

FUMIGATION WITH METHYL BROMIDE (ICA-04)

REVISION REGISTER

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6.1	05/07/2013	Updated DEPI and Plant Biosecurity Act references.
6.2	08/11/2013	Reformatted and reviewed.
6.3	03/11/2014	Reformatted and reviewed; addition of requirement to keep endorsed copies of Authorised Signatory forms (9.2); clarification that centre means inside middle of pallet for fruit collection (7.5.5).
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7.1	07/11/2018	Whole document review and reformatted; Updated DEDJTR name references to Agriculture Victoria; Additional requirement included for Gas Retention Testing (7.2); Definitions updated in line with standard definitions list (4); updated to include increase in minimum flesh temperature rate to 17°C at 40g/m ³ for 2 hours for treatment of fruit and fruiting vegetables for Queensland fruit fly (6 and 7.6.1); update to impervious packaging (7.5.2).
8.0	14/02/2019	Amendments to align to new Tasmanian entry requirements; add responsibilities for Fumigator (5); add temperature requirement for treatment chamber (7.1); add chamber temperature standards (7.4); add fruit fly infestation inspection (7.6.4–7.6.7); require 3 pulp temperature testing for bins and Tasmanian allowance for <3 packages (7.6.10); add record keeping for treatment chamber temperature (7.9).

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1. PURPOSE

The purpose of this procedure is to describe:

- the principles of operation, design features and standards required for fumigation chambers and facilities; and
- the responsibilities and actions of personnel;

that apply to the certification of methyl bromide fumigation of produce under an Interstate Certification Assurance (ICA) arrangement.

2. SCOPE

This procedure covers all certification of methyl bromide fumigation by a business operating under an ICA arrangement.

This procedure covers the requirements of plant and plant material for quarantine treatment for Queensland fruit fly and other pests, where the requirements are a specified condition of entry of an interstate quarantine authority and/or intrastate markets.

This procedure does not override the responsibility of fumigators to comply with chemical use obligations and relevant occupational health and safety legislation.

Certification of fumigation under this procedure may not be an accepted quarantine entry condition for all produce to all intrastate or interstate markets.

Some intrastate or interstate markets may require additional plant health certification for other pests and diseases as a condition of entry.

It is the responsibility of the business consigning the produce to ensure compliance with all applicable quarantine requirements.

Information on interstate quarantine requirements can be obtained from a local Agriculture Victoria Officer or the plant quarantine service in the destination state or territory.

3. REFERENCES

PSW-02 Guide for Completion of Plant Health Assurance Certificates.

Schedule 1B Tasmanian Plant Biosecurity Manual

4. DEFINITIONS

Accredit means to authorise nominated staff within a business to issue assurance certificates.

Act means the Plant Biosecurity Act 2010 (the Act).

Application for Accreditation	means an Application for Accreditation of a business for an Interstate Certification Assurance (ICA) arrangement.
APVMA	means the Australian Pesticides and Veterinary Medicines Authority.
Assurance Certificate	means a Plant Health Assurance Certificate (PHAC).
Audit	means the verification activity for evaluation of conformance or non-conformance with accreditation requirements.
Authorised Inspector	means an inspector authorised under the Act.
Authorised Signatory	means an employee of an ICA accredited business whose name and specimen signature is provided on the business's Authorised Signatory form.
Business	means the legal entity responsible for the operation of the facility and ICA arrangement detailed on the business's Application for Accreditation.
Certification Assurance	means a voluntary arrangement between the Accrediting Authority and a business that demonstrates effective in-house quality management and provides assurance through documented procedures and records that produce meets specified requirements.
Certified/Certification	means covered by a valid Plant Health Assurance Certificate.
Chamber	means a permanent or semi-permanent enclosure made from gas proof material specifically designed for the purpose of fumigation.
Colorimetric tubes	means Draeger/Kitagawa stain or detector tubes for measuring fumigant concentrations.
Facility	means the approved location of the fumigation chamber or chambers covered by the ICA arrangement.
Fumigant	means 1000g/kg methyl bromide (CH ₃ Br).
Fumigation	means the treatment of produce with methyl bromide fumigant.
Fumigator	means a person licensed to undertake fumigation pursuant to the requirements of relevant legislation.

Interstate Certification Assurance (ICA)	means a system of Certification Assurance developed to meet the requirements of State and Territory governments for the plant health certification of produce for interstate and intrastate quarantine purposes.
Load	means total number of packages covered by one fumigation treatment.
Lot	means a discrete number of packages of one produce type (e.g. apples or mangoes) from one source (e.g. one packer).
Plant Health Assurance Certificate (PHAC)	means certification issued by an Authorised Signatory of an accredited business.
Queensland Fruit Fly (QFF)	means all life stages of the species <i>Bactrocera tryoni</i> (Froggatt).
Silver Leaf Whitefly	means all life stages and biotypes of the species <i>Bemisia tabaci</i> (Gennadius).
Stone fruit	means peach, nectarine, plum, apricot and hybrids of peach, nectarine, plum and apricot
Thrips	means all species of the Thysanoptera Order that are of quarantine concern.

5. RESPONSIBILITY

The position titles used reflect responsibilities of staff under this arrangement. These positions may not be present in all businesses, or different titles may be used for staff who carry out these responsibilities. One person may carry out the responsibilities of more than one position.

The **Certification Controller** is responsible for:

- representing the business during audits and other matters relevant to ICA accreditation;
- ensuring the business has current accreditation under this procedure;
- training staff in their duties and responsibilities under this procedure;
- ensuring the business and its staff comply with their responsibilities and duties;
- ensuring all fumigation is performed by a licensed fumigator;
- ensuring the fumigation facility has been approved by relevant local Authorities;
- obtaining and reading the Material and Safety Data Sheet for the fumigant in use; and

- arranging workplace risk assessments in compliance with relevant Victorian legislation.

The **Fumigator** is responsible for:

- maintaining a current Agricultural Chemical User Permit issued by Agriculture Victoria;
- maintaining the fumigation chamber and fumigation equipment;
- maintaining calibration and fumigation records;
- maintaining temperature monitoring equipment and temperature records;
- ensuring all stone fruit and mangoes have been inspected for fruit fly infestation prior to treatment where required; and
- ensuring produce temperature is within the required range and the treatment chamber remains within the correct temperature range during treatment.

The **Authorised Dispatcher** is responsible for:

- ensuring all packages intended for export under this procedure are covered by a PHAC;
- ensuring all packages covered by an Assurance Certificate are identified; and
- maintaining copies of all Assurance Certificates issued.

The **Authorised Signatory** is responsible for:

- ensuring prior to signing and issuing an Assurance Certificate, that produce covered by the certificate has been prepared in accordance with the business's ICA arrangement, and the details on the certificate are true and correct in every particular.

6. REQUIREMENT

Fumigation must be conducted with a product containing 1000g/kg methyl bromide as its only active ingredient. DO NOT use chemicals containing chloropicrin.

Fumigation must be conducted for a period of two (2) hours at one of the following rates:

6.1 Fumigation for Queensland Fruit Fly

Requirements for fumigation for Queensland fruit fly (QFF)

Flesh and Ambient Air Temperature (°C)	Methyl Bromide (g/m ³)
21 - 31.9	32
17 – 20.9	40
DO NOT apply when flesh temperatures exceed 31.9°C.	

The temperature of fruit and fruiting vegetables prior to fumigation must be at or above 17°C. The temperature must be taken from the flesh next to the seed (if seed present).

6.2 Fumigation for Other Plant Pests

Requirements for fumigation for fruit fly (excluding QFF) and other plant pests

Temperature (°C)	Methyl Bromide (g/m ³)
21 - 31.9	32
16 – 20.9	40
11 – 15.9	48
10 – 10.9	56
DO NOT apply when flesh temperatures exceed 31.9°C.	

The temperature prior to fumigation must be above 10°C and for:

- Fruit and fruiting vegetables – taken from the flesh next to the seed (if seed present); or
- Food producing plants and ornamentals – taken from the ambient temperature of the fumigation chamber.

6.3 Chamber Loading Rates

Loading rates within the chamber must be:

- for fruits and vegetables - not less than 30% nor more than 50% of the volume of the chamber when empty; and
- for all other plants and plant products - not more than 50% of the volume of the chamber when empty.

Inadequate ventilation of produce after fumigation may lead to residues of methyl bromide above the Maximum Residue Limit (MRL) and leave produce open to seizure by relevant authorities.

Victorian and interstate quarantine authorities maintain the right to inspect at any time certified produce and to refuse to accept a certificate where produce is found not to conform to specified requirements.

Some produce may be damaged by chemical treatments. Businesses applying chemical treatments should check with experienced persons such as Departmental Officers for any available information. Testing of small quantities is recommended.

The business must use products in accordance with the instructions included on the product's approved label, any applicable APVMA Minor Use Permit and this procedure; and follow any first aid, safety, protection, storage and disposal directions on the product label.

The use of fumigants containing chloropicrin does not have National Registration Authority approval for the fumigation of these commodities. Chloropicrin is phytotoxic and is likely to cause damage to any living plant material.

6.4 Licence

Agricultural Chemicals that are Schedule 7 Poisons are "restricted use" chemicals under Victoria's Agricultural and Veterinary Chemicals (Control of Use) Act 1992. The fumigator must be authorised for use of fumigants and must carry out all fumigation activities under this procedure.

A current Agricultural Chemical User Permit (ACUP) for fumigants must be held by the fumigator where they are not receiving a fee or reward for conducting the treatment (e.g. treating their own produce only).

Note: Where conducting fumigation treatment for fee or reward, a Commercial Operator's Licence and/or a Pest Controllers Licence that authorises fumigation is required.

For more information on chemical use requirements go to www.agriculture.vic.gov.au.

7. PROCEDURE

7.1 Fumigation Facility

Each chamber operated at the facility for methyl bromide fumigation of produce must:

- (a) be a permanently constructed chamber or a semi-permanent chamber made from gas-proof material designed specifically for the purpose of fumigation; and
- (b) be covered by a current and valid Gas Retention Test Certificate issued by a licensed fumigator within the last six (6) months (refer 7.2); and
- (c) include temperature measurement and recording equipment to measure the ambient air temperature during treatment (Tasmania and South Australia only, refer 7.4).

7.1.1 Fumigation Dosage Chart

The Certification Controller shall ensure a record is maintained, which details the quantity of fumigant required to be added to the chamber to achieve the desired concentration. This record shall be in the form of a Fumigation Dosage Chart (Attachment 2) or similar record. This record shall be kept in close proximity to the relevant chamber.

7.1.2 Fumigation Chamber and Equipment Maintenance

The Fumigator shall carry out regular checks of the fumigation chamber and any fumigation equipment such as halide lamps, gas monitoring devices and gas sampling tubes and temperature monitoring equipment to ensure continued effective operation and freedom from malfunction, damage or excessive wear.

7.2 Gas Retention Testing

The Fumigator shall ensure all operational chambers are tested for gas retention at least every six (6) months, or as required by an Authorised Inspector. All chambers used for methyl bromide fumigation must be covered by a valid Gas Retention Test Certificate.

Gas Retention Test Certificates (refer 7.2.1) shall be issued following testing under the supervision of an Authorised Inspector in accordance with the following:

- after preparing the chamber in accordance with the requirements of this procedure, gas concentrations shall be measured and recorded twenty (20) minutes after the start of the fumigation and at two (2) hours after the start of the fumigation prior to venting.
- a measurement shall be taken at all monitoring points to determine the concentration of fumigant. All measurements shall be within $\pm 5\%$ of each other at the twenty (20) minute monitoring where more than one monitoring point is in use (refer 7.6.9).
- where measurements are not within $\pm 5\%$ of each other at the twenty (20) minute monitoring, the fumigation will be deemed to have failed and the Fumigator shall vent off all fumigant, ensure gas freedom and then inspect the chamber for the possible cause.

- a minimum of 50% of the original fumigant concentration is required to be retained at the final monitoring (after two hours). If the required final concentration is not reached then the fumigation will be deemed to have failed and the Fumigator shall vent off all fumigant, ensure gas freedom and then inspect the chamber for the possible cause.
- at least one successful fumigation retention test for a chamber must be undertaken before a Gas Retention Test Certificate may be issued for that chamber.

The Authorised Inspector may require additional retention testing if considered necessary.

It is recommended that newly constructed chambers be tested for leakage using a coloured smoke generator prior to gas retention testing.

7.2.1 Gas Retention Test Certificate

The test record shall be in the form of a Gas Retention Test Certificate (Attachment 4), or other certificate which captures the same information.

7.3 Calculation of Fumigation Chamber Volume

The volume of the space to be fumigated is calculated using a measuring tape or other suitable device to determine length, width and height and is to be expressed in cubic metres (m³).

Where an enclosed chamber is used for fumigation, the volume of any gas circulation equipment, external to the chamber, which is not sealed from the chamber during fumigation, must also be included in calculation of the chamber volume.

The following calculation may be used to determine the volume of the chamber:

- (chamber height (m) x chamber length (m) x chamber width (m)) + external ducting volume (m³) = total chamber volume (m³).

For example:

- Chamber Height = 2.5m Length = 3m Width = 3m
- Chamber Volume = 2.5 x 3 x 3 = 22.5 m³
- External Ducting Volume = 0.5 m³ (if applicable)
- Total Chamber Volume = 22.5m³ + 0.5m³ = 23.0m³

Details of chamber volume and fumigant dosage rates shall be prominently displayed in the vicinity of the chamber (refer 7.1.1).

7.4 Treatment Chamber Ambient Air Recording (Tasmania and South Australia only)

The treatment chamber must contain temperature sensing equipment for monitoring ambient air temperature during fumigation treatments. Records of the ambient air temperature during fumigation treatment must also be maintained (refer 7.9).

The Certification Controller shall ensure that the treatment sensor or sensors used for monitoring the ambient air temperature are located in a position that does not receive direct airflow from the circulation fans and heating element. The sensor must be located in an area either behind the circulation fans or an area in which the air passing the sensor is returning to the fans (i.e. return air monitoring).

7.4.1 Ambient Air Temperature Sensing and Recording Equipment

Temperature sensing and recording systems shall have an overall variance of not more than $\pm 0.5^{\circ}\text{C}$ in the range of 10°C to 17°C . The sensor and recording system must have a resolution of not more than 0.1°C .

The combined sensing and data recording systems must be accurate to within 0.5°C of the true temperature and must be able to be read in increments of 0.1°C or less.

7.4.2 Ambient Air Temperature Sensors

Each sensor shall be uniquely identified e.g. a tag attached to the sensor or on the adjacent wall. Each sensor shall be matched to a specific data recorder or uniquely identifiable in a computer database.

A plan indicating the location and identity of each sensor shall be kept with the data-recording instrument. A blank Sensor Placement Plan is provided at Attachment 5.

7.4.3 Ambient Air Temperature Recording Equipment

Output of recording instruments shall be accurate to within $\pm 0.1^{\circ}\text{C}$ of the true temperature in the range of 10°C to 17°C in the normal operating environment. The instrument must be capable of repeatability in the range of 10°C to 17°C .

Strip Chart Recorder Display Standards

The scale deflection for strip chart recorders shall not be less than 5 mm for each degree Celsius. A print interval of approximately two minutes and a chart speed of approximately 500mm per hour shall be used.

The chart scale shall be graduated with major scale marks at 1°C graduations and minor scale marks at 0.2°C graduations. Temperature values for each sensor shall be printed at least once 30 minutes.

Each symbol on the wheel shall correspond to and identify the sensor it represents. The chart shall be of sufficient length to display a complete treatment record.

Data Logger Display Standards

For each sensor the temperature value shall be sampled at least every 30 minutes with identified temperature points accurate to 0.1°C . Each reading shall be displayed on the data log sheet/database and contain a clear, fully informative record including the sensor identity/location, the temperature reading to a resolution of at least 0.1°C , and the date and time of sampling.

Mini Data Logger Display Standards

For mini data loggers, temperature records shall be downloaded onto a personal computer at completion of the treatment period. At conclusion of the treatment, the Fumigator shall save the treatment record until the next audit on a computer or obtain print outs of the treatment temperatures throughout the treatment period and date and sign these data log sheets as being an accurate treatment record (refer 7.9).

For each sensor, the temperature value shall be sampled at least once every 30 minutes with identified temperature points accurate to 0.1°C. Each reading shall be displayed in the computer database or on the data log sheet and contain a clear, fully informative record including the sensor identity/location, the temperature reading to a resolution of at least 0.1°C and the date and time of sampling.

Manual Recording Systems

Temperature reading and recording may be completed manually on log sheets maintained by the Fumigator. Temperatures shall be read from each sensor and recorded on log sheets at least every 30 minutes for the duration of the treatment.

Each reading shall contain a clear, fully informative record including the sensor identity/location, the temperature reading with a resolution of not more than 0.1°C, the date and time of sampling, and the identification and initials of the staff member taking the reading. Manual temperature sampling shall only be carried out by the Fumigator or Certification Controller.

7.4.4 Calibration of Ambient Air Temperature Sensing and Recording Equipment

The Fumigator shall ensure temperature sensors and recording systems are calibrated at least annually. Temperature calibration shall be conducted at the freezing point of water (0°C). At calibration, each sensor must be uniquely identified and matched with the corresponding data recorder.

Calibration shall be undertaken by the Fumigator or by a recognised Testing Authority. For the purpose of this Procedure, a recognised Testing Authority is a person or company that is approved by the manufacturer or Agriculture Victoria to calibrate treatment chamber temperature sensing and recording equipment.

Calibration Method

Where calibration is undertaken by the Fumigator, the calibration method below shall be used.

(a) Equipment and Supplies

- An insulated container with a volume of at least 1 litre and an open neck.
- Thermometer clamp or similar device.
- 5 litres of chilled deionised water.
- Crushed ice made from deionised water.

(b) Sensor Calibration Procedure

Sensor calibration shall be undertaken at least annually. Calibration shall be conducted using a mixture of crushed ice made from deionised water and deionised water in an insulated container using the following procedure –

- Fill the insulated container with crushed ice. Add sufficient pre-cooled deionised water to cover the ice.
- Thoroughly stir the ice/water mixture. Add additional ice as the ice melts.
- Using the thermometer clamp or similar device, submerge each sensor in the ice/water mixture. Sensors must not touch the sides or bottom of the container.
- Constantly stir the ice/water mixture while testing is being carried out. Allow the temperature shown by the sensors to stabilise at the lowest temperature obtainable.
- Two consecutive readings shall 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.

Calibration shall be to the nearest 0.1°C. Any sensor that records a temperature of $\pm 0.5^\circ\text{C}$ or more from the standard of 0.0°C shall be replaced.

The temperature variance of each sensor shall be calculated as the mean of the variation of the two readings from 0°C and shall be clearly identified for each sensor and traceable to the data recording instrument.

The Fumigator shall maintain records of the results of calibration of all temperature sensors and recording equipment used under this Procedure.

Records shall be in the form of calibration test records from the recognised Testing Authority or a Treatment Chamber Sensor Calibration Test (Attachment 6) or similar record that includes the following information:

- the business name and interstate produce number;
- the date of calibration;
- the identification of the sensor and data recording instrument;
- the results of the two readings taken at 0.0°C;
- the correction ($\pm^{\circ}\text{C}$), if any, to be applied to the sensor reading; and
- the name of the person or recognised Testing Authority that conducted the calibration.

7.5 Fruit Pulp Thermometer Calibration

7.5.1 Equipment

Thermometers used for measuring produce temperature may be of the bimetallic, glass (mercury or alcohol) or digital type, and shall be uniquely identified for calibration purposes.

Thermometers capable of reading in graduations of 0.1°C or 0.2°C shall be used.

7.5.2 Calibration of Thermometers

Thermometers used for measuring produce temperatures shall have been calibrated within the previous six (6) months and shall be accurate to within $\pm 0.5^{\circ}\text{C}$.

Calibration may be undertaken using the ice-point check method, by checking against a calibrated reference platinum resistance thermometer, or by a recognised testing authority.

The business shall maintain results of thermometer calibration checks.

Thermometer calibration records shall record the following information:

- the date of calibration;
- the identification of the thermometer calibrated;
- the temperature reading(s) and the correction, if any, to the thermometer reading to an accuracy of at least $\pm 0.1^{\circ}\text{C}$; and
- the name of the person or testing authority responsible for conducting the calibration.

Ice - Point Check Calibration

Thermometers should be washed with distilled or de-ionised water and stored for several hours at 0°C before calibration.

A slurry mixture of distilled or de-ionised water and shaved ice made from distilled water is prepared in an insulated vessel. Drain any excess free water and then fully immerse each thermometer to above the mercury column. Lift the thermometer until the mercury is just visible and read the indicated temperature.

Repeat this procedure until there is no change in the reading, then record the temperature.

The correction for the thermometer will be the deviation of the reading from 0°C.

If the indicated temperature is outside the range $0 \pm 0.5^\circ\text{C}$ the thermometer is unsuitable for use under this procedure.

Whilst it may be possible to adjust electronic thermometers, inaccurate glass thermometers shall be replaced and appropriate records made.

7.6 Preparing, Loading and Sealing the Chamber

7.6.1 Pre-Treatment Checks.

The Fumigator shall, prior to the chamber being loaded:

- check the chamber for damage and possible leak sites;
- repair any damage (e.g. torn door seals or holes / tears in walls); and
- check that chamber circulation and ventilation systems are operating correctly and all vents are closed and sealed.

7.6.2 Loading

The Fumigator shall ensure that an adequate distance is maintained between each package, pallet or bulk bin and the sides and top of the chamber to allow circulation of the fumigant. A 5cm space shall be left between each package, pallet load or bulk bin in the chamber with a minimum space of 10cm between the top and sides of produce to the walls and ceiling.

The Fumigator shall calculate loading rates within the chamber to ensure specified loading rates are not exceeded for the commodity or commodities being fumigated.

Chamber loadings shall be recorded as a percentage of the chamber volume for each fumigation.

Loading rates within the chamber must be:

- (a) for fruits and vegetables, not less than 30% nor more than 50% of the volume of the chamber when empty; and
- (b) for all other plants and plant products, not more than 50% of the volume of the chamber when empty.

7.6.3 Packaging Fumigant Permeability

Produce may be fumigated either unpacked, in bulk bins or in acceptable packing as described below:

The Fumigator shall ensure that any produce which is packaged or covered with impervious materials such as plastic bags or waxed paper are either opened, cut or removed to allow adequate penetration of the gas. Acceptable perforations include:

- not less than four unobstructed perforations of 6mm diameter per 100cm²; or
- five unobstructed perforations of 5mm diameter per 100cm²; or
- numerous pinholes (at least 6 holes per square centimetre).

7.6.4 Pre-treatment produce inspection (Tasmania and South Australia only)

An Agriculture Victoria approved inspection service shall be contracted to conduct inspection of mangoes and stone fruit in accordance with the requirements of this procedure.

Mangoes and stone fruit must be inspected prior to treatment for evidence of fruit fly infestation. Separate 600 piece inspections must be completed for all mangoes in a treatment chamber and another 600 piece inspection must be conducted for all stone fruit in a treatment chamber (i.e. 600 mangoes and 600 stone fruit of any variety).

Where there are less than 600 pieces of produce in a chamber, all the produce must be inspected. Additionally, where there is not enough produce to inspect from one lot, it will be made up of other types of the same fruit (i.e. mango or stone fruit).

Example: Where there is one (1) lot of mangoes that comprises only 18 pieces of fruit, and the inspection rate requires 60 pieces of fruit to be examined from each lot; the additional 48 pieces of fruit must be inspected across the nine other lots of mangoes.

Inspection of mangoes and stone fruit must be completed as follows:

- Inspect a random selection of 600 pieces of mangoes/stone fruit obtained from a minimum of three cartons;
- Ensure that the selection represents an even distribution of all the mango or stone fruit varieties and produce suppliers (growers/packers) in the chamber load (see example).

Suspect fruit shall be cut across any areas of damage that show symptoms of fruit fly infestation and examined with proper inspection equipment (7.6.7). The presence of moving white larvae in the flesh indicates fruit fly infestation and is deemed non-conforming product.

Example: If a treatment chamber contains three (3) varieties of mango and ten (10) varieties of stone fruit, all from different growers; then 200 pieces are to be inspected from each variety of mango and 60 pieces from each variety of stone fruit.

Alternatively, if a treatment chamber contains five (5) varieties of stone fruit from ten (10) growers, then 60 stone fruit from each grower must be inspected.

7.6.5 Records of Inspections

The Certification Controller shall maintain records of suspect fruit inspection, in the form of a Fruit Inspection Record (Attachment 7) or a record that captures the same information.

Additionally, the Agriculture Victoria approved inspection service shall mark all the boxes in a lot in the chamber they have inspected.

7.6.6 Action Following Identification of Non-conforming Product

A lot that has had larvae detected must be rejected for treatment by the Fumigator. Additionally, all other produce from the grower/packer of the non-conforming lot must also be rejected for treatment for that day, excluding any produce that has already been treated.

Where a new lot is substituted from a different grower/packer, the same original proportional inspection as that conducted on the original lot must be conducted on the substituted produce (see example below).

Any additional non-conforming product will follow the same process as described above.

Example: The proportion of the 600 piece inspection required for nectarines in the chamber was 60 pieces, as there were 10 different lots of stone fruit in the chamber. One package was found to have multiple nectarines with larvae present.

The whole lot was substituted from another grower/packer and therefore the substituted lot will also require 60 nectarines to be inspected for fruit fly infestation.

7.6.7 Inspection Equipment

Businesses shall maintain the following inspection equipment:

- adequate illumination;
- a hand lens, microscope or other device that provides at least X10 magnification;
- reference illustrations and photographs for identification of fruit fly (attachment 8);
- sealable plastic bags and labels for collecting specimens of infested produce; and

- pocket knife or similar to cut produce to further investigate for the presence of fruit fly.

7.6.8 Gas Supply Line(s)

The gas supply line(s) shall be strategically placed within the chamber to allow the effective introduction and dispersal of the gas. As the fumigant is heavier than air, the gas should be introduced directly into the airstream of the circulation fan. Precautions must be taken to prevent any liquid fumigant coming in contact with produce being fumigated. A piece of impermeable sheeting (plastic or rubberised canvas) or a tray may be used.

Adequate fan circulation must be provided to circulate the fumigant (refer 7.7.4).

7.6.9 Gas Sampling Line(s)

For monitoring of gas concentrations during each fumigation, gas-sampling lines must be positioned within the chamber. Sampling lines must be crushproof (for example 6mm internal diameter hydraulic hose) and must be positioned as follows:

- (a) for chambers less than 5m³, one gas sampling line shall be located in the centre of the stack; or
- (b) for chambers 5m³ or greater, three sampling lines shall be used and located at the top back, centre, and base front of the stack.

7.6.10 Calculation of Produce Temperature

Immediately prior to the commencement of fumigation, the Fumigator shall determine the minimum flesh temperature of each load of produce to be fumigated using a calibrated thermometer (refer 7.5). A minimum of three (3) temperature readings shall be taken from each lot to be fumigated. Each sample must be taken from the centre of the package.

(a) Fruits and Vegetables

For each sample, the thermometer shall be inserted into the piece(s) of fruit or vegetable by placing the tip of the temperature probe into the centre of a piece of fruit and the flesh temperature measured. Separate temperature measurements must be taken from each lot of fruit or vegetables in the load as described below:

- i. For palletised produce or bulk bins:

The Fumigator shall collect a minimum of three (3) samples of fruit or vegetable from each bin/pallet or lot on each pallet, samples, where possible must be selected from different packages in the lot. Samples shall include a sample taken from:

- one (1) from the centre/inside/middle; and
- one (1) from the outer edge.

Tasmania only:

For palletised produce, where there are three (3) or less packages (e.g. box, tray, carton) of one lot, only one temperature measurement from each package is required. The sample must be taken from the centre of the package.

Example: Where one (1) pallet contains five (5) lots (e.g. lemon, cherry, apple, pear and grapefruit), three (3) temperature readings must be taken from each lot on the pallet (3 measurements times 5 lots = 15 total temperature measurements for the whole pallet).

Where there are two (2) pallets from one (1) lot (e.g. two (2) pallets of oranges from the same grower), three (3) temperature readings must be taken from each pallet (3 measurements times 2 pallets = 6 total temperature measurements for the lot).

ii. For un-palletised produce:

The Fumigator shall collect a minimum of two (2) samples of fruit or vegetable from every twentieth package:

- one (1) from the inner region; and
- one (1) from the outer edge.

(b) Live Plants and Plant Products

The Fumigator shall take sufficient temperature readings from each lot to be fumigated to determine the minimum and maximum temperatures of the load.

Temperature measurement sites shall be varied between the top, middle and bottom, and from outer and inner packages of each load.

7.6.11 Produce Temperature Records

The Fumigator shall record each temperature reading and the maximum and minimum produce temperatures of the load on the Fumigation Treatment Record (Attachment 3).

7.6.12 Sealing the Chamber

Once all of the produce has been placed into the chamber, the Fumigator shall ensure the chamber is gas tight by closing all vents and access points and checking all possible leak sites such as doors, gaskets and joints.

7.7 Fumigation Treatment

After the chamber has been sealed the Fumigator must turn on all circulation fan(s).

7.7.1 Calculation of Fumigant Dosage

The fumigant dosage rates are specified in this procedure (6) and the APVMA Permit. The dosage rate varies for change in temperature from a minimum of 10°C to maximum of 31.9°C. These temperatures are dependent on the pest species being treated.

The dosage rate applied to fumigation shall be determined by the temperature of the **coldest** produce from any lot to be fumigated in the chamber load.

Treatment of fruit must not commence if the temperature of the fruit is below the minimum temperatures specified (refer 6) or above 31.9°C.

Determine the amount of methyl bromide required in grams (g) using the following formula:

- Chamber volume (m³) x dosage rate (g/m³) = methyl bromide (g)

The Fumigator shall maintain records of the total amount of methyl bromide applied for each treatment on the Fumigation Treatment Record (Attachment 3).

7.7.2 Application of Fumigant

The Fumigator shall measure out the required amount of fumigant into the measuring cylinder. After the required amount of fumigant has been decanted and checked, the fumigant is introduced into the chamber via the volatiliser.

7.7.3 Vaporiser/Volatiliser

Although methyl bromide has a boiling point of 3.6°C and will vaporise when released at temperatures above 4.0°C, freezing may occur as the gas is released from the delivery cylinder. For this reason, a vaporiser or volatiliser must be used to introduce methyl bromide as a hot gas.

A suitable device has part of the delivery tube of copper, coiled and submerged in hot water.

7.7.4 Mixing of Fumigant

To ensure adequate mixing, fans shall be used to disperse the gas throughout the chamber and thereby enhance the penetration of the fumigant. Once the gas is evenly distributed it must maintain that condition unless an outside event such as excessive leakage occurs.

It is suggested that an axial fan capable of providing 60 room changes of volume per hour be used for 15 minutes after the introduction of the gas. Low velocity/low volume fans may be used for longer periods.

The use of high velocity/high volume fans for periods longer than 15 minutes may lead to the fumigant being forced from the chamber.

Fumigation commences once all the fumigant has been introduced into the chamber and vaporised (the time of vaporisation).

Effective mixing of methyl bromide may be determined by monitoring gas concentrations at all monitoring points 20 minutes after the introduction of the gas (refer 7.7.6). All monitoring points must equilibrate within ±5% of each other (where more than one sampling point is used) otherwise the fumigation is deemed to have failed.

7.7.5 Testing for Leaks

Once the fumigation has commenced, the Fumigator shall test the chamber for leaks using “TIF” or “Riken” leak detectors.

Sites checked shall include:

- doors sealing points;
- external ducting; and
- exit points for supply lines and gas sampling lines.

Any leaks detected shall be repaired immediately. If leaks are detected that cannot be repaired during treatment, the fumigation must be aborted and the chamber repaired before further use.

7.7.6 Monitoring Fumigant Concentration

Effective treatment is dependent on maintaining a satisfactory level of fumigant within the chamber during the fumigation.

Where monitoring indicates that the required concentration will not be achieved, the Fumigator shall vent off all fumigant, ensure gas freedom and then inspect the chamber for the cause.

Label information advises that produce must not be re-treated with methyl bromide. Where fumigation has failed, affected produce must be destroyed or sent to another market, and must not be certified under this procedure.

7.8 Completion of Fumigation

7.8.1 Venting

After two (2) hours of treatment the chamber shall be ventilated by running the exhaust system to extract all of the remaining gas and ensure that the concentration of the fumigant is below 5ppm before produce is released from the chamber.

Fumigant concentrations should be checked by drawing an air sample from the chamber into a colorimetric tube before releasing the produce. Air samples must be taken near the floor of the chamber in the vicinity of the exhaust duct. This can be accomplished by installing a metal tube in the chamber to transport the sample from the floor to an opening in the chamber wall.

The concentration of the fumigant in the chamber must be below the Exposure Standard of 5ppm or less before the product can be released. If the concentration is greater than 5ppm then forced venting should be resumed and further measurements of concentration taken.

Inadequate aeration of produce poses grave risks to the health of workers involved in unpacking, transport and marketing of fumigated fruit.

7.8.2 Unloading the Chamber

Unloading of the chamber may commence after the Fumigator has released the produce. The ventilation system should be kept running during this process.

7.8.3 Aeration of Produce

Treated produce shall be given sufficient time to air after treatment to allow adequate dispersal of the fumigant out of the produce and ensure that the Exposure Standards of 5ppm of fumigant and any applicable maximum residue limits are not exceeded.

7.8.4 Identification and Control of Treated and Untreated Produce

Procedures must be in place to prevent mixing of treated and untreated produce at the facility.

Methods of identifying the status of treated and untreated produce after fumigation include:

- locating untreated produce in a clearly identified and separate area to treated produce and maintaining separation until dispatch; or
- marking each package of treated produce in a manner that clearly identifies the produce as conforming to the requirements specified under this procedure (refer 7.11.1).
- Other methods may be used provided treated and untreated produce are clearly identified and segregated.

7.9 Treatment Records

The business must record each treatment using a Fumigation Treatment Record (Attachment 3) or similar record which captures the same information.

Strip charts, continuous data log sheets or manual data log sheets shall be maintained with the Fumigation Treatment Record to which they relate.

For electronic mini data loggers, temperature records may be downloaded onto a personal computer at completion of the treatment period. At conclusion of the treatment, the Fumigator shall maintain the record in a computer database or obtain printed data log sheets of the treatment temperatures for the treatment period.

Treatment temperature records must identify:

- the treatment chamber;
- the date and time of temperature sampling;
- the sensor identification to which the temperature reading relates; and
- the temperature reading to a resolution of not more than 0.1°C.

The Fumigator shall date and sign manual temperature records at the conclusion of the treatment as verification of the accuracy of the record.

Any alterations to printed temperature or time schedules must be noted on the relevant treatment temperature record with an explanation for the alterations and the date and initials of the Fumigator.

7.10 Post Treatment Security (Tasmania only)

Treated fruit may be allowed to air adequately prior to securing the produce against reinfestation (refer 7.8.3). Treated fruit shall be held for the minimum practical period after fumigation and airing before it must be secured against reinfestation.

Any fruit which is stored outside the treatment facility after treatment and prior to dispatch must be held under secure conditions as per Schedule 1B of the Tasmanian Plant Biosecurity Manual.

Any treated fruit which remains unpacked at the end of the day must be held in secure conditions until packed.

Certified fruit must be transported from the facility in secure conditions that prevent infestation by fruit fly. Secure conditions include:

- (a) unvented packages;
- (b) packages with vents secured with gauze/mesh with a maximum aperture of 1.6 mm;
- (c) fully enclosed under tarpaulins, hessian, shade cloth, mesh or other covering which provides a maximum aperture of 1.6mm;
- (d) shrink wrapped and sealed as a palletised unit; or
- (e) fully enclosed or screened buildings, cold rooms, vehicles or other facilities free from gaps or other entry points greater than 1.6mm.

Fruit consigned to Tasmania must be transported in full container lots sealed prior to transport or as lesser container lots in accordance with the requirements of (a), (b) or (d) above.

Where consignments are transported to Tasmania as full container lots, the seal number must be included in the Brand Name or Identifying Marks section of the Assurance Certificate covering the consignment (Attachment 1).

Where consignments are transported in vented packages that are sealed as a palletised unit in accordance with (d) above, the business must secure the top layer of the pallet by applying a row of tape over the shrink wrap and have applied to the tape in waterproof ink the signature of an Authorised Signatory, the number of the Plant Health Assurance Certificate covering the consignment and the date.

7.11 Dispatch

7.11.1 Package Identification

Prior to the issuing an Assurance Certificate under this procedure, the Authorised Dispatcher shall ensure that each package is marked in indelible, visible and legible characters of at least 5mm, with:

- the Interstate Produce number of the business that operates the approved facility in which the produce was treated;
- the words "MEETS ICA 04"; and
- the date (or date code) on which the fruit/produce was treated.

Packages may be marked prior to fumigation; however, any packages containing produce that has not been treated in accordance with the requirements of this procedure shall not leave the fumigation facility if marked as stated above.

7.11.2 Assurance Certificates

The Authorised Dispatcher shall ensure an Assurance Certificate, in the form of a Plant Health Assurance Certificate (Attachment 1) is completed and signed by an Authorised Signatory of the business prior to dispatch of the consignment from the facility to a market requiring certification of fumigation.

Individual PHACs shall be issued to cover each consignment (i.e. a discrete quantity of product transported to a single consignee at one time) to avoid splitting of consignments.

PHACs shall be completed, issued and distributed in accordance with the Work Instruction Guide for Completion of Plant Health Assurance Certificates (PSW-02).

7.11.3 Assurance Certificate Distribution

The **original** (yellow copy) must accompany the consignment.

The **duplicate** (white copy) must be retained by the business.

8. ACCREDITATION

In order to become accredited, *the Application for Accreditation* must be signed and returned. The application form includes the terms and conditions applying to this agreement.

8.1 Application for Accreditation

A business seeking accreditation for an ICA arrangement under this procedure must make an application for accreditation at least 10 working days prior to the intended date of commencement of certification of produce.

8.1.1 Required application documents

A business may apply for accreditation by lodging a completed application package which must include the following documents:

- (a) a fully completed Application for Accreditation form; and
- (b) proof of business registration.

Failure to provide any of the above documentation may result in delays to your application for accreditation.

8.2 Audit process

8.2.1 Initial audit

Prior to accrediting a business, an Authorised Inspector shall conduct an initial audit of the business to verify the system is implemented and capable of operating in accordance with the requirements of this ICA procedure, and the system is effective in ensuring compliance with the specified requirements of the arrangement.

On completion of a successful initial audit, applicants will be granted provisional accreditation and issued a Certificate of Accreditation.

8.2.2 Compliance Audits

Compliance Audits are conducted to verify that the ICA system continues to operate in accordance with the requirements of this procedure. Compliance audits are, wherever practical, conducted when the system is operating.

A compliance audit is conducted:

- within four (4) weeks of the initial audit and accreditation or issue of the first PHAC; and
- within twelve (12) weeks of the business being re-accredited; and
- in the case of a business operating for more than six (6) months of a year, between six (6) and nine (9) months after accreditation or re-accreditation.

Upon completion of a successful initial compliance audit, accreditation is granted to cover the current season, up to a maximum of twelve (12) months.

Random audits are conducted on a selected number of accredited businesses each year. Random audits may take the form of a full compliance audit, or audits of limited scope to sample certified produce, ICA system records or ICA system documentation.

Unscheduled compliance audits may be conducted at any time to investigate reported or suspected non-conformances.

8.2.3 Re-Accreditation

Accredited businesses are required to re-apply for accreditation each year the business seeks to operate under the arrangement. Businesses seeking re-accreditation must lodge a renewal application prior to accreditation lapsing, or if accreditation has lapsed, prior to commencing further certification of produce under the arrangement.

A compliance audit is conducted within twelve (12) weeks of the business applying for re-accreditation each year.

A compliance audit is conducted between six (6) and nine (9) months after the date of re-accreditation for an arrangement that operates for more than six (6) months of the year.

8.3 Certificate of Accreditation

An accredited business will receive a Certificate of Accreditation detailing the facility location, procedure, scope (type of produce covered) and period of accreditation. This Certificate of Accreditation will also detail which interstate markets the business is permitted to send to.

The business must maintain a current Certificate of Accreditation and make this available on request by an Authorised Inspector.

A business may not commence or continue certification of produce under this arrangement unless it is in possession of a valid and current Certificate of Accreditation for the procedure and produce type covered by the Assurance Certificate.

8.4 Non-conformances and Sanctions

8.4.1 Non-conformances

Audits are regularly undertaken to evaluate the effectiveness of implementation requirements. If, in the opinion of the auditor, there is evidence indicating that there has been a failure to meet one or more accreditation requirements, the auditor may raise a Non-conformance Report (NCR). Actions required to address the non-conformance shall be discussed and recorded on the NCR.

If the integrity of the accreditation has been significantly compromised, the non-conformance may provide grounds for the suspension or cancellation of the accreditation and prosecution.

8.4.2 Incident Reports

Incident Reports may be raised by interstate quarantine authorities to report the detection of a non-conformance in produce certified under this arrangement. An investigation into the incident shall be conducted and findings reported back to the originator.

If the integrity of the accreditation has been significantly compromised, the incident may provide grounds for the suspension or cancellation of the accreditation and prosecution.

8.4.3 Suspension and Cancellation

Agriculture Victoria may suspend or cancel an accreditation when an accredited business is found, for example, to have:

- obtained accreditation through the provision of false or misleading information;
- not paid fees owing to Agriculture Victoria;
- contravened a requirement that compromises the integrity of the arrangement; and
- not rectified a non-conformance.

Any action taken by Agriculture Victoria to suspend or cancel an accreditation shall be provided in writing to the business. This shall also provide guidance on the lodgement of a written appeal requesting that the decision be reviewed.

8.4.4 Prosecution

Businesses found to be operating contrary to the Act may be liable for prosecution.

8.5 Charging Policy

The business will be charged for all audit and investigation activities and an annual accreditation fee.

A fee will be charged for all scheduled audits conducted. Unannounced audits will not be charged. Agriculture Victoria can be contacted for a schedule of fees.

9. RECORDS AND DOCUMENT CONTROL

9.1 ICA System Records

The business shall maintain the following records:

- Fumigation Dosage Chart for each chamber (refer 7.1.1 – Attachment 2);
- Gas Retention Test Certificate for each chamber (refer 7.2.1 – Attachment 4);
- Thermometer calibration records (refer – 7.5.2 and 7.4.4 – Attachment 6);
- Ambient Air Treatment Temperature Records (refer 7.9);
- Sensor Placement Plan (refer 7.4.2 – Attachment 5);
- Fumigation Treatment Record (Attachment 3); and
- Fruit Inspection Record (refer 7.6.5 – Attachment 7).
- A copy of each Plant Health Assurance Certificate issued by the business.

ICA system records shall be retained for a period of at least twenty-four (24) months from completion, or until the next compliance audit of the ICA arrangement, whichever is the later.

ICA system records shall be made available on request by an Authorised Inspector.

9.2 ICA System Documentation

The business shall maintain the following documentation:

- a copy of the business's current endorsed Application for Accreditation;
- a copy of the current endorsed Authorised Signatory forms;
- a current copy of this Operational Procedure; and
- a current Certificate of Accreditation.

ICA system documentation shall be made available on request by an Authorised Inspector.

10. ATTACHMENTS

Attachment 1	Plant Health Assurance Certificate	(PSE-030)
Attachment 2	Fumigation Dosage Chart	(PSF-093)
Attachment 3	Fumigation Treatment Record	(PSF-092)
Attachment 4	Gas Retention Test Certificate	(PSF-094)
Attachment 5	Sensor Placement Plan	(PSF-100)
Attachment 6	Sensor Calibration Test Record	(PSF-453)
Attachment 7	Fruit inspection record	(PSF-454)
Attachment 8	QFF information sheet	(PSF-354)

Plant Health Assurance Certificate

Certificate number
XXXXXXXX

Consignment details (please print)

Consignor
Name ABC PTY LTD
Address STORE 21, STREET ROAD, MELBOURNE, VIC 3000

Consignee
Name TOMATO PRODUCE
Address 221 PRODUCE ROAD, ADELAIDE, SA

Reconsigned to (splitting consignments or reconsigning whole consignments)
Name
Address

Certificate details (please print)

IP Number	Facility number	Procedure
V9999	01	ICA-04

Accredited business that prepared the produce
Name ABC PTY LTD
Address STORE 21, STREET ROAD, MELBOURNE, VIC 3000

Grower or Packer
Name ABC PTY LTD
Address STORE 21, STREET ROAD, MELBOURNE, VIC 3000

Other facilities supplying produce

Brand name OR identifying marks (as marked on packages)	Date OR date code (as marked on packages)
ABC PRODUCE	12/09/2018

Number of packages	Type of packages (e.g. trays, cartons)	Type of produce	Authorisation for split consignment
20	TRAYS	TOMATO	

EXAMPLE ONLY

Treatment details

Treatment date	Treatment	Chemical (active ingredient)	Concentration / duration and temperature
12/09/2018	Fumigation	Methyl Bromide	40g/m ³ for 2 hours at 17°C

Additional certification / Codes

Declaration: I, an Authorised Signatory of the accredited business that prepared the plants or plant products described above, hereby declare that the plants or plant products have been prepared in the business' approved facility in accordance with the business' Certification Assurance arrangement and that the details shown above are true and correct in every particular. I acknowledge that it is an offence under the *Plant Biosecurity Act 2010* to issue assurance certificates without being accredited and/or to make false statements in certificates and declarations.

Authorised Signatory (print name) A. Signature	Signature A. Sign	Date 12 / 09 / 2018
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FUMIGATION DOSAGE CHART

Business Name: _____

Facility Address: _____

Interstate Produce No.: V _____

Chamber Identification: _____

Total Chamber Volume: _____ m³

DOSAGE CHART

Concentration (g/m ³)	Quantity of Fumigant Grams (g)
32	
40	
48	
56	

Prepared by: _____ / /
Printed Name Signature Date

FUMIGATION TREATMENT RECORD

Owner of Fumigation Facility:				Interstate Produce (IP) No.:	V
Fumigator's Name:			VIC Licence No:		
Date of Fumigation:	/	/20	Chamber Temperature (°C):		
Min Pulp Temp (°C):		Max Pulp Temp (°C):		Fumigation Rate:	
				Chamber ID:	
				Chamber Volume:	m ³
				Amount of Fumigant Used:	(g)

Grower/Packer Name	Number of Packages	Product Type (eg Banana)	Type of Packages (e.g. Cartons, Bins)	Min Produce Temp (°C)	Time Vaporisation Completed	Time Venting Commenced	Chamber Loading (%)	ID Code <i>(If applicable)</i>

Comments: _____



GAS RETENTION TEST CERTIFICATE

Owner of Fumigation Facility:				Interstate Produce No.:	V			
Facility Address:				Chamber Identification:	m ³			
				Date of Test:	/ /			
Chamber Dimensions (internal):	Length	m	Width	m	Height	m	Chamber Volume:	m ³
Fumigators Printed Name:					External Ducting (if applicable)	m ³		
Fumigators DHS License No:			Expiry Date	/ /		Total Chamber Volume	m ³	

Test Number	Fumigation Rate (g/m ³)	Quantity of Methyl Bromide added (g)	Time Vaporisation Completed	Gas Concentration at Monitoring Point(s) after 20 minutes	Gas Concentration at Monitoring Point(s) after 2 hours	Time Venting Commenced	Percentage of Methyl Bromide retained after 2 hours

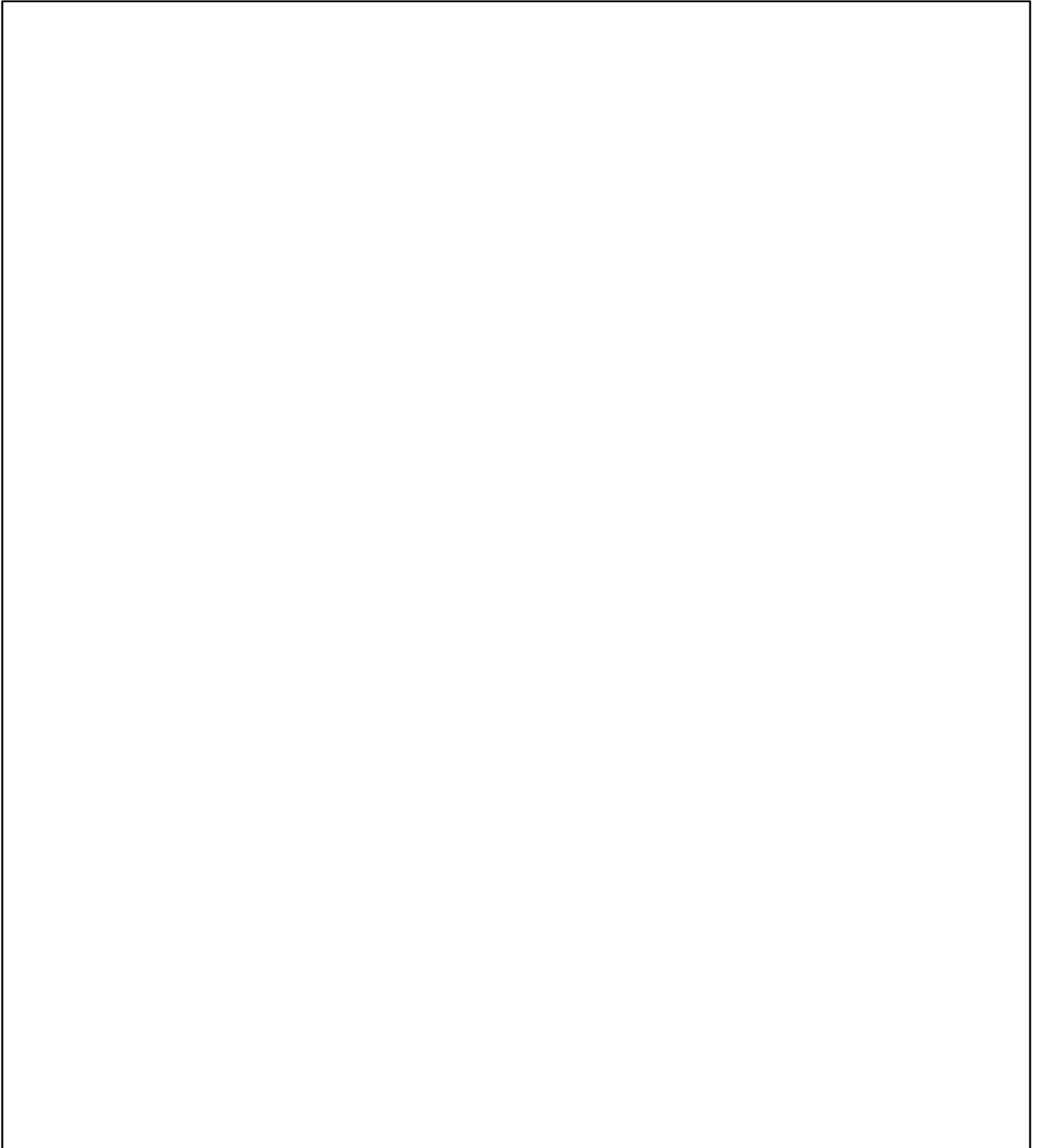
The fumigation chamber described above has been tested in accordance with requirements of Agriculture Victoria's Operational Procedure Fumigation with Methyl Bromide [ICA-04] and has been shown to achieve at least 50% retention of methyl bromide gas after a two hour fumigation period.

Fumigator's Name	Signature	/ / Date
Inspector's Name	Signature	/ / Date



Sensor Placement Plan

The Sensor Placement Plan should comprise a diagram of the treatment vessel/room/area and include the location and identification of each temperature sensor.



SENSOR CALIBRATION TEST RECORD

Business details						
Business name:			Data recoding instrument ID:			
Place of Sensor:			Interstate produce number	V		

Date of testing	Sensor identification	First reading	Second reading	Sensor correction value (± °C)	Person conducting calibration name	Signature

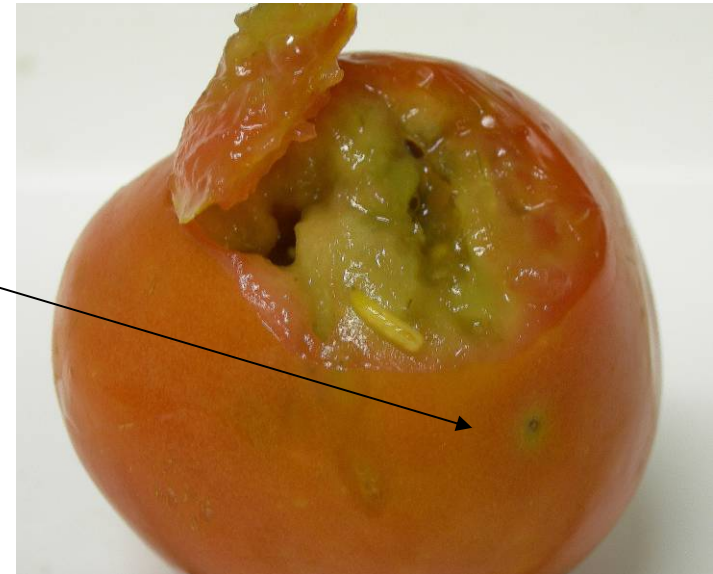
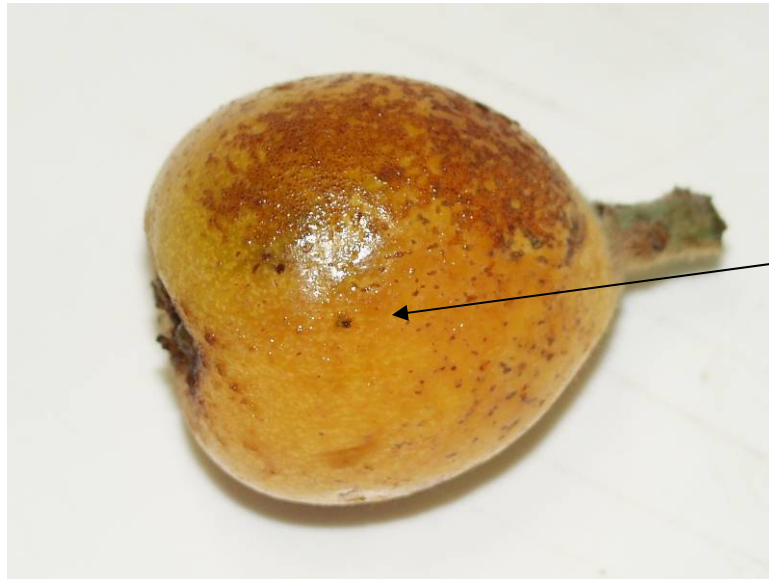


FRUIT INSPECTION RECORD

Business Name						Business Interstate Produce (IP) Number:	V	
Date	Produce Type	Grower/Packer	# Inspected	Free of Larvae		Comments	Authorised Inspector	
	(nectarine, R2E2, peach)			Yes	No	(Note any defects or problems detected during inspection and the number of any withdrawn or rejected packages)	Printed Name	Signature



QUEENSLAND FRUIT FLY (QFF) LARVAE and STING MARKS



STING MARKS



LARVAE