



Notification of Department of Agriculture
Re: Conditions for Import of Citrus Fruit from
the Republic of South Africa
B.E. 2555 (2012)

The Department of Agriculture has completed pest risk analysis for commercial importation of citrus fruit from the Republic of South Africa.

By virtue of the provisions of Section 8 (2) and Section 10 of the Plant Quarantine Act B.E. 2507 (1964) amended by the Plant Quarantine Act (No. 3) B.E. 2551 (2008) with particular provisions that may restrict the right and freedom of any person in which Section 29 together with Section 32, Section 33, Section 41 and Section 43 of the Constitution of the Kingdom of Thailand permits by virtue of the law. The Director-General of Department of Agriculture through the recommendation of the Plant Quarantine Committee, hereby announces the conditions that have to be met in order to import citrus fruit from the Republic of South Africa as follows:

1. This notification shall be called “Notification of Department of Agriculture, Re: Conditions for Import of Citrus Fruit from the Republic of South Africa B.E. 2555 (2012)”.
2. This notification shall enter into force a day after the date of its proclamation in the Government Gazette.
3. **Plant species**

The following citrus fruits are permitted to import to the Kingdom of Thailand;

- 3.1 Sweet orange (*Citrus sinensis*) i.e. Navel and Valencia cultivars
- 3.2 Mandarin (*Citrus reticulata*) i.e. Clementine and Satsuma cultivars
- 3.3 Lemon (*Citrus limon*) i.e. Eureka cultivar
- 3.4 Grapefruit (*Citrus paradise*) i.e. Marsh, Rose and Star Ruby cultivars

4. Quarantine pests of concern

A list of quarantine pests of current concern to the Kingdom of Thailand for citrus fruit from the Republic of South Africa is given in **Attachment 1**.

5. Responsible organizations

5.1 Kingdom of Thailand: Department of Agriculture (hereinafter referred to as DOA).

5.2 Republic of South Africa: Department of Agriculture, Forestry and Fisheries (hereinafter referred to as DAFF)

6. Import permit

Import permit issued by DOA is required.

7. Means of conveyance

Citrus fruit must be imported from a port in the Republic of South Africa to a designated port in the Kingdom of Thailand by sea cargo or air cargo.

8. Production areas

Citrus fruit must be produced and sourced from DAFF registered commercial orchards in the Republic of South Africa, where the DAFF designated as production areas for export to the Kingdom of Thailand and the DOA has approved prior to export.

9. Requirements for Orchard

9.1 All orchards in designated production areas involved in the export of citrus fruit to the Kingdom of Thailand must be registered with and monitored by DAFF to ensure that fruit is produced free of quarantine pests. Copies of the registration records must be made available to DOA upon requested. DAFF is required to register export orchards prior to commencement of exports.

9.2 Growers of registered orchards must implement good agricultural practice (GAP). This includes maintaining of orchard sanitation and the implementation of integrated pest management or other pest control measures to ensure that quarantine pests of concern to the Kingdom of Thailand are adequately managed.

9.3 DAFF must provide information on the management program undertaken for citrus fruit throughout the growing season when required by DOA.

10. Requirements for Packinghouse or Export Establishment

- 10.1 All packinghouses or export establishments involved in the export of citrus fruit to the Kingdom of Thailand must be registered with and monitored by DAFF. Copies of the registration records must be made available to DOA upon requested. DAFF is required to register packinghouses or export establishments prior to commencement of exports.
- 10.2 Packinghouses or export establishments are required to source fruit only from DAFF registered commercial orchards in designated production areas to facilitate trace back of export fruit. Records of growers supplying fruit for export to the Kingdom of Thailand must be maintained by packinghouses or export establishments and made available to DOA upon request.
- 10.3 Packinghouses or export establishments are required to have a well documented Standard Operation Procedures (SOP), which describes in detail all processes related to grading, handling and packing of citrus fruit.
- 10.4 An audit must be conducted by DAFF prior to registration of packinghouses or export establishments and then done at least annually. Packinghouses or export establishments must be responsible for maintaining all documentation.
- 10.5 Cold treatment for pre-shipment disinfestation of quarantine pests must be conducted within the registered packinghouses or registered export establishments.
- 10.6 Inspection of fruit for freedom from quarantine pests must be done within the registered packinghouses or registered export establishments.

11. Requirements for Treatment

- 11.1 It is mandatory that citrus fruit intended to export to the Kingdom of Thailand must be subjected to phytosanitary treatment for false codling moth, (*Thaumatotibia leucotreta*), Mediterranean fruit fly (*Ceratitits capitata*) and Natal fruit fly (*Ceratitits rosa*). The following treatment schedules are accepted for cold disinfestation of false codling moth, Mediterranean fruit fly and Natal fruit fly in citrus fruit.

Innermost fruit pulp temperature	Exposure period (consecutive days)
- 0.55 ° C (31 ° F) or below	24 days or more

- 11.2 The treatment shall not commence until all sensors are reading - 0.55 ° C (31 ° F) or below. If the temperature exceeds - 0.27 ° C (31.5 ° F), the treatment shall be extended for at least 8 hours for each day or part of a day the temperature is above - 0.27 ° C (31.5 ° F). If the exposure period is extended, the temperature during the extension period must be 1.11 ° C (34 ° F) or below. If the temperature exceeds 1.11 ° C (34 ° F) at any time, the treatment is nullified.

- 11.3 It is requirement that citrus fruit intended for in-transit cold disinfestation treatment must be pre-cooled at least 72 hours until innermost fruit pulp temperature at or below the target treatment temperature of - 0.55 ° C (31 ° F) before the loading of a container can be took place.
- 11.4 Treatment can be performed pre-shipment or in-transit. The in-transit treatment may be carried out partly as a pre-shipment treatment start in the Republic of South Africa and completed in-transit. In the event of a treatment failure, treatment may be completed on arrival.
- 11.5 Pre-shipment cold disinfestation treatment and in-transit cold disinfestation treatment are assessed on fruit temperature sensors only. Air temperature sensors are not used to assess cold treatment efficacy.

12. Requirements for Pre-Shipment Cold Disinfestation Treatment

- 12.1 Treatment conducted prior to shipment must be supervised by DAFF in a cold disinfestation treatment facility approved by DAFF and DOA. Citrus fruit for export to the Kingdom of Thailand may be treated concurrently with citrus fruit destined for other markets.
- 12.2 If a consignment is to receive pre-shipment cold disinfestation treatment, DAFF must ensure compliance with conditions specified in **Attachment 2**.

13. Requirements for In-Transit Cold Disinfestation Treatment

- 13.1 In-transit cold disinfestation treatment refers to cold disinfestation treatment conducted in-transit in shipping containers.
- 13.2 In-transit cold disinfestation treatment in shipping containers may be commenced on shore and completed in-transit or completed at destination.
- 13.3 If a consignment is to receive in-transit cold disinfestation treatment, DAFF must ensure compliance with conditions specified in **Attachment 3**. In addition, certificate of calibration for in-transit cold disinfestation treatment specified in **Attachment 4** must accompany with every consignment.

14. Requirements for Packing and Labeling

- 14.1 Packing material may be made of corrugated fiber-board which can be manufactured either from recycled material or virgin material. Only clean, new cartons are allowed.
- 14.2 Boxes must be free from soil, sand and contaminating plant materials e.g. leaves, stem, plant debris or other potential carriers of quarantine pests.

- 14.3 For fruit to be exported by air freight, boxes containing fruit must have no hole(s). If it does, the hole(s) or opening must have screen of which the diameter not more than 1.6 millimeters to prevent the entry of quarantine insects.
- 14.4 The following information must be appeared on each package e.g. product of South Africa, name of exporting company, name of fruit (common name and cultivar), production unit code (PUC), packinghouse code (PHC) and packing date.
- 14.5 If citrus fruit is shipped to the Kingdom of Thailand in loose cartons, the following information “EXPORT TO THAILAND” must be appeared on each carton. However, if citrus fruit is shipped to the Kingdom of Thailand on pallets, it is allowable to have the following information “EXPORT TO THAILAND” appearing on each side.
- 14.6 All consignments of citrus fruit destined to the Kingdom of Thailand using solid wood packing material must comply with ISPM No. 15: *Regulation of Wood Packaging Material in International Trade*.

15. Export Inspection

- 15.1 The consignment must be inspected in accordance with appropriate official procedures and found to be free from any quarantine pest specified in **Attachment 1**.
- 15.2 In case of quarantine pests as specified in **Attachment 1** are found, the following measures must be undertaken.
 - 15.2.1 If any live false codling moth, Mediterranean fruit fly and Natal fruit fly are found, the consignment must be rejected for export to the Kingdom of Thailand.
 - 15.2.2 If live quarantine pests other than false codling moth, Mediterranean fruit fly and Natal fruit fly are detected, the consignment must be exported to the Kingdom of Thailand after disinfection/disinfestations or removing all of the pests.
- 15.3 The consignment must be undergone an agreed treatment specified in Section 11 to disinfest false codling moth, Mediterranean fruit fly and Natal fruit fly of citrus fruit.

16. Phytosanitary Certification

- 16.1 A phytosanitary certificate (PC) issued by DAFF is required. The original copy must accompany every consignment to the Kingdom of Thailand and bear the following additional declaration:

“The consignment of citrus fruit was produced and prepared for export in accordance with the conditions for import of citrus fruit from South Africa to Thailand”

16.2 Pre-shipment cold disinfestation treatment

If the consignment received pre-shipment cold disinfestation treatment then the cold treatment facility, treatment temperature and period (number of consecutive days) must be inserted in the appropriate sections of the phytosanitary certificate.

16.3 In-transit cold disinfestation treatment

16.3.1 If the consignment is subjected to in-transit cold disinfestation treatment, then the phytosanitary certificate must also bear the following additional declaration:

“DAFF has supervised the calibration and the placement of fruit sensors into the fruit within the container(s) in accordance with the conditions for import of citrus fruit from South Africa to Thailand and cold disinfestation treatment has been initiated”

16.3.2 The original copy of a certificate of calibration for in-transit cold disinfestation treatment specified in **Attachment 4** must accompany with the phytosanitary certificate.

16.4 The common name and cultivar of the citrus fruit as well as container and seal numbers (for sea freight) must be recorded on the phytosanitary certificate.

17. Import Inspection

17.1 When the consignments arrive at the point of entry in the Kingdom of Thailand, the import inspection must be conducted after confirming the respective documents accompanying the consignments concerned.

17.2 A representative sample of the consignments will be randomly selected, at the inspector’s discretion, and examined to determine if pests are present. If live pests are found, samples will normally be sent for laboratory identification, and the consignments held pending the results.

17.3 For consignments of fruit of less than 1000 units, the sample size is either 450 units or 100% of consignment. For consignments of fruit of greater than or equal to 1000 units, then 600 units are to be sampled.

17.4 In case of quarantine pests of the Kingdom of Thailand concern as stipulate in **Attachment 1** are found during import inspection, the following measures must be taken;

- 17.4.1 If live false codling moth, Mediterranean fruit fly or Natal fruit fly is found, the infested consignment must be either re-exported or destroyed at the importer's expenses. The DOA immediately suspends importation and notify to DAFF of the interception.
- 17.4.2 DAFF shall immediately investigate the cause of such incidence and propose corrective actions. Suspension of import will be lift when the cause of non-compliance has been clarified and corrective actions have been implemented to the satisfaction of DOA.
- 17.4.3 If live quarantine pests other than false codling moth, Mediterranean fruit fly and Natal fruit fly are found, the consignment must be either destroyed or re-exported at the importer's expenses.
- 17.5 If any live organism of potential quarantine concern to the Kingdom of Thailand not listed in **Attachment 1** is found, the consignment must be re-exported or destroyed at the importer's expenses. The DOA reserves the right to temporary suspension of import from the identified pathway until a risk assessment of intercepted organisms is determined.
- 17.6 DOA reserves the right to have fruit re-exported or destroyed at the importer's expenses, if one or more of the following case arises:
- 15.6.1 Cold disinfestation treatment was unsuccessfully.
- 15.6.2 Container doors are not completely closed.
- 15.6.3 Container seal is broken or replaced or does not match the number on the phytosanitary certificate.
- 15.6.4 Temperature sensor extends beyond the fruit or is not located in specified positions or sensor fruit was ruptured;
- 15.6.5 Packaging labeling is missing or incorrect or incomplete.

18. Audit of export procedures

- 18.1 The export of citrus fruit from the Republic of South Africa to the Kingdom of Thailand shall only initiate after the DOA has already audited export certification procedures. The costs of such audits must be borne by the Republic of South Africa.
- 18.2 In the event of a suspension of import, DOA may audit export certification procedures in the Republic of South Africa prior to a decision being taken on resumption of import. Where DOA has determined that such audits are necessary, the costs of these audits must be borne by the Republic of South Africa.

- 18.3 DOA reserves the rights to regularly dispatch officer (s) to the Republic of South Africa to observe whether all export certification procedures implemented by DAFF are effective. This is to ensure that citrus fruit exported to the Kingdom of Thailand is still undergone appropriate managements for quarantine pests. The costs of these activities must be borne by the Republic of South Africa.

Issued on 26 April B.E. 2555 (2012)

Mr. Jirakorn Kosaisevi

Director-General
Department of Agriculture

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- The Government Gazette: Vol. 129, Special Part 87 D, Page 17-23, Date 30 May 2012
 - UNOFFICIAL TRANSLATION
 - This is an English translation. In case of any difference in meaning between the Thai text and the English translation, the Thai text shall be applied.

Attachment 1

List of Quarantine Pests of Citrus Fruit from the Republic of South Africa
 Attached to Notification of Department of Agriculture
 Re: Conditions for Import of Citrus Fruit from the Republic South Africa B.E. 2555 (2012)

Scientific name	Common name
Insects	
Order Coleoptera	
Family Curculionidae	
<i>Asynonychus cervinus</i>	Fuller's rose weevil
Order Diptera	
Family Tephritidae	
<i>Ceratitis capitata</i>	Mediterranean fruit fly
<i>Ceratitis rosa</i>	Natal fruit fly
Order Hemiptera	
Family Coccidae	
<i>Ceroplastes rusci</i>	fig wax scale
<i>Ceroplastes brevicauda</i>	white waxy scale
<i>Ceroplastes destructor</i>	white wax scale
<i>Coccus celatus</i>	coffee green scale
<i>Protopulvinaria pyriformis</i>	pyriform scale
<i>Pulvinaria aethiopica</i>	soft green scale
Family Diaspididae	
<i>Aspidiotus nerii</i>	aucuba scale
<i>Chrysomphalus diversicolor</i>	false circular purple scale
<i>Chrysomphalus pinnulifer</i>	pinnule scale
<i>Ischnaspis longirostris</i>	black thread scale
<i>Saissetia jocunda</i>	black scale
<i>Saissetia miranda</i>	black scale
<i>Saissetia neglecta</i>	black scale
<i>Saissetia privigna</i>	black scale
<i>Saissetia somereni</i>	black scale
Family Pseudococcidae	
<i>Delottococcus elisabethae</i>	mealybug
<i>Paracoccus burnerae</i>	Oleander mealybug
<i>Pseudococcus calceolariae</i>	citrophilous mealybug
<i>Pseudococcus longispinus</i>	longtailed mealybug
Order Lepidoptera	
Family Tortricidae	
<i>Thaumatotibia leucotreta</i>	false codling moth
<i>Tortrix capensana</i>	apple leaf roller
Order Thysanoptera	
Family Thripidae	
<i>Scirtothrips aurantii</i>	South African citrus thrips
Mites	

Scientific name	Common name
Family Brevipalpidae	
<i>Brevipalpus obovatus</i>	scarlet tea mite
Family Eriophyidae	
<i>Eriophyes sheldoni</i>	citrus bud mite

Requirements for Pre-Shipment Cold Disinfestation Treatment
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1. Requirements for Cold Treatment Facility

- 1.1 Pre-shipment disinfestation treatment must be only permitted in a cold treatment facility approved by DAFF and DOA. The cost of DOA officer (s) to visit and approve cold treatment facilities must be born by the Republic of South Africa.
- 1.2 DAFF is responsible for ensuring that cold treatment facilities used by exporters are of a suitable standard, have refrigeration equipment capable of achieving and holding the fruit at the required temperature and must be lockable to ensure the security and integrity of the fruit being treated.
- 1.3 DAFF must keep a register of cold treatment facilities approved for pre-shipment treatment. This register will include documentation covering;
 - 1.3.1 location and construction plans of all facilities, including owner/operator contact detail,
 - 1.3.2 dimensions of the facilities and room capacity,
 - 1.3.3 type of insulation used in walls, ceiling and floors,
 - 1.3.4 maker, model, type and capacity of the refrigeration condenser and evaporator air circulation,
 - 1.3.5 the temperature range of the equipment, defrost cycle control and specifications and details of any integrated temperature recording equipment.
- 1.4 DAFF will forward to DOA names and addresses of currently registered cold treatment facilities before the start of each export season.

2. Requirements for Temperature Recording System

DAFF must ensure that temperature recording system, the combination of the cold treatment data recorders and fruit pulp temperature sensors, must meet the following criteria:

- 2.1 The system must be suitable for cold disinfestation treatment. The accuracy of the system must be within plus or minus 0.3 ° C of the true temperature in the range of minus 3 ° C to plus 3 ° C.

- 2.2 The system must be capable of automatic operation and able to accommodate a minimum of four fruit temperature sensors.
- 2.3 The system must be capable of continuous recording of date, time, sensor number, and temperature during all calibrations and for the duration of treatment period.
- 2.4 The system must be capable of recording all temperature sensors at least once every hourly, with a resolution of 0.1 ° C and storing data until the information can be examined by an authority.
- 2.5 The system must be capable of producing printout which identifies each sensor, time and the temperature, as well as the identification number of the cold treatment facility.

3. Requirements for Temperature Sensors

- 3.1 Sensor's type must have an optimal accuracy for the temperature range of this cold treatment.
- 3.2 Sensors must have an outer sheath diameter of 6.4 millimeters or less. The sensing unit must be located within the first 25 millimeters or less of the sensor's tip. Sensors must be accurate to within plus or minus 0.3 ° C in the range of minus 3 ° C to plus 3 ° C.
- 3.3 Each sensor must be tagged with a number identical to sensor's number accompanying it readings in the printout produced by the temperature recording system.

4. Calibration of Temperature Sensors

- 4.1 Calibration of the temperature sensors must be conducted under the supervision of DAFF.
- 4.2 Calibration must be conducted using a mixture of crushed ice and distilled water in clean insulated container measured against a certified thermometer prior to the temperature sensors being placed in fruit.
- 4.3 Crushed ice must completely fill the container. Enough water should be added to stir the mixture. The percentage of ice is estimated at 80-85 percent while the water fills the air void (15-20 percent).
- 4.4 The mixture must be thoroughly stirred to ensure the water is completely cooled and good mixing has occurred. At least 10 minutes of adaptation period, confirmation with a certified thermometer that the water temperature has reached a steady state of 0 ° C is essential.

- 4.5 During the calibration, all the temperature sensors and the calibrated thermometer must be immersed in the ice water slurry without touching the sides or bottom of the container. The mixture must be constantly stirred while testing is being carried out. Only after the readings are stabilized at the lowest constant temperature, the calibration readings can be conducted.
- 4.6 Two consecutive reading must be recorded for each sensor at the lowest temperature obtainable. There shall be at least a 60 second interval between the two readings for any one sensor; however, the interval should not exceed 5 minutes. The variance between the two readings must not exceed 0.1 ° C.
- 4.7 Any sensor which reading shows a deviation of more than plus and minus 0.3 ° C from the standard 0 ° C must be replaced and rejected for further use for cold treatment.

5. Placement of Temperature Sensors

- 5.1 Placement of temperature sensors and connection of temperature sensors to a data logger must be conducted under the supervision of DAFF.
- 5.2 Palletized fruit must be loaded into cold room under the supervision of DAFF and may be pre-cooled at the exporter's discretion.
- 5.3 Records for pre-shipment cold disinfestation treatment are required at least four temperature sensors to monitor fruit pulp temperature in a cool room.
- 5.4 The temperature sensor used to measure the fruit pulp temperature must be inserted carefully into the center of a test fruit. The test fruit shall be selected from the largest fruit size in the lot. With small fruit, the sensor shall penetrate two or more fruit. The sensor's tip must not be extended beyond the fruit, as well as fruit rupture and opened by sensor insertion, to prevent measuring air temperature instead of fruit pulp temperature. In these cases, the cold treatment is rejected.
- 5.5 Temperature sensors must be placed in a cool room in the following locations.
 - 5.5.1 A minimum of two sensors at the inlet (return air) and the outlet (supply air) point of air circulation must be used to measure room temperature.
 - 5.5.2 A minimum of four sensors must be used to measure innermost fruit pulp temperature in the following locations.
 - (a) one at the center of the stack, in the center of the cold room,
 - (b) one at the corner of the top stack, in the center of the cold room,
 - (c) one at the center of the stack near the outlet of cold air, and

(d) one at the corner of the top stack near the outlet of cold air

- 5.6 Data logger records may commence at any time, however the treatment time will be deemed to have begun only after all fruit temperature sensors have attained the nominated treatment temperature.
- 5.7 Where only the minimum of sensors have been used, and in the event that any probes fails to record a temperature for a period of more than four consecutive hours, the treatment must be declared void and must be started again.

6. Confirmation of Treatment

- 6.1 The treatment shall be considered to have been successfully completed if the record of treatment indicates that the treatment parameters have been met and re-calibration of the sensors has been passed. Sensors are to be re-calibrated using the procedures in Section 4. Records must be kept for DOA audit.
- 6.2 If any sensor shows a higher calibration factor at the completion of the treatment than at the initial calibration setting, the recordings from the sensor (s) will be adjusted accordingly. If this adjustment reveals that the nominated treatment schedule is not met, the treatment must be deemed to have failed. There is the option of re-treating this fruit at the discretion of DAFF and the exporter.
- 6.3 Printouts of temperature records are to be accompanied by suitable data summaries that indicate that the required cold disinfestation treatment of the product has been achieved.
- 6.4 DAFF must endorse these records and summaries before confirm that the treatment has been successful. These are to be available for DOA audit when required.
- 6.5 If the required cold disinfestation treatment of the product has not been achieved, the logger may be reconnected and the treatment continued provides that:
- 6.5.1 DAFF confirms the maintenance of the required conditions as per Section 6.3 or
- 6.5.2 The elapsed time since treatment cessation and re-commencement is less than 24 hours.

In both cases, data will continue to be collected from the time the logger is reconnected.

7. Loading into Containers

- 7.1 Containers must be inspected by DAFF before loading to ensure pest freedom and that any vents are covered to prevent the entry of pests unless the vents are closed.
- 7.2 Fruit should be loaded within an insect proof building or using an insect proof enclosure between the cool room entrance and the container.

8. Sealing of Containers

- 8.1 After completion of loading, the container door must be closed properly and sealed with a numbered metal seal under DAFF supervision. The seal must be intact until arrival at the port of entry in the Kingdom of Thailand, where the DOA inspectors only are authorized to open it. Containers with a broken seal must be rejected.
- 8.2 The seal number must be recorded on the Phytosanitary Certificate.

9. Storage of Fruit If Not Immediately Loaded

Treated fruit not intended for immediate loading may be stored for subsequent shipment provided security conditions are maintained by DAFF;

- 9.1 If fruit is stored in the treatment room, the room's doors must be sealed.
- 9.2 If fruit is to be transferred to another room for storage, it must be transferred in a secure manner approved by DAFF and the room must contain no other fruit, and
- 9.3 Subsequent container loading must be performed under the supervision of DAFF in accordance with Section 7.

Requirements for In-Transit Cold Disinfestation Treatment
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1. Requirements for Containers

- 1.1 Container's types and series must be suitable for in-transit cold disinfestation treatment.
- 1.2 Containers must be self refrigerated shipping containers and must be equipped with a recording device. DAFF is responsible for ensuring that containers used by exporters are of a suitable type, and have refrigerator equipment capable of achieving and holding the required temperatures.

2. Requirements for Temperature Recording System

DAFF must ensure that temperature recording system, the combination of the cold treatment data recorders and fruit pulp temperature sensors, must meet the following criteria:

- 2.1 The system must be suitable for cold disinfestation treatment. The accuracy of the system must be within plus or minus 0.3 ° C of the true temperature in the range of minus 3 ° C to plus 3 ° C.
- 2.2 The system must be capable of automatic operation and able to accommodate a minimum of three fruit temperature sensors.
- 2.3 The system must be capable of continuous recording of date, time, sensor number, and temperature during all calibrations and for the duration of treatment period.
- 2.4 The system must be capable of recording all temperature sensors at least once every hourly, with a resolution of 0.1 ° C and storing data until the information can be examined by a DOA officer.
- 2.5 The system must be capable of producing printout which identifies each sensor, time and the temperature, as well as the identification number of the recorder and the container.

3. Requirements for Temperature Sensors

- 3.1 Sensor's type must have an optimal accuracy for the temperature range of this cold treatment.

- 3.2 Sensors must have an outer sheath diameter of 6.4 millimeters or less. The sensing unit must be located within the first 25 millimeters or less of the sensor's tip. Sensors must be accurate to within plus or minus 0.3 ° C in the range of minus 3 ° C to plus 3 ° C.
- 3.3 Each sensor must be tagged with a number identical to sensor's number accompanying its readings in the printout produced by the temperature recording system.

4. Calibration of Temperature Sensors

- 4.1 Calibration of the temperature sensors must be conducted under the supervision of DAFF.
- 4.2 Calibration must be conducted using a mixture of crushed ice and distilled water in a clean insulated container measured against a certified thermometer prior to the temperature sensors being placed in fruit.
- 4.3 Crushed ice must completely fill the container. Enough water should be added to stir the mixture. The percentage of ice is estimated at 80-85 percent while the water fills the air voids (15-20 percent).
- 4.4 The mixture must be thoroughly stirred to ensure the water is completely cooled and good mixing has occurred. At least 10 minutes of adaptation period, confirmation with a certified thermometer that the water temperature has reached a steady state of 0 ° C is essential.
- 4.5 During the calibration, all the temperature sensors and the calibrated thermometer must be immersed in the ice water slurry without touching the sides or bottom of the container. The mixture must be constantly stirred while testing is being carried out. Only after the readings are stabilized at the lowest constant temperature, the calibration readings can be conducted.
- 4.6 Two consecutive readings must be recorded for each sensor at the lowest temperature obtainable. There shall be at least a 60 second interval between the two readings for any one sensor; however, the interval should not exceed 5 minutes. The variance between the two readings must not exceed 0.1 ° C.
- 4.7 Any sensor which reading shows a deviation of more than plus and minus 0.3 ° C from the standard 0 ° C must be replaced and rejected for further use for cold treatment.
- 4.8 A "Certificate of calibration for in-transit cold disinfestation treatment in self-refrigerated container" as shown in **Attachment 4** must be prepared for each container by a DAFF officer. The original copy must be attached to the Phytosanitary Certificate which accompanies the consignment.

5. Placement of Temperature Sensors

- 5.1 Loading of packed fruit into containers and placement of temperature sensors must be conducted under the supervision of DAFF.
- 5.2 Containers must be packed in an appropriate manner which ensures that there is even airflow under and around all pallets and loose stacked cartons.
- 5.3 Records for in-transit cold disinfestation treatment are required at least three temperature sensors to monitor innermost fruit pulp temperature in a container. These sensors must be distributed throughout the fruit in a representative cross section of the container that enables an adequate monitoring of the temperature.
- 5.4 The temperature sensor used to measure the fruit pulp temperature must be inserted carefully into the center of a test fruit. The test fruit shall be selected from the largest fruit size in the lot. With small fruit, the sensor shall penetrate two or more fruit. The sensor's tip must not be extended beyond the fruit, as well as fruit rupture and opened by sensor insertion, to prevent measuring air temperature instead of fruit pulp temperature. In these cases, the cold treatment is rejected.
- 5.5 Fruit temperature sensors must be placed in a 6 meter (20 foot) container and a 12 meter (40 foot) container in the following locations, as depicted in **Figure 1**.
 - 5.5.1 Two fruit pulp temperature sensors must be placed in boxes diagonally opposite at the side walls approximately 1 meter from the end of the load for a 6 meter container and approximately 1.5 meters from the end of the load for a 12 meter container.
 - 5.5.2 One fruit pulp temperature sensors must be placed in a box in the center of the container
 - 5.5.3 All three sensors must be placed at mid-height of the stack.

6. Sealing of Containers

- 6.1 After completion of loading, the container door must be closed properly and sealed with a numbered metal seal under DAFF supervision. The seal must be intact until arrival at the port of entry in the Kingdom of Thailand, where the DOA inspectors only are authorized to open it. Containers with a broken seal must be rejected.
- 6.2 The seal number must be recorded on the Phytosanitary Certificate.

7. Confirmation of Treatment

- 7.1 The in-transit arrangement is for the cold disinfestation treatment to be completed during the voyage between exporting country and the port of discharge in the Kingdom of Thailand. The Shipping Company shall download

the computer records of the cold disinfestation treatment and forward them to officer at port of entry.

- 7.2 DOA Bangkok Office must verify whether the treatment records meet disinfestation requirements and advise the DOA officer at the port of arrival that, subject to calibration of sensors, the treatment is complete.
- 7.3 On arrival DOA must check the calibration of the fruit temperature sensors using the method referred to in Section 4 and verify that the treatment records meet disinfestation requirements.
- 7.4 Re-calibration of the fruit sensors at the completion of the treatment which shows a higher than initial calibration setting, the recordings from the probe(s) will be adjusted accordingly.
- 7.5 If this adjustment reveals that the nominated treatment schedule was not met, the treatment will be deemed to have failed. The consignment must be re-exported or destroy at the importer's expenses.

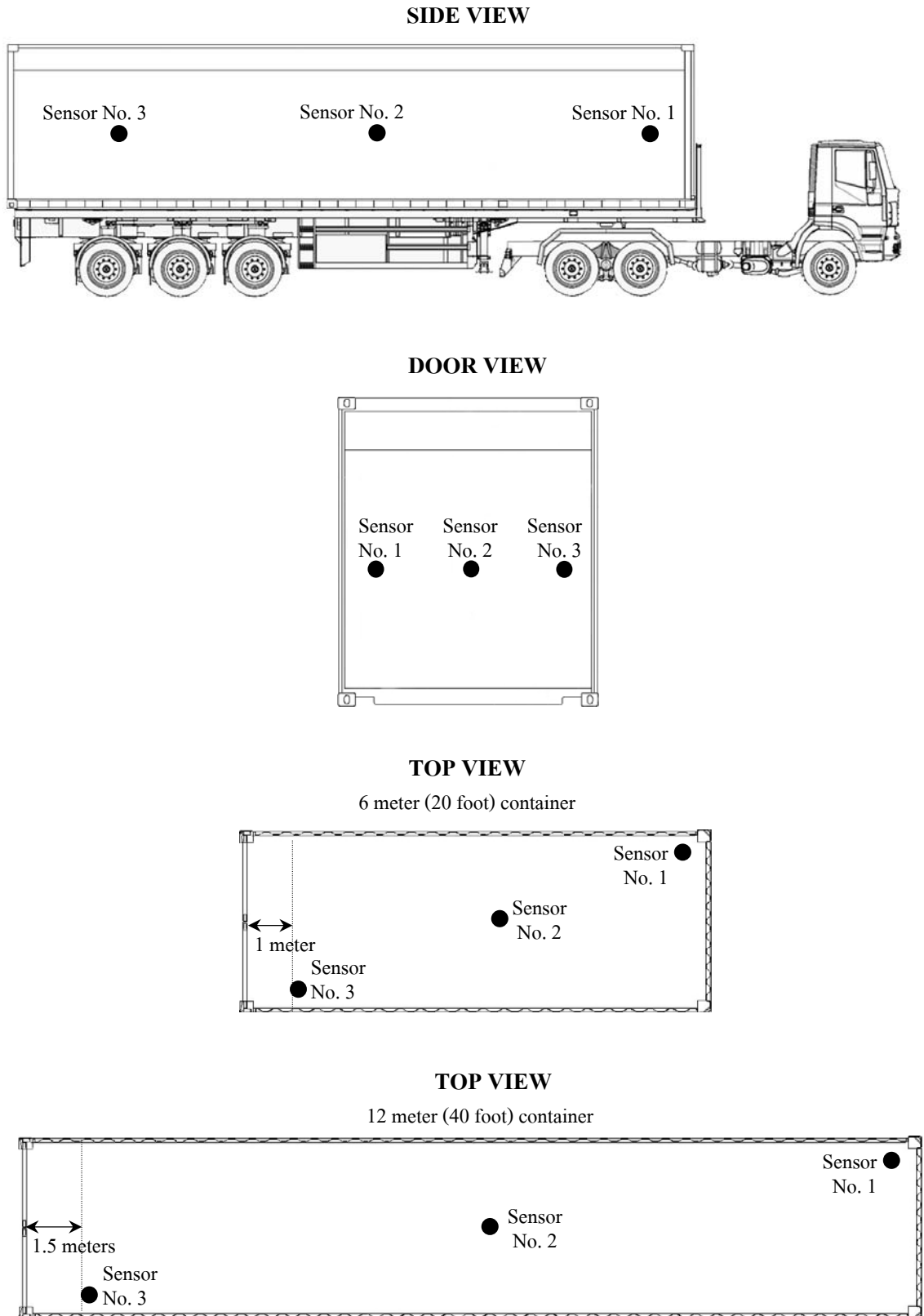


Figure 1. Placement of fruit temperature sensors in a container for in-transit cold disinfestation treatment.

Attachment 4

Certificate of Calibration for In-Transit Cold Disinfestation Treatment
in Self-Refrigerated Container for Thailand

Attached to Notification of Department of Agriculture

Re: Conditions for Import of Citrus Fruit from the Republic of South Africa B.E. 2555 (2012)

Exporter name:

Phytosanitary certificate number:

Container number:

Seal number:

Recorder serial number:

Date calibrated (dd/mm/yy):

1. Sensor calibration (at 0 °C):

Sensor Identification	1 st Reading	2 nd Reading	Correction factor
1
2
3

2. Sensor placement:

Sensor placement	Pulp temperature
1 Degrees Celsius
2 Degrees Celsius
3 Degrees Celsius

3. Container sealed:

Time: Date (dd/mm/yy):

Inspector name Inspector signature Stamp