Work Plan for the export of fresh mangoes from

Mexico to Australia

April 2023

Version control:

Date	Version	Description
April 2023	Final V.1	• Amalgamation of Mexican workplans for mangoes: hot water dipping treatment, irradiation and area freedom • Prepared in consultation with SENASICA • Final version completed: April 2023

Explanatory notes for the import requirements for fresh mangoes from Mexico to Australia

This document includes the joint understanding between Mexico and Australia of the requirements for the export of fresh mangoes from Mexico to Australia.

1. Applicable goods

Fresh mangoes (*Mangifera indica*) commercially produced in Mexico for export to Australia.

2. Definitions

Fresh mangoes

Fresh mangoes are defined as the entire mango fruit including the skin, pulp, stone and up to 3cm mango stalk.

Quarantine pest

A pest of potential economic importance to the area endangered thereby and not yet present there, or present but not widely distributed and being officially controlled (FAO, 2019a).

Regulated article

Any plant, plant product, storage place, packaging, conveyance, container, soil, and any other organism, object, or material capable of harboring or spreading pests, deemed to require phytosanitary measures, particularly where international transportation is involved (FAO 2019a).

Area Freedom

Area freedom may include pest free areas, pest free places of production or pest free production sites. The areas recognised as free from *Ceratitis capitata* and *Anastrepha spp* are the states of Sonora, Baja California Sur, Chihuahua, and five municipalities of Sinaloa (i.e. Ahome, El Fuerte, Choix, Guasave and Sinaloa).

Biosecurity Import Conditions system (BICON)

The Biosecurity Import Conditions (BICON) is a system to determine whether a commodity intended for import to Australia is permitted, subject to import conditions, requires supporting documentation, requires treatment or needs an import permit.

Consignment

One or more lots imported by one importer, on one conveyance at one time, and covered by one phytosanitary certificate.

Lot

A lot will be defined as the whole shipment of fruit sent from the same orchard to a packing facility for a specific period. If a vehicle transports fruit from two or more orchards the fruit must be properly identified according to the quantity per respective lot with sampling from each of these lots.

3. Participating entities and key roles and responsibilities

I. The Mexican NPPO: The Servicio Nacional de Sanidad, Inocuidad Y Calidad Agroalimentaria (SENASICA).

a) Has overall responsibility for the implementation and compliance with this work plan. Activities to verify compliance with this work plan include (but are not limited to) audit of grower, packing house, processing facilities and treatment facilities against this work plan and monitoring outcomes of phytosanitary inspection.

b) To register exporters, packing houses and treatment facilities to ensure they meet requirements of this work plan.

c) To inspect goods for export and issue phytosanitary certificates.

d) To maintain and provide to the Australian NPPO, upon request, records of activities (including but not limited to) registration, inspection, training, audits, approved operating procedures, etc.

e) To investigate non-compliance and implement corrective actions as required.

II. The Australian NPPO: The Department of Agriculture, Fisheries and Forestry (the department):

a) To undertake inspection of commodity shipments when they arrive in Australia to verify phytosanitary compliance and to provide guidance and/or instructions to regional staff at port of entry for clearance of consignments.

b) To notify the Mexican NPPO of any issues of non-compliance detected on-arrival for the Mexican NPPO to investigate and implement corrective actions as required.

c) To verify that the responsibilities of all participants with regard to the technical commitments in these work plans are properly executed. The Australian NPPO may request the Mexican NPPO to conduct additional verification activities as necessary to verify program integrity or address program issues if they occur.

4. Quarantine pests

The following organisms have been determined by the department to be quarantine pests on the pathway for Australia:

Pest	Common name	Measure
Fruit Fly		
Anastrepha spp.	South American fruit fly	• **Area freedom** • **Hot water dipping treatment** • **Irradiation 150Gy**
Ceratitis capitata	Mediterranean fruit fly	
Other fruit flies of economic significance		
Mealybugs		
Dysmicoccus neobrevipes	Grey pineapple mealybug	• **Pre-export visual inspection and, if found, remedial action a**
*Ferrisia malvastra**	Malvastrum mealybug	
Paracoccus marginatus	Papaya mealybug	
Planococcus minor	Citrus mealybug	
Pseudococcus jackbeardsleyi	Jack Beardsley mealybug	
Pseudococcus solenedyos	Oral-rim mealybug	

*Quarantine pest for Western Australia only.

a Remedial action includes treatment of the consignment to ensure that the pest is no longer viable or withdrawal of the consignment from export to Australia.

5. Risk management measures for quarantine pests

5.1 Risk management measures for managing quarantine pests of mangoes from Mexico

Option 1—Hot water dipping treatment

If this option is used, all the requirements outlined in Annex 1 must be met.

Option 2— Irradiation treatment

If this option is used, all the requirements outlined in Annex 2 must be met.

Option 3— Area freedom

If this option is used, all the requirements outlined in Annex 3 must be met.

6. General requirements

6.1 Registration of places of production

I. Growers and/or places of production must be registered with SENASICA before the commencement of harvest each season. SENASICA is required to ensure that the registered growers or places of production are suitably equipped and have systems in place to carry out the specified phytosanitary activities. Places of production registered and approved with SENASICA must comply with the provisions of this workplan, the annex, and the associated regulations between SENASICA and the Department.

II. SENASICA must keep, and make available, all lists of registered growers or places of production, and provide records of audits on request.

III. Growers seeking registration will undertake to comply with a phytosanitary control program laid down by SENASICA, for the control of pests other than fruit flies and diseases.

IV. SENASICA is responsible for ensuring that registered growers are aware of pests of quarantine concern to Australia and requirements for these quarantine pests.

V. Data may be encoded using barcodes or other identification systems approved in advance by SENASICA.

6.2 Registration of packing houses and treatment facilities

I. The Packinghouses and treatment facilities must be registered with SENASICA before the commencement of harvest each season. SENASICA is required to ensure that packing houses and treatment facilities are suitably equipped and have systems in place to carry out the specified phytosanitary activities. Packinghouses registered and approved with SENASICA must comply with the provisions of this workplan, the annex, and the associated regulations between SENASICA and the Department.

II. Have certification of the Mexican Official Standard NOM-022-SAG/FITO-2016: *Specifications, criteria and phytosanitary procedures for natural or legal persons that provide phytosanitary treatment services*.

Have certification of the Mexican Official Standard NOM-075-FITO-1997 for: *Establishing phytosanitary requirements and specifications for movement of fruit hosts of fruit flies*.

III. SENASICA must keep, and make available, all lists of registered packing houses and treatment facilities, and provide records of audits on request.

IV. SENASICA is required to ensure that the registered packinghouses are suitably equipped and have systems in place to carry out the specified phytosanitary activities.

V. Registered packinghouses must only receive mangoes from registered production unit (places of production) that are destined for the Australian market.

VI. The hygiene of registered packing houses and treatment facilities must be maintained.

VII. Appropriate quarantine security of the fruit must be maintained at all times, including during transport between production sites and packing houses/treatment facilities and when mangoes are on the premises.

VIII. Packing houses and treatment facilities must have a system of record keeping enabling trace-back of the packed fresh mangoes back to the place of production.

IX. SENASICA is responsible for ensuring that registered packing house and treatment facility (if applicable) personnel are aware of pests of quarantine concern to Australia and requirements for these quarantine pests.

X. Approval of new treatment facilities may also be subject to the Department's audit and review prior to trade commencing.

6.3 Pre-export sorting

I. All fruit bins containing fruit received at a packing shed must be clearly marked with the registration number to identify the orchard from which the fruit was picked.

II. Fruit that has been sorted or graded as not being acceptable for the Australian market must be rejected or removed daily.

III. To prevent any potential contamination of fresh mangoes destined for Australia by any plant produce destined for domestic or other export markets, processing equipment in packing houses must be suitably cleaned prior to the commencement of processing fresh mangoes for export to Australia.

6.4 Packing and labelling

I. Packing of the mangoes into cartons will be carried out in an insect proof area.

II. All packages / packing boxes must be inspected and free from contaminating pests and regulated articles. Regulated articles are any items other than fresh mangoes.

III. Secure packaging must be used during storage and transport of fresh mangoes for export to Australia. Packaging must be fully sealed or if not sealed the opening must be covered by mesh/screen that is no more than 1.6mm pore.

IV. Packed into approved export cartons that are labelled in accordance with requirements set out in BICON.

V. Packing material must be synthetic or highly processed if of plant origin. No unprocessed packaging material of plant origin, such as straw, will be allowed.

VI. All wood material used in packaging of fresh mangoes must comply with The Department's conditions as described in BICON

VII. The phytosanitary status of fresh mangoes must be maintained throughout the packing, treatment (if applicable), storage and transport.

VIII. The following information should be visible each carton:

- Product of Mexico for Australia
- Fruit type (mangoes)
- Packing house registration number (PHC)
- Production unit code (PUC)
- Treatment facility name and/or code *
- Treatment Identification Number (TIN)*

* only required for treated pathways

6.5 Storage

I. Fresh mangoes and packaging is to be protected from pest contamination during and after packing, during storage and movement between locations this includes but is not limited to; movement from packing house to cold storage/depot, to inspection point, to export point.

II. Fresh mangoes for export to Australia that have been inspected and certified by SENASICA or treated (if applicable), must be maintained in secure conditions that will prevent mixing with any plant produce for export to other destinations and the domestic market. This can be achieved through segregation of fresh mangoes for export to Australia in separate storage facilities, through the use of tarpaulin and physical segregation from any other plant produce, netting or shrink-wrapping pallets in plastic, or by placing sealed cartons in cold storage before loading into a shipping container.

III. Cartons must be packed into containers under secure conditions which ensure that the mangoes will not be subject to cross- infestation by quarantine pest this could be under insect-proof mesh, if necessary.

IV. SENASICA must inspect the interior and exterior of containers used for shipments before they are loaded and used for export. Inspection must include checking ventilation is meshed to ensure the container is free of pests and hitchhiking or contaminants.

V. Security of the consignment is to be maintained until release from quarantine in Australia.

6.6 Pre-export phytosanitary inspection by SENASICA

I. All consignments must be inspected in accordance with official procedures for all visually detectable quarantine pests at a standard sampling rate per phytosanitary certificate (PC).

II. SENASICA will inspect all consignments for any pests of quarantine concern to Australia and any other regulated article in accordance with ISPM23: Guidelines for inspection [FAO 2019b]. Individual mangoes are to be inspected carefully.

III. Fresh mangoes must be sampled in accordance with ISPM31: Methodologies for sampling of consignments [FAO 2016a] that would provide 95% confidence that there is not more than 0.5% infestation in a consignment.

IV. If pests are found in the inspection sample, SENASICA must identify the organism and take appropriate action:

- Detections of specified quarantine pests in Section 4 will require regulatory action as described in the Annex for the relevant pest risk management measure.
- Detections of pests other than specified quarantine pests in Section 4 will require their regulatory status to be determined, or application of an appropriate pest management measure. If required, SENASICA can contact the Department and request a determination of regulatory status.
- If determined to be quarantine pest for Australia, an appropriate and effective pest management measure must be conducted prior to certification.

V. Records of the interceptions made during the inspection (live or dead pests or regulated articles) are to be maintained by SENASICA and made available if requested. SENASICA inspection records must detail certification number, PHC, PUC, quantity and inspection result.

VI. Consignments that do not comply with the requirements outlined above will be rejected by SENASICA for export to Australia.

VII. Any fruit showing signs of damage must be cut to investigate for internal infestation of fruit flies.

6.7 Phytosanitary certification by SENASICA

I. SENASICA is required to issue a phytosanitary certificate for each consignment that has successfully passed its pre-export phytosanitary inspection.

II. Each phytosanitary certificate is to include additional declarations as described in Australia's import conditions database.

III. The place of production and packing house registration number or reference code, number of cartons per consignment and container and seal number (for sea freight) must be recorded on the phytosanitary certificate. See Australia's import conditions database for current requirements.

6.8 Transporting and trans-shipping

I. Containers or air cans must have an official seal applied on completion of loading and treatment. The goods must be part of a commercial shipment.

II. For mangoes that are shipped via USA; the transport vehicle doors must be sealed under the supervision of SENASICA inside the "clean area" of the origin pack house. Mangoes in vans with broken seals and/or pallets will not be exported.

7. Phytosanitary inspection and quarantine clearance in Australia

I. Each consignment will be inspected by the department on-arrival in Australia and the original Phytosanitary certificate and documentation examined for consignment verification purposes at the first port of entry.

II. The department's officers will conduct a verification inspection for any quarantine pests and regulated articles in accordance with official procedures for all visually detectable quarantine pests at a standard sampling rate per Phytosanitary certificate.

8. Outcomes of on arrival verification

I. Consignments that meet import conditions and successfully pass inspection will be released into the Australian market.

II. Where consignments are found to be non-compliant with Australia's requirements, the importer will be given the option to treat (if suitable treatments for the pests or regulated articles detected are available and can be applied), re-export or destroy the consignment.

III. If consignments continually fail inspection, the Department reserves the right to suspend the imports of fresh mango from Mexico, pending an investigation by SENASICA and a review by the Department. The imports will recommence when the Department is satisfied with the outcomes of the investigation and that appropriate corrective action have been undertaken.

IV. If an organism is detected on fresh mangoes from Mexico that has not been assessed in the final report, it will require an assessment to determine its quarantine status and if phytosanitary action is required.

9. Audit

9.1 Audit by SENASICA

I. SENASICA must have a system in place for monitoring/auditing of registered places of production, packing houses and treatment providers (if applicable) to ensure that all requirements are met.

II. Records of SENASICA audits must be kept and made available to the Department, if requested.

III. SENASICA will notify the department of any significant phytosanitary concerns and corrective actions to preserve the integrity of the program.

9.2 Audit by the Department

I. The Department may request to audit the implementation of the agreed import requirements, which could include, for example, registration, pest management, a system of monitoring/auditing and trace-back system. Audit may be via desk audit and/or site visit as required.

II. Production units, packinghouses and treatment facilities will be cross-referenced with registered lists provided by SENASICA.

10. Review of policy

I. The Department reserves the right to review the import policy at any time after trade commences or when there is reason to believe that the phytosanitary status of the exporting country has changed.

II. The detection of any pests of quarantine concern not already identified in the final risk analysis report may result in a review of import requirements to ensure that trade for fresh mangoes from Mexico, will meet Australia's appropriate level of phytosanitary protection.

III. Other phytosanitary measures which have been reviewed and deemed by the Department to offer an equivalent level of Biosecurity protection may be adopted as additional measure options during the period of trade.

11. Communication

I. SENASICA and the Department will communicate as necessary in relation to this agreement. The agreement will become effective upon acceptance by both parties and will remain in effect indefinitely. Modifications will be made by mutual consent or terminated by either party upon a 30 day advance written notice to the other.

Annex 1

Hot water dipping treatment

Risk management measures for mangoes from Mexico.

Pest	**Common name**	**Measure**
Fruit Fly		
Anastrepha spp.	South American fruit fly	Hot water dipping treatment
Ceratitis capitata	Mediterranean fruit fly	
Other fruit flies of economic significance		

1. Postharvest disinfestation treatment.

1.1 Specifications

All export fruit will be treated prior or export with a hot water submersion according to the following schedule:

Round varieties (e.g. Tommy Atkins, Kent, Haden, Keitt)

Maximum fruit weight	**Water temperature**	**Treatment time**
701-900 gram	46.1°C or higher	110 min
501–700 gram	46.1°C or higher	90 min
Up to 500 gram	46.1°C or higher	75 min

Flat varieties (e.g. Frances, Ataulfo, Manila)

Maximum fruit weight	Water temperature	Treatment time
376-570 gram	46.1°C or higher	75 min
Up to 375 gram	46.1°C or higher	65 min

The minimum temperature permitted during the treatment period is 45.4°C. The aggregate time the water may be at temperatures between 45.4 °C. and 46.0 °C. may not exceed 10 minutes in any treatment lasting 65 or 75 minutes, and for no more than 15 minutes in any treatment lasting 90 minutes.

1.2 Supervision

All treatments will be conducted under the supervision of an authorized SENASICA officer who will:

1.2.1 Confirm that the fruit intended for treatment originated from registered orchards.

1.2.2 Confirm chart treatment units are operational and that the treatment temperatures (or higher) have been attained prior to initiation of the treatment.

1.2.3 Initiate the treatment period once the fruit is submerged to a minimum of 10 cm below the water super-face and record the time on initiation.

1.2.4 Measure the temperature of the water at a minimum of 15 minutes intervals thought the treatment period.

1.2.5 Keep records of all the activities carried out under 1.2.1 to 1.2.4.

1.3 Cancellation of treatment

Any treatment which fails by virtue of violation of the above specifications be considered an unacceptable treatment. Another, separate treatment period may be start at request of owner, packer, or exporter of the fruit.

1.4 Documentation

1.4.1 Treatment certificates, pretreatment inspection reports, and treatment temperature records, calibration certificates, and internal auditing documents must be retained and made available to the Department upon request.

1.4.2 SENASICA will supply the Department with a list of registered treatment facilities and packing houses before the start of each season and notify of any changes to the list as they occur during the season.

Annex 2

Irradiation

For further information on irradiation, this Annex (Annex 2) should be read in conjunction with:

The Operational Work Plan for the export of Mexican articles treated with irradiation to Australia
Plan de trabajo operative para la exportacion a Australia de articulos de Mexico tratados con irradiacion.

Risk management measures for mangoes from Mexico

Pest	**Common name**	**Measure**
Fruit Fly		
Anastrepha spp.	South American fruit fly	Pre-export irradiation at 150Gy
Ceratitis capitata	Mediterranean fruit fly	
Other fruit flies of economic significance		

1. Preharvest monitoring.

1.1 Specifications

To ensure that the fruit fly populations in the export orchards are monitored by SENASICA or by an approved or authorised third party and that, the pest control measures used are necessary to maintain a low level of fruit fly infestation.

2. Postharvest disinfestation treatment.

2.1 Specifications

The Department rules, all pests in the insect family, Tephritidae (fruit fly) are neutralised by a minimum absorbed dose of 150 Gy. The fruit must be irradiated and receive the required minimum absorbed dose and meet all other relevant phytosanitary requirements of the Department. The fruit must not absorb more than 1000 Gy.

All export fruit will be treated prior to export with an irradiation treatment according to the following schedule:

Pre-treatment phytosanitary inspection	Outcome of inspection	Irradiation dose
600-unit inspection	No mealybugs or pests other than fruit flies found	150 Gy
	Mealybugs and/or other pests for which Dmin 400 Gy is effective pests other than fruit flies found	400 Gy ([1&2])
	Pests for which Dmin of 400 Gy is not effective	Irradiation not available. The consignment may be withdrawn from export to Australia, or if available, application of an approved treatment known to be effective to ensure the pest is no longer viable.

[(1)] If SENASICA wish to apply a Dmin of 400Gy, the Benebion facility will need to provide evidence that 400 Gy can be applied accurately by providing dose mapping at a Dmin of 400 Gt to the Department for assessment.

[(2)] If SENASICA does not wish to apply a Dmin of 400 Gy, the consignment may be withdrawn from export to Australia, or if available, application of an approved treatment known to be effective to ensure the pests is no longer viable.

2.2 Approved facilities

Facility name	Address	Facility code / number	Commodity	Mean package weight density
Benebion Irradiation Facility	Parque Industrial Matehuala Carr. Fed. 57 km 7+250 Tramo Matehuala – Saltillo, C.P. 78760, Matchuala, S.L.P, Mexico	ETCF04 24020002/2011	Mangoes	0.47

3. SENASICA certification requirements for approved treatment facilities

Approved facilities must be able to demonstrate that your team and your staff is trained to administer the minimum adsorbed dose safely, accurately and consistently for all components of the product, over the range of expected conditions for treatment as well as having some physical and production process specifications to ensure an adequate safeguard. They must have at least the following:

3.1 Current license

The installation must be licensed by the National Commission of Nuclear Safety and Safeguards of the Ministry of Energy of Mexico ("Comision Nacional de Seguridad Nuclear y Salvaguardias de la Secretaria de Energia de Mexico"), where specified the kind of source and authorized quantity and the responsible for radiological safety.

3.2 Approved radiation sources

Gamma radiation (radio nucleotides) from Cobalt 60 to Cesium 137, or sources of generating machines which include operated at / or below an energy level of 7.5 MeV or electron beams operated x-ray (bremsstrahlung) to / or below an energy level of 10 MeV. Any of these sources can be used effectively to sterilize or off pests that may be contaminants. Sources and equipment used for the treatment must have the ability to radiate effectively and safely, plant products according to the specifications that are required for target pests.

3.3 Minimum dose

The installation must be able to manage the minimum absorbed dose required to control a particular pest specified in the addendum.

3.3.1 Dose Mapping

The treatment facility must develop enough validation studies (dose mapping) to fully characterize the dose distribution in the container products and to identify areas of maximum and minimum dose. The dose mapping activities should be conducted taking into account the density ranges of product to be processed. Loading patterns of products and routes used for irradiation procedure should also be considered. Validation information for dose mapping is used to select the location of dose monitoring for routine processes (commercial treatments). The additional dose mapping is required when significant changes are made to the irradiator (including change of source material), to the load, the size of the product, or packaging that may affect the distribution and amount of doses. Dose mapping shall fulfils with the ISO / ASTM 51204-2002 €, practice for dosimetry application in the characterization of Gamma irradiation facility to process food, or the standard ISO7ASTM 51431-2002 €, practice for dosimetry in an irradiation facility with electrons and bremsstrahlung radiation by (X-ray) food processing.

3.3.2 Chronometer validation or timing controller

To ensure administration of a specific dose, exposure time to radiation must *also* be evaluated. In processes with radioisotope, the timer on which are based the movement of containers with products should be validated, and for the electrons process for or X-rays, conveyor speed is validated.

3.3.3 Biological safeguards

The products must be packed in insect-proof boxes. There must be a physical separation of products treated and untreated, that barrier should be enough to prohibit inadvertent movement of products and provide biosafety.

3.3.4 Biological safeguards

The products must be packed in insect-proof boxes. There must be a physical separation of products treated and untreated, that barrier should be enough to prohibit inadvertent movement of products and provide biosafety.

3.3.5 Documented training

Document the training of key employees in operation of irradiation processes applied to agricultural products. All personnel with relative responsibilities to phytosanitary treatment must have adequate certification, training in accordance with applicable international standards and authority for the application of irradiation treatments. Records must be available for inspection by personnel of DGSV or the Department upon request.

3.4 Application for approval of the treatment facility

The legal representative of the company or treatment facility, makes a written request to DGSV, through which annexed the documentary information required by the Mexican Official Standard NOM-022-SAG/FITO-2016, Specifications, criteria and phytosanitary procedures for natural or legal persons that provide phytosanitary treatment services. NOM-022- SAG/FITO-2016 is aligned to ISPM No. 18. Guidelines for the use of irradiation as a phytosanitary measure.

3.5 Visiting the irradiation facility in order to approve

Once SENASICA checks that the documentary information is complete and correct, is scheduled a visit to facility to verify that the provided information is in line with reality. Comparing the plane, the flow pattern of products, safeguards, formats treatment records and logs is performed.

3.6 Approval certificate

Once that is verified on site that the installation fulfils with the infrastructure requirements and specifications, equipment, materials, processes, human resource, the certificate is issued, where conditions and restrictions are established of approval.

3.7 Recertification

The certificate is valid for one year, unless that operational or structural change in the installation were made as well as changes or refills in the radiation source.

4. Irradiation treatment for commercial shipment of products

4.1 Approval of configurations

For each type of fruit and commercial presentation (box, fruit caliber, stowed) tests dosimetry are made jointly by treatment facility and DGSV, to determine the zones of maximum and minimum radiation doses for that presentation (configuration), since irradiation doses vary according to the product density (density = mass ÷ volume). So, in these tests are set for each configuration, parameters weight and volume that should be fulfill in commercial treatments and it's defined the point or factor of reference where dosimeters were placed in commercial treatments to verify that dose actually absorbed by the product is the minimum required dose to pest or target pest control.

4.2 Treatment verification

Once the shipment finishes the treatment, the dosimeters that were placed at the previously established benchmarks during the test for approval of the configuration are taken away and they are carried to the scanner for the reading, in the monitor screen appears absorbed irradiation dose and the value obtained is multiplied by the correction factor calculated on tests, to obtain the real value of absorbed minimum dose. Once that a DGSV officer verifies that the Rmin and Rmax are within the minimum and maximum values set the Phytosanitary Certificate is issued.

4.3 Verification according to ISPM No. 18 guidelines.

4.3.1 Dosimetry system

Using the standard ISO / ASTM 51261-2002 € or the current standard, selection guide and calibration of dosimetry systems for radiation processing (or some equivalent international standard) as a guide to selection and calibration of a dosimetry system with an appropriate routine corresponding to dosimetry requirements for the specific criteria to application. Other individual standards ISO / ASTM 51204-2002 and 51431-2002 € or applicable standards, provide detailed procedures for using specific dosimetry systems (ASTM dosimetry standards for radiation processes are published in the Annual Book of ASTM Standards). Prior to use the dosimetry system should be calibrated according to the documented proceeding that specifies the details of the calibration process and the requirements of quality assurance. This calibration must be repeated where appropriate to ensure that the minimum dose is absorbed by the target pest (s). Dosimeters calibration should be traceable to an international standard.

4.3.2 Routine dosimetry

Is part of a verification process to verify that the irradiation process is being fulfilled. Dosimetry is only a component of a program of full quality assurance for compliance with good production practices. An appropriate system of dosimetry should be selected and dosimetry procedures should be followed to characterize the irradiator, the process rating and routine procedure to ensure that the product has been treated with the minimum absorbed dose prescribed for mitigation of target pests, which are supposed to infest / infected / contaminate a product with a particular origin. The dosimetry system should be calibrated periodically in accordance with the standard 51261-2002 € of ASTM, or the current existing standard and should be traceable to national or international standards. Procedures of dosimetry measures should be used with appropriate statistical controls

and documentation in accordance with ASTM 51204-2002 € standard (for gamma facilities) or 51431-2002 € (for facilities of electron beam and x-ray (bremsstrahlung) or current standards. Once that is demonstrated the capability to process objects within prescribed limits of absorbed dose that are established, but it is necessary to monitor and record the minimum and maximum absorbed dose during each production run, to verify compliance with process specifications within a predetermined confidence level. The operating procedures (PO) should specify how frequently be used dosimeters.

4.3.3 Loss or damage of treated product

DGSV-SENASICA and its personnel do not assume the responsibility for any loss or damage resulting from any treatment prescribed or supervised. Treatments are approved to have biosafety against the target pests, based on the available literature. Tolerance of plant products to prescribed dose should be corroborated or verified by the treatment plant and the exporter.

5. Documentation

5.1

For traceability purposes, the SENASICA or authorized personnel will assign a unique and permanent Production Unit Code (PUC) for each production unit and a Packinghouse Code (PHC) to each packinghouse participating in the program.

5.2

Thirty days before the beginning of shipments, SENASICA will provide the Department with a master list of the participating production units and packinghouses and their corresponding traceability codes (PUC or PHC)

5.3

The records for each treated lot must be kept for one year and shall be available for inspection officials of SENASICA or the Department. The records must contain at least:

- Name and quantity of the product
- Codes of: TIN (Treatment Identification Number), PUC, and PHC.
- Prescribed treatment.
- Evidence of prescribed treatment.
- Dosimetry data (minimum and maximum).
- Irradiation date.
- Certificate of the irradiation treatment procedure.

5.4

Have the following documents and records in the irradiation plant:

- Phytosanitary Standard Compliance Certificate (current).
- Operational work plan.
- Record of training and credentials of facility employees.
- Standard Operating Procedure(s) document(s).
- Document confirming the type of ionizing energy used by the plant.

- Calibration records of dosimetry system,
- Records of dose mapping or qualification irradiator.
- Calibration certificate of the irradiator time controller

6. Packaging

6.1
SENASICA must approve insect-resistant packaging before its use, it is to be properly constructed and to ensure that radiation doses are received by contained articles

6.2
Ensure that pallets are securely wrapped and that each box is properly labelled in accordance with the provisions of the program and requirements for goods subject to irradiation.

6.3
Commercial parties in the origin country are responsible of coordinating and working with the treatment facility (s), to establish the parameters of packaging of included products in the program. Packing parameters and process configurations are essential for correct delivery of the target doses. These configuration parameters may include, but are not limited to the size / shape / type of packaging, number of fruit per package, fruit size, gross weight of the packaging and stacking configurations. Packing parameters must be approved by the DGSV. Once they are approved, the DGSV will ensure that all participants will adhere strictly to the specifications of the configuration and approved packaging process.

6.4
To ensure than exporters and packers of mango place stickers on individual fruits before packing. The sticker information may include the lot number, the packinghouse or treatment facility code numbers, country of origin or other information that would correlate treated fruit with import documents and it serve as a tool for the commodity trace back, once the fruit is on display and outside of the pest proof boxes in which they were treated. For carton boxes or bulk sale containers, at least 20% of the mangoes in each box shall bear stickers. For mangoes contained in plastic boxes (clamshells), mesh bags or other packing material of common use for its retail sale, only the external part must have a sticker.

7. Sampling and inspection

7.1
Before the treatment of a fresh mango shipment, fruit must be sampled and inspected. This will require a 600 unit (unit equaling one-piece of fruit) inspection of fruit from a single production area/producer to a packinghouse in one day. Fruit must be inspected carefully using methods that can be demonstrated to detect the target pests.

8. Registration and certification requirements

8.1
Production units must register 90 days before the start of the export season and should use

control measures appropriate to ensure low levels of pest population and to meet all the standards required for orchards, fields or production areas, as determined by SENASICA.

8.2
Thirty days before the beginning of shipment(s), DGSV will provide the Department with a master list of the participating production units and packinghouses and their corresponding traceability codes (PUC or PHC).

8.3
Registered packinghouses must have written operating procedures which describe in detail all the processes related to the classification, handling, and packaging of products under the Irradiation program.

8.4
Only fruit from registered production units and registered packinghouses will be eligible for treatment at approved facilities.

8.5
To issue the certificate of treatment for each shipment that successfully meets program requirements and phytosanitary irradiation doses.

8.6
To approve insect-resistant packaging before its use to be properly constructed and to ensure that radiation doses are received by contained articles.

9. Safeguard requirements and post-treatments

9.1 General
Treated products must be safeguarded to prevent reinfestation. The irradiation facility location and the surrounding environment infestation are important considerations in determining what safeguards apply in a given case. The purpose of all safeguards and mitigation activities is to prevent pest's incidence by moving them from infected ecosystems to uninfected ones. Then further details are provided about the safeguards procedures and minimum safeguards required.

9.2 Operation procedures
Operating procedures should be developed and documented for each installation that applies phytosanitary irradiation treatments. This document should include the "how" for all phases of operation, safeguards and treatment products. Critical control points are; dose, dosimetry and safeguards. Operating procedures are reviewed along with the installation and personnel specifications to determine acceptance or not in certification.

9.3 Safeguards procedures should at least describe:

9.3.1 Reception

The products must arrive at the treatment facility in a sealed and packed in insects proof boxes previously approved, which come from packing houses and orchards registered for export, for

which all shipments should arrive with documentation proving their origin. The irradiation treatment should be done immediately as the shipment arrives to facility, otherwise is recommended storage in temporary cold.

9.3.2 Separation

Separation of treated products from untreated: all products of the program should be separated from those who are not in the program. Treated products should also be separated from untreated ones.

9.3.3 Packaging

The products must be received at the treatment facility in the same cartons that will be irradiated. Boxes should not have holes that allow the entry of quarantine target pests or non-target. If the holes are necessary for ventilation, they will be covered with a minimum frame curtains 30 meshes per linear inch or the full pallet may be within a bag of a minimum of 30 meshes per linear inch.

9.3.4 Labelling

Boxes must arrive to the treatment facility marked or labelled with the Production Unit Code (PUC), Packing House Code (PHC), packing date, Treatment Facility Code and Treatment Identification Number (TIN) and treatment date. For the latter two data: Treatment Identification Number and date of treatment it can be placed a sign by pallet before the shipment leaves the treatment facility.

9.3.5 General health

The facility must be kept clean on the outside and inside, as well as storage areas of pre- and post-treatment and equipment used to transport the product to the irradiator.

9.3.6 Containers loading and transportation

The containers are carefully inspected by the DGSV officer to verify that they are free of pests, plant residues and soil before the treated products are placed. Containers must have a sealed connection with the treatment facility during loading to prevent pest from entering.

In the case of air shipments, treated products should be loaded immediately in shipping containers and secured (locked doors, completely covered) until the load in the airplane. If air shipment is delayed or the flight is canceled, the products must be safeguarded until exportation.

Immediately after closing the container, this will be sealed and the seal number will be placed on phytosanitary certificate. The Phytosanitary Certificate is issued when the DGSV officer verifies that the requirements treatment and post treatment safety have been met and maintained.

9.3.7 Waste disposal or waste product

The treatment facility should take the necessary procedures to dispose of rotting and damaged products, at the end of each working day. The floor area for loading and unloading shall be clean.

10. Phytosanitary certification of shipment

10.1 Inspection and sampling before treatment

Inspections of target quarantine pests and non-target will be carried out by DGSV-SENASICA personnel. The inspection area should have adequate lighting, inspection table, magnifier and assistance from the treatment facility for handling boxes.

10.2

The proportion of sampling and actions related to the interception of living target and non-target quarantine pests are detailed in the respective section. If unusual pests are found, they will be reported to the headquarters of the DGSV-SENASICA.

11. Corrective actions and sanctions to treatment facility and packinghouses

SENASICA/DGSV shall identify and document any apparent deficiencies and bring them to the attention of the registered packinghouse or treatment facility so will be given to them the opportunity to correct any minor deficiencies and take remedial actions.

11.1

When the minimum dose is not administered or other treatment requirements are not reached:

- First incident: the lot will be rejected and a warning letter will be issued to the facility administrator. DGSV shall conduct an investigation and corrective actions will be taken to prevent recurrence.
- Subsequent incidents within a calendar year (January 1 to December 31): the lot will be rejected and certification services will be suspended, depending on the investigation conducted by the DGSV. The investigation report will be provided to the Department, before considering of establishment in the export program.

11.2

Treated products that have been compromised (product substitution, placement of products that have not been treated in safety areas, untreated product shipment)

- First incident: products will be rejected and services of the treatment facility will be suspended until an investigation is conducted and corrective actions may prevent recurrences.
- Second incident within a calendar year: lots will be rejected and services will be suspended until an investigation is conducted, providing a report to the Department before considering restoration.
- The immediate suspension of its participation in the export program will be applied after the third infringement.

11.3

Interception of a target or non-target quarantine pest in a commercial consignment upon arrival in Australia.

- First incident: Reject or treat the shipment if the treatment is available and allows its entry.
- Subsequent incident of the same pest within a calendar year: Reject the shipment and the packinghouse from which the commodity originated will be suspended until an investigation is conducted by DGSV and the corrective actions be taken

11.4

Any registered packinghouse that receives products for the program from unapproved production areas.

- First incident: to suspend the participation of the packinghouse until the DGSV conducts an investigation and corrective actions be taken to prevent recurrences.
- Subsequent incident in a calendar year: the packinghouse will be excluded from the program until corrective actions are made, and sent to the Department and it approves them.

12. Program review and evaluation

Independent of the oversight of phytosanitary treatment required in Mexican regulation and in this work plan, DGSV will conduct audits (as necessary) of irradiation treatment operations and from participant facilities.

Annex 3

Area freedom

Risk management measures for mangoes from Mexico.

Pest	Common name	Measure
Fruit Fly		
Anastrepha spp.	South American fruit fly	Area freedom
Ceratitis capitata	Mediterranean fruit fly	
Other fruit flies of economic significance		

1. Requirements

1.1 The Mexican states of Sonora, Baja California Sur, Chihuahua, and five municipalities of Sinaloa (i.e. Ahome, El Fuerte, Choix, Guasave and Sinaloa) have established fruit fly area freedom.

Mangoes that have been grown and packed in these areas may be exported to Australia under area freedom certification for fruit flies, without the requirement for hot water dip or irradiation treatment.