

The Plant Quarantine Import Requirements of Fresh Dragon Fruits from Vietnam.

17 April 2020

1. Areas and Plant of Application

Fresh dragon fruit (*Hylocereus undatus*, *Hylocereus undatus x Hylocereus costaricensis*) commercially produced in Vietnam

2. Means of Conveyance

Air cargo or ship cargo (except hand luggage carried by passenger or post cargoes)

3. Registration of Export Orchards and Packinghouses

- A. Orchards producing fresh dragon fruit for export to Korea shall register with the NPPO of Vietnam (hereinafter referred to as “PPD”) each year.
- B. PPD shall implement strict control of orchards producing fresh dragon fruit for export to Korea against quarantine pests of Korea in Annex 1 and supervise and oversee to ensure that low pest prevalence status is maintained.
- C. Growers shall record the pest control activities according to the form provided by PPD. PPD shall provide the result of record upon request by Animal and Plant Quarantine Agency (hereinafter referred to as “APQA”).
- D. Packinghouses that sort and pack fresh dragon fruit for export to Korea shall register with PPD each year and regularly undergo disinfection and inspection.
- E. The PPD must inform the APQA the list of registered orchards, packinghouses and vapor heat treatment facilities before commencement of dragon fruit exportation every year.

4. Sorting

- A. The fresh dragon fruit for export to Korea shall be sorted and packed only in packinghouses registered with PPD.
- B. When the dragon fruits for export to Korea arrive at the packinghouse, the harvest carton of fruits shall attach the label. The labels shall indicate that the dragon fruits were produced in the registered export orchards, such as the name or the registration number of the orchards. The packing house shall verify the label.
- C. When sorting fresh dragon fruit for export to Korea, it must be ensured that dragon fruit produced from unregistered orchards or fresh fruits of other kinds are not sorted together.
- D. PPD shall oversee, when sorting fresh fruits, to ensure that contaminants including infected fruits, pests, soil, and plant debris are removed.
- E. The sorting process of dragon fruit for export must include washing with water and compressed air cleaning.
- F. If the washing facility is not located in the registered packinghouses (vapor heat treatment facility), PPD shall manage the fruits using insect proof net to prevent re-infestation from the pest, soil etc during the conveyance.

5. Vapor Heat Treatment

- A. The vapor heat treatment facility shall be registered with PPD and PPD shall oversee and carry out regular inspection.
- B. The vapor heat treatment shall be conducted on each consignment at the registered facilities in attendance of plant quarantine inspectors of Vietnam.
- C. The vapor heat treatment must be conducted by raising the fruit core temperature up to 46.5°C or higher and applying treatment for 40 minutes. (relative humidity over 90%)
- D. Other details of vapor heat treatment shall be complied with the Guidelines for Vapor Heat Treatment in Annex 2.

6. Packing and Labeling

- A. The packinghouses for fresh dragon fruit which have been treated shall be equipped with insect-proof facilities and regularly undergo disinfection.
- B. Dragon fruits that have been approved by the export inspection shall be sealed in each packing cartons using the methods (including sticky tape, sticker or label) approved by PPD.
- C. On the outside the export packing cartons or pallets of palletized cargo shall be labeled “For Korea” and “the names (or registration numbers) of orchards and packinghouses”.
- D. In case there are any ventilation holes on packing cartons or palette of palletized cargo, they shall be covered with a net mesh of no more than 1.6mm in diameter.
- E. Export consignments that have been packed shall be covered with insect proof nets to prevent re-infestation from the pest during the storage or conveyance.

7. On-site survey

- A. APQA plant quarantine inspector shall conduct the on-site survey of dragon fruits in Vietnam every year.
- B. PPD shall send APQA a letter requesting for on-site survey by a Korean plant inspector 30 days before the Korean inspector’s departure.
- C. The invitation letter shall include the following information pertaining to export.
 - The number of plant quarantine inspectors from Korea and required inspection period;
 - Estimated volume of export; and
 - The site of Vapor heat treatment facility
- D. APQA inspector dispatched to Vietnam shall carry out the test run of per VHT chamber.
- E. All costs pertaining to the on-site survey by APQA plant quarantine inspector shall be paid by the Vietnamese side in accordance with the schedule for overseas travel cost of Korea.

8. Export Inspection and Certification

- A. The export inspection shall be carried out on 2% sample by the Vietnamese plant quarantine inspector, and a phytosanitary certificate shall be issued on consignments passed by the export inspection.
- B. In case a live fruit fly is detected as a result of export inspection, export inspection shall be suspended until the cause is identified and remedial measures are implemented. Nevertheless, in case other live quarantine pests are found, the consignment can be exported after the treatment.
- C. For consignments passed by the export inspection, PPD shall issue a phytosanitary certificate which includes additional declaration specified as in the below:
 - “This consignment comply with the import requirements agreed between APQA and PPD.”

- The name (or the registration number) of the registered orchard and packinghouse; and the name of the vapor heat treatment facility, treated date, temperature and duration
 - In case of a ship cargo, PPD shall seal the container and indicate the seal number.
- D. Consignments that were passed by the export inspection shall be managed separately from that were rejected or that were not inspected in order to prevent cross contamination of pests.
- E. Consignments that were passed by the export inspection shall be stored and managed in order to prevent recontamination by contaminants such as pests and soil, until their arrival in Korea.

9. Import Inspection

- A. Upon arrival of consignments, plant quarantine officers shall check the additional declarations prescribed under article 8. C.
- B. If a packing carton that is missing the labels prescribed under article 6. B and C, all or parts of the consignment shall be destroyed or returned.
- C. If there are no problems found as a result of the inspection specified in the above, import inspection shall be conducted.
- D. In case a live fruit fly is found during the import inspection, the consignment shall be destroyed or returned, and the import inspection shall be suspended until the cause is identified and remedial measures are implemented.
- E. In case a live quarantine pest is detected during the import inspection, the consignment shall be treated and if there are no treatments available, it will be destroyed or returned.

10. Others

In case a new unassessed pest is intercepted or Korea's quarantine pest is continuously intercepted, pest risk assessment shall be conducted and necessary measures (including resume the pre-clearance inspection) can be determined based on the result of assessment.

[ANNEXE 1]

Quarantine pests of fresh dragon fruit from Vietnam

Pathogens(12): *Colletotrichum capsici*, *Alternaria* sp., *Aspergillus* sp., *Cladosporium* sp., *Diplodia* sp., *Colletotrichum* sp., *Curvularia* sp., *Fusarium* sp., *Phoma* sp., *Gloeosporium* sp., *Penicillium* sp., *Phomopsis* sp.

Pests(19): *Bactrocera correcta*, *B. cucurbitae*, *B. dorsalis*, *Dysmicoccus brevipes*, *D. neobrevipes*, *Ferrisia virgata*, *Maconellicoccus hirsutus*, *Planococcus lilacinus*, *P. minor*, *Pseudococcus jackbeardsleyi*, *Aphis* sp., *Toxoptera* sp., *Cataenococcus* sp., *Coccus* sp., *Dysmicoccus* sp., *Planococcus* sp., *Pseudococcus* sp., *Platynota* sp., *Tarsonemus* sp

[ANNEXE 2]

Guidelines for Vapor Heat Treatment

I . Vapor Heat Treatment Conditions

- The fruit shall be treated for the duration of at least 40 minutes after the fruit core temperature reaches 46.5°C. During the treatment, the relative humidity level of VHT chamber shall be kept at 90% or higher.
- Pest subject to vapor heat treatment : *Bactrocera correcta*, *B. cucurbitae*, *B.dorsalis*

II . Facility Requirements and Inspection Standards

1. Inspection of VHT Facility and Equipment

- All the entrance doors and windows of packinghouses with VHT facilities shall be equipped with appropriate insect-screening facility.
- The area where treated fruits are packed shall be sealed to prevent pest re-contamination
- VHT facility and equipment shall be inspected in accordance with manufacturer's manual on a regular basis. Other parts that may affect the VHT effect shall be inspected as well.
- More than 3 core temperature sensors, more than 2 space temperature sensors and more than 1 humidity sensor shall be installed per VHT chamber.
- The number of temperature sensors installed in VHT chamber can be added in accordance with facility size.
- The temperature and humidity level of VHT chamber and fruit core temperature shall be possible to be checked from outside, and the record of treatment shall be saved and be possible to be printed out if necessary.
- VHT chamber shall be test run before commencement of each export season to check whether equipment operates accurately.

2. Sensor Calibration

- All sensors shall be calibrated before the commencement of every export season and every month by using a standard thermometer to check on the measurement error of a standard water tank set at 46.5°C.

- The gradation of the standard thermometer shall be 0.1°C and shall be approved by National Testing Agency.
- After water temperature of standard water tank is stabilized at 46.5°C, the value resulted from three measurements at intervals of 5 minutes shall be used for calibration.
- All sensors whose error range of measured value is within ±0.3°C, and the one that is out of the range shall be calibrated (zero adjustment) or replaced.
- The result of the calibrating the sensors shall be recorded.

3. Cold Spot Test

- The test shall be conducted at the beginning of every export season and the additional test may be carried out whenever deemed necessary.
- Load the fruits to the maximum capacity inside the chamber, based on commercial export volume.
- The fruits for cold spot test shall be hard and their weight must be within the same range. The temperature sensor shall be inserted the largest and heaviest fruit.
- To identify the coldest spot, the fruit core temperature sensor shall be installed in the cartons located opposite from the heat outlet(vent).
 - ex) In case hot air moves from below to above, the sensor shall be installed in the carton located in the top.
- The location of temperature sensor can be adjusted depending on the location of heat outlet
- The VH treatment for the cold spot test shall be carried out in the same condition for the actual commercial export of mango.
 - * The fruits for test treated could be exported after the test.
- The core temperature sensor shall be installed at the cold spot which reached the latest temperature of 46.5°C according to the cold spot test results.
- If the gap of each temperature sensor to reach the target temperature(46.5°C) is more than 2 hours, the chamber shall be calibrated.
 - Cold spot test of the chamber shall be re conducted after the chamber calibration
- The result of the cold spot test shall be recorded.

III . Detail Procedures of VHT

1. Installation of thermometer and hygrometer

- Core temperature sensor shall be inserted in more than 3 fruits per VHT chamber (in case of small size fruits such as litchi, sensor shall be inserted by connecting several fruits)
- At least more than 1 temperature sensor shall be installed at the cold spot identified through the cold spot test.

2. Vapor Heat Treatment

- The fruit shall be treated for the duration of at least 40 minutes after the fruit core temperature reaches 46.5°C. During the treatment, the relative humidity level of VHT chamber shall be kept at 90% or higher.
- After VHT, water or air cooling could be carried out.(optional)

3. Re-infection Preventive Measure after VHT

- The treated fruits shall be separated from other fresh fruits that were not treated.
- In the packing process, only the VHT treated fruits shall be packed together and shall be stored in a way to prevent re-infection by pests.
- The packed fruits shall be loaded and transported in a clean container and vehicle confirmed to be free from pest contamination.

IV. Standards for treatment Rejection

- In case that the fruit core temperature fails to be kept at 46.5°C or higher for the duration of 40 minutes and the relative humidity level of VHT chamber fails to be kept at 90% or higher.
- In case any live pest which was subject to treatment is detected after VHT;
- In case temperature sensor was installed not meeting the conditions under III.1
- In case the factor is founded that degraded the result of the VH treatment.

V . VHT Report Writing and Confirmation.

- Packing houses equipped with VHT facility shall record and keep the VHT report per case (see Attachment).
- The items and template of the VHT report may be modified in part in accordance with the characteristics of the system.

[Attachment]

VAPOR HEAT TREATMENT REPORT

Issue No. :

▣ General Information of Treatment

Factory Name	:	
Chamber No.	:	
Date of Treatment	:	
Commodity Name	:	
Destination	:	
No. of pallets	:	
No. of crates	:	
Total Volume(kg)	:	

▣ Operating Information

VHT Start Time	:
Holding Time Start	:
Holding Time End	:
Treatment Duration	:
Relative humidity maintenance	: Yes / No
Remarks	:

Name of Confirmed by :

Date : **(Signature) :**