A GUIDE FOR

AUSTRALIAN MANGO GROWERS EXPORTING TO THE USA

AUSTRALIAN® MANGOES

BACKGROUND

The USA is one of the world's largest mango importers at more than 500,000 tonnes imported per annum with imports steadily growing in volume and value. After 15 years of negotiation the Australian mango industry gained access in January 2015 under a four-year pilot program developed between the Australian Department of Agriculture and Water Resources (DAWR) and the United States Department of Agriculture (USDA).

The US market imports from southern and northern hemisphere markets to provide year-round supply and drive consumer interest in fresh mangoes. In the USA, mangoes are typically sourced from Mexico, being the largest mango exporter to US market with 54% import share due to their close geographic proximity. The most common varieties include Ataulfo, Francis, Haden and Keitt, and are largely purchased based on ripeness, price and overall quality. While Mexico has a strong grasp of the USA market, opportunities remain towards the end of the year when Australia is in peak harvest season (Nov/Dec).

The opportunity for Australian mangoes in the USA market, despite the high landed cost (typically four times the cost of mangoes from other sources), is to provide US consumers with a better flavoured, better coloured, and higher quality mango compared to mangoes from other sources.

Despite supply chain challenges due to COVID-19 in 2020 and high air freight costs, Australian mangoes saw a 167% increase in exported volume and a 210% increase in value (AU$2,162,217 in 2021/22) in the USA from the previous year. There are market channels in the USA, prepared to pay a substantial premium for the superior appearance and eating quality of Australian mangoes. There is a significant opportunity to expand the US program by lengthening the season and by increasing distribution to further US retailers and regions. This will be achieved by committed growers and exporters working with USA importers to deliver planned and consistent programs of high-quality Australian mangoes across the season.

The USA is a protocol market and in addition to its own requirements regarding varieties, quality and maximum residue limits, technical phytosanitary restrictions are in place to ensure pests of quarantine concerns are managed. This guide has been developed to assist mango growers better understand and meet the USA market requirements.

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July 2024 — Correct at the time of writing but subject to change without notice. Growers are encouraged to contact AMIA if they have questions or queries.

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AT A GLANCE

MANGO EXPORT TO THE USA

1. REGISTRATION PROCESS

DAFF Registration

Orchards and packhouses must register and pass audits annually with the Department of Agriculture, Fisheries, and Forestry (DAFF). Protocol requirements are detailed in the operational Workplan (OWP).

EXDOC System

Exporters must register with the EXDOC system.

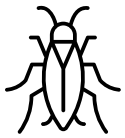
US Food and Drug Administration (US FDA) Registration

Packing sheds must register with the US FDA.

2. CROP MONITORING

Fortnightly crop monitoring: Required from flowering to harvest by trained and accredited crop monitors.

Ensures adherence to USA phytosanitary standards including management option for *Cytosphaera mangiferae*.



3. MAXIMUM RESIDUE LIMITS (MRLs)

Pesticide MRLs: Mangoes must meet US Environmental Protection Authority (US EPA) standards. Growers should be aware of USA MRLs for any products used.

4. PACKAGING AND LABELLING

Mangoes must be airfreighted in approved and pest-secure packaging.

Labelling must comply with the Operational Workplan (OWP) and Australian export requirements.

5. RIPENING AND COOL CHAIN MANAGEMENT

Partial ripening before irradiation reduces fruit damage caused by the treatment.

Cool chain management is crucial from packing to USA arrival.

6. INSPECTION AND TREATMENT

DAFF inspections: Destructive sampling conducted to ensure compliance.

Treatment: Mangoes must undergo irradiation with a minimum dose of 300 Gy to neutralise fruit flies and mango seed weevils.

Steritech: Provides USDA-approved irradiation treatment in Brisbane and Melbourne.

ORCHARD AND PACKHOUSE REGISTRATION

1. DAFF REGISTRATION OF ORCHARD AND PACKHOUSE

The USA export requirements are detailed in the Operational Workplan (OWP) which is available on the DAFF's MICoR website. Please note that access to workplans and protocols is restricted and users are required to register with DAFF Plant Exports to access these documents.

As required in the OWP, orchard blocks and packing sheds need to be registered and accredited annually by DAFF for the USA including passing a DAFF audit. USA program growers and packers are required to have a copy of the latest OWP on hand and be familiar with it. Grower and packing shed export registrations usually open mid-May and are managed by AMIA.

Usually, DAFF audits for export to protocol markets take place pre-season for new and non-compliant businesses and in-season for previously accredited and compliant businesses.

Growers are encouraged to consider the size of the property blocks they register for the US program as fruit from each block will be inspected as a separate lot at the export inspection (see Inspection below)

More information can be found here.

DAFF's instructional material is available on the Plant Export Operations Manual (PEOM) to support growers, packers and crop monitors in understanding their roles and responsibilities relating to the export of plants and plant products from Australia.

2. REGISTER AS AN EXDOC USER

DAFF's Export Documentation System (EXDOC) is used to generate export documents. EXDOC can be used to electronically request and issue:

- export permits as required by the Export Control Act (1982)
- certificates and related documents as required by importing countries.

You can apply for different levels of access to EXDOC, depending on how much of the export documentation process you want to complete yourself. There are two types of users of EXDOC:

- **Exporter**— the exporter is the party legally liable for the goods. Your name and address will be included as the exporter/owner on any documents generated for you.
- **Electronic Data Interface (EDI user)**—to generate requests for export permits, certificates and related documents (usually for freight forwarders). EDI Users are required to have an installed third party software package to interface with the EXDOC system.

It is possible to register as both an Exporter and an EDI User.

AMIA recommend you **register as an exporter only**. Freight forwarders can raise an import permit on the exporters behalf once the grower is registered as an exporter.

Download and complete an Application to Register as an Exporter User in EXDOC form, with details of:

- your company
- user type required (recommended: exporter user only)

Wait for notification that your registration has been processed. The registration process will take a maximum of two business days from when a correctly completed form was submitted.

After your application is processed, exporter users will be issued with a unique exporter number and can now have permits and other documents requested and issued in their name.

3. REGISTER YOUR PACKHOUSE WITH THE US FDA

The packing shed must be registered with US FDA (foreign food packing facility) prior to export to the US. Information and registration are available at https://www.access.fda.gov/oaa/createNewAccountflow.htm?execution=e2s1

(This link may change without notice. Alternatively visit fda.gov registration of food facilities or contact AMIA)

4. KNOWN CONSIGNOR SCHEME - OPTIONAL

The Department of Home Affairs' *Known Consignor Scheme* (KC) regulates business to clear air cargo where it is not suitable or practicable to be examined by a Regulated Air Cargo Agent. Suggested – Packing sheds can register with the Known Consignor scheme. Packers are encouraged to discuss this with their exporter and / or freight forwarder.

PHYTOSANITARY COMPLIANCE

1. CROP MONITORING

Crop monitoring is required, from flowering, by trained and approved crop monitors. Training must be completed every year before flowering (budburst) when crop monitoring needs to start.

Training is available through the Department's Learnhub. The training consists of a core module and a commodity specific module (mango). Crop monitors must register to conduct crop monitor training by completing and submitting the Crop Monitor Training Request Form.

Monitoring needs to be performed during the entire growing season on every accredited block fortnightly, unless otherwise specified by the protocol or work plan. All monitoring records must be maintained and provided to the farm manager. Crop monitoring records must contain the following details:

- date of monitoring
- block number (as per DAFF export registration)
- target pests (see Table 1)
- results of the monitoring.

Table 1. Pests of quarantine concern for the USA.

ARTHROPODS		PATHOGENS	
FRUIT FLY	**MANGO SEED WEEVIL**	**BACTERIAL BLACK SPOT**	**STEM END ROTS**
B. aquilonis *B. cucumis* *B. frauenfeldi* *B. jarvisi* *B. kraussi* *B. murrayi* *B. neohumeralis* *B. opiliae* *B. tryoni* *C. capitata*	*Sternochetus mangiferae*	*Xanthomonas campestris pv mangiferae indicae*	*Cytosphaera mangiferae* *Lasiodiplodia pseudotheobromae* *Neofusicoccum mangiferae* *Neoscytalidium novaehollandiae* *Phomopsis mangiferae* *Pseudofusicoccum adansoniae*

The crop monitor performance standards can be found in the Appendix 2.

2. FUNGICIDE CERTIFICATION

The packing shed is required to certify either a post-harvest fungicide treatment or freedom from the fungi *Cytosphaera mangiferae*. A certificate template is provide as Appendix 1.

3. MAINTAINING PHYTOSANITARY STATUS

Phytosanitary security must be maintained for all goods destined for export from the time the goods attain a phytosanitary status.

For the USA, mangoes attain a phytosanitary status after harvest from accredited properties (orchards and packing sheds) required to eliminate, manage and monitor specific pests. To ensure phytosanitary security is maintained as mangoes move through the export pathway, consignments must be accompanied by a transfer record each time they are transported from the packing shed onwards.

4. APPROVED ENTRY PORTS FOR USA SHIPMENTS

Mango shipments to the USA must enter through specific ports. Air shipments are only allowed into San Francisco (SFO), Dallas Fort Worth (DFW), New York (JFK), or Los Angeles (LAX).

MAXIMUM RESIDUE LIMITS

Fruit for the USA must be compliant with US Environmental Protection Agency pesticide MRLs, supported with a chemical residue analysis (equivalent to Freshcare) prior to the start of USA packing. Please refer to Table 2, Appendix 3 and the AMIA's Mango MRLs Search App.

Table 2: List of pesticides which may lead to compliance issues with the USA market

ACTIVES	AUST WHP	AUST MRL (mg/kg)	USA MRL (mg/kg)
Beta-cyfluthrin (Bulldock)	7 days	0.1	0 (less than LOQ*)
Carbaryl (Bugmaster)	7 days	2	0 (less than LOQ)
Chlorpyrifos (Lorsban)	21 days	0.05	0 (less than LOQ)
Clothianidin (Shield or Samurai)	7 days (16 weeks for MSW)	2	0.01
Dimethoate (Saboteur)	3 days	0.5	0 (less than LOQ)
Fluopyram / Trifloxystrobin: Luna Sensation	3 days	2 / 2	0 (less than LOQ) / 0.7
Metiram (Polyram)	1 day Co-formulation with Pyraclostrobin= 14 days	7	0 (less than LOQ)
Paclobutrazol	Not required when used as directed.	1	0 (less than LOQ)
Procholraz (Octave)	Post harvest use only.	5	0 (less than LOQ)
Sulfoxaflor (Transform)	7 days	0.5	0 (less than LOQ)
Tetraniliprole (Vayego)	3 days	0.1	0 (less than LOQ)
Thiram	14 days	7	0 (less than LOQ)
Trichlorfon (Dipterex)	7 days	T3	0 (less than LOQ)

**LOQ: The limit of analytical quantitation, also sometimes referred to as the 'limit of analytical determination', is the lowest concentration of a pesticide residue for which positive identification and quantitative measurement can be achieved using a specified method.*

LABELLING AND PEST SECURE PACKAGING REQUIREMENTS

1. PACKAGING REQUIREMENTS

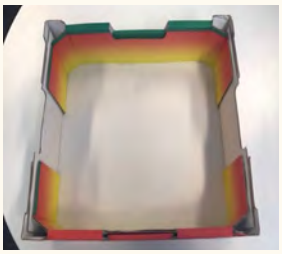
All Australian mangoes are airfreighted to the US. Unit Load Devices (ULDs) are the pallets and containers used to safely transport freight in aircrafts. They allow a large volume of cargo to be bundled into a single unit. Airlines have different types of ULDs available for use. Mangoes are generally shipped using the 4.5 tonnes PMCs. The shipment size should optimise the airfreight unit to minimise the $/kg airfreight cost.

There are seven packaging options currently approved by the USDA (Table 3).

To get new boxes and subsequent configurations approved, please contact DAFF's Horticulture Exports Program, horticultureexports@aff.gov.au.

Table 3. List of boxes approved for irradiated mangoes to the USA

ID	BOX NAME	COMMENTS	DIMENSIONS (L X W X H)	IMAGES	
152	**USA Mango Package 1**	Cardboard box. all holes covered with pest proof mesh. all seams are taped	38cm x 29cm x 12cm		 Pest secure 5 kg 'Australian Mangoes' branded box available from Opal. 832 of these boxes stow on the airline PMC.
196	**Open Mango Tray (12 cm)**	Open mango trays must be used with pest-proofing at pallet level configuration	38cm x 29cm x 12cm		120 standard height (120mm) Mod 12 trays load on to a 1200x1000 pallet and 6 x 1200x1000 pallets (720 trays) load on to airline PMC pallet.
194	**Open Mango Tray (10 cm)**	Open mango trays must be used with pest-proofing at pallet level configuration	38cm x 29cm x 10cm		A shallower 100mm Mod 12 tray (suitable for small fruit). 14 layers / 140 trays of the 100mm Mod 12 will fit on a pallet (840 trays/PMC).
197	**Open Mango Tray (13.4 cm)**	Open mango trays must be used with pest-proofing at pallet level configuration	38cm x 29cm x 13cm		A deeper 134mm Mod 12 tray (suitable for R2E2). 11 layers / 110 trays of the 134mm Mod 12 will fit on a pallet (660 trays/ PMC).

ID	BOX NAME	COMMENTS	DIMENSIONS (L X W X H)	IMAGES
266	**MOD 8 Standard Australian Mango Box (12 cm)**	Open top cardboard tray. For use with pallet-level pest proof packaging open.	42cm x 35cm x 12cm	
331	**Open mango tray 14.5 cm**	It is an open cardboard tray for use with pallet based wrapping.	43cm x 35cm x 14cm	
1392	**Mod 6 Mango Carton**	Open mango trays must be used with pest-proofing at pallet level configuration.	57cm x 38cm x 12cm	

The Mod 12 tray netted pallet consists of:

- OWP compliant net and net tie,
- ISPM* 15 compliant 1200x1000 pallet,
- Pallet pad,
- Corner boards/net protectors,
- Tray or pallet lid (to ensure the net does not drape on to the top layer of fruit),
- Pallet strapping or ventilated stretch wrapping,
- Locking pads (recommended).

*ISPM = International Standards for Phytosanitary Measures

There are strict requirements (detailed in the OWP) on the net specifications. At the time of writing, ProFresh Systems are the only supplier of a US compliant net. Profresh Systems can supply packers with a kit of all the above elements. Recognising that some packers may already have their own 1200x1000 pallets, 1200 x1000 pallet pads, lids for the Mod 12 and pallet stretch wrap, Profresh must, at a minimum, supply the net and corner boards/net protectors.

Please ensure you order your nets early. Currently, cost starts at $65/net and decreases if buying in bulk.

The netted pallet should have a pallet card with the information required on the package label (see **Package labelling** below) + “pallet 1 of X”].

For correct fruit temperature and cool chain performance, it is critical that packer, transport and exporter assess the ventilated pallet stretch wrapping or strapping options. This assessment needs to also take account of the netting which further reduces air flow. Some ventilated stretch wrapping, with smaller vent holes, requires forced draft cooling for effective cooling.

2. ADDITIONAL INFORMATION REGARDING INSERTS AND SOCKS

The use of Low-Density Polyethylene fruit socks on mango configurations are permitted. (Brand: Cosmothene LDPE, Grade: F210 CAS No: 9902-88-4) (June 2016)

The addition of a bubble plastic pad, or bubble paper pad or bubble plastic foam pad placed at the bottom of the box is permitted (approved December 2018).

3. FRUIT LABELS

Fruit labels are a commercial matter and subject to discussion and agreement with your importer.

4. PACKAGE LABELLING

The OWP specifies the following requirements for carton/ tray labelling:

- Your PUC is your block number (e.g. M99-1, M99-2 or M99-3)
- the PHC is your packhouse number (e.g. MP99)
- Steritech's TFC (Treatment Facility Code) is 2997
- Treatment Identification Number (TIN) – this number will uniquely identify the US consignment and is made up of the PHC hyphen followed by the packer's own batch number unique to the consignment (generated by the packer). We recommend a simple sequential number starting with 1 for your first US shipment.
- Date the consignment was packed on. This should be in the format of 01-JAN-2000 to avoid confusion between AU and US date formats.
- Radura symbol (may be pre-printed directly onto the package)
- Words "Treated by Irradiation" (may be pre-printed directly onto the package)

An example of a label for mango packages is:

PUC: NQ029-2
PHC: NQ030
TFC: 2997
TIN: NQ030-1
Packed on: 6-Feb-2015
Treated by Irradiation

It is important that the above information is grouped, clearly and in a similar prominent font, for Australian and US inspectors to easily locate.

Growers are encouraged to submit draft package labels to AMIA for review prior to packing.

In addition, the package and / or package label must comply with Australian export requirements including the grower's names and address, the variety, count, grade and "Product of Australia" or equivalent.

RIPENING AND COOL CHAIN MANAGEMENT

There are sufficient findings in the scientific literature[1] to suggest that:

- Mangoes are sensitive to damage from irradiation.
- Some varieties are more sensitive to irradiation than others.
- The level of irradiation is important, with levels above 300 grays causing more damage.
- Irradiation damage can be reduced by treating fruit that have been pre-ripened to at least colour stage 3[2,3].
- Fruit harvested soon after or during rain are more likely to develop lenticel damage, and these should not be irradiated for export.
- It is essential to cool the fruit (at least to 16˚C, preferably using forced draft) after ripening and prior to inspection and treatment.
- Fruit should be cooled again after the export treatment to 12˚C to extend shelf life and delay the expression of irradiation damage (lenticel spotting and skin browning).

The current industry practice is to ripen mangoes to a colour stage of 2 to 4 , depending on the fruit and supply chain, prior to export treatment. This requires active cool chain management to succeed as you are exporting (sealing in the airline pallet for ~24 hours) ripening fruit, which is then subject to US distribution of up to 5—7 days and in-store shelf life of another 5-7 days.

There is no current recommendation on the ripening time, temperature or whether gas (ethylene) is required. Therefore, it is encouraged that you work with a ripener who has expertise in handling mangoes for the USA market.

There may be variety differences in the ripening / time / temperature response. There are differences with fruit from the same block as the season progresses; later season, more mature fruit, will ripen faster.

As the pallet is sealed to comply with the Operational Workplan, it is difficult to get a comprehensive picture of the temperature of the fruit throughout the shipment. This needs to be considered when looking at temperature data and managing the fruit temperature through the cool chain from packing shed to import arrival. Grower, domestic road transport, treatment facility, freight forwarder and exporter need to be working together. The use of temperature data loggers approved for airfreight is recommended. To help you choose a single-use real-time logger, QDPI developed a user guide, available here.

[1] *Ainsworth, N., (2015) Predicting the impact of irradiation on mango quality, Department of Agriculture and Fisheries, Brisbane*

[2] *J. R. Marques, D. C. Joyce, P. J. Hofman & J. B. Davies (2022): Irradiation-induced lenticel discolouration in 'B74' mango fruit is modulated by ripeness, The Journal of Horticultural Science and Biotechnology*

[3] *Mango Quality Assessment Manual (2009); Holmes, Hofman and Barker*

EXPORT INSPECTION AND TREATMENT

1. INSPECTION

Prior to treatment, DAFF undertake an inspection of the export shipment. The OWP specifies the parameters:

- Each 'Lot' or approved block will be inspected separately.
- A minimum of 150 pieces of fruit per lot will be inspected.
- A minimum of 30 pieces of fruit per lot will be cut in half through the centre. Assuming a '10' count, this means that 3 cartons or trays per lot are lost at inspection. If the export lot is 720 trays, a minimum of a further 3 trays, identical in every respect, total 723 trays, need to be included in the shipment ex the packing shed. The DAFF inspector will select the fruit for inspection using a normal random method.
- The OWP specifies the inspection tolerances. If two or more target pests are found in a sample, the consignment is rejected.
- The DAFF inspector will also check the packaging and package label for compliance with the OWP requirements and Australian export requirements such as 'Product of Australia' and grower / packer name and address.

Each consignment must be inspected and accompanied by a Phytosanitary Certificate (PC) issued by the Department.

2. TREATMENT

Irradiation is a phytosanitary treatment used to neutralise pests of quarantine concern by killing them or disrupting their reproductive capabilities. The effectiveness of irradiation as a phytosanitary treatment is well established and is subject to International Standards for Phytosanitary Measures (ISPMs), ISPM 18 and several annexes under ISPM 28.

A distinct advantage of phytosanitary irradiation is that it maintains the integrity of the cold chain and allows whole pallets to be treated without the need to unpack and repack the fruit.

For export into the USA, mangoes must be treated by irradiation with a minimum absorbed dose of 300 grays to neutralise fruit flies and mango seed weevils.

Steritech is currently the only phytosanitary irradiation provider and operates two treatment facilities which are approved by the USDA APHIS to treat mangoes for export into the USA. These facilities are located in Brisbane and Melbourne.

COMMON CHALLENGES

Common challenges at the Australian side to consider are:

- Labelling not complying with the Operational Workplan (OWP),
- Boxes not complying with the OWP,
- Interception of pests during inspection which can lead to rejection of the shipment or delays due to the need for pest identification,
- Inadequate cool chain management leading to overheated and / or over ripe fruit on arrival in the US,
- Not transmitting shipment details and documentation to the US importer in a timely manner,
- Limited logistics/airfreight options to the West Coast of the USA.

Common challenges at the US side to consider are:

- Shipments not arriving in the US as planned with US importers leading to insufficient supply and unfulfilled retailer orders,
- Lack of information from Australian growers and shippers on events and activities impacting on supply,
- US supply chains have limited experience handling products with high perishability such as Australian Mangoes,
- the US West Coast has limited road freight availability at 12-14°C, and small air freight shipments often need to be consolidated on trailers that run at significantly cooler temperatures,
- Overheated shipments leading to a shortfall in volume to retailers and disposal costs,
- Competition with other mango import programs from the Americas involves significantly higher volumes at lower costs, which can lead to substantial losses for downgraded Australian fruit that ends up without a market.

Conclusion

In summary, while the US market offers significant opportunities for Australian mango exporters, it also requires careful planning, market research, and strategic partnerships to navigate challenges and establish a strong presence. By focusing on quality, differentiation, and targeted marketing efforts, Australian exporters can capitalise on the growing demand for mangoes in the United States.

ACKNOWLEDGMENTS

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Special thanks go to the growers and AMIA staff for their time and contributions during the review process. Your input has been valuable in shaping this guide into a useful resource for exporting mangoes to the USA.

APPENDIX 1 - FUNGICIDE CERTIFICATE TEMPLATE

US MANGO PROGRAM - PACKING SHED FUNGICIDE CERTIFICATION

I confirm that the following mangoes:

PUC	
LOT/s	
PHC	
TIN	
Number of cartons (shipment + inspection sample = total)	+ =

Were subjected to one of the following fungi mitigation options (select one) in accordance with the Operational Workplan (OWP):

Fungi mitigation options	Tick or cross one box
Option 1 Treated with the broad-spectrum port-harvest fungicidal (name) _____ By dip/flood spray (delete one) at _____ml in _____ L of water at _____ °C for _____ minutes (label rate).	
Option 2 The fruit originated from an orchard that was inspected prior to the beginning of harvest during the growing season and the orchard was found free of *Cytosphaera mangiferae*. Please attach crop monitoring records demonstrating freedom.	
Option 3 The fruit originated from an orchard that was treated with a broad-spectrum fungicide during the growing season, inspected prior to harvest and the fruit was found free of the fungi *Cytosphaera mangiferae*. Please attach spray and crop monitoring records.	

Signed: .....

Date: .....

Position: .....

This certificate must accompany the shipment and be made available to the Department of Agriculture, Fisheries and Forestry when booking appointment for export phytosanitary inspection. Failure to provide appropriate evidence may result in delay and/or rejection for export to the USA.

APPENDIX 2 - PREPARING FOR THE DAFF AUDIT

The following tables outline the performance standards for the crop monitors, farms and packing sheds and are based on DAFF's Plant Export Operations Manual (PEOM). Growers, crop monitors and packing shed managers need to demonstrate an understanding and be able to demonstrate compliance with the performance measures described in the tables below. Please note they are not USA specific.

PERFORMANCE STANDARDS FOR CROP MONITORS

CHECKLIST ITEMS	PERFORMANCE STANDARDS – CROP MONITORING	NON-COMPLIANCE RATING	EXAMPLES OF EVIDENCE (GUIDE ONLY)
1.1 Training	Demonstrates training has been undertaken and successfully completed.	Major	Crop monitoring training certificate or record
2.1 Crop monitoring	The correct pests and diseases of quarantine concern are being monitored. Monitoring is performed during the entire growing season on every accredited block fortnightly, unless otherwise specified by the protocol or work plan.	Major or Critical	Crop monitoring records to the end of harvest Crop monitoring records which cover quarantine pests and diseases of concern as per protocol/ workplan requirements
2.3 Fruit and field surveys	Where required, fruit or field surveys are conducted: • by the accredited crop monitor • as per the protocol (or agreed industry standard).	Minor or Major or Critical	Crop monitoring records
3.1 General	All monitoring records are maintained and provided to the farm manager. Records are kept for: • crop monitoring • trapping program (if required) • fruit or field survey. Where pests or diseases are found during monitoring, recommendations are given to the grower on a course of action consistent with the relevant protocol and/or industry standard.	Minor or Major or Critical	Crop monitoring records provided upon request Crop monitoring records detailing recommendations to the grower in managing protocol/workplan pests and diseases
3.2 Records	Crop monitoring records contain the following details • date of monitoring • block identifying name or number • target pests • results of the monitoring. • Trapping program records contain the following details • location of each trap • date deployed • results of trap checks • any required maintenance. Records have been kept for two years.	Minor or Major or Critical	Complete crop monitoring records

PERFORMANCE STANDARDS FOR FARMS (GROWERS)

CHECKLIST ITEMS	PERFORMANCE STANDARDS – FARMS	NON-COMPLIANCE RATING	EXAMPLES OF EVIDENCE (GUIDE ONLY)
1.1 Legislation and obligations	Has access to the current and relevant accredited properties performance standards. Explains notification requirements for changes to accredited property (management changes, operational changes etc.). Has evidence of property's accreditation (only relevant if currently accredited). Where required, has notified the department when a pest of concern was detected.	Minor or Major	Online or manual accreditation notification Access to relevant accredited properties guidelines and performance standards
1.2 Importing country requirements	Has a current copy, or can access, the protocol and/or work plan. Explains (or demonstrates) where to access importing country requirements. Explains importing country requirements for relevant countries.	Minor or Major	Micor online access Industry manual Knowledge of protocols/ workplans
1.3 Identification	Is able to identify physical location of blocks. Supplied farm maps are found to be accurate through the site inspection.	Major or Critical	Supply of farm location map Identifies blocks using location map during site inspection
1.4 Traceability	Has demonstrated traceability from harvest through to dispatch. Maintains traceability records to the next accredited property or registered establishment in line with Guideline: Maintenance of phytosanitary security for horticulture exports.	Minor or Major or Critical	Harvest record Delivery docket Bin/lugg card Consignment note Online system
1.5 Training	Staff (including pickers) have been trained in the departmental standards and protocol requirements relevant to their functions Training records have been kept for staff when required. Training records contain details of the training undertaken date the training was completed name of the individual that was trained.	Minor or Major	Harvest induction training record Staff training record Work instruction Signage Packhouse guidance correspondence for growers
2.1 Pest and disease management	Has measures in place to manage pests and diseases that meet exporting country requirements. Demonstrates pest and disease management measures by providing records of all activities. Example: Crop monitoring records.	Minor or Major or Critical	Visual inspection Industry specific manual Crop monitoring records until end of harvest Spray application records/diary Online system records
2.2 Records	Has current copies of all pest and disease management records.	Minor or Major or Critical	Crop monitoring records Spray application records/diary Farm diary/notes Online system records

2.3 Crop monitoring	Is using an approved crop monitor. Explains when monitoring is to begin and cease. Monitoring occurs during the correct timeframes. The correct pests and diseases of quarantine concern are being monitored for. Implements controls for specific pest requirements following crop monitor reports.	Minor or Major or Critical	Supply of crop monitoring records which cover quarantine pests and diseases of concern as per protocol/workplan requirements Crop monitoring records detailing commencement dates Crop monitoring training certificate or record Spray application record/diary Farm diary/notes Online system records
2.4 Chemical control	Where chemical controls are used, complies with state and commonwealth legislation. Spray records are kept, and include • application date • name of product • concentration/application rate • accreditation number of the farm (or blocks treated), or a system to link the identified treatment area to the accredited block numbers • name of person who conducted the treatment. • Chemical spray records correspond to pest detections.	Minor or Major	Spray application records/diary Chemical labels
3.1 Hygiene	Has demonstrated harvest practices to maintain good hygiene and prevent contamination. **Note:** Practices may include: • cleaning picking bins if not undertaken at the packhouse • weed control managing abandoned blocks in the accredited farm to manage the risk of cross contamination to accredited blocks measures to manage rotting product on the ground after harvest to reduce the risk of cross contamination to remaining product other measures specified in importing country requirements. Record the commencement and completion of harvest dates for accredited blocks. Where product is field packed into the final export carton the packaging must be appropriate for the product being packed, strong to withstand handling, clean, new (or if used, must be reconditioned for each subsequent use to ensure it meets all other packaging requirements), free from pests and compliant with importing country requirements.	Minor or Major	Visual inspection Industry manual Documented processes Spray application record/diary detailing weed control sprays Farm notes/diary detailing harvest dates Export cartons if field packed

PERFORMANCE STANDARDS FOR PACKHOUSES

CHECKLIST ITEMS	PERFORMANCE STANDARDS – PACKHOUSES	NON-COMPLIANCE RATING	EXAMPLES OF EVIDENCE (GUIDE ONLY)
1.1 Legislation and obligations	• Has access to the current and relevant accredited properties standards. • Explains notification requirements for changes to accredited property (for example: management changes, operational changes). • Has evidence of property's accreditation (only relevant if currently accredited). • Where required, has notified the department when a pest of concern was detected.	Minor or Major	• Industry specific manual • Online or manual accreditation notification • Demonstrates access to current performance standards
1.2 Importing country requirements	• Has a current copy, or can access, the protocol and/or work plan. • Explains (or demonstrates) where to access importing country requirements. • Explains importing country requirements for relevant countries.	Minor or Major	• Micor online access and/or current hardcopy protocols/ workplans • Industry specific manual • Knowledge of protocols/ workplans
1.3 Training	• Packhouses must have a documented system to ensure staff receiving, inspecting, storing or moving export horticulture commodities are trained. The training should cover the protocol/workplan requirements applicable to their role. As part of the system the packhouse must have a training program in place and includes » training material covered » frequency of training. • Staff training records are retained. • Training records contain » details of the training undertaken » date the training was completed » name of the individual that was trained.	Minor or Major	• Induction training record • Staff training record • Training program • Visual aids (posters) • Industry specific manual • QA manual
1.4 Plans and specifications	• Plans and specifications include the following » a floor plan of processing areas, showing all permanent fixtures and layout of equipment » a product flow chart and main features of the product flow	Minor	Supply of current floor plan and product flow meeting minimum requirements
2.1 Receivals	• Has demonstrated traceability to individual blocks. • Has demonstrated that only product from accredited properties is packed for particular markets.	Major or Critical	• Receival records • Delivery dockets from the farm • Consignment note • Receival inspection records (i.e. quality assurance checks) • Lug/Bin cards • Traceability system
2.2 Documentation	Has a documented system for containing the following: • A documented traceability program is in place and includes » how the packhouse tracks movement of goods from an accredited block to receival and through storage and loadout » how the packhouse tracks movement of product to the next receiving establishment for inspection and/or treatment in accordance with the Guideline: Maintenance of phytosanitary security for horticulture exports. • has demonstrated that all receival and loadout records are in possession.	Minor or Major or Critical	• Documented program for traceability of product • Online identification/ traceability system • Receival records/receipts/ dockets. • Receival lug/bin cards • Loadout/dispatch records and /or dockets/invoices • Transfer records

2.3 Security	• Ensure the integrity of goods being prepared at the packhouse through: • measures in place to minimise the risk of infestation or contamination. For example, effective hygiene, waste removal and pest control measures, security measures for goods being prepared for export such as physical barriers and isolation by distance • measures to keep export goods which have acquired a phytosanitary status separate from goods which haven't. For example, physical barriers (packaging, separate storage areas), isolation by distance and effective traceability systems • measures in place to minimise the risk of substitution (switching of goods) For example, effective traceability systems and secure packaging/labelling of goods • for goods which have reached a phytosanitary status they must meet the phytosanitary security requirements in the Guideline: **Maintenance of phytosanitary security for horticulture exports.**	Major or Critical	• Visual inspection • Signage • Documented procedures
2.4 Load out	• There is demonstrated traceability from receivals through to dispatch and delivery of traceability information to the next entity.	Major or Critical	• Final inspection record • Loadout/dispatch records and /or dockets/invoices Transfer record to the inspection and/or treatment establishment
3.1 Premises conditions	• Has demonstrated that the premises are in a clean and sanitary condition. • Has suitable equipment and infrastructure to allow handling of product.	Minor or Major or Critical	• Visual inspection
3.2 Documentation	Has a documented system in place which is effective in minimising the risk of contaminating product. The system must meet the following: • Hygiene program is in place and includes » frequency of cleaning » cleaning methods used (i.e. sweep floors, wash bins) » areas and equipment to be cleaned (i.e. cool rooms, packing lines). • Pest control program is in place and includes » frequency of pest control activities » pest control methods (i.e. insect spray, rodent baits) » location of pest control stations (rodent bait stations/traps). • Waste removal program (general and product waste) is in place and includes » frequency of waste removal » waste removal methods used (i.e. product waste removed from sorting/grading line and stored in bins awaiting removal). • Completed records of all above activities.	Minor or Major or Critical	• Hygiene program and records • Pest control program and records for pest control measures » bait station monitoring/ service reports » records or invoices for insect sprays • Waste removal program and records and/or 3rd party provider invoices or • Recognition using current certification to a GFSI approved scheme.
4.1 Packaging	• Has demonstrated that the packaging is appropriate for the product being packed, strong to withstand handling, clean, new (or if used, must be reconditioned for each subsequent use to ensure it meets all other packaging requirements), free from pests and is compliant with importing country requirements. • Has demonstrated that unused packaging is kept clean if on site or has a documented system on how packaging is kept clean whilst being stored.	Minor or Major	Visual inspection of packaging
4.2 Labelling	• Has demonstrated correct labels are used if applied at the packhouse as per trade description and importing country (protocol) requirements. • Labels applied to cartons/pallets are securely attached.	Minor or Major	• Visual inspection of labels used or to be used • Computer template of labels to be used

APPENDIX 3 - CHEMICALS MRL GUIDE

The following tables provide a comparison of the Australian and USA MRLs of chemicals that are approved for use on mangoes in Australia. The information in the following tables is taken from the Mango MRL Search App and was up to date as of 1 July 2024.

INSECTICIDES

ACTIVE INGREDIENT: Trade names	**AUST WHP (DAYS)**	**AUST MRL (mg/kg)**	**USA MRL (mg/kg)**	**COMMENTS**
Acetamiprid 186 g/L / Pyriproxyfen 124 g/L: Trivor Insecticide	28 days	0.2 / 0.3	0.5 / 1	
Beta-cyfluthrin: Bulldock 25 EC Insecticide	7 days	0.1	0 (less than LOQ*)	DO NOT APPLY
Buprofezin: Applaud	4 weeks	0.2	0.9	
Carbaryl 800 g/kg: Eurochem carbaryl 800 WP Insecticide; Kendon Carbaryl Wettable Granule Insecticide	7 days	2	0 (less than LOQ)	DO NOT APPLY
Carbaryl 500 g/L: Bugmaster	7 days (minor use permit no withholding period when used as directed)	2	0 (less than LOQ)	DO NOT APPLY
Chlorpyrifos: Chlorban; Lorsban	21 days	0.05	0 (less than LOQ)	The MRL for this market is lower than the Australian MRL but it should not be a compliance issue if label directions are followed.
Clothianidin 200 g/L: Sumitomo Shield Systemic Insecticide	16 weeks 7 days	2 2	0.01 0.01	DO NOT APPLY DO NOT APPLY
Clothianidin 500 g/L: Sumitomo Samurai Systemic Insecticide	7 days	2	0.01	DO NOT APPLY
Dimethoate	3 days	1	0 (less than LOQ)	DO NOT APPLY
Etoxazole: Paramite selective miticide	21 days	0.1	0.2	
Fipronil 100 g/L: Termidor Residual Termicide and Insecticide **Fipronil 200 g/L:** Regent 200 SC Insecticide	2 months	0.01	0 (less than LOQ)	The MRL for this market is lower than the Australian MRL but it should not be a compliance issue if label directions are followed.

Flupyradifurone 200 g/L: Sivanto Prime	3 days	0.7	0.6	The MRL for this market is lower than the Australian MRL but it should not be a compliance issue if label directions followed. Same WHP applies.
Maldison 440g/L: Fyfanon 440 EW Insecticide **Maldison 500 g/L:** Fyfanon 500 EC Insecticide **Maldison 1000 g/L:** Fyfanon 1000 EC Insecticide **Maldison 1150 g/L:** HY-MAL Insecticide	3 days (highly toxic to bees)	2	8	
Methomyl: Lannate-L, Eurochem Senaca Ultra 400	Not required when used as directed	0.01	0 (less than LOQ)	DO NOT APPLY
Methoxyfenozide: Prodigy	14 days	0.5	0.6	
Paraffinic oil	1 day	No MRL required	0 (less than LOQ)	The MRL for this market is lower than the Australian MRL. Compliance issues may arise when used according to the label, please liaise with your chemical provider and/or exporter.
Petroleum oil	1 day	No MRL required	No MRL required	
Pyriproxyfen: Admiral	4 weeks	0.3	1	
Spinetoram: Success Neo Insecticide	Not required when used as directed	0.3	0.3	
Spirotetramat: Movento 240 SC Insecticide, Surefire Viento 240 SC Insecticide	14 days	0.3	0.6	
Spinosad: Entrust Organic	Not required when used as directed	0.3	0.3	
Sulfoxaflor: Transform	3 days	0.5	0 (less than LOQ)	DO NOT APPLY
Tetraniliprole: Vayego 200 SC	3 days	0.1	0 (less than LOQ)	The MRL for this market is lower than the Australian MRL but it should not be a compliance issue if Bayer's advice is followed. Maximum one application no less than 62 days before harvest.
Trichlorfon: Dipterex 500 SL Insecticide	7 days	3	0 (less than LOQ)	DO NOT APPLY

FUNGICIDES AND PLANT GROWTH REGULATORS (PRGS)

ACTIVE INGREDIENT: TRADE NAMES	**Aust WHP (Days)**	**Aust MRL (mg/kg)**	**USA MRL (mg/kg)**	**Comments**
Azoxystrobin: Amistar	3 days	0.5	4	
Bacillus amyloliquefaciens strain QST 713 (Biofungicide): Serenade Opti	Not required when used as directed	Exempt	Exempt	
Chlorothalonil: Bravo Weather Fungicide	Not required when used as directed	1	1	
Copper (various)	1 day	Exempt	Exempt	
250 g/L Fluopyram / 250 g/L Trifloxystrobin: Luna sensation	3 days	2 / 2	0 (less than LOQ) / 0.7	The MRL for this market is lower than the Australian MRL but it should not be a compliance issue if Bayer's advice is followed. Maximum two applications with last application no less than 10 weeks before harvest.
Mancozeb 625g/kg and 750g/kg	1 day	7	15	
Mancozeb 800g/kg	14 days	7	15	
Mancozeb 300 g/kg / Copper present as the tribasic sulphate 120 g/kg : Farmalinx Copman; Novofix Disperss; Cuprofix Plus	14 days	7	15	
Metiram: Polyram DF	1 day	7	0 (less than LOQ)	DO NOT APPLY
Metiram 550 g/kg / Pyraclostrobin 50 g/kg : Aero Fungicide	14 days	7	0 (less than LOQ)	DO NOT APPLY
Prochloraz 462 g/kg present as the manganese chloride complex: Octave WP	Not required when used as directed	5	0 (less than LOQ)	The MRL for this market is lower than the Australian MRL. Compliance issues may arise when used according to the label, please liaise with your chemical provider and/or exporter.
Thiram: Barmac Thiram DG; Grochem Thiram 800 WG; Thiragranz	14 days	7	0 (less than LOQ)	DO NOT APPLY
Paclobutrazol: Austar PGR, Syntar PGR	Not required when used as directed	1	0 (less than LOQ)	The MRL for this market is lower than the Australian MRL. Compliance issues may arise when used according to the label, please liaise with your chemical provider and/or exporter.
Ethephon (various strenghts): Accensi 480, Titan 720, Titan 900SL	Not required when used as directed	0.02	0 (less than LOQ)	The MRL for this market is lower than the Australian MRL but it should not be a compliance issue if label directions are followed.

POST-HARVEST

ACTIVE INGREDIENT: TRADE NAMES	AUST WHP (DAYS)	AUST MRL (mg/kg)	USA MRL (mg/kg)	COMMENTS
1-Methylcyclopropene: EasyFresh PGR; Floratech PROLONG; Smartfresh Protabs; Smartfresh Smarttabs; Smartfresh	Post-harvest use only	Exempt	Exempt	
Fludioxonil: Scholar		3	8	
Iodine (AIS Iodine Granules Post- harvest sanitizer)		Exempt	Exempt	
Peroxyacetic Acid / Hydrogen Peroxide: Tsunami, Citrocide Plus		Exempt	Exempt	
Prochloraz: Sportak		5	0 (less than LOQ)	The MRL for this market is lower than the Australian MRL. Compliance issues may arise when used according to the label, please liaise with your chemical provider and/or exporter.

**LOQ: The limit of analytical quantitation, also sometimes referred to as the 'limit of analytical determination', is the lowest concentration of a pesticide residue for which positive identification and quantitative measurement can be achieved using a specified method.*

APPENDIX 4 - CHECKLIST

	✓
REGISTRATION	
Complete export registration managed by AMIA.	☐
Register as EXDOC users to generate export documents.	☐
Register packing sheds with the US FDA.	☐
CROP MONITORING	
Complete crop monitor training before flowering (budburst).	☐
Begin monitoring from flowering.	☐
Maintain and provide monitoring records to the farm manager.	☐
ON-FARM SPRAY PROGRAM	
Choose and implement mitigation options to control Cytosphaera mangiferae (complete fungicide certification template)	☐
Ensure fruit complies with US EPA pesticide MRLs.	☐
Conduct chemical residue analysis to support compliance.	☐
PACKAGING	
Use and order approved packaging options.	☐
Use and order nets from Profresh.	☐
Design and check compliance of carton labels.	☐
LOGISTICS	
Order airfreight approved temperature data loggers (if using).	☐
Liaise and regularly update your transporter, ripener, Steritech, freight forwarder and US importer/customer.	☐