

Quarantine Requirements for the Importation of Fresh
Dragon Fruits (*Hylocereus undatus*) from Viet Nam

1. The importation of fresh dragon fruits (*Hylocereus undatus*) (hereinafter referred to as dragon fruits) from Viet Nam must follow the “Quarantine Requirements for the Importation of Plants or Plant Products into the Republic of China”, as well as the quarantine requirements.
2. Requirements for orchards
 - 2.1 Dragon fruits should be produced from orchards which are registered by the Plant Protection Department, Ministry of Agriculture & Rural Development (hereinafter referred to as “PPD”) and the pest control measures are under the supervision of PPD.
 - 2.2 PPD shall ensure that records of pest control measure or working diaries are undertaken and kept by registered orchards. PPD also shall keep orchard registration numbers, name and address of the producers for inspection. The dossier should be made available to the plant quarantine authority of Taiwan (hereinafter referred to as “BAPHIQ”) upon request, and BAPHIQ may conduct on-site verification.
3. Dragon fruits must be treated in vapor heat treatment (VHT) facilities approved by PPD and BAPHIQ prior to the export. VHT commences when the core temperature of pulp reaches 46.8°C or above for at least 40 minutes, with relative humidity of 90% or above. Fruits shall be cooled after the treatment by cold water for 10 minutes followed by forced-air cooling to bring the fruits temperature back to room temperature.

4. Requirements for VHT facilities (including packinghouses and cold storage):

4.1 Facility cleanliness shall be maintained and the facility shall be sanitized regularly.

4.2 Entrances, exits or doors shall be equipped with insect-proof equipment such as downward-facing air curtain, plastic curtains or insect proof apparatus. Windows and air holes at the facilities must be covered with screen and with opening of no larger than 1.6 mm.

4.3 The entryway to the packing area must be in a dark enclosure and have multiple doors (with three doors at least).

4.4 VHT chamber shall be equipped with automatic data loggers outside of the chamber to monitor the humidity and the temperature of the fruits in the chamber. The data loggers shall be able to print the data out.

4.5 The packing houses should have an insect sticking board installed on the inside, light-inducing traps or other non-sex pheromone traps in order to detect any harmful pests.

PPD must keep records of the name, registration number and address of the approved VHT facilities. The registration list must be made available to BAPHIQ when PPD invites BAPHIQ to conduct on-site audit.

5. Prior to the commencement of VHT operations each year, PPD should invite BAPHIQ to jointly perform inspection and conduct verification tests to the VHT facilities according to the verification guidelines specified in the attachment. Only the facilities that have been verified and are compliant can commence with the VHT treatment operation.

Facilities that have passed inspection but have conducted treatments to dragon fruits for export to Taiwan after one month should be verified again.

6. Requirements for VHT:

- 6.1 PPD and BAPHIQ officers should jointly supervise the quarantine treatment.
- 6.2 At least one fruit temperature sensor should be installed within each pallet of the chamber. The sensor shall be positioned at the coldest spot according to the outcome of the vapor heat treatment verification test.
- 6.3 Temperature sensors shall be inserted into the fruit's pulp to confirm they are able to read the core temperature of the fruits with accuracy.
- 6.4 Dragon fruits for export to Taiwan shall not be treated together with dragon fruits for export to other countries, nor shall they be treated with other fresh fruits in the same heat treatment.
- 6.5 After the VHT has been completed, fruits with temperature sensors should be dissected to confirm if the sensor stays at the center of the fruits. If not, the treatment is considered a failure, and the fruits should be treated again.

7. Requirements for dragon fruits after completion of VHT:

- 7.1 Fruits shall be packed in one of the following methods:
 - 7.1.1 Packed by sealed packaging or packed by sealed carton. If packing cartons have ventilation holes, the holes should be covered with screening with openings of no larger than 1.6 mm.
 - 7.1.2 The opening of each sealed carton should be sealed by approved quarantine tape labelled with serial numbers. The quarantine tape shall not to be used again. The PPD shall provide a sample of the quarantine tape to the BAPHIQ beforehand.
- 7.2 Fruits shall be transported in one of the following methods:
 - 7.2.1 Packed on pallets. The pallets should be closely wrapped on all sides and covered with screen with openings of no larger than 1.6 mm to prevent the entry of pests. The openings should be

sealed by approved quarantine tape labelled with serial numbers. The quarantine tape shall not be used again. The PPD should provide a sample of the sealing tape to the BAPHIQ beforehand.

7.2.2 Packed by sealed container. A numbered seal must be placed on loaded container door. The seal number and the container number should be noted on the phytosanitary certificate issued by the PPD.

7.3 Each packed carton or pallet should be clearly marked with the name of the approved VHT facility or the registration number along with the words “To Taiwan”.

7.4 After the packing has been completed, the dragon fruits shall be stored in a closed facility before being loaded on to the container. The fruits should not be stored with other dragon fruits for domestic market or for export to other countries, or with other varieties of fresh fruits. The shipping container should not be loaded with other fresh fruits or commodities for export to Taiwan.

8. Requirements for export inspection:

8.1 Inspections shall be conducted in insect-proof facilities with sufficient lighting and equipped with inspection apparatus and inspection table.

8.2 Inspection shall be conducted to the same lot of dragon fruits treated in the same VHT facility to ensure the efficacy of disinfestation.

8.3 At least 5% of the random sample of the packed cartons in a given lot of the consignment will be inspected. For each sampling carton, three fruits will be taken and cut for inspection.

8.4 Quarantine officers from both the PPD and the BAPHIQ should conduct quarantine inspection jointly to ensure the fruits are free of harmful pests.

8.5 Should there be a detection of fruit fly larvae or eggs during export inspection, the larvae or eggs should be observed under a normal

environment for 3 hours and 48 hours respectively beginning from the time when larvae or eggs were detected to determine if they are living organisms. The VHT where pests are intercepted must suspend all of its operations during the observation period.

8.6 Should there be interception of live fruit flies during inspection, all fruits of the intercepted lot which underwent the same treatment will be prohibited for export to Taiwan and export operations of dragon fruits from Viet Nam to Taiwan will also be suspended. Exports can be resumed after BAPHIQ approves the improvement measures made to correct the cause of interception.

8.7 If any other harmful pests are intercepted, that consignment must be treated with appropriate quarantine treatment prior to the export to disinfest or mitigate the pests of quarantine concern.

8.8 Dragon fruits that have passed export inspection but are not exported within 7 days must be re-inspected according to these requirements and re-issued with a phytosanitary certificate before the exportation.

9. Dragon fruits which pass the export inspection should be accompanied with a phytosanitary certificate issued by PPD with the following additional declarations, and also endorsed by a BAPHIQ inspector:

9.1 Name or registration number of the VHT facility, serial number of the quarantine tape, container number and seal number.

9.2 Date of VHT, treatment temperature and treatment duration.

9.3 Stating that dragon fruits have been inspected and found free of guava fruit fly (*Bactrocera correcta*) and other quarantine pests of Taiwan.

10. Import inspection

10.1 Procedures, methods and sampling methods for import inspection shall follow Taiwan's "Enforcement Rules on The Plant Protection

and Quarantine Act” and other quarantine regulations.

- 10.2 Dragon fruits that have not met with these quarantine requirements will be rejected from entry, and will be re-shipped or destroyed.
- 10.3 Should fruit fly larvae or eggs be intercepted during import inspection, the larvae or eggs should be observed under a room temperature environment for 3 hours and 48 hours respectively to determine if larvae or eggs are alive. The BAPHIQ should notify PPD of the interception immediately. The VHT facility that performed the treatment should suspend all of its operations during the observation period.
- 10.4 If live fruit flies are intercepted during import inspection, the intercepted consignment will be rejected from entry, and will be re-shipped or destroyed. BAPHIQ should notify PPD immediately to suspend the export of dragon fruits to Taiwan. Export will be resumed only after the cause of infestation is clarified, and BAPHIQ approves and verifies the improvement measures that have been taken.
- 10.5 Fresh dragon fruits from those suspended production sites (prefectures) that have passed export inspection and obtained a phytosanitary certificate prior to the suspension date shall be loaded on board traveling to Taiwan within 3 days and undergo stricter import inspection.
- 10.6 Should pests other than fruit flies be intercepted during import inspection, quarantine measures will be taken in accordance with relevant quarantine regulations.

11. Guidelines for BAPHIQ inspectors to conduct on-site verification and inspection in Viet Nam:

- 11.1 Standard working hours will be from 8:30 to 17:30 each day from Monday to Friday.
- 11.2 Should overtime work be required, PPD should consult with the

on-site BAPHIQ inspector 24 hours in advance of the overtime work. Overtime working hours are listed below:

11.2.1 Normal working days overtime starts from 17:30 and should not exceed 21:30.

11.2.2 Weekends or public holiday (Taiwan) overtime starts from 8:30 and should not exceed 21:30.

11.3 Should overtime be required beyond the aforementioned timeframe, the request shall be agreed by a BAPHIQ inspector before overtime is commenced.

11.4 An interpreter should be made available when a BAPHIQ inspector is on duty.

12. Requirements for on-site verification and inspection:

12.1 Two months prior to each dragon fruits export season, PPD should provide the details on the number of inspectors required, period of visit, estimated quantity of dragon fruits to be exported to Taiwan and the lists of orchards and VHT facility registrations and their locations, along with a formal letter of invitation to BAPHIQ for dispatching the inspectors.

12.2 BAPHIQ will dispatch inspectors to Viet Nam based on the aforementioned details to conduct verification of the VHT facilities and export inspection with PPD officers jointly. If the visit program takes more than a month, BAPHIQ can take turns to dispatch its inspectors.

12.3 All costs including logistics, per diem, overtime charge, incidental expenses, insurance, interpretation and visa fees associated with BAPHIQ conducting the on-site verification visit should be borne by Viet Nam.

Appendix

Guidelines for the Verification of Vapor Heat Treatment (VHT) Facilities

1. BAPHIQ and PPD should check the vapor heat treatment facilities (including packinghouses and cold storage) have met with these quarantine requirements before conducting the verification.
2. Procedures for the calibration of temperature sensors are as follows:
 - 2.1. Temperature sensors must be calibrated in a water bath equipped with a standard psychrometer. The psychrometer must be calibrated by an accredited organization each year. The calibration certificate must be kept available for BAPHIQ inspector.
 - 2.2. Submerge temperature sensors in the water bath with water temperature maintained at 46.8°C. Once the temperature is stabilized, start recording the temperature every 5 minutes for five consecutive readings. The fruit's temperature sensors should be accurate to $\pm 0.1^{\circ}\text{C}$.
 - 2.3. If any three out of the five sensor measurement readings are the same, that temperature reading will be used to calibrate the automatic data loggers.
 - 2.4. Any temperature sensor showing a reading outside the testing range or over a variation $\pm 0.3^{\circ}\text{C}$ must be replaced. If five temperature readings were all different, the sensor must also be replaced.
 - 2.5. PPD must take appropriate measures to prevent temperature and humidity records from being falsified.
 - 2.6. Automatic temperature data loggers must be calibrated regularly on a monthly basis once the VHT facility commences the operation.
3. Procedures for empty chamber testing in the VHT facility are as follows:

- 3.1. Load maximum quantity of empty boxes possible to the empty chamber.
 - 3.2. Place the automatic temperature sensors in the empty boxes that are closest to the vapor heat outlet. If there are multiple pallets in the chamber, temperature sensors should be placed on every pallet.
 - 3.3. The chamber should be heated until all the temperature sensors have reached and maintained at 46.8°C or above with humidity confirmed at 90% or above in the chamber.
 - 3.4. All temperature sensors must be confirmed to read 46.8°C or above for 40 minutes. The temperature readings must be recorded or printed every 5 minutes.
 - 3.5. If there are multiple pallets in the chamber, all the temperature sensors positioned on the pallets must reach 46.8°C with a relative humidity of 90% or above during empty chamber testing. The readings of automatic data loggers should fall within a range of $\pm 4^{\circ}\text{C}$ between all the sensors.
4. Procedures for the cold spot test in the VHT facility are as follows:
 - 4.1. Testing should be conducted to all the pallets.
 - 4.2. When conducting cold spot testing, the pallets that have been selected for cold spot testing must be loaded with filler fruits. The rest of the pallets should be loaded with empty boxes. The pallet fans should be switched on.
 - 4.3. VHT treatment chamber must be loaded with a maximum number of fruits that are permitted in a commercial shipment for export in the cold spot test.
 - 4.4. The size of the test fruits should be the bigger fruits in each pallet. All the test fruits should be hard and at a similar weight.
 - 4.5. Temperature sensors should be inserted into the fruits' core and positioned on the top, middle and bottom of each pallet of filler

fruits and at each of the four corners. Each pallet should be set up with 15 fruit temperature sensors. Cold spot test can be conducted separately to each pallet. The test conditions for cold spot test must be the same as the actual treatment conditions for a commercial shipment. Only the fruits that have been treated and met with the quarantine requirements are permitted to be exported.

- 4.6. Fruits undergo VHT to bring the fruits' core temperature to the required treatment temperature of 46.8°C and maintained for at least 40 minutes. The automatic data loggers should record the temperature every 5 minutes.
- 4.7. After the cold spot testing has been completed, fruits with temperature sensors should be dissected to confirm if the sensor stays at the center of the fruits. If not, the test should be conducted again.
- 4.8. During the test, the cold spot is determined as the spot where the sensor reaches 46.8°C at the latest.
- 4.9. Temperature sensors should be placed at the cold spots according to the cold spot test result for commercial operations.