within its expiry date) and all the temperature sensors are immersed in the same location of the treatment tank, and after that, the temperature is measured after the reading has stabilized. The temperature sensors will be replaced when the measuring of the sensor is different from the Standard Thermometer in about 0.3 ° C.
 - (3) The reading of the temperature sensor is adjusted at the temperature of the Standard Thermometer and, after that, the reading of the sensor must not be changed (ex. Define a password to prevent a person, who is not the director of the facility, from accessing the PC.)
 - (4) When removed from the Hydrothermal Treatment tank, the temperature sensor is once again immersed in the tank to perform three readings every five minutes of interval after the temperature measured in the sensor remains stabilized. Another three readings with 5 minutes of interval with the Standard Thermometer are also performed because the temperature of the hot water is susceptible to be changed during the measuring.
 - (5) A correction value is the value between the Standard Thermometer and the temperature sensor detected with the same interval for two or more times

in three readings. When these three measures are different, two more calibrations will be conducted and the same value detected for two or more times, will be used as the correction value.

9.3 SIMULATION TEST

- The Simulation Test has the objective of identifying if the Hydrothermal Treatment facility has the capacity of fulfilling the specified treatment conditions; if the Hydrothermal Treatment tank has the temperature increased gradually, and decide which is the point where the hot water temperature sensor must be installed.
 - (1) Total of 9 hot water temperature sensors, three for the upper part, three for the mid part and three for the lower part of a Hydrothermal Treatment tank, are adjusted in order to check the temperature of the treatment tank.
 - (2) Fruit temperature sensors are placed in the loaded fruits in the center of the upper, mid and lower parts of a cage (total of 3 sensors: When units with plural cages are immersed continually in a Hydrothermal Treatment tank with time lag, 3 fruit temperature sensors are placed each unit.).
 - (3) After the confirmation that the hot water temperature sensors show 47.0 °C or above. The maximum estimated quantities of mangoes to be disinfected in commercial treatment are immersed in the treatment tank, and then the Hydrothermal Treatment begins with the same setup of commercial treatment to Japan.
 - (4) The Hydrothermal Treatment will begin when the cage containing recipients is at the bottom of the treatment tank. All the hot water temperature sensors must be confirmed if they are at the temperature of 46.1 °C or more within five minutes.
 - (5) The mangoes must be immersed at least 10 centimeters below the water surface.
 - (6) After all the temperature sensors of the fruits reach 46.0 °C, the Hydrothermal Treatment will be maintained for more five minutes.
 - (7) The hot water temperature must be uniform at 47.0 °C and confirmed during the Hydrothermal Treatment.
 - (8) The facility, which is confirmed in items (4) to (7) above, is registered as a Hydrothermal Treatment facility to Japan during the exportation period.
 - (9) The temperature records are analyzed. The commercial treatment will be performed according to the following:
 - a. The quantity of loaded mangoes is equal or inferior to the one used in the Simulation Test;

- b. The location where the cage is immersed in the treatment tank is the same location as in the Simulation Test;
- c. A hot water temperature sensor is adjusted in the location with the temperature increased the slowest;
- d. A fruit temperature sensor is placed in the largest mango to be treated.

10. INSPECTION OF THE QUARANTINE AREA

The packing quarantine area must fulfill completely the following conditions:

- (1) The packing Quarantine Area is connected to the Hydrothermal Treatment facility, and all the openings, such as Windows, doors are covered with net (the mesh of the net must be equal or inferior to 1.6mm);
- (2) Double entrance doors are installed (equally efficient methods can be adopted in substitution);
- (3) The Quarantine Area is exclusively used for the packing of disinfested mangoes. Certifying that no mangoes for other countries are found in this facility during the packing process of mangoes to Japan;
- (4) The packing Quarantine Area must be disinfected with insecticide prior to its usage.

OBS.: The Quarantine Area which fulfills to the requirements of item (1)-(4) above must be registered as a packing Quarantine Area of mangoes for exportation to Japan.

11. CONFIRMATION ABOUT THE MAINTENANCE OF THE TEMPERATURE RECORDS

- (1) After confirming that the hot water temperature is of 47°C, a cage containing fruit containers is immersed in the Hydrothermal Treatment tank. The hot water temperature must be 46.1°C or more within five minutes after the cage is immersed at the bottom of the Hydrothermal Treatment tank.
- (2) When all the fruit temperature sensors have reached 46.0°C, the treatment will be conducted at this temperature or above for five minutes.
- (3) The hot water temperature is uniformly maintained at 47°C during the Hydrothermal Treatment period.