

A review and update of the Quality Banana Approved Nursery (QBAN) Compliance Scheme

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Tasmanian Quality Assured Inc

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HAL project BA08026 (November 2009)

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- Tony Heidrich – CEO, Australian Banana Growers' Council
- Sharon Hamill – Principal Scientist, Queensland Primary Industries and Fisheries (QPIF), Department of Employment, Economic Development and Innovation (DEEDI)
- Dr John Thomas – Senior Principal Plant Pathologist, Queensland Primary Industries and Fisheries (QPIF), Department of Employment, Economic Development and Innovation (DEEDI)
- Peter Newley – District Horticulturalist, NSW Department of Industry and Investment
- Grant Telford – former Principal Policy Officer, Biosecurity Queensland, Department of Employment, Economic Development and Innovation (DEEDI)
- Dr Suzy Perry – Principal Scientist (Plant Biosecurity), Biosecurity Queensland, Department of Employment, Economic Development and Innovation (DEEDI)

In addition to the steering committee, a number of industry stakeholders were involved in reviewing and commenting on the updated QBAN Compliance Scheme, including Steve Lavis (Mission Beach Tissue Culture), Frank Benson (Benson Micro Propagation) and Natasha Marocik (Lowes Tissue Culture).

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Media summary

The primary purpose of the Quality Banana Approved Nursery (QBAN) scheme is to prevent the introduction, establishment, and spread of plant pests and diseases that may affect banana plants.

Horticulture Australia Limited has funded a review and update of the QBAN scheme. The primary reason for this review and update was to further strengthen the existing QBAN scheme by developing a standard aimed at assisting tissue culture laboratories and nurseries produce disease-free banana plants and plantlets.

A number of key industry organisations were involved in the review including the Department of Industry and Investment NSW, Queensland Primary Industries and Fisheries, the Australian Banana Growers' Council and representatives from QBAN facilities.

A series of documents were developed including:

- QBAN scheme manual
- Written protocols to outline key roles and responsibilities
- Forms to monitor compliance to the scheme requirements
- Self assessment and internal audit checklists to verify compliance to the QBAN scheme

As a result of the review, a number of recommendations have been made that, if developed and implemented, may enhance adoption of the QBAN scheme. These recommendations include:

- The development of a QBAN technical committee and implementation plan
- The development of clear training materials to assist with implementation
- A review of existing banana movement regulations

The updated QBAN scheme provides clear guidelines for establishments involved in the commercial production of tissue culture plantlets. This will ensure the implementation of a rigorous and transparent system aimed at preventing the spread of priority plant pests and diseases of banana across Australia.

Abbreviations and acronyms

ABGC	Australian Banana Growers' Council
CEO	Chief Executive Officer
DEEDI	Department of Employment, Economic Development and Innovation
HACCP	Hazard Analysis Critical Control Point. An internationally recognised risk assessment method commonly used to manage food safety and quality.
HAL	Horticulture Australia Limited
NSW	New South Wales
QA	Quality Assurance
QBAN scheme	Quality Approved Banana Nursery scheme
QLD	Queensland
QPIF	Queensland Primary Industries and Fisheries, a division of the Department of Employment, Economic Development and Innovation.
VIC	Victoria
WA	Western Australia

Introduction

Background

The QBAN scheme was originally developed in 1994 as an initiative of the National Banana Plant Health Improvement project supported by the Australian Banana Growers' Council (ABGC), Banana Industry Committee (NSW), the Banana Industry Protection Board (QLD), Horticulture Australia Limited, NSW Department of Agriculture and Queensland Department of Primary Industries.

Since that time, the QBAN scheme has been managed by Queensland Primary Industries and Fisheries in consultation with the banana industry. In 2008, Queensland Primary Industries and Fisheries made the decision to hand over management responsibility of the scheme to the Australian Banana Growers' Council, the Australian banana industry's peak national organisation.

As part of the handover of the scheme, a review was conducted. This review determined that the scheme no longer met the needs of stakeholders, particularly regulatory authorities. The Australian Banana Growers' Council applied for funding to Horticulture Australia Limited to update the scheme.

In 2009, Horticulture Australia Limited funded a review and update of the QBAN scheme. A number of organisations were involved in the update of the scheme, including the Department of Industry and Investment NSW, Queensland Primary Industries and Fisheries (part of the Department of Employment, Economic Development and Innovation) and the Australian Banana Growers' Council.

The scheme was to be re-written to comply with the requirements of the international quality management standard ISO 9001:2000.

Whilst the original QBAN scheme has been judged an outstanding success in achieving its core objectives, it has fallen behind industry best practice in terms of documented protocols and procedures.

Objectives

1. The development of an ISO 9001:2000 compliant banana tissue culture certification scheme.
2. Adoption of the QBAN scheme by all establishments involved in the commercial production of tissue culture plantlets.
3. Acceptance by state regulatory authorities that QBAN certification denotes freedom from banana viruses and plant movement certificates can be issued on that basis.

Scoping study

Prior to the project start, a scoping study was organised by the Australian Banana Growers' Council for Tundra Howe in January 2009. The aim of the scoping study was to introduce the project manager to a number of people involved in the QBAN scheme, and allow the project manager to see in person how the scheme worked. Visits were made to:

- Dr John Thomas (QPIF Virology Laboratory) to discuss the process of indexing.
- Sharon Hamill (QPIF Maroochy Research Station) to discuss banana tissue culture.
- Ceri Pearce, Aaron Russell and Rhiannon Evans (QPIF Centre for Wet Tropics Agriculture) to discuss the collection of banana plant material and the issuing of QBAN clone numbers.

Methodology

Formation of the steering committee

The project was developed by Tundra Howe, TQA Australia and Tony Heidrich, Australian Banana Growers' Council. The project was managed by Tundra Howe. To ensure the steering committee had the right combination of technical skills and experience with the QBAN scheme, Queensland Primary Industry and Fisheries, NSW Department of Industry and Investment and Biosecurity Queensland were all approached by the Australian Banana Growers' Council to be involved.

The initial steering committee members were:

- Tony Heidrich – CEO, Australian Banana Growers' Council.
- Sharon Hamill – Principal Scientist, Queensland Primary Industries and Fisheries
- Dr John Thomas – Senior Principal Plant Pathologist, Queensland Primary Industries and Fisheries
- Peter Newley – District Horticulturalist, NSW Department of Industry and Investment
- Grant Telford – former Principal Policy Officer, Biosecurity Queensland, Department of Employment, Economic Development and Innovation (DEEDI)

During the project, Grant Telford left his position with Plant Biosecurity. Dr Suzy Perry, a Principal Scientist with Biosecurity Queensland took his place.

Initial steering committee meeting

The first of two planned steering committee meetings was held on July 14-15. In addition to the steering committee members, John Tyas from Horticulture Australia Limited was present. The aim of this initial meeting was to communicate the desired outcomes of the project to the steering committee, and to begin the review process by developing a HACCP plan. See attachment 1 for the agenda of this meeting.

The steering committee met at the Australian Banana Growers' Council office in Brisbane. After discussing the aims and outcomes of the project, the steering committee began the process of developing a customised HACCP plan for the QBAN scheme. See attachment 2 for the QBAN HACCP plan.

The first step in this process was to determine the scope and purpose of the QBAN HACCP plan. The scope and purpose of a HACCP Plan should describe what the plan will cover, and what the purpose of the system is. The following scope and purpose was developed by the steering committee.

Scope

“This HACCP Plan applies to the introduction and movement of tissue cultured banana plantlets and banana plants around Australia by accredited QBAN (Quality Banana Approved Nursery) scheme facilities.”

Purpose

“The purpose of the QBAN system is to prevent the introduction, movement and spread of notifiable pests and diseases of bananas by using only tested and registered tissue culture material from QBAN accredited facilities.”

Once the scope and purpose were developed, the steering committee developed a flow chart. This flow chart described the steps involved in the QBAN scheme. The flow chart assisted the steering committee to conduct a hazard analysis of all the steps in the process. In turn, the hazard analysis helped shape the protocols that would need to be put in place to control the hazards identified in the analysis.

Development of draft HACCP plan

After the steering committee meeting, the draft HACCP plan was completed and emailed out to all members of the steering committee. Members were encouraged to review the HACCP plan, and make comment. A number of comments were received, with the HACCP plan updated to include recommendations from the steering committee members.

Development of scheme manual

The initial project brief required that the QBAN scheme be upgraded to allow compliance to ISO 9001:2000. ISO 9001:2000 is an internationally recognised quality management standard used as a framework to guide an organisation toward improved performance. A number of concerns were raised by the project manager, steering committee members and stakeholders regarding the requirements of the ISO standard. The major concerns raised were:

- Increased cost of compliance. The scheme and participants would face increased external auditing requirements to gain certification to the ISO standard. This would lead to increased costs, and may have led to decreased participation in the scheme.
- Unnecessary criteria. In order to be certified to the ISO standard, a number of requirements would need to be met by both the QBAN Administrator, and the QBAN scheme participants. These requirements do not contribute to the attainment of QBAN scheme goals, but are simply included to meet the requirements of the ISO standard. The concern was that participants would resist these increased requirements, which again, may have led to decreased participation.

These concerns were discussed with Queensland Primary Industries and Fisheries. The decision was made that the Australian Banana Growers' Council were not required to have the QBAN scheme certified to any third party standard, on the condition that the Australian Banana Growers' Council:

- develop a Quality Management System (QMS) consistent with the requirements of the QBAN scheme; and
- enter into an agreement with Queensland Primary Industries and Fisheries allowing for the Australian Banana Growers' Council to take on the QBAN functions. A condition of the agreement will be that the Australian Banana Growers' Council undertakes the QBAN functions in accordance with the documented and implemented QMS; and
- allow Queensland Primary Industries and Fisheries to regularly audit the Australian Banana Growers' Council against the documented QMS to verify compliance with the standard and implementation of the system.

As a result of these requirements, a scheme manual was developed. This manual includes all management requirements of the QBAN scheme including a quality policy and a number of support programs. These support programs include auditing, corrective action, management review and training. See Attachment 3 for the QBAN scheme manual.

Development of protocols and forms

The next step in the process was to develop a series of protocols. These protocols outline the roles and responsibilities of all participants in the QBAN scheme. Draft protocols were distributed to all members of the steering committee for review and comment. Five protocols have been developed. These protocols are:

1. QP01 – QBAN Administrator
2. QP02 – QBAN Inspector
3. QP03 – QBAN Laboratory
4. QP04 – QBAN Nursery
5. QP05 – Movement and transport

To support the HACCP plan and QBAN protocols, a series of forms were developed. These forms will be used to record information relevant to the QBAN scheme, and will assist in auditing the QBAN scheme. See Attachment 4 for protocols and forms.

Steering committee meeting 2

On September 8 and 9, the second steering committee meeting was held. The main purpose of this steering committee meeting was to review the draft protocols. Each protocol was reviewed in detail, with changes being made during the meeting. The agenda for the meeting also included a discussion about implementation of the QBAN scheme. This discussion was not held, as the meeting was spent on reviewing and adjusting the protocols.

Participant review

Upon completion, QBAN participants were given the opportunity to read and make comment on the draft protocols. A number of participants responded, and the protocols were distributed to this group. Participants were requested to review the protocols in preparation for a meeting to be held in Brisbane in October. A number of participants submitted a response – these were included in the agenda for the meeting. See Attachment 1 for agenda.

The meeting was held in Brisbane on the 21st October. Representatives from three QBAN facilities were present at the meeting. A number of other QBAN participants had reviewed and emailed through their comments on the protocols. The purpose of the meeting was to allow the QBAN participants to raise specific issues they had with the protocols. The meeting also gave the steering committee the opportunity to explain the reasons behind the requirements. A number of changes were made to the protocols as a result of the meeting.

Development of internal audit checklists

Internal audit checklists have been developed for the tissue culture laboratory, nursery and scheme manual. These internal audit checklists will be used by:

- QBAN participants for an annual self-assessment of their operation against the QBAN scheme manual and protocols
- QBAN Administrator for an annual internal audit of each QBAN facility against the relevant QBAN protocol and scheme manual
- QBAN Administrator for an annual self-assessment against the relevant protocols and the QBAN scheme manual, prior to external audit.

The internal audit checklists will be reviewed after the annual review of the QBAN scheme manual and protocols to ensure they remain up-to-date. See Attachment 5 for internal audit checklists.

Conclusion

While the project aims have remained the same, some of the outputs are slightly different to what was anticipated at the beginning of the project.

It is not anticipated that the scheme will be certified to ISO 9001:2000 in the near future. This is due to a number of concerns being raised by participants in this program including increased cost of compliance and the implementation of unnecessary criteria – requirements put in place simply to meet ISO 9001:2000. At some point in the future, the relevant plant health authorities or the banana industry may require that the scheme become certified to ISO, or an equivalent third-party certified standard. The QBAN scheme has been written to allow for this development if and when the time comes.

The relevant state regulatory authorities are in the process of reviewing the scheme. Once the scheme has their endorsement, the implementation of the scheme to new and existing participants can begin.

The primary reason for the review and update of the QBAN scheme was to deliver a rigorous and transparent system that can be adopted by all establishments involved in the commercial production of tissue culture plantlets. For the QBAN system to be fully embraced by these businesses, it must be adequately resourced and supported by all individuals and organisations that make up the banana industry.

Recommendations

1. Development of a QBAN technical committee

A QBAN technical committee should be developed. The committee should be made up of representatives from state regulatory bodies, the Australian Banana Growers' Council, and other relevant industry representatives. It would also be beneficial to have a representative from a QBAN facility, to ensure a commercial perspective is brought to the deliberations of the technical committee.

On at least an annual basis, this committee will be responsible for:

- reviewing the QBAN scheme manual against relevant plant health and biosecurity regulations
- reviewing the QBAN HACCP plan
- reviewing the QBAN protocols and forms

Essentially, this committee will be the 'brains trust' for all QBAN related questions or concerns. They will also make decisions on applications from new participants and review the performance of existing participants.

2. Development of an implementation plan

When any standard or scheme is updated, communication on the changes needs to be provided to all participants.

An implementation plan should be developed and must include:

- Communication to existing participants
- Communication to the wider industry
- Formal adoption of the QBAN scheme by the relevant plant health authorities
- Training for participants in the updated scheme
- Timeframes for compliance to the scheme

3. Development of training materials

Using the QBAN scheme manual and other QBAN documents, a training package could be developed for all new participants into the QBAN scheme. In addition to including all the relevant scheme requirements, this training package would educate new participants on the background and the main objectives of the scheme.

The development of these training materials would ensure that the training of participants is consistent in its approach, and covers all the requirements of the QBAN scheme.

In addition, training materials should be developed for QBAN Inspectors. It is proposed that these inspectors do not necessarily need to be plant health inspectors, but would

need to be trained in the specifics of banana plant inspection and collection. Assistance from the relevant plant health authorities would be required to ensure the training meets all regulatory requirements, as well as all QBAN requirements.

4. Review of movement protocols

Based on the updated QBAN scheme, the relevant plant health authorities should be approached to review all existing movement regulations. Current movement protocols do not 'reward' growers for participation in the scheme. Movement protocols should be reviewed, with a view to streamlining these protocols for those participants that are involved in the QBAN scheme.

Attachments

Attachment 1 – Agendas for project meetings

Agenda

BA08026 –Steering committee meeting

**Meeting 1 – 14-15 July 2009
Australian Banana Growers' Council office**

14 July 2009 – 10.00am-4.00pm

<i>Time</i>	<i>Item</i>	<i>Who</i>
10:00am	WELCOME – TEA / COFFEE	
10:15am	Overview of the project - A review and update of the Quality Banana Approved Nursery (QBAN) Compliance Scheme	Tundra and Tony
10:45am	Discussion of desired outcomes of: a. Project b. Steering committee meeting	All
11.00am	Discussion of current system and identified deficiencies	All
11.15am	Introduction to HACCP	Tundra
11.30am	Determine scope and purpose of QBAN system	All
11.45am	Review process flow and identify additional steps, inputs and outputs	All
12.15pm	LUNCH	
1.00pm	Review hazard analysis and: a. Determine applicable hazards and causes for each step b. Determine significance of each hazard c. Document current / proposed measures to eliminate or control hazards d. Establish critical control points (CCPs) and control points (CPs)	All
2.30pm	AFTERNOON TEA	
2.45pm	Continuation of hazard analysis review	All
4:00pm	CLOSE	

15 July 2009 – 9.00am-2.30pm

<i>Time</i>	<i>Item</i>	<i>Who</i>
9.00am	Review Day 1 outcomes	All
9:15am	Review the HACCP table and: a. Determine critical limits for each critical control point b. Establish monitoring of each critical limit c. Document corrective actions if non-conformance to procedures occur	All
10.30am	MORNING TEA	
10:45am	Discuss support programs and additional protocols required	All
12.15pm	LUNCH	
1.00pm	Forward planning a. implementation and training for existing / new participants b. auditing	All
2.30pm	CLOSE	

Agenda

BA08026 –Steering committee meeting

Meeting 2 – 8-9 September 2009 Australian Banana Growers' Council office

8 September 2009 – 10.00am-4.00pm

<i>Time</i>	<i>Item</i>	<i>Who</i>
10:00am	WELCOME – TEA / COFFEE	
10:15am	Review project to date, and outline plan for steering committee meeting	Tundra
10:45am	Review protocols: • QBAN Administrator protocol • QBAN Inspector protocol • Tissue culture laboratory protocol • Nursery protocol • Movement and transport protocol	All
12.15pm	LUNCH	
1.00pm	Continue review of protocols	All
2.30pm	AFTERNOON TEA	
2.45pm	Review system manual	All
5.00pm	CLOSE	

9 September 2009 – 8.30am-2.00pm

<i>Time</i>	<i>Item</i>	<i>Who</i>
8.30am	Review of movement protocols	
10.00am	Internal and external auditing	All
10.30am	MORNING TEA	
10:45am	Forward planning c. Participant review d. Implementation e. Training for existing / new participants	All
12.30pm	LUNCH	
1.00pm	Wrap up and review action plan	All
2.00pm	CLOSE	

Agenda – Stakeholder and participant meeting

Project name: BA08026 – A review and update of the Quality Banana Approved Nursery (QBAN) Compliance Scheme

Date / time: 21 October 2009 – 9.30am-3.00pm

Location: DPI&F Entomology Building, 80 Meiers Rd, Indooroopilly

<i>Time</i>	<i>Item</i>	<i>Discussion led by</i>
9.30am	WELCOME – TEA / COFFEE	
9.45am	Background and current status of the project	Cameron MacKay Tundra Howe
10.15am	Establishing priority pests and diseases	Cameron MacKay
10.30am	ICA verses QBAN	Tony Heidrich
10.45am	QBAN Administrator protocol review – specific issues to discuss: - Approval of collection – defined distances (element 4.1.3) - Expected timeframe for completion of indexing (element 4.6) - Expected timeframe for communicating QBAN clone number to tissue culture laboratory (element 4.8)	Group discussion
11.00am	MORNING TEA	
11:10am	QBAN Inspector protocol review – specific issues to discuss: - Can a representative of the laboratory / nursery be a QBAN Inspector? - Symptoms of ill-health (element 4.4) - Inspection of suckers (element 4.6.4) - Proposed change – Grouping suckers into lots of 10, rather than keeping suckers from each mother plant separate	Group discussion
12:00pm	Tissue culture laboratory protocol review – specific issues to discuss: - Laboratory design requirements (element 3.5) - Laboratory process requirements (element 3.6) - Initiation and establishment of banana cultures (element 4.3) - Waste disposal (element 4.6)	Group discussion
12.45pm	LUNCH	
1:15pm	Nursery protocol review – specific issues to discuss: - Permit to plant - Material traceability (element 3.6) - Nursery design requirements (element 3.4) - Water supply (element 4.4) - Waste disposal and procedures (element 4.6)	Group discussion
2:00pm	Forward planning f. Training for existing / new participants g. Implementation	Tony Heidrich Tundra Howe
2.30pm	Wrap up and review action plan	Tony Heidrich
3.00pm	CLOSE	

Quality Banana Approved Nursery (QBAN) scheme

QBAN HACCP Plan



Scope

This HACCP Plan applies to the introduction and movement of tissue cultured banana plantlets and banana plants around Australia by accredited QBAN (Quality Banana Approved Nursery) scheme facilities.

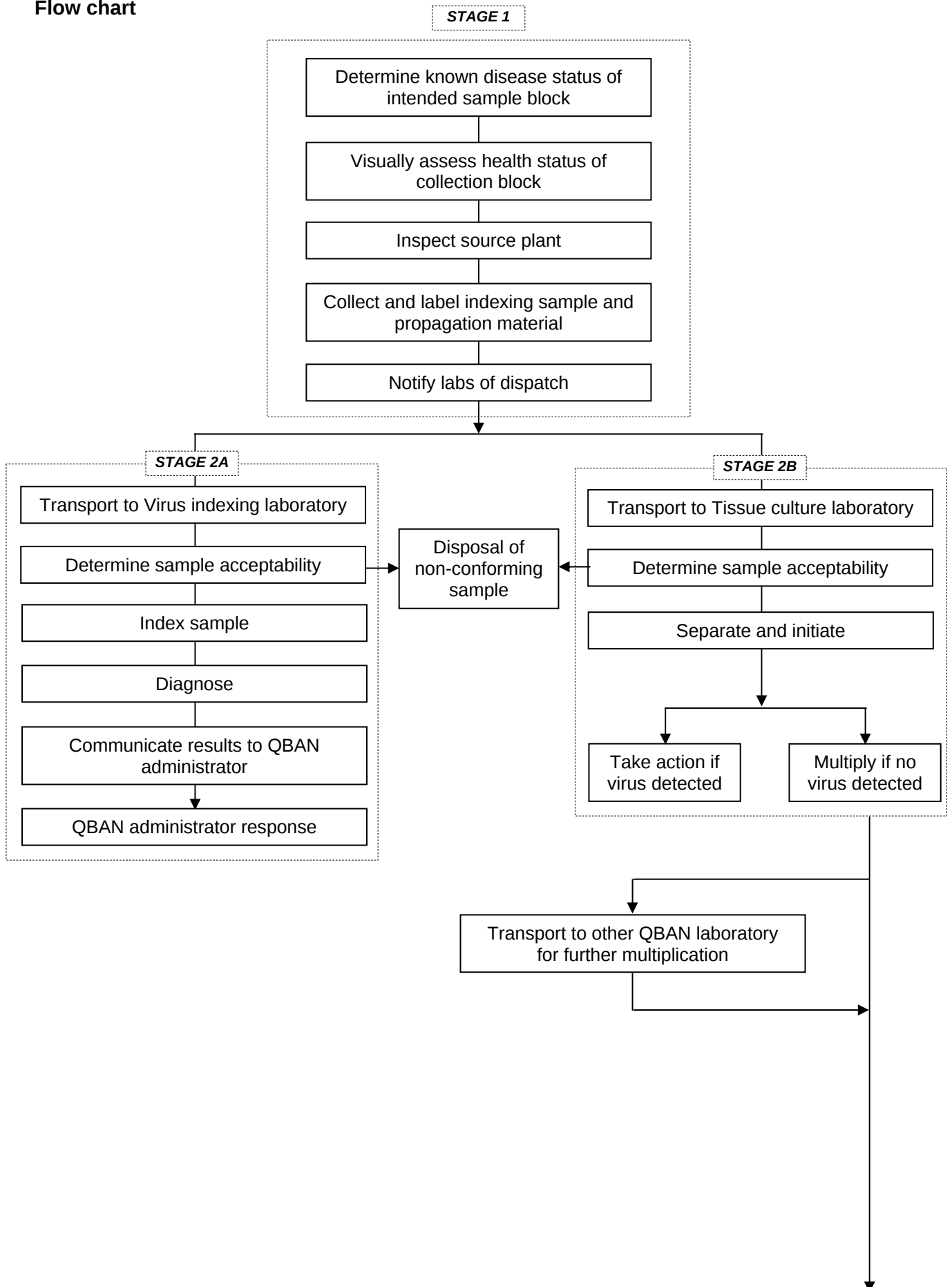
Purpose

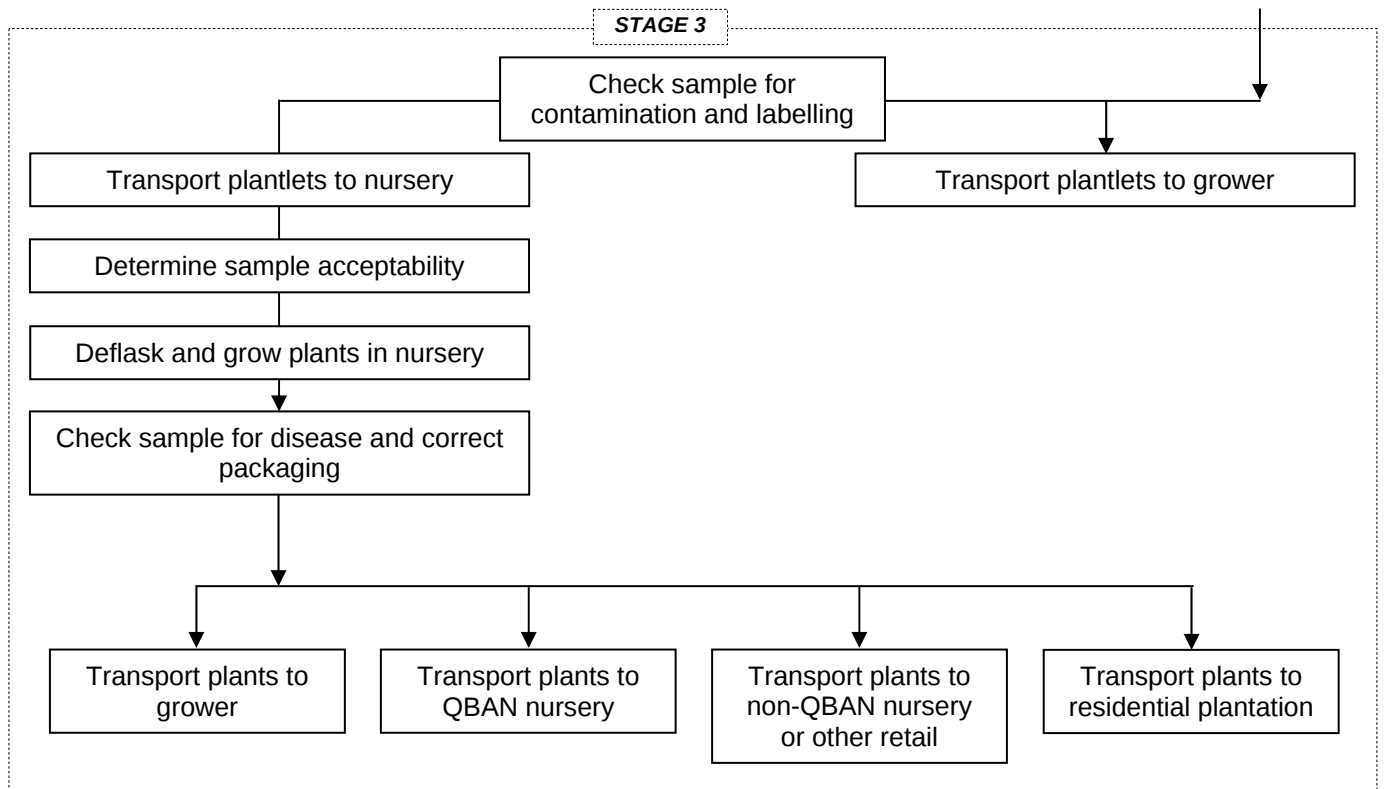
The purpose of the QBAN system is to prevent the introduction, movement and spread of notifiable pests and diseases of bananas by using only tested and registered tissue culture material from QBAN accredited facilities.

Method

- To assist in analysing the hazards associated with the QBAN Compliance Scheme, a flow chart has been developed that identifies all steps in the process.
- A hazard analysis has been completed by members of the steering committee. For each step in the process, hazards have been identified and documented.
- The significance of each hazard has been assessed, and control measures for each hazard have been established.
- Records for monitoring critical control points (CCPs) and critical quality points (CQPs) have been established.
- The hazard analysis will be reviewed on an annual basis. This review will be coordinated by the QBAN Administrator.
- Records of the review will be kept by the QBAN Administrator.

Flow chart





Hazard analysis

Step	Hazard	Cause	Severity	Likelihood	Significance	Control measure	Q1	Q2	Q3	Q4	Q5	CCP, CQP, QP, CP?
Determine known disease status of intended sample block	Biosecurity	Unknown disease status	1	C	4	- Written advice provided by regulating authority - Buffer zones established - QBAN Administrator protocol implemented - QBAN Administrator trained to protocol	Y	Y	Y			CCP
		Incorrect determination of disease status	1	D	7	- Written advice provided by regulating authority - Data integrity - QBAN Administrator protocol implemented - QBAN Administrator trained to protocol	Y	Y	Y			CCP
		Incorrect source location	1	D	7	- Real property description or equivalent system utilised - QBAN Administrator protocol implemented - QBAN Administrator trained to protocol	Y	Y	Y			CCP
		No determination made	1	E	11	- QBAN administrator to authorise dig with approved inspector or authorised person - QBAN Administrator protocol implemented - QBAN Administrator trained to protocol	N					CP
Visually assess health status of collection block	Biosecurity	- Misdiagnosis of symptoms - Symptomless plants	1	B	2	- Inspector protocol implemented - Inspector or authorised person trained to protocol	Y	Y	Y			CCP
		Failure to recognised diseased plants	1	C	4	- Inspector protocol implemented - Inspector or authorised person trained to protocol	Y	Y	Y			CCP
		- Introduction of disease through lack of decontamination and hygiene - No assessment completed	1	E	11	- Decontamination occurs before entering property - Good hygiene protocols followed whilst on property - Inspector protocol implemented - Inspector or authorised person trained to protocol	N					CP
Inspect source plant	Biosecurity	- Misdiagnosis of symptoms - Symptomless plants	1	B	2	- Inspector protocol implemented - Inspector or authorised person trained to protocol	Y	Y	Y			CCP
		Failure to recognised diseased plants	1	C	4	- Inspector protocol implemented - Inspector or authorised person trained to protocol	Y	Y	Y			CCP
		Inadequate inspection of source plant	1	D	7	- Inspector protocol implemented - Inspector or authorised person trained to protocol	Y	Y	Y			CCP

Step	Hazard	Cause	Severity	Likelihood	Significance	Control measure	Q1	Q2	Q3	Q4	Q5	CCP, CQP, QP, CP?
Collect and label indexing sample and propagation material	Biosecurity	• Collection of diseased material	1	B	2	- Inspector protocol implemented - Inspector or authorised person trained to protocol	Y	Y	N	Y	Y	CP
		• Introduction of disease through lack of decontamination and hygiene	1	D	7	- Decontamination occurs before entering property - Good hygiene protocols followed whilst sampling - Inspector protocol implemented - Inspector or authorised person trained to protocol	Y	Y	N	Y	N	CCP
		• Identification on indexing sample, propagation material and mother plant do not match	1	D	7	- Inspector protocol implemented - Inspector or authorised person trained to protocol	Y	Y	N	Y	N	CCP
		- Incorrect sampling for indexing - No or incorrect labelling of indexing sample , propagation material and mother plant - Movement and introduction of disease to propagation material and property	1	E	11	- Inspector protocol implemented - Inspector or authorised person trained to protocol	N					CP
		• Clone number prematurely issued	1	E	11	- Inspector protocol implemented - Inspector or authorised person trained to protocol - QBAN administrator protocol implemented - QBAN administrator trained to protocol - Access to QBAN database limited	N					CP
	Quality / system	• Degradation of samples	3	C	13	- Inspector protocol implemented - Inspector or authorised person trained to protocol	N					QP
		• Non-viable propagation material collected	4	C	18	- Inspector protocol implemented - Inspector or authorised person trained to protocol	N					QP
Notify labs of dispatch	Quality / system	• No or delayed notification	4	E	23	- Inspector protocol implemented - Inspector or authorised person trained to protocol	N					QP
Transport to Virus indexing laboratory and Tissue culture laboratory (Stage 2A and 2B)	Quality / system	• Sample lost or damaged in transport	3	D	17	• Transport protocol implemented	N					CP
Determine sample acceptability (Stage 2A and 2B)	Quality / system	• Sample degraded and unsuitable	3	B	9	- Lab protocol developed - Approved supplier utilised and audited annually against Lab protocol - Tissue culture lab protocol implemented - Relevant workers trained to protocol	Y	Y	N	Y	Y	QP

Step	Hazard	Cause	Severity	Likelihood	Significance	Control measure	Q1	Q2	Q3	Q4	Q5	CCP, CQP, QP, CP?
Determine sample acceptability (Stage 2A and 2B)	Quality / system	Integrity of sample compromised	3	D	17	- Lab protocol developed - Approved supplier utilised and audited annually against Lab protocol - Tissue culture lab protocol implemented - Relevant workers trained to protocol	N					QP
Index sample	Biosecurity	Disease not identified by testing (lack of sensitivity or new strain)	1	C	4	- Lab protocol developed - Approved supplier utilised and audited annually against Lab protocol	Y	Y	Y			CCP
		- Testing failure - Sample mix-up - Incorrect or incomplete test	1	D	7	- Lab protocol developed - Approved supplier utilised and audited annually against Lab protocol	Y	Y	Y			CCP
	Quality / system	Loss of integrity whilst sample at lab	3	D	17	- Lab protocol developed - Approved supplier utilised and audited annually against Lab protocol	N					QP
Diagnose	Biosecurity	Incorrect diagnosis	1	D	7	- Lab protocol developed - Approved supplier utilised and audited annually against Lab protocol	Y	Y	Y			CCP
Communicate results to QBAN Administrator	Quality / system	Results not communicated within 4 weeks	3	B	9	- Lab protocol developed - Approved supplier utilised and audited annually against Lab protocol	Y	Y	N	Y	N	QCP
		No notification of identified disease to relevant persons	4	D	21	- Lab protocol developed - Approved supplier utilised and audited annually against Lab protocol	N					QP
QBAN Administrator response	Biosecurity	Clone number incorrectly issued	1	D	7	- QBAN administrator protocol implemented - QBAN administrator trained to protocol	Y	Y	Y			CCP
	Quality / system	Data integrity lost	2	C	8	- QBAN administrator protocol implemented - QBAN administrator trained to protocol	Y	Y	N	Y	N	QCP
		No or incorrect action taken	2	D	12	- QBAN administrator protocol implemented - QBAN administrator trained to protocol	N					QP
		Delayed actions	3	C	13	- QBAN administrator protocol implemented - QBAN administrator trained to protocol	N					QP
Separate and initiate	Biosecurity	Fungal contamination not monitored during initiation	1	C	4	- Tissue culture lab protocol implemented - Relevant workers trained to protocol	Y	Y	N	Y	N	CCP

Step	Hazard	Cause	Severity	Likelihood	Significance	Control measure	Q1	Q2	Q3	Q4	Q5	CCP, CQP, QP, CP?
		• Cross contamination within or between batches during culture initiation • Mislabelling within or between batches during culture initiation • Unindexed tissue culture not held separately • Separation not maintained • Tissue culture not uniquely labelled or not labelled • Cross-contamination through subculture process • Disease introduced by laboratory producing other plant genera that also harbours banana pathogens • Introduction of disease to field from waste plant material	1	D	7	• Tissue culture lab protocol implemented • Relevant workers trained to protocol	Y	Y	N	Y	N	CCP
		• Lab security not maintained	2	D	12	• Tissue culture lab protocol implemented • Relevant workers trained to protocol	N					CP
Take action if virus detected	Biosecurity	• Plants not held securely • Plants not destroyed • Cross-contamination	1	D	7	• Tissue culture lab protocol implemented • Relevant workers trained to protocol	Y	Y	Y			CCP
		• Incorrect plants destroyed	3	D	17	• Tissue culture lab protocol implemented • Relevant workers trained to protocol	N					CP
Multiply if no virus detected	No hazards identified											
Transport plantlets to other QBAN laboratory, to nursery and to growers	Biosecurity	• Move before clone number issued	1	E	11	• Tissue culture lab protocol implemented • Relevant workers trained to protocol	N					CP
Determine sample acceptability	Quality / system	• Sample degraded and unsuitable	3	B	9	• Nursery protocol implemented • Nursery workers trained to protocol	Y	Y	N	Y	Y	QP
		• Integrity of sample compromised	3	D	17	• Nursery protocol implemented • Nursery workers trained to protocol	N					QP

Step	Hazard	Cause	Severity	Likelihood	Significance	Control measure	Q1	Q2	Q3	Q4	Q5	CCP, CQP, QP, CP?
Deflask and grow plants in nursery	Biosecurity	- Sample is not checked for fungal contamination - Disease introduced to plantlets in nursery via potting media or water source - Disease introduced by inappropriate practices and infrastructure (e.g. growing plants on ground). - Disease introduced to nursery by poor operator hygiene - Disease introduced by close proximity to neighbouring banana plants - Disease introduced by nursery located in diseased area. - Disease introduced by nursery producing other plant genera that also harbour banana pathogens	1	D	7	- Nursery protocol implemented - Nursery workers trained to protocol - Annual review of disease presence for location of nursery (e.g. If BBTV moves into same location as nursery)	Y	Y	N	Y	N	CCP
Transport of plants to grower, QBAN nursery, non-QBAN nursery or other retail customer and residential plantation	Quality / system	Contamination occurs in transport (across quarantine zones)	1	E	11	Transport protocol implemented	N					QP
		Loss of packaging integrity (when transported across quarantine zones)	3	C	17	Transport protocol implemented	N					QP

Risk Matrix

Severity (Consequences)

1. Spread of regulated disease
2. Spread of non-regulated disease / QBAN scheme integrity compromised
3. Needless destruction of materials / mitigation measures required
4. Customer dissatisfaction / QBAN scheme integrity not compromised
5. No biosecurity issue / Not of commercial significance

Likelihood (Frequency)

- A. Common occurrence
- B. Known to occur
- C. Could occur
- D. Not expected to occur
- E. Practically impossible

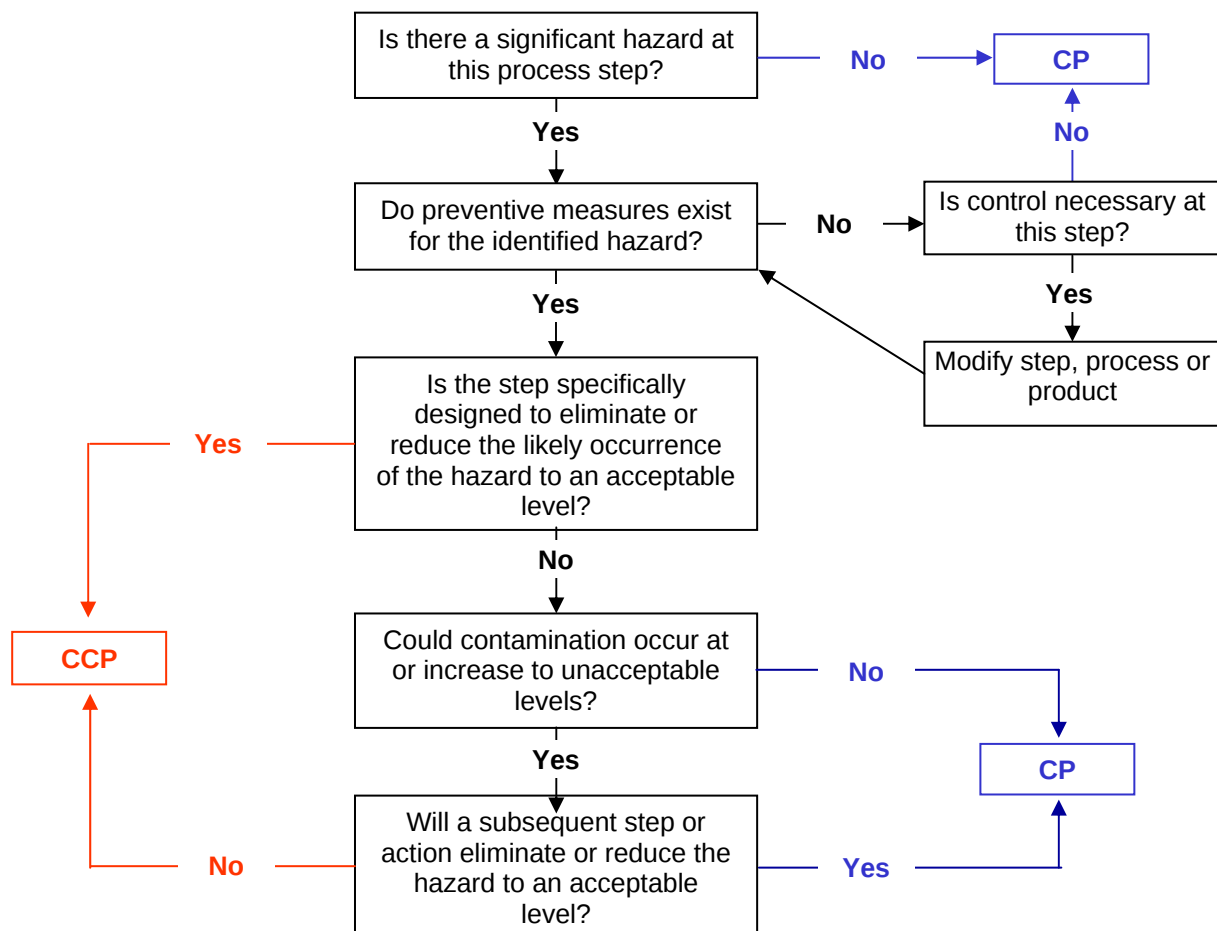
Significance Matrix

Severity	Likelihood				
	A	B	C	D	E
1	1	2	4	7	11
2	3	5	8	12	16
3	6	9	13	17	20
4	10	14	18	21	23
5	15	19	22	24	25

Assessment of Hazard Significance

- A value of 1-10 indicates a significant issue and control measures must be put into place. These hazards may represent Critical Control Points (CCPs) or Critical Quality Points (CQPs) and should be taken through the Decision Tree.
- A value over 10 indicates an issue that is less significant. Control measures should be put into place. These hazards represent Control Points, and there is no requirement to take this hazard through the decision tree.

Decision Tree



CCP / CQP monitoring

Step	Hazard	Cause	CCP or CQP	Monitoring records / documents
Determine known disease status of intended sample block	Biosecurity	- Unknown disease status - Incorrect determination of disease status - Incorrect source location	CCP	- QBAN Inspector protocol - Training records - Collection Request
Visually assess health status of collection block	Biosecurity	- Misdiagnosis of symptoms - Symptomless plants - Failure to recognise diseased plants	CCP	- QBAN Inspector protocol - Training records - Inspection Checklist
Inspect source plant	Biosecurity	- Misdiagnosis of symptoms - Symptomless plants - Failure to recognise diseased plants - Inadequate inspection of source plant	CCP	- QBAN Inspector protocol - Training records - Inspection Checklist
Collect and label indexing sample and propagation material	Biosecurity	- Introduction of disease through lack of decontamination and hygiene - Identification on indexing sample, propagation material and mother plant do not match	CCP	- QBAN Inspector protocol - Training records - Inspection Checklist
Index sample	Biosecurity	- Disease not identified by testing (lack of sensitivity or new strain) - Testing failure - Sample mix-up - Incorrect or incomplete test	CCP	- Tissue culture laboratory protocol - Approved supplier specification - Approved supplier list and inspection
Diagnose	Biosecurity	Incorrect diagnosis	CCP	- Tissue culture laboratory protocol - Approved supplier specification - Approved supplier list and inspection - Indexing results
QBAN Administrator response	Biosecurity	Clone number incorrectly issued	CCP	- Indexing results - QBAN Administrator protocol - Training records
	Quality / system	Data integrity lost	QCP	- Indexing results - QBAN Administrator protocol - Training records

Step	Hazard	Cause	CCP or CQP	Monitoring records / documents
Separate and initiate	Biosecurity	• Fungal contamination not monitored during initiation • Cross contamination within or between batches during culture initiation • Mislabelling within or between batches during culture initiation • Unindexed tissue culture not held separately • Separation not maintained • Tissue culture not uniquely labelled or not labelled • Cross-contamination through subculture process • Disease introduced by laboratory producing other plant genera that also harbours banana pathogens • Introduction of disease to field from waste plant material	CCP	• Tissue culture laboratory protocol • Training records
Take action if virus detected	Biosecurity	• Plants not held securely • Plants not destroyed • Cross-contamination	CCP	• Tissue culture laboratory protocol
Deflask and grow plants in nursery	Biosecurity	• Sample is not checked for fungal contamination • Disease introduced to plantlets in nursery via potting media or water source • Disease introduced by inappropriate practices and infrastructure (e.g. growing plants on ground). • Disease introduced to nursery by poor operator hygiene • Disease introduced by close proximity to neighbouring banana plants • Disease introduced by nursery located in diseased area. • Disease introduced by nursery producing other plant genera that also harbour banana pathogens	CCP	• Nursery protocol • Training records



QBAN scheme manual

Definitions

Term	Definition
Approved supplier	A supplier who is approved by the business to supply materials and services that meet agreed specifications.
Audit	A systematic examination of compliance, to determine whether practices that have been introduced are being followed and to ensure that the system achieves its aims.
Australian Banana Growers' Council	ABGC – Australian banana industry's peak national agripolitical organisation established in February 1961.
Autoclaving	30 minutes at 121° Celsius
Banana	Plants of the genera <i>Musa</i> and <i>Ensete</i> (family Musaceae) used in production of food and fibre or for ornamental purposes. They include plants known as Plantain, abaca and Ensete.
Banana Industry Committee	Statutory body reporting to the NSW Minister for Primary Industries. Now trading as BananasNSW.
Corrective Action Record (CAR)	A written record of an issue, or issues, which must be addressed to demonstrate compliance with this QBAN scheme. CARs may be raised during self assessment, at internal audit, or during routine activities.
Fungi	A member of a large group of eukaryotic organisms that includes microorganisms such as yeasts and moulds, as well as the more familiar mushrooms.
Hazard analysis	The method of identifying potential hazards, assessing the significance of the risk and determining the good agricultural practices that prevent or minimise the risk of the hazard occurring.
Indexing	The testing of banana material for the presence or absence of pathogens
Indexing laboratory	An laboratory set up to test banana material for the presence or absence of pathogens
Multiplication	The act of producing offspring
Non conformance	A failure to comply with the requirements of the QBAN scheme
Nursery	An area in which tissue culture banana plantlets are de-flasked and propagated into pots for field planting.
Priority plant pests and diseases	Any pest or disease that obliges a person who has knowledge or a suspicion of the presence of that pest or disease to notify the relevant State Authority inspector
Plantlet	A tissue cultured banana plant grown in a sterile tissue culture medium in a sealed flask.
Plant	A banana plant produced directly from tissue culture then de-flasked and grown-on in pots.
Propagation material	Suckers or bells from banana plants to be used to generate tissue culture.
Plant pathogens	An organism (generally a bacterium, virus or fungus) that causes disease in plants.
QBAN Administrator	A suitably trained person authorised by the ABGC as responsible for administering and managing the QBAN scheme. Reports to the CEO of the ABGC.
QBAN clone number	A number assigned to all suckers and plantlets derived from a mother plant and that has tested negative to virus.
QBAN Compliance Officer	A suitably trained person representing a QBAN accredited laboratory or nursery responsible for the implementation of the QBAN scheme.

Term	Definition
QBAN database	A database (maintained by the QBAN Administrator) containing all clone numbers issued to a QBAN facility and showing clone numbers assigned to plantlets that have been indexed virus free.
QBAN facility	A banana plant nursery or laboratory accredited under the QBAN scheme by the QBAN Administrator.
QBAN Inspector	A suitably trained person authorised by the QBAN Administrator to collect propagation materials for indexing and multiplication.
Sterilisation	The act of making an object free of live bacteria or other microorganisms (usually by heat or chemical means).

Quality Policy

Australian Banana Growers' Council have formed the Quality Banana Approved Nursery (QBAN) Compliance Scheme ("the QBAN scheme"), to prevent the introduction, movement, and spread of notifiable pests and diseases of bananas by using only tested and registered tissue culture material from QBAN Accredited facilities.

It is intended that this QBAN Scheme Manual ("manual") is mutually recognised Australia wide, and is communicated and understood by all the members of the QBAN scheme. This manual applies to the introduction and movement of tissue cultured banana plantlets and banana plants interstate and intrastate by QBAN facilities.

QBAN is maintained by the QBAN Administrator, and is reviewed annually via management reviews to ensure continuous improvement of the system and compliance with regulatory requirements.

Members of the QBAN scheme commit to following the requirements of the QBAN system manual, and to:

- comply with relevant State/Territory regulations
- assist with ongoing improvement of the system

The relevant authorising legislation in each state is:

- New South Wales – *Plant Diseases Act 1924 No. 38*
- Queensland – *Plant Protection Act 1989* and *Plant Protection Regulation 2002*
- Northern Territory – *Plant Diseases Control Act 2000*
- Western Australia – *Plant Diseases Act 1914* and regulations in 1989
- Tasmania – *Plant Quarantine Act 1997 (Tasmania)*
- South Australia – *Plant Health Act 2009*
- Victoria – *Plant Health and Plant Products Act 1995*

Signature:

Date:

Document control

Document control is critical to the QBAN scheme. Records provide objective evidence of compliance to the QBAN scheme. Obsolete information must be distinguished from current information to prevent tasks being carried out according to superseded specifications or methods.

Document control

Documents may be hard copy or electronic format. Documents are made available to staff at locations where operations essential to the effective functioning of the quality system are performed.

Documents shall be reviewed and approved for adequacy prior to use. All QBAN scheme documents shall be authorised by the QBAN Administrator prior to issue. All documents issued by the QBAN Administrator shall be identified with the date of issue and version number to enable the user to ensure they are using the current document / record. Multi-page documents will be paginated with the total number of pages noted.

Record control

Records may be in hard copy or electronic format. Records maintained to provide objective evidence of the conformity, implementation, and effective operation of the QBAN scheme are defined in each protocol.

Completed records are filed appropriately to enable easy retrieval should it be required, and stored to prevent damage and deterioration in a central location at:

- the QBAN Administrators office; and
- each QBAN facility.

Document and record retention

Obsolete documents will be retained by the QBAN Administrator for a minimum period of two years. These copies may be kept in hard copy or electronically.

Records are retained for a minimum period of two years, with records relating to indexing retained for a minimum of seven years. At the end of the retention period, documents and records will be destroyed.

Amending documents and records

Anyone can request a document change by contacting the QBAN Administrator. The QBAN Administrator is responsible for authorising the change.

Changes to any QBAN-issued documents shall be recorded on the amendment register. The QBAN Administrator shall ensure that amended documents are distributed to all holders of documents, and obsolete copies are destroyed.

Current document list

The QBAN Administrator shall keep a master copy of all QBAN documents, and will be responsible for maintaining a register of all documents. The document list will include:

- Document name
- Date of issue
- Version number
- Authorisation
- Location

A register of relevant externally generated documents will also be maintained by the QBAN Administrator.

Resource management

The Australian Banana Growers' Council (ABGC) will provide adequate resources to ensure that the QBAN Compliance scheme runs efficiently and effectively.

Training

The hazard analysis has identified critical activities that must be undertaken by appropriately trained employees. Protocols have been developed that clearly outline the responsibilities for all participants in the QBAN scheme. Training shall be provided to these protocols. Records of training will be maintained.

Protocols have been established for a number of roles / tasks within the QBAN scheme. These protocols include:

- QBAN Administrator protocol
- QBAN Inspector protocol
- Transport and movement protocol
- Nursery protocol
- Tissue culture laboratory protocol

QBAN Administrator

The QBAN Administrator will be required to have a thorough understanding of the QBAN scheme and all protocols relating to the QBAN scheme. The QBAN Administrator will be trained against the requirements outlined in the QBAN Administrator protocol and will report to the CEO of the Australian Banana Growers' Council (ABGC).

Upon completion of training, the QBAN Administrator will be required to sign a declaration to indicate they have understood their responsibilities. A signed copy of this declaration will be kept on file at the QBAN Administrator's office.

The QBAN Administrator will be responsible for developing and co-ordinating training for authorised representatives from QBAN facilities, including the QBAN Compliance Officer and QBAN Inspector.

The training program will be reviewed annually by the QBAN Administrator.

QBAN Inspector

The QBAN Inspector will be trained against the requirements outlined in the QBAN Inspector protocol. Upon completion of training, the QBAN Inspector will be required to sign a declaration to indicate they have understood their responsibilities. A signed copy of this declaration will be kept on file at the QBAN Administrator's office.

When completing tasks covered by the QBAN protocols, the QBAN Inspector will report to the QBAN Administrator.

QBAN facilities

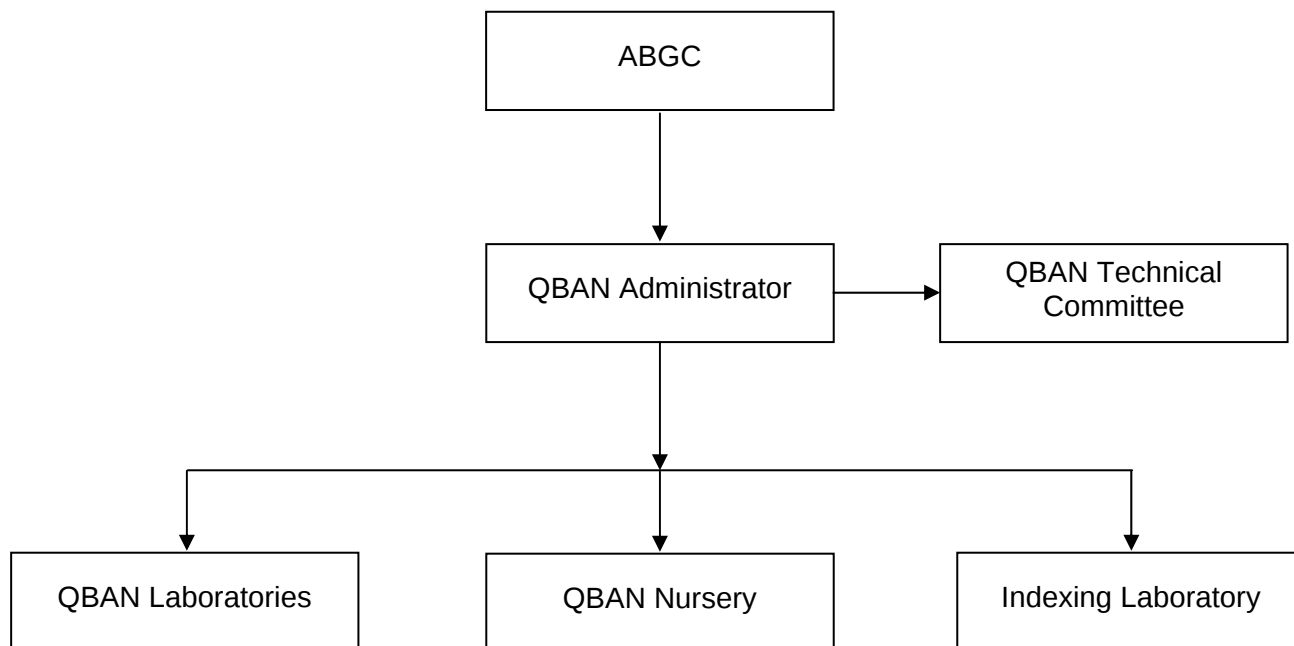
Each QBAN facility will ensure at least one person from within the business has been trained by the QBAN Administrator in the requirements of the QBAN scheme. This person becomes the QBAN Compliance Officer for the QBAN facility. The QBAN Compliance Officer will be responsible for training all employees in the requirements of the QBAN scheme on commencement of employment.

Upon completion of training, the QBAN Compliance Officer will be required to sign a declaration to indicate they have understood their responsibilities, and will ensure all participants from within the business they are representing are trained to the requirements of the QBAN scheme. A signed copy of this declaration will be kept on file at the QBAN Administrator's office and at the relevant QBAN facility.

All records associated with training will be kept as per the Document Control procedure.

Roles and responsibilities

Organisational chart



Responsibilities

These position titles have been used to reflect the responsibilities of persons / organisations under the QBAN Compliance scheme.

QBAN Administrator is responsible for:

- authorising collections
- issuing QBAN clone numbers
- coordinating training of QBAN Inspectors and QBAN Compliance Officers in their duties and responsibilities under the QBAN Compliance scheme
- coordinating annual internal audits of all QBAN facilities
- issuing certificates to QBAN facilities upon completion of successful internal audits
- representing QBAN during external audits
- ensuring that processes needed for the quality management system are established, implemented and maintained
- maintaining records that show compliance to the QBAN Compliance scheme
- reporting to ABGC on the performance of the QBAN Compliance scheme and any need for improvement
- other duties as outlined in the QBAN Administrator protocol

QBAN Inspector is responsible for:

- assessing collection sites
- inspecting mother plants
- collecting plant materials for indexing and propagation
- packaging materials ready for dispatch to relevant laboratory
- other duties as outlined in the QBAN Inspector protocol

Tissue culture laboratory is responsible for:

- appointing a QBAN Compliance Officer to manage the QBAN scheme who will ensure:
 - o the laboratory is designed and operated so as to prevent contamination of the plantlets and media
 - o propagation and preparation of banana plantlets is carried out in accordance with the relevant protocols
 - o ensuring all employees of the laboratory are trained in the relevant protocols
 - o an annual self-assessment against the QBAN scheme is conducted, with relevant corrective actions implemented to address non conformance
 - o the laboratory is accredited to the QBAN scheme

Nursery is responsible for:

- appointing a QBAN Compliance Officer to manage the QBAN scheme who will ensure:
 - o ensuring the nursery facility is designed and operated to prevent contamination of banana plants and/or banana plantlets
 - o ensuring that the business only obtains banana plants or plantlets from a QBAN facility
 - o ensuring the source of water meets requirements outlined in the Nursery protocol
 - o ensuring all employees of the nursery are trained in the relevant QBAN protocols
 - o the nursery is accredited to the QBAN scheme

QBAN technical committee is responsible for:

- reviewing the QBAN scheme on an annual basis to ensure it is achieving the desired outcomes
- reviewing the QBAN hazard analysis on an annual basis to ensure no new hazards are occurring
- conducting an annual Management Review

Approved suppliers

Approved suppliers are vendors that are outside the QBAN scheme who are considered critical to the integrity of the scheme.

The QBAN Administrator will be responsible for developing and maintaining the approved supplier program. The QBAN Administrator will be responsible for ensuring specifications for each supplier are documented and communicated to the supplier.

To become an approved supplier, each supplier must demonstrate compliance with the defined specifications. Once compliance has been demonstrated, the QBAN Administrator can add the supplier to the Approved Supplier List.

The QBAN Administrator will coordinate an annual audit or self-assessment of each supplier to ensure these specifications are continually being met.

If specifications are not being met, the QBAN Administrator will implement appropriate corrective actions to address the non conformance. These actions may include removal from the approved suppliers list.

During the internal scheme audit, the QBAN Administrator will review the list of approved suppliers to ensure the list is current. Suppliers may be removed for commercial reasons or if their actions result in the integrity of the QBAN scheme being compromised. The reasons for removal from the approved suppliers list will be documented.

Traceability

The QBAN Administrator will be responsible for issuing QBAN clone numbers upon receipt of indexing results indicating a negative test for priority pest and disease. The QBAN protocols outline the requirements for traceability throughout the QBAN scheme.

Mock traceability exercise

An annual mock traceability exercise is to be conducted by the QBAN Administrator. The mock traceability exercise may require the involvement of other participants in the QBAN Compliance scheme. A Corrective Action Record will be used to record the results of the traceability exercise.

Continuous improvement

QBAN aims to continually improve the quality of its services through the use of best practice and the adoption of a continuous improvement approach. No system is perfect and from time to time there will be opportunities for improvement of the system and of the organisation. These opportunities may be provided by feedback from a wide variety of sources including QBAN Inspectors, suppliers and other QBAN facilities.

The Australian Banana Growers' Council (ABGC) is committed to reviewing the operation of the quality system and to continuous improvement of the system to reflect both internal and external changes (customer requirements and regulatory compliance).

Continual improvement activities that regularly occur include:

- auditing, both internal and external
- raising and resolving non-conformances
- dealing with customer feedback
- Management Review, including review of the hazard analysis

Auditing

Audits are undertaken to verify that the QBAN Compliance scheme is functioning correctly, and achieving its stated objectives. By auditing the QBAN Compliance scheme, opportunities for improvement may be identified.

Types of audits

There are four types of audits that may occur.

Self-assessment

Each QBAN facility is required to undertake a self-assessment of their facility against the relevant protocol on at least an annual basis. The self-assessment must be scheduled at a time when practices are occurring.

Where possible, the self-assessment should be completed by a person independent of the practices being completed.

A record of the self-assessment must be kept. A self-assessment checklist will be provided by the QBAN Administrator to each QBAN facility.

Internal audit of QBAN facilities

The QBAN Administrator will coordinate an annual internal audit of each QBAN facility. These audits may be more frequent than annually if considered necessary. The internal audit will cover all aspects of the QBAN protocols relevant to the facility. Previous internal audits will be reviewed as part of the audit.

To retain QBAN accreditation, the QBAN facility must complete a successful internal audit. An internal audit checklist will be used to record the results of the internal audit.

Internal audit of QBAN scheme

A representative of the ABGC will conduct an annual internal audit of the QBAN scheme. This audit may be more frequent than annually if considered necessary. The internal audit will cover all aspects of the QBAN scheme. Previous internal audits will be reviewed as part of the audit.

The QBAN Administrator is responsible for organising this internal audit, and must be present during the audit.

External audit

On an annual basis, an independent auditor will conduct an audit of the QBAN scheme against the requirements of this manual, and the relevant protocols. The auditor will review the internal audits of the QBAN scheme and each QBAN facility. The QBAN Administrator is responsible for organising this audit, and must be present during the audit.

To conduct the external audit, the auditor will be required comply with and provide evidence of the following:

- Attained at least a secondary school qualification or diploma or equivalent;
- Completed training in HACCP principles by the successful completion of a formal course based on the principles of Codex Alimentarius;
- Practical auditing experience in ISO, BRC or similar (minimum 10 days); and
- Successful completion of a Lead Assessor training course based on ISO 19011 principles with a minimum duration of 37 hours that is externally recognised. The certificate must specify the course content and duration.

Scheduling the audit

Each audit must be completed at least annually. The QBAN Administrator must document an internal audit schedule. The audit schedule details timing of audits.

Carry out audit

Audits must be carried out by trained auditors, who preferably, do not work in the area(s) they are auditing. Inexperienced or trainee auditors may assist the trained auditor as a means of gaining experience as part of auditor training.

An audit checklist is created by the QBAN Administrator from the QBAN protocols. Previous audit reports will be reviewed to identify problem areas. The auditor then carries out the audit by observing and speaking to personnel carrying out the activities detailed in the checklist.

Create audit report

Once the audit is concluded an audit report is completed. The report should be completed as soon as possible so that any problems can be addressed while details are fresh in the auditors mind. Positive findings should be recorded as well as problem areas.

The relevant internal audit checklist is completed and Corrective Action Records (CARs) are initiated for any problems that were discovered during the audit.

Discuss audit findings with auditee

It is important to discuss the audit findings with the auditee so that they fully understand the reasons for any CARs generated and to clarify any misunderstandings. At this stage the auditor may assist the auditee with finding appropriate solutions to problems, but the auditor must not "solve" all the problems for the auditee as this does not promote ownership.

It is a good idea to involve key people from areas audited so that they can understand problems and work on solutions. The auditee is required to detail an agreeable time frame for addressing corrective actions or agree to a date when the auditee will have determined a suitable time frame.

Address Corrective Action Records

It is the responsibility of the auditee to detail appropriate corrective actions and improvements for the problems identified in the audit. These are documented on the CAR. Timeframes for completion of actions are also completed and the form is returned to the auditor.

Assess effectiveness of changes

Once the completion date for corrective actions has passed, the auditor checks with the auditee that changes have been made and assesses their effectiveness. If the auditor is happy that changes are effective, the CAR is closed out. It is important to check that all necessary document changes have been made.

Non-conformances

Mistakes happen, but it is important to learn from mistakes. In the instance that a mistake occurs, responsibilities and procedures need to be clearly allocated to ensure efficient communication ensues, corrective action is promptly implemented, and adequate records are kept.

Non-conformances may be identified:

- during routine activities
- during a self-assessment
- during an internal or external audit
- through a complaint raised by a customer or another Accredited QBAN facility

Non-conformances must be documented on the Corrective Action Record (CAR). Information required when completing a CAR includes:

- Date non-conformance identified
- Details of the non-conformance (including what the issue is and how it occurred)
- Quick fix (what can be done to fix the non-conformance now)
- Long term fix (what can be done to prevent the non-conformance from recurring)
- Expected dates of completion
- Date and signature upon completion
- Review to ensure the actions taken have been effective in fixing the problem

If a critical non-conformance is identified during an audit, the QBAN Administrator will inform the ABGC immediately.

If a CAR has been raised as the result of a complaint from a customer or another QBAN facility, a copy of the CAR must be forwarded to the complainant and to the QBAN Administrator.

If a QBAN facility raises a CAR, the QBAN Compliance Officer is responsible for ensuring the actions have been completed in a timely manner. The QBAN Compliance Officer will review all CARs annually as part of the self-assessment to ensure the action has been completed, and that the action was effective in addressing the issue.

The QBAN Administrator will review system non-conformances and CARs relating to complaints every six months to ensure the action has been completed, and that the action was effective in addressing the issue. The QBAN Administrator will review internal CARs raised by QBAN facilities during the annual internal audit.

Management Review

Management Review meetings are undertaken by the technical committee of QBAN to show management commitment to the system. By attending the meetings, the technical committee are kept abreast of any issues and improvements surrounding the QBAN scheme.

Management Review meetings are held at least annually and consider the operation of the quality system. In particular, the review examines:

- Follow-up actions from previous Management Review meetings
- Internal and external audit findings
- Corrective Action Records
- Relevant legislative changes and emerging issues that may impact on the QBAN scheme
- Impending changes to the process
- Approved Supplier performance
- The effectiveness of the entire QBAN scheme

Any impending process changes are reviewed in light of their impact to the hazard analysis. A review of the hazard analysis is instigated if necessary. In addition, a review of the hazard analysis takes place at the Management Review meeting.

An agenda of items to be discussed at Management Review will be documented, and must be distributed by the QBAN Administrator to the Management Review team at least two weeks prior to the meeting. Minutes of the meeting will be taken by the QBAN Administrator. Copies of the minutes are to be distributed to all attendees within 2 weeks of the meeting.

Suspension and cancellation of accreditation

Grounds for suspension or cancellation of accreditation

The following are grounds which may result in suspension or cancellation of accreditation. Each situation will be considered on an individual basis by the QBAN technical committee and the ABGC.

1. The accreditation was obtained by false or misleading information or documents without a reasonable excuse.
2. The QBAN facility has contravened an accreditation condition without a reasonable excuse.
3. The QBAN facility has a critical non-conformance against the QBAN scheme.
4. The QBAN facility has committed an offence against the relevant State/Territory Authorising Legislation.
5. The QBAN facility makes a statement or other representation about a banana plant that is likely to cause someone reasonably to believe that an acceptable assurance certificate has been given for the banana plant, if the representation is made for the sale or movement of the plant or to an inspector.
6. The holder of the QBAN accreditation has been convicted of an indictable offence, relating to fraud.

Procedures for suspension and cancellation of accreditation

If the QBAN Administrator considers a reason exists to cancel or suspend an accreditation, the QBAN facility will be given written notice stating the proposed action and grounds for the proposed action, outlining the facts and circumstances.

A period of at least 28 days will be allowed to enable the QBAN facility to show why the proposed action should not take place.

If, after considering all written representations made within the stated time period, action is still taken to cancel, amend or suspend accreditation, the QBAN facility will be notified in writing of the decision.

The Certification of Accreditation may, by written notification, be requested to be returned to the QBAN Administrator if cancelled, amended or suspended.

Refusal to grant accreditation

If an application for accreditation is refused the applicant will be given a notice in writing stating the decision, the reasons for the decision and that the applicant may apply to the QBAN Administrator for a reconsideration of the decision. Refer to the section on Administrative Review for more details.

Administrative review

Reconsideration of decisions

A person aggrieved by the making or failure to make a decision of an administrative character may apply to the Chairman of the ABGC for reconsideration of the decision.

An application must be made in writing and set out the grounds on which the applicant seeks the reconsideration. A decision made by the Chairman of the ABGC on an application for reconsideration cannot be the subject of a further application for a reconsideration of the decision.

Review by magistrate

A person dissatisfied by a decision of the Chairman of the ABGC may appeal to the Magistrates Court nearest the place where the dissatisfied person lives, or carries on, or proposes to carry on, a business affected by the decision.

Such appeal is to be written notice to the Clerk of the Court and within 28 days after notice of the decision was given to the person.

Ombudsman review

A person aggrieved by the making or failure to make a decision of an administrative character may apply to the Ombudsman for review of that decision.

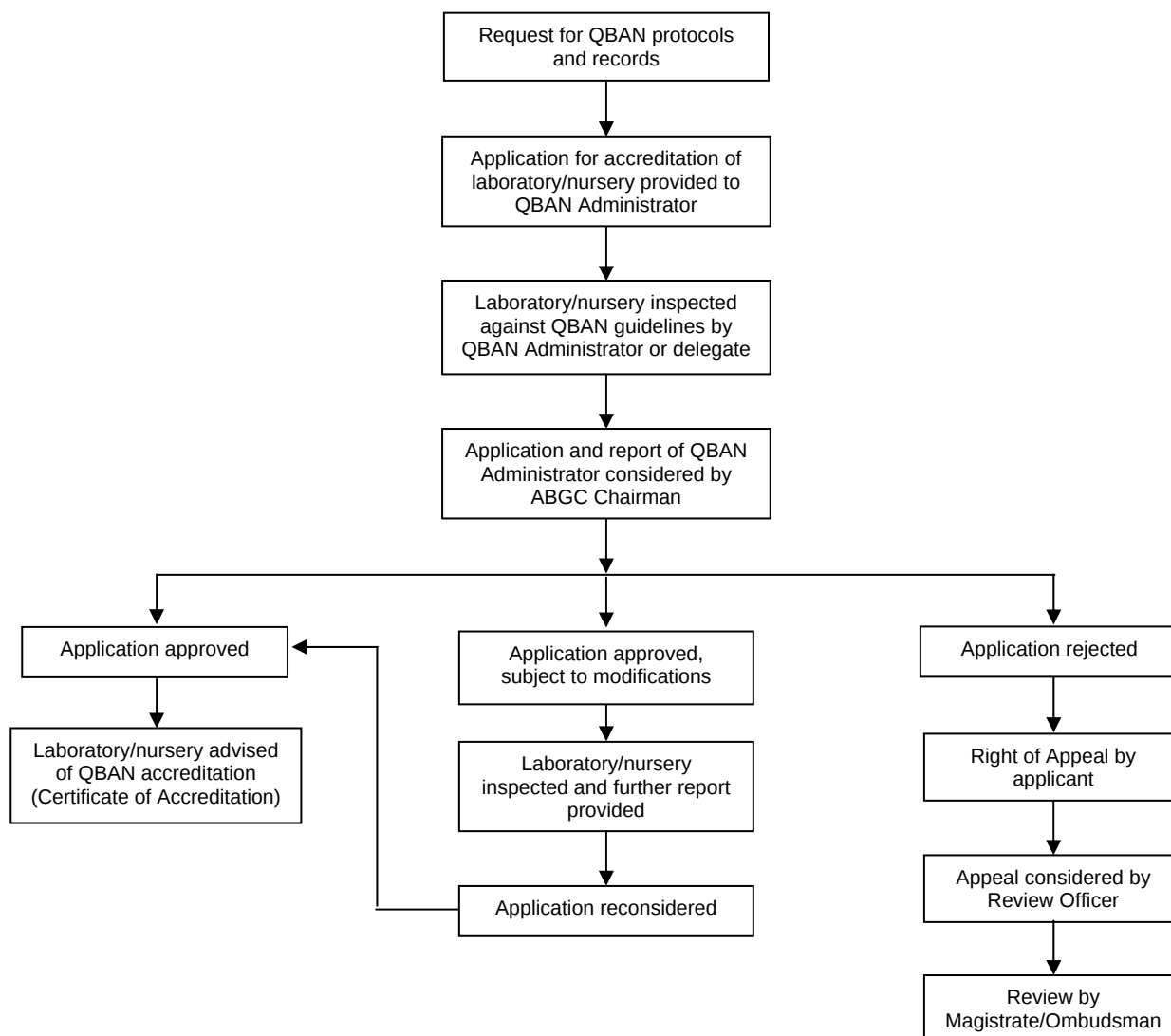
Judicial review

Under the *Judicial Review Act 1991*, a person aggrieved by an administrative decision of the Chairman can also ask the Chairman to provide a written state of reason for the decision, if they were not given.

Accreditation of QBAN facilities

Process for accreditation of a QBAN facility

The process for the accreditation of a QBAN facility is set out in the flow chart below.



Application for accreditation

A business seeking accreditation under this Scheme must make an application for accreditation prior to the intended date of commencement as a QBAN facility.

General provision of accreditation

A laboratory or nursery that is not a QBAN facility (i.e. not accredited under QBAN or whose accreditation has lapsed) will not be able to supply banana plantlets or plants, or to initiate or grown-on in pots.

An accredited QBAN facility must notify the QBAN Administrator within one (1) month of the QBAN facility ceasing to supply banana plantlets or plants.



QP01

QBAN Administrator

1 Introduction

1.1 Purpose

The purpose of this protocol is to describe the tasks and responsibilities to be completed by the QBAN Administrator for the management of the Quality Banana Approved Nursery (QBAN) Scheme.

1.2 Scope

This protocol includes a description of the tasks and responsibilities that are required to manage the QBAN scheme, including:

- granting approval to and organising for approved QBAN Inspectors to collect banana plant material for virus indexing and propagation as part of the QBAN scheme
- training and assessing competence of participants in the QBAN scheme
- maintaining accurate and current records of training of QBAN Inspectors and authorised personnel from QBAN accredited facilities
- maintaining accurate and current records of activities within the QBAN scheme
- managing and maintaining accurate and current information in the QBAN database
- ensuring annual internal audits of QBAN accredited facilities and approved suppliers are conducted
- maintaining knowledge of current plant health legislation
- processing applications for QBAN accreditation, and issuing or revoking QBAN accreditation
- organising and conducting annual QBAN review meetings
- managing corrective actions
- ensuring appropriate actions are taken in response to potential incidents
- reporting to the Australian Banana Growers' Council (ABGC) as required
- communicating information regarding the QBAN scheme to relevant regulatory bodies, the ABGC, QBAN participants and other relevant stakeholders

1.3 Definitions

Term	Definition
Approved supplier	A supplier who is approved by the business to supply materials and services that meet agreed specifications.
Audit	A systematic examination of compliance, to determine whether practices that have been introduced are being followed and to ensure that the system achieves its aims.
Australian Banana Growers' Council	ABGC – Australian banana industry's peak national agripolitical organisation established in February 1961.
Autoclaving	30 minutes at 121° Celsius
Banana	Plants of the genera <i>Musa</i> and <i>Ensete</i> (family Musaceae) used in production of food and fibre or for ornamental purposes. They include plants known as Plantain, abaca and Ensete.
Banana Industry Committee	Statutory body reporting to the NSW Minister for Primary Industries. Now trading as BananasNSW.
Corrective Action Record (CAR)	A written record of an issue, or issues, which must be addressed to demonstrate compliance with this QBAN scheme. CARs may be raised during self assessment, at internal audit, or during routine activities.

Term	Definition
Fungi	A member of a large group of eukaryotic organisms that includes microorganisms such as yeasts and moulds, as well as the more familiar mushrooms.
Hazard analysis	The method of identifying potential hazards, assessing the significance of the risk and determining the good agricultural practices that prevent or minimise the risk of the hazard occurring.
Indexing	The testing of banana material for the presence or absence of pathogens
Indexing laboratory	An laboratory set up to test banana material for the presence or absence of pathogens
Multiplication	The act of producing offspring
Non conformance	A failure to comply with the requirements of the QBAN scheme
Nursery	An area in which tissue culture banana plantlets are de-flasked and propagated into pots for field planting.
Priority plant pests and diseases	Any pest or disease that obliges a person who has knowledge or a suspicion of the presence of that pest or disease to notify the relevant State Authority inspector
Plantlet	A tissue cultured banana plant grown in a sterile tissue culture medium in a sealed flask.
Plant	A banana plant produced directly from tissue culture then de-flasked and grown-on in pots.
Propagation material	Suckers or bells from banana plants to be used to generate tissue culture.
Plant pathogens	An organism (generally a bacterium, virus or fungus) that causes disease in plants.
QBAN Administrator	A suitably trained person authorised by the ABGC as responsible for administering and managing the QBAN scheme. Reports to the CEO of the ABGC.
QBAN clone number	A number assigned to all suckers and plantlets derived from a mother plant and that has tested negative to virus.
QBAN Compliance Officer	A suitably trained person representing a QBAN accredited laboratory or nursery responsible for the implementation of the QBAN scheme.
QBAN database	A database (maintained by the QBAN Administrator) containing all clone numbers issued to a QBAN facility and showing clone numbers assigned to plantlets that have been indexed virus free.
QBAN facility	A banana plant nursery or laboratory accredited under the QBAN scheme by the QBAN Administrator.
QBAN Inspector	A suitably trained person authorised by the QBAN Administrator to collect propagation materials for indexing and multiplication.
Sterilisation	The act of making an object free of live bacteria or other microorganisms (usually by heat or chemical means).

2 Background

2.1 What is QBAN?

The primary purpose of the Quality Banana Approved Nursery (QBAN) scheme is to prevent the introduction, establishment, and spread of priority plant pests and diseases of banana across Australia. The QBAN scheme is managed by the Australian Banana Growers' Council (ABGC).

The QBAN scheme was originally developed in 1994 as an initiative of the National Banana Plant Health Improvement project supported by the Australian Banana Growers' Council, Banana Industry Committee (NSW), the Banana Industry Protection Board (Qld), Horticulture Australia Limited, NSW Department of Agriculture and Queensland Department of Primary Industries.

In 2009, Horticulture Australia Limited funded a review and update of the QBAN scheme. A number of organisations were involved in the update of the scheme, including the Department of Industry and Investment NSW, Queensland Primary Industries and Fisheries, part of the Department of Employment, Economic Development and Innovation and the Australian Banana Growers' Council (ABGC).

In addition, a number of organisations and individuals reviewed and provided feedback on the updated QBAN scheme including the Department of Agriculture and Food Western Australia and the Northern Territory Department of Regional Development, Primary Industry, Fisheries and Resources.

International sources of banana planting material require an import permit from the Australian Quarantine Inspection Service (AQIS) and fulfilment of strict conditions of entry and post-entry quarantine as determined by AQIS.

2.2 What legislation applies?

The QBAN scheme manual and protocols have been developed in line with the following authorising legislation in relevant States and Territories:

- New South Wales – *Plant Diseases Act 1924 No. 38*
- Queensland – *Plant Protection Act 1989* and *Plant Protection Regulation 2002*
- Northern Territory – *Plant Diseases Control Act 2000*
- Western Australia – *Plant Diseases Act 1914* and regulations in 1989
- Tasmania – *Plant Quarantine Act 1997 (Tasmania)*
- South Australia – *Plant Health Act 2009*
- Victoria – *Plant Health and Plant Products Act 1995*

2.3 What is the role of the QBAN Administrator?

The QBAN Administrator has overall responsibility for maintaining the integrity of the QBAN scheme as outlined in section 1.2 of this protocol. The QBAN Administrator reports directly to the Chief Executive Officer (CEO) of the Australian Banana Growers' Council (ABGC) or delegate.

3 QBAN scheme requirements

3.1 Training requirements

- 3.1.1 The CEO of the Australian Banana Growers' Council will ensure the QBAN Administrator is trained to this protocol upon commencement of employment.
- 3.1.2 The QBAN Administrator will also be familiar with the requirements outlined in the QBAN scheme manual and all other QBAN protocols.
- 3.1.3 A record of training received by the QBAN Administrator is maintained and will include:
 - Date of training
 - Name and signature of the trainee
 - Name and signature of the trainer
- 3.1.4 A record of external training will be kept.

3.2 QBAN database

- 3.2.1 The QBAN Administrator is responsible for maintaining the QBAN database.
- 3.2.2 The database includes information on all collections, results of testing and QBAN clone numbers.
- 3.2.3 The database will be password-protected, with the password known only to the QBAN Administrator and to the CEO of the Australian Banana Growers' Council or delegate.
- 3.2.4 In the case of annual leave or sickness, the CEO of the Australian Banana Growers' Council or delegate will ensure the duties of the QBAN Administrator are carried out. Persons authorised to relieve the QBAN Administrator will be trained, with records of training retained.

3.3 QBAN scheme

- 3.3.1 The QBAN Administrator is responsible for maintaining the QBAN scheme, including:
 - Document and record control
 - Training
 - Continual improvement
 - Scheme review
 - Approved suppliers
- 3.3.2 The QBAN scheme manual outlines the required system elements of the QBAN scheme.

3.4 Internal and external audits

- 3.4.1 The QBAN Administrator will coordinate internal audits of each QBAN facility at least annually to ensure that they are operating in accordance with the QBAN scheme.
- 3.4.2 The CEO of the Australian Banana Growers' Council will coordinate an internal audit of the QBAN scheme at least annually to ensure the scheme is operating in accordance with the QBAN scheme manual and associated documents.
- 3.4.3 Internal audits will be completed using a standard checklist.
- 3.4.4 Additional internal audits or checks of QBAN facilities or the QBAN scheme may be undertaken to monitor compliance. At least 24 hours notice will be given.
- 3.4.5 An external audit of the QBAN scheme will be completed on at least an annual basis.
- 3.4.6 The external audit will be undertaken by a trained auditor independent of the QBAN scheme.

3.5 Register of QBAN facilities

- 3.5.1 One employee from each facility will complete a written assessment to demonstrate an understanding of the QBAN scheme.
- 3.5.2 This employee becomes the 'QBAN Compliance Officer' and is responsible for QBAN operation in each QBAN facility.
- 3.5.3 The QBAN Administrator will maintain a register of QBAN accredited facilities including:
- Name of facility
 - Owner of facility
 - Physical address of facility
 - Postal address (if different from location address)
 - Name of the QBAN Compliance Officer
 - Contact details
 - Date of previous internal audits
 - Record of training of the QBAN Compliance Officer

3.6 Register of QBAN Inspectors

- 3.6.1 The QBAN Administrator will maintain a register of QBAN Inspectors including:
- Name of QBAN Inspector
 - Record of training of QBAN Inspector
 - Postal address
 - Contact details

3.7 Resources for QBAN Inspectors

- 3.7.1 The QBAN Administrator is responsible for updating and distributing the following forms to relevant QBAN participants:
- *Collection Request*
 - *Certification of Banana Material for Tissue Culture Initiation*
 - *Inspection Checklist*

4 Work instruction

4.1 Initiating and approving a banana propagation material collection

- 4.1.1 The collection approval process commences upon receipt of a completed *Collection Request* form.
- 4.1.2 The QBAN Administrator will enter the details from the *Collection Request* form into the QBAN database. Information includes:
- Name and contact details of the person or company requesting the collection
 - Name and contact details of the property owner or lessee (if different than the person requesting the collection)
 - Physical address of collection block
 - Preferred date of collection
 - Name of QBAN laboratory that has agreed to culture the material
 - Instructions for invoicing for collection and indexing
- 4.1.3 The QBAN Administrator will approve the request for a collection unless the location is:
- within 1000 metres of a block where bunchy top was detected in the last 12 months
 - within 1000 metres of a block where Panama disease has ever been detected
 - within a defined distance to any other priority plant pest or disease
- 4.1.4 The QBAN Administrator may deny or delay the request for a collection on other reasonable grounds.
- 4.1.5 If the collection is denied or delayed, the QBAN Administrator will contact the person requesting the collection and advise them of the denial / delay in writing.

4.1.6 The QBAN Administrator will retain a copy of this written communication.

4.2 Coordinating a collection

4.2.1 If the request for collection is approved, the QBAN Administrator, by telephone, will contact the relevant QBAN Inspector to confirm the details of the collection.

4.2.2 The QBAN Administrator will provide the QBAN Inspector with a copy of the completed *Collection Request* form.

4.2.3 The QBAN Inspector will consult with the property owner or lessee to determine:

- Date of collection
- Exact source location
- Availability of propagation material from source location
- Presence of unusual plant pest or disease symptoms

4.2.4 The QBAN Inspector then completes the *Collection Request* form.

4.2.5 If details of the collection change, the QBAN Inspector will communicate this change in writing to the QBAN Administrator.

4.2.6 The QBAN Administrator will reassess the collection if a change is made to the block originally documented on the *Collection Request* form.

4.2.7 If a QBAN Inspector is not available, the QBAN Administrator will contact the person requesting the collection to advise of the delay.

4.3 Completing a collection

4.3.1 Within 1 working day of completion of the collection, one copy of the Certification of *Banana Material for Tissue Culture Initiation* form and one copy of the *Inspection Checklist* will be forwarded to the QBAN Administrator by the QBAN Inspector.

4.3.2 The QBAN Administrator will contact the QBAN Inspector to acknowledge receipt of the completed records.

4.3.4 The QBAN Administrator will enter relevant information into the QBAN database.

4.3.5 The completed records will be maintained with other details of the collection by the QBAN Administrator.

4.3.6 Upon completion of a collection:

- leaf indexing samples are transported to QPIF Virology Laboratory, Plant Pathology Building, 80 Meiers Road, Indooroopilly, Qld
- propagation materials are transported to the QBAN accredited tissue culture laboratory selected by the person requesting the collection

4.3.7 Another indexing laboratory may be used, provided the QBAN Administrator has approved the laboratory as per the Approved Supplier requirements of the QBAN scheme manual prior to a collection commencing.

4.3.8 If the samples are assessed as unsuitable¹ for indexing or initiation, the QBAN Compliance Officer at the relevant laboratory will inform the QBAN Administrator of the non conformance.

4.3.9 The QBAN Administrator will complete a Corrective Action Record to address the non conformance.

¹ Samples may be considered unsuitable if materials are covered with excessive dirt or if seals have been broken and materials have been damaged during transport.

4.4 Notification of indexing result

- 4.4.1 Upon completion of testing, the indexing laboratory will forward a copy of the test results to the QBAN Administrator.
- 4.4.2 Indexing must be completed within 4 weeks of receipt of sample at indexing laboratory.
- 4.4.3 The QBAN Administrator is responsible for monitoring this timeframe. If this timeframe has been exceeded, the QBAN Administrator will follow actions outlined in Section 5 of this document.
- 4.4.4 The QBAN Administrator will enter the relevant data from the test results into the QBAN database, including:
 - Date results received
 - Result of testing
- 4.4.5 In the event of a positive test result (indexing has indicated the presence of disease) it is the responsibility of the indexing laboratory to notify the QBAN Administrator and regulatory bodies of priority disease.
- 4.4.6 If the testing reveals a negative result for a priority disease outlined in Schedule 1 the QBAN Administrator will assign a QBAN clone number.

4.5 Issuing a QBAN clone number

- 4.5.1 Upon receipt of a negative result from the indexing laboratory, the QBAN Administrator will issue a QBAN clone number. The clone number **cannot** be issued until written confirmation of the negative result is received by the QBAN Administrator.
- 4.5.2 The QBAN clone number is automatically assigned by the QBAN database upon entering the negative result.

4.6 Communicating a QBAN number

- 4.6.1 Once a QBAN clone number is assigned, the number will be communicated to the tissue culture laboratory via the *Certification of Banana Material for Tissue Culture Initiation* form.
- 4.6.2 This communication should occur as soon as results are received, but must occur within two (2) working days of the QBAN Administrator receiving the result from the indexing laboratory.
- 4.6.3 A copy of the *Certification of Banana Material for Tissue Culture Initiation* form will be retained by the QBAN Administrator.

5 Addressing, correcting and preventing non conformances

5.1 Samples in unsuitable condition upon arrival to indexing laboratory or tissue culture laboratory

- If samples are considered to be unsuitable, it is the responsibility of the indexing laboratory or tissue culture laboratory to inform the QBAN Administrator of the condition of the samples.
- Samples may be considered unsuitable if:
 - o both the outer and inner packaging is intact, ensuring leaf or propagation materials are not exposed
 - o propagation materials are covered with excessive dirt
 - o the materials are accompanied by a completed *Certification of Banana Material for Tissue Culture Initiation form* issued by a QBAN Inspector
 - o suckers and bells are packed together in groups no greater than 10
- The relevant laboratory will record all details on the Corrective Action Record (CAR), and will also include:
 - o Date sample received
 - o Name of laboratory
 - o Name of QBAN Inspector
- Details of actions to be taken regarding disposal (if necessary) will be completed by the laboratory.
- The CAR must be forwarded to the QBAN Administrator as soon as possible after completion.
- The QBAN Administrator may include additional actions to be completed.
- The QBAN Administrator is responsible for ensuring the actions have been addressed in a timely manner, at which point the CAR can be closed.
- Copies of all CAR's will be retained by the QBAN Administrator.

5.2 Indexing results not available within documented timeframe

- If the indexing laboratory has not provided results of indexing within 4 weeks of receipt of samples, the QBAN Administrator must contact the indexing laboratory to discuss revised timeframes.
- If the indexing samples will not be received within 1 working day, the QBAN Administrator must:
 - o request an expected completion date from the indexing laboratory
 - o advise the person that requested the collection of expected completion date
 - o complete a Corrective Action Record (CAR)
- The QBAN Administrator is responsible for ensuring actions have been addressed in a timely manner, at which point the CAR can be closed.
- Copies of all CAR's will be retained by the QBAN Administrator.



QP02

QBAN Inspector

1 Introduction

1.1 Purpose

The purpose of this protocol is to describe the methods and steps to be completed by approved Quality Banana Accredited Nursery scheme (QBAN) Inspectors for the collection of banana plant material for virus indexing and propagation.

1.2 Scope

This protocol includes a description of the methods that are to be employed by the QBAN Inspector to:

- respond to requests from the QBAN Administrator to collect banana plant material for propagation as part of the QBAN scheme
- consult with the property owner or lessee to arrange collection
- take actions to prevent the spread of banana plant pests and disease through employing appropriate hygiene and decontamination precautions
- visually assess the health status of a banana plant collection area
- visually assess the health status of each mother plant
- notify relevant regulatory authorities of any unknown or suspect priority plant pest and disease
- collect a sample of source plants for viral indexing to determine each plant's health status
- collect propagation material from each source plant
- complete and forward accurate collection records
- label, pack and consign banana plant material
- address legislative obligations in respect to movement of banana plant material

1.3 Definitions

Term	Definition
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Audit	A systematic examination of compliance, to determine whether practices that have been introduced are being followed and to ensure that the system achieves its aims.
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Autoclaving	30 minutes at 121° Celsius
Banana	Plants of the genera <i>Musa</i> and <i>Ensete</i> (family Musaceae) used in production of food and fibre or for ornamental purposes. They include plants known as Plantain, abaca and Ensete.
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Indexing	The testing of banana material for the presence or absence of pathogens
Indexing laboratory	An laboratory set up to test banana material for the presence or absence of pathogens
Multiplication	The act of producing offspring
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Nursery	An area in which tissue culture banana plantlets are de-flasked and propagated into pots for field planting.
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QBAN Compliance Officer	A suitably trained person representing a QBAN accredited laboratory or nursery responsible for the implementation of the QBAN scheme.
QBAN database	A database (maintained by the QBAN Administrator) containing all clone numbers issued to a QBAN facility and showing clone numbers assigned to plantlets that have been indexed virus free.
QBAN facility	A banana plant nursery or laboratory accredited under the QBAN scheme by the QBAN Administrator.

Term	Definition
QBAN Inspector	A suitably trained person authorised by the QBAN Administrator to collect propagation materials for indexing and multiplication.
Sterilisation	The act of making an object free of live bacteria or other microorganisms (usually by heat or chemical means).
Subculture	A microbiological culture made by transferring microorganisms from a previous culture to a fresh growth medium.
Sucker	A shoot which arises from an underground shoot of a plant.
Tissue culture	The growth of tissues and/or cells separate from the organism.

2 Background

2.1 What is QBAN?

The primary purpose of the Quality Banana Approved Nursery (QBAN) scheme is to prevent the introduction, establishment, and spread of priority plant pests and diseases of banana across Australia. The QBAN scheme is managed by the Australian Banana Growers' Council (ABGC).

The QBAN scheme was originally developed in 1994 as an initiative of the National Banana Plant Health Improvement project supported by the Australian Banana Growers' Council, Banana Industry Committee (NSW), the Banana Industry Protection Board (Qld), Horticulture Australia Limited, NSW Department of Agriculture and Queensland Department of Primary Industries.

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- Northern Territory – *Plant Diseases Control Act 2000*
- Western Australia – *Plant Diseases Act 1914* and regulations in 1989
- Tasmania – *Plant Quarantine Act 1997 (Tasmania)*
- South Australia – *Plant Health Act 2009*
- Victoria – *Plant Health and Plant Products Act 1995*

2.3 What is the role of the QBAN Inspector?

The role of a QBAN Inspector is to ensure that indexing samples and propagation materials are collected from healthy plants located in areas free of known disease. The Inspector will understand and follow the relevant QBAN scheme protocols.

Adherence to the QBAN scheme requirements is critical to the success of achieving the outcomes of the QBAN scheme. An analysis of potential risks at this step in the process identified a number of critical hazards that may occur including:

- inadequate assessment and inspection of the site and source plants
- failure to identify diseased plants
- introduction of disease through inadequate decontamination and hygiene procedures

3 QBAN scheme requirements

3.1 Training requirements

- 3.1.1 The QBAN Administrator is responsible for ensuring the QBAN Inspector is trained prior to commencement of duties.
- 3.1.2 The QBAN Inspector will also be familiar with the requirements outlined in QP05 - *QBAN Movement and transport*.
- 3.1.3 A record of training received by the QBAN Inspector is maintained by the QBAN Administrator and will include:
 - Date of training
 - Name and signature of the trainee
 - Name and signature of the trainer
- 3.1.4 A record of external training will be kept.

3.2 Register

- 3.2.1 The QBAN Administrator will maintain a register of QBAN Inspectors including:
 - Name of Inspector
 - Record of training of QBAN Inspector
 - Postal address
 - Contact details

3.3 Resources for QBAN Inspectors

- 3.3.1 The QBAN Inspector will request additional copies of forms from the QBAN Administrator in a timely manner.
- 3.3.2 The QBAN Administrator is responsible for updating and distributing the following forms to QBAN Inspectors:
 - *Certification of Banana Material for Tissue Culture Initiation* form
 - *Inspection Checklist*
- 3.3.3 QBAN Inspectors are responsible for ensuring they are using a current copy of all forms.
- 3.3.4 QBAN Inspectors must be able to account for all *Certification of Banana Material for Tissue Culture Initiation* forms.

4 Work instruction

4.1 Coordinating a collection

- 4.1.1 If the request for a collection is approved, the QBAN Administrator, by telephone, contacts the relevant QBAN Inspector to confirm their availability.
- 4.1.2 The QBAN Administrator provides the QBAN Inspector with a copy of the completed *Collection Request* form.
- 4.1.3 If an independent QBAN Inspector is being used, the QBAN Inspector consults with the property owner or lessee to determine:
 - Date of collection
 - Exact source location
 - Availability of propagation material from source location
 - Presence of unusual plant pest or disease symptoms
- 4.1.4 The QBAN Inspector then completes the *Collection Request* form and forwards a copy to the QBAN Administrator.
- 4.1.5 If details of the collection change, the QBAN Inspector is required to communicate this change in writing to the QBAN Administrator.

4.2 Decontamination

- 4.2.1 Plant pests and diseases can be dispersed via direct contact, wind, rain, movement of contaminated people, clothing, equipment, plants and by specific vectors.
- 4.2.2 Decontamination involves the removal of all soil and plant debris, and the inactivation of the plant pests (insects or mites) or disease causing organisms (bacteria, fungi, phytoplasmas and viruses).
- 4.2.3 During work duties, it is important to follow correct hygiene or decontamination procedures in order to minimise the risk of dispersing plant pests and diseases.
- 4.2.4 A decontamination kit will be available for use by all QBAN Inspectors. The kit will include:

Spray container of bleach (<i>Bleach 1:10 = 1% sodium hypochlorite</i>)(1-2L)	Large spray container of water (25L)
Hand cleaner(<i>chlorohexidine gluconate</i>)	Spray container of Farmcleanse® (10%)
Hand broom (fine bristled)	Footbath (<i>see below for details</i>)
Bucket	Garbage bags
Zip lock plastic bags	Large plastic box
Scrubbing brush	Paper towel
MSDS for chemicals	Plastic sheet

- 4.2.5 All chemical containers must be clearly labelled with contents and MSDS information. It is advisable to also use colour-coded containers to highlight their different chemical contents.
- 4.2.6 Staff should commence duties each day in a freshly laundered uniform. Normal showering of personnel and hot water laundering of uniforms is sufficient for the destruction of most potential plant pests and diseases.
- 4.2.7 Footwear should be clean at the start of each day.
- 4.2.8 On arrival at the site, the QBAN Inspector must decontaminate their footwear by washing them in a bath of Farmcleanse® in accordance with the product label directions and as follows:
- Remove excess soil or mud from footwear prior to using the footbath.
 - Set up a foot bath next to the vehicle. A foot bath comprises a flat plastic box with a sealable lid, containing a foam pad, with enough reconstituted (10%) Farmcleanse® to make the foam damp.
 - Prior to entering and on leaving a property, wipe shoes on the moistened foam to clean them.
- 4.2.9 Equipment should be cleaned and disinfected.
- 4.2.10 Any tools or equipment taken on to the property and which are likely to come into contact with banana plant material or soil (e.g. mattocks, cane knives), must be decontaminated by washing with Farmcleanse®, then rinsed with water if required and sprayed with bleach then air dried.
- 4.2.11 Ensure all organic matter and soil is removed and scrub clean (during the Farmcleanse® wash) if necessary.
- 4.2.12 Vehicles should be kept as clean as possible and free of dirt and organic material.
- 4.2.13 Prior to entry and exit from a property, vehicles are decontaminated by spraying tyres and under the guards with Farmcleanse® according to the product label specifications.

- 4.2.14 Vehicles are not to be taken onto a property if it can be avoided.
- 4.2.15 Where the distance is too far to avoid driving onto the property and it is possible to enter the property without driving through banana production areas, the vehicle is to be driven to and is to remain at the packing shed. If there is a requirement for transport around the property the inspector should either walk or use transport arranged with and provided by the grower.
- 4.2.16 Vehicles are to be kept as clean as possible at all times. Vehicles must be regularly and thoroughly cleaned with a high pressure hose to remove adhering mud and organic plant material.
- 4.2.17 The frequency of this high pressure cleaning process is dependent on prevailing weather, driving conditions and the hygiene state of the vehicle. Whenever there is a build up of mud and or plant tissue under the guards etc of a vehicle, the vehicle is to be cleaned to remove this potential source of contamination.
- 4.2.18 All waste paper towel and disposable matter must be placed in a garbage bag and safely disposed of.

4.3 Entering site

- 4.3.1 If the collection is being conducted by an independent QBAN Inspector, the QBAN Inspector will contact the property owner or lessee to confirm their arrival on site.
- 4.3.3 The QBAN Inspector completes Section 1 of the *Inspection Checklist* which includes:
- Name of person requesting collection
 - Physical address of collection block
 - Date of collection
 - Start time

4.4 Visual assessment of surrounding plants

- 4.4.1 A visual assessment of plants surrounding the mother plant(s) will be completed prior to inspection of the mother plant.
- 4.4.2 Section 2 of the *Inspection Checklist* will be completed during the assessment.
- 4.4.3 The QBAN Inspector will ensure there is no evidence of:
- priority plant pests and diseases documented on Schedule 1
 - other symptoms that may indicate ill-health
- 4.4.4 If evidence of the above is found during the assessment, the QBAN Inspector is required to follow actions outlined in Section 5 of this document.

4.5 Inspection of the first mother plant

- 4.5.1 The QBAN Inspector approves the mother plant to be inspected.
- 4.5.2 The QBAN Inspector will ensure the mother plant is:
- free from the symptoms of banana bunchy top virus (BBTV), banana streak virus (BSV), cucumber mosaic virus (CMV) and Panama diseases
 - in good cultural condition and true to type
- 4.4.2 Section 3 of the *Inspection Checklist* will be completed during the inspection.
- 4.5.4 If the mother plant does not meet these requirements, the QBAN Inspector will follow actions outlined in Section 5 of this document.

4.6 Collection of leaf indexing samples and propagation materials

- 4.6.1 Leaf and / or bract samples are to be used for virus indexing. Suckers and / or bells are to be used for initiating tissue culture.
- 4.6.2 The steps detailed below are to be followed:

1. Label the mother plant

The mother plant is marked with flagging tape indicating the date and mother plant ID. The mother plant ID is made up of the certificate number, followed by the sample number i.e.

0776 - 1

(Certification of Banana Plant
Material for Tissue Culture
Initiation form number)

(Sample
number for
mother plant)



2. Sample the mother plant

A sample of the newest leaf on the mother plant is wrapped in moist paper towel and put into a plastic bag labelled with the mother plant ID.



- 4.6.3 If collecting suckers, follow steps 3 – 8. If collecting bells, go to steps 9 – 13.

3. Select and dig suckers

The sucker will be inspected for evidence of plant pest and disease during collection.



4. Inspect suckers

The QBAN Inspector will inspect each sucker:

- for signs of plant pest and disease i.e. vascular discolouration, root or corm rot may indicate *Fusarium*
- for signs of bacteria e.g. *Erwinia*

5. Collect leaf from suckers

Leaf material from the top of the sucker is wrapped in moist paper towel and put into the plastic bag containing the newest leaf on the mother plant.



6. Clean and trim suckers

Suckers will be cleaned and trimmed in the field to remove soil, roots and leaves. The suckers are placed into a breathable bag or bags labelled with the mother plant number so that individual suckers can be traced back to the mother plant.

7. Completing records

Before sampling the next mother plant, complete details for the mother plant and associated suckers on the *Certification of Banana Plant Material for Tissue Culture Initiation* form.

8. Decontamination of tools

Refer to element 4.2 for details of decontamination procedures for tools.

4.6.4 Repeat steps 3-7 for each successive mother plant.

4.6.5 If sourcing bells, follow steps 9 – 13.

9. Select and harvest bell

Cut the bell from the plant and remove a bract.

10. Pack the bract

The bract is wrapped in moist paper towel and put into the plastic bag containing the newest leaf on the mother plant.

11. Pack the bell

The bell is wrapped in moist paper towel and put into a plastic bag that is labelled with the mother plant number so that the bell can be traced to the mother plant.

12. Completing records

Complete all details for the mother plant and bell on the *Certification of Banana Plant Material for Tissue Culture Initiation* form before sampling the next mother plant.

13. Decontamination of tools

Refer to element 4.2 for details of decontamination procedures for tools.

4.6.6 Repeat steps 9-13 for each successive mother plant.

4.6.7 Up to 10 suckers or bells may be grouped together. If the suckers or bells are sourced from different mother plants, the bag must be labelled with each mother plant ID. In the event of a positive indexing result, all 10 suckers or bells must be destroyed.

4.6.8 The inspector will ensure that the number of samples sent matches the number described on the form.

4.7 Packaging leaf indexing sample for transport

4.7.1 A copy of the *Certification of Banana Material for Tissue Culture Initiation* form will accompany the leaf indexing sample.

4.7.2 The outer packaging will be sound and clean.

4.7.3 Once the leaf indexing samples are packaged, the QBAN Inspector is required to seal the package with tape.

4.7.4 The package will be clearly labelled with the address of the virology laboratory.

4.7.5 The primary laboratory used for indexing is the QPIF Virology Laboratory, Plant Pathology Building, 80 Meiers Road, Indooroopilly, Qld, 4068.

4.7.6 Another laboratory may be used, provided they have been approved by the QBAN Administrator prior to the collection commencing.

4.8 Packaging propagation material for transport

- 4.8.1 A copy of the *Certification of Banana Material for Tissue Culture Initiation* form will accompany the propagation material.
- 4.8.2 The outer packaging will be a sturdy, sound and clean cardboard box.
- 4.8.3 Once the propagation material is packaged, the QBAN Inspector is required to seal the package with tape.
- 4.8.4 The package will be clearly labeled with the address of the approved QBAN accredited tissue culture laboratory.

4.9 Completing a collection

- 4.9.1 Section 4 of the Inspection Checklist will be completed, including:
 - Finish time
 - Additional comments (if necessary)
 - Signature of QBAN Inspector
- 4.9.2 One copy of the *Certification of Banana Material for Tissue Culture Initiation* form will be forwarded to the QBAN Administrator within 1 working day of completing the collection.
- 4.9.3 The remaining copy of the *Certification of Banana Material for Tissue Culture Initiation* form is retained by the QBAN Inspector.
- 4.9.4 The packaged samples and materials may be sent by the QBAN Inspector, or the person attending the collection may choose to complete this step.
- 4.9.5 Requirements for transportation are outlined in the *Movement and transport Protocol*.
- 4.9.6 Decontamination will be completed as per element 4.2.

5 Addressing, correcting and preventing non conformances

5.1 Visual assessment of surrounding plants indicates an issue

- If the surrounding plants show evidence of priority plant pests and diseases documented on Schedule 1 or other symptoms that may indicate ill-health the QBAN Inspector will complete a Corrective Action Record (CAR), and will also include:
 - o Physical address of the collection site
 - o Indicators of priority plant pests and diseases or symptoms that may indicate ill-health
 - o Name of QBAN Inspector
- Details of actions to taken will be completed by the QBAN Inspector.
- The CAR must be forwarded to the QBAN Administrator as soon as possible after completion.
- The QBAN Administrator may include additional actions to be completed.
- The QBAN Administrator is responsible for ensuring the actions have been addressed in a timely manner, at which point the CAR can be closed.
- Copies of all CAR's will be retained by the QBAN Administrator.

5.2 Inspection of mother plant indicates an issue

- An issue with a mother plants may include (but is not limited to):
 - o symptoms of banana bunchy top virus (BBTV), banana streak virus (BSV), cucumber mosaic virus (CMV) and Panama diseases; or
 - o is not in good cultural condition;
 - o is not true to type
- In these situations, the QBAN Inspector will complete a Corrective Action Record (CAR), and will also include:
 - o Physical address of the collection site
 - o Symptoms or indicators that prompted the completion of the CAR
 - o Name of QBAN Inspector
- Details of actions to taken will be completed by the QBAN Inspector.
- The CAR must be forwarded to the QBAN Administrator as soon as possible after completion.
- The QBAN Administrator may include additional actions to be completed.
- The QBAN Administrator is responsible for ensuring the actions have been addressed in a timely manner, at which point the CAR can be closed.
- Copies of all CAR's will be retained by the QBAN Administrator.



QP03

Tissue culture

laboratory

1 Introduction

1.1 Purpose

The purpose of this protocol is to describe the methods and steps to be completed by approved Quality Banana Approved Nursery scheme (QBAN) tissue culture laboratories for the tissue culture production of banana plant material free from priority pests and diseases of bananas. This protocol is in place to ensure there can be no entry point for disease into the tissue culture

1.2 Scope

This protocol includes a description of the requirements of tissue culture laboratories to:

- be accredited as a QBAN accredited laboratory
- receive and accept banana plant material
- register banana plant material
- initiate cultures and multiply plantlets
- distribute plantlets free from priority pests and disease

1.3 Definitions

Term	Definition
Approved supplier	A supplier who is approved by the business to supply materials and services that meet agreed specifications.
Audit	A systematic examination of compliance, to determine whether practices that have been introduced are being followed and to ensure that the system achieves its aims.
Australian Banana Growers' Council (ABGC)	Australian banana industry's peak national agripolitical organisation established in February 1961.
Autoclaving	30 minutes at 121° Celsius
Banana	Plants of the genera <i>Musa</i> and <i>Ensete</i> (family Musaceae) used in production of food and fibre or for ornamental purposes. They include plants known as Plantain, abaca and Ensete.
Banana Industry Committee	Statutory body reporting to the NSW Minister for Primary Industries. Now trading as BananasNSW.
Corrective Action Record (CAR)	A written record of an issue, or issues, which must be addressed to demonstrate compliance with this QBAN scheme. CARs may be raised during self assessment, at internal audit, or during routine activities.
Fungi	A member of a large group of eukaryotic organisms that includes microorganisms such as yeasts and moulds, as well as the more familiar mushrooms.
Hazard analysis	The method of identifying potential hazards, assessing the significance of the risk and determining the good agricultural practices that prevent or minimise the risk of the hazard occurring.

Term	Definition
Indexing	The testing of banana material for the presence or absence of pathogens
Indexing laboratory	An laboratory set up to test banana material for the presence or absence of pathogens
Multiplication	The act of producing offspring
Non conformance	A failure to comply with the requirements of the QBAN scheme
Nursery	An area in which tissue culture banana plantlets are de-flasked and propagated into pots for field planting.
Priority plant pests and diseases	Any pest or disease that obliges a person who has knowledge or a suspicion of the presence of that pest or disease to notify the relevant State Authority inspector
Plantlet	A tissue cultured banana plant grown in a sterile tissue culture medium in a sealed flask.
Plant	A banana plant produced directly from tissue culture then de-flasked and grown-on in pots.
Propagation material	Suckers or bells from banana plants to be used to generate tissue culture.
Plant pathogens	An organism (generally a bacterium, virus or fungus) that causes disease in plants.
QBAN Administrator	A suitably trained person authorised by the ABGC as responsible for administering and managing the QBAN scheme. Reports to the CEO of the ABGC.
QBAN clone number	A number assigned to all suckers and plantlets derived from a mother plant and that has tested negative to virus.
QBAN Compliance Officer	A suitably trained person representing a QBAN accredited laboratory or nursery responsible for the implementation of the QBAN scheme.
QBAN database	A database (maintained by the QBAN Administrator) containing all clone numbers issued to a QBAN facility and showing clone numbers assigned to plantlets that have been indexed virus free.
QBAN facility	A banana plant nursery or laboratory accredited under the QBAN scheme by the QBAN Administrator.
QBAN Inspector	A suitably trained person authorised by the QBAN Administrator to collect propagation materials for indexing and multiplication.
Sterilisation	The act of making an object free of live bacteria or other microorganisms (usually by heat or chemical means).
Subculture	A microbiological culture made by transferring microorganisms from a previous culture to a fresh growth medium.

Term	Definition
Sucker	A shoot which arises from an underground shoot of a plant.
Tissue culture	The growth of tissues and/or cells separate from the organism.

2 Background

2.1 What is QBAN?

The primary purpose of the Quality Banana Approved Nursery (QBAN) scheme is to prevent the introduction, establishment, and spread of priority plant pests and diseases of banana across Australia. The QBAN scheme is managed by the Australian Banana Growers' Council (ABGC).

The QBAN scheme was originally developed in 1994 as an initiative of the National Banana Plant Health Improvement project supported by the Australian Banana Growers' Council, Banana Industry Committee (NSW), the Banana Industry Protection Board (Qld), Horticulture Australia Limited, NSW Department of Agriculture and Queensland Department of Primary Industries.

In 2009, Horticulture Australia Limited funded a review and update of the QBAN scheme. A number of organisations were involved in the update of the scheme, including the Department of Industry and Investment NSW, Queensland Primary Industries and Fisheries, part of the Department of Employment, Economic Development and Innovation and the Australian Banana Growers' Council (ABGC).

In addition, a number of organisations and individuals reviewed and provided feedback on the updated QBAN scheme including the Department of Agriculture and Food Western Australia and the Northern Territory Department of Regional Development, Primary Industry, Fisheries and Resources.

International sources of banana planting material require an import permit from the Australian Quarantine Inspection Service (AQIS) and fulfilment of strict conditions of entry and post-entry quarantine as determined by AQIS.

2.2 What legislation applies?

The QBAN scheme manual and protocols have been developed in line with the following authorising legislation in relevant States and Territories:

- New South Wales – *Plant Diseases Act 1924 No. 38*
- Queensland – *Plant Protection Act 1989* and *Plant Protection Regulation 2002*
- Northern Territory – *Plant Diseases Control Act 2000*
- Western Australia – *Plant Diseases Act 1914* and regulations in 1989
- Tasmania – *Plant Quarantine Act 1997 (Tasmania)*
- South Australia – *Plant Health Act 2009*
- Victoria – *Plant Health and Plant Products Act 1995*

2.3 What is the role of the laboratory?

The role of the QBAN tissue culture laboratory is to initiate and multiply banana tissue culture from virus indexed plants in a way that maintains their disease freedom throughout the production process.

Adherence to the QBAN scheme requirements is crucial to the success of achieving the outcomes of the QBAN scheme. An analysis of potential risks at this step in the process identified a number of critical hazards that may occur. These risks can include:

- Loss of sample identification.
- Mixing up, mislabelling or combining different suckers from different mother plants.
- Failure to keep indexed and non-indexed cultures segregated (both in location and process).
- Cross contamination between different source cultures.
- Failure to communicate suitability of sample to QBAN Administrator.
- Failure to maintain records of results from QBAN Administrator.
- Failure to maintain traceability linking plantlets to location of mother plant, virus indexing result and QBAN clone number through the production cycle and to the end user.

3 QBAN scheme requirements

3.1 Training requirements

- 3.1.1 The QBAN Compliance Officer, appointed by the laboratory, must be trained in the requirements of the QBAN scheme.
- 3.1.2 The QBAN Administrator is responsible for ensuring the QBAN Compliance Officer is trained to this protocol.
- 3.1.3 A record of all training received by the QBAN Compliance Officer is maintained by the QBAN Administrator and must include:
 - Date of training
 - Name and signature of the trainer
 - Name and signature of the QBAN Compliance Officer
- 3.1.4 When trained, the QBAN Compliance Officer is responsible for ensuring all personnel in the laboratory that work with banana are trained in the requirements of the QBAN scheme and the implementation of required QBAN protocols on commencement of their employment.
- 3.1.5 A record of this training will be maintained by the QBAN Compliance Officer, and must include:
 - Date of training
 - Description of training
 - Name and signature of the trainee
 - Name and signature of the trainer
- 3.1.6 A record of external training will be kept.

3.2 Register

- 3.2.1 The QBAN Compliance Officer must provide the following information to the QBAN Administrator when requested, or when changes occur:
 - Name of facility
 - Location address of facility
 - Owner of facility
 - Name of QBAN Compliance Officer
 - Postal address (if different from location address)
 - Contact details
- 3.2.2 The QBAN Compliance Officer is the key point of contact for all QBAN associated activities and correspondence, and must have a nominated delegate in case of absence.

3.3 Resources for QBAN facilities

3.3.1 The QBAN Compliance Officer must request additional copies of relevant forms from the QBAN Administrator in a timely manner.

3.4 Ongoing assessment of laboratory facilities

3.4.1 The laboratory must conduct a self-assessment against the requirements of the QBAN scheme at least annually. Records of this self-assessment must be kept.

3.4.2 If non-conformances are identified, corrective actions must be taken. Records of corrective actions must be kept, and made available to the QBAN Administrator upon request.

3.4.3 The QBAN Administrator will coordinate internal audits of each accredited QBAN laboratory at least annually to ensure that they are operating in accordance with the QBAN Scheme.

3.4.4 Additional internal audits or checks may be undertaken by the QBAN Administrator or nominated delegate to monitor compliance with the QBAN scheme. At least 24 hours notice will be given.

3.5 Laboratory design requirements

3.5.1 The QBAN facility must:

- be designed and managed to prevent the introduction of contaminants and pest and disease agents into or out of the facility
- be designed to prevent contamination of the plantlets and media both inside the facility and from outside sources
- be constructed to contain a secure culture room
- have adequate disinfection and sterilizing capabilities using tested / validated equipment
- be physically secure to prevent unauthorised access

3.5.2 Plants must not be grown within 5 metres of air intake points.

3.6 Laboratory process requirements

3.6.1 A QBAN Compliance Officer must be appointed. This person is responsible for ensuring the laboratory and employees comply with QBAN scheme requirements.

3.6.2 Good overall record keeping systems and laboratory quality culture management systems must be established and maintained.

3.6.3 High standards of hygiene must be employed to avoid cross-contamination and to minimise overall contamination.

3.6.4 Decontamination processes must be developed and implemented for employees or visitors that enter the laboratory after visiting areas where banana plants are grown.

3.6.5 Any tools and equipment must be sterilised between cultures and different source accessions.

3.6.6 A process will be put in place to prevent clones being mixed or mislabelled.

3.6.7 Only propagation material that has been collected by a QBAN Inspector following QBAN collection protocols can be initiated.

3.6.8 Other plant genera known to carry banana disease (described in Schedule 2) must not be cultured.

3.6.9 Physical segregation, as well as segregation of subculture practices, must be enforced to prevent cross contamination between indexed and non-indexed cultures.

3.6.10 Fungicides, biocides and antibiotics are not to be used in culture media as a means of suppressing the growth of fungi and bacteria.

- 3.6.11 Any cultures showing visible evidence of contamination with fungi must be destroyed by autoclaving.²
- 3.6.12 Excess banana material and / or packing material will be disposed of by autoclaving or direct placement into bags into waste bins. No banana material is to be dumped in an exposed environment.
- 3.6.13 Insect screens and air conditioning filters must be clean.

3.7 Material traceability

- 3.7.1 A tissue culture plantlet recording system must be in place, which will allow all plantlets to be identified accurately and traced back to a registered banana clone and traced forward to the recipient labelling system.
- 3.7.2 This can be done by identifying the materials throughout the process using a unique code issued by the laboratory internally, with this code written as a documented link on the original collection certificate completed by the QBAN Inspector.
- 3.7.3 The laboratory code should then link directly to the QBAN clone number.

4 Work instruction

4.1 Transport of propagation materials

- 4.1.1 At the completion of a collection of banana propagation material, the packaged propagation material will be transported to the laboratory.
- 4.1.2 Specifications for packaging and transport are outlined in the protocols *OP02 – QBAN Inspector* and *QP05 – Movement and transport*.

4.2 Receipt of propagation materials

- 4.2.1 Upon receipt of the propagation materials, the QBAN Compliance Officer or delegate must check the suitability of the materials ensuring that:
- both the outer and inner packaging is intact, ensuring leaf or propagation materials are not exposed
 - propagation materials are covered with excessive dirt
 - the materials are accompanied by a completed *Certification of Banana Material for Tissue Culture Initiation form* issued by a QBAN Inspector
 - suckers and bells are packed together in groups no greater than 10
- 4.2.2 If the samples are assessed as unsuitable for indexing or initiation, the QBAN Compliance Officer or delegate at the laboratory will follow actions outlined in Section 5 of this document.
- 4.2.3 The QBAN Administrator will complete a Corrective Action Record to address the non conformance.
- 4.2.4 Propagation material awaiting initiation into culture must be kept segregated from each other and from all other banana plantlets.

4.3 Initiation and establishment of banana cultures

- 4.3.1 Propagation of banana material must occur in a facility that meets the requirements outlined in element 3.5.
- 4.3.2 Tools and equipment must be sterilised prior to and between each initiation material extraction.
- 4.3.3 Suckers must be examined during culture initiation.³ Any internal discolouration running through the sucker must be recorded, the sucker kept for further examination and the QBAN Administrator advised.

² It is important to destroy cultures contaminated with fungi as there is currently no indexing for the fungal disease *Fusarium oxysporum* f. sp. *cubense* which can be transmitted in the vascular system.

³ Internal damage or symptoms will only become apparent at this stage

- 4.3.4 A unique laboratory code must be assigned to the initiation material. The container must be labelled with this code. The code must also be recorded on the *Certification of Banana Material for Tissue Culture Initiation* form and on all subsequent cultures generated from this initiation material.
- 4.3.5 Newly initiated plantlet cultures awaiting virus results must be kept segregated from each other and from all other banana plantlets.
- 4.3.6 This segregation must be maintained until the laboratory has received written notification of the QBAN clone number from the QBAN Administrator.
- 4.3.7 Any culture that has fungal contamination must be discarded and destroyed by autoclaving.

4.4 Notification of indexing results

- 4.4.1 If the virus indexing results are negative for disease, the QBAN Administrator will forward a copy of the completed *Certification of Banana Material for Tissue Culture Initiation* form to the QBAN Compliance Officer. This form will include the QBAN clone numbers.
- 4.4.2 Indexing must be completed within 4 weeks of receipt of sample at indexing laboratory.
- 4.4.3 The QBAN Administrator is responsible for monitoring this timeframe. If this timeframe has been exceeded, the QBAN Administrator will take action as defined in the *QP01 – QBAN Administrator*.
- 4.4.4 Whilst traceability must be maintained, segregation from cultures that have been issued with a QBAN clone number is no longer necessary, and multiplication of the materials within the laboratory system can occur.

4.5 Multiplication of banana cultures

- 4.5.1 When banana suckers used to initiate cultures have had a QBAN clone number issued, and have shown no fungal contamination, the cultures may be removed from isolation.
- 4.5.2 These cultures can be introduced into the general production environment but must retain a unique code that links them to the QBAN clone number.

4.6 Disposal of banana materials

- 4.6.1 All excess banana plant material must be destroyed by one of the following methods:
- Autoclaving
 - High temperature incineration
 - Deep burial or capped landfill
- 4.6.2 In the event of a positive result for a disease from virus indexing, a direction will be issued by the relevant plant health authority if it is a priority disease, or by the QBAN administrator for any other disease.
- 4.6.3 The directed method of waste disposal must be documented, with procedures available to all laboratory personnel.

5 Addressing, correcting and preventing non conformances

5.1 Samples in unsuitable condition upon arrival to indexing laboratory or tissue culture laboratory

- If samples are considered to be unsuitable, it is the responsibility of the QBAN Compliance Officer or delegate to inform the QBAN Administrator of the condition of the samples.
- Samples may be considered suitable if:
 - o both the outer and inner packaging is intact, ensuring leaf or propagation materials are not exposed
 - o propagation materials are covered with excessive dirt
 - o the materials are accompanied by a completed *Certification of Banana Material for Tissue Culture Initiation* form
 - o suckers and / or bells are packed together in groups no greater than 10 in labelled packages
- The QBAN Compliance Officer or delegate will record all details on the Corrective Action Record (CAR), and will also include:
 - o Date sample received
 - o Name of laboratory
 - o Name of QBAN Inspector
- Details of actions to be taken regarding disposal (if necessary) will be completed by the laboratory.
- The CAR must be forwarded to the QBAN Administrator as soon as possible after completion.
- The QBAN Administrator may include additional actions to be completed.
- The QBAN Administrator is responsible for ensuring the actions have been addressed in a timely manner, at which point the CAR can be closed.
- Copies of all CAR's will be retained by the QBAN Administrator.



QP04

Nursery

1 Introduction

1.1 Purpose

The purpose of this protocol is to describe the methods and steps to be completed by accredited Quality Banana Approved Nursery scheme (QBAN) nurseries for the growing of tissue cultured banana plants from an accredited laboratory to ensure they remain free from priority pests and diseases.

1.2 Scope

This protocol includes a description of the requirements that are to be adhered to by nurseries to be accredited to the QBAN scheme and to:

- receive banana plantlets
- deflask and grow plantlets
- distribute plants free from priority pests and disease
- maintain traceability of plantlets and plants

1.3 Definitions

Term	Definition
Approved supplier	A supplier who is approved by the business to supply materials and services that meet agreed specifications.
Audit	A systematic examination of compliance, to determine whether practices that have been introduced are being followed and to ensure that the system achieves its aims.
Australian Banana Growers' Council (ABGC)	Australian banana industry's peak national agripolitical organisation established in February 1961.
Autoclaving	30 minutes at 121° Celsius
Banana	Plants of the genera <i>Musa</i> and <i>Ensete</i> (family Musaceae) used in production of food and fibre or for ornamental purposes. They include plants known as Plantain, abaca and Ensete.
Banana Industry Committee	Statutory body reporting to the NSW Minister for Primary Industries. Now trading as BananasNSW.
Corrective Action Record (CAR)	A written record of an issue, or issues, which must be addressed to demonstrate compliance with this QBAN scheme. CARs may be raised during self assessment, at internal audit, or during routine activities.
Fungi	A member of a large group of eukaryotic organisms that includes microorganisms such as yeasts and moulds, as well as the more familiar mushrooms.
Hazard analysis	The method of identifying potential hazards, assessing the significance of the risk and determining the good agricultural practices that prevent or minimise the risk of the hazard occurring.
Indexing	The testing of banana material for the presence or absence of pathogens

Term	Definition
Indexing laboratory	An laboratory set up to test banana material for the presence or absence of pathogens
Multiplication	The act of producing offspring
Non conformance	A failure to comply with the requirements of the QBAN scheme
Nursery	An area in which tissue culture banana plantlets are de-flasked and propagated into pots for field planting.
Priority plant pests and diseases	Any pest or disease that obliges a person who has knowledge or a suspicion of the presence of that pest or disease to notify the relevant State Authority inspector
Plantlet	A tissue cultured banana plant grown in a sterile tissue culture medium in a sealed flask.
Plant	A banana plant produced directly from tissue culture then de-flasked and grown-on in pots.
Propagation material	Suckers or bells from banana plants to be used to generate tissue culture.
Plant pathogens	An organism (generally a bacterium, virus or fungus) that causes disease in plants.
QBAN Administrator	A suitably trained person authorised by the ABGC as responsible for administering and managing the QBAN scheme. Reports to the CEO of the ABGC.
QBAN clone number	A number assigned to all suckers and plantlets derived from a mother plant and that has tested negative to virus.
QBAN Compliance Officer	A suitably trained person representing a QBAN accredited laboratory or nursery responsible for the implementation of the QBAN scheme.
QBAN database	A database (maintained by the QBAN Administrator) containing all clone numbers issued to a QBAN facility and showing clone numbers assigned to plantlets that have been indexed virus free.
QBAN facility	A banana plant nursery or laboratory accredited under the QBAN scheme by the QBAN Administrator.
QBAN Inspector	A suitably trained person authorised by the QBAN Administrator to collect propagation materials for indexing and multiplication.
Sterilisation	The act of making an object free of live bacteria or other microorganisms (usually by heat or chemical means).
Subculture	A microbiological culture made by transferring microorganisms from a previous culture to a fresh growth medium.
Sucker	A shoot which arises from an underground shoot of a plant.
Tissue culture	The growth of tissues and/or cells separate from the organism.

2 Background

2.1 What is QBAN?

The primary purpose of the Quality Banana Approved Nursery (QBAN) scheme is to prevent the introduction, establishment, and spread of priority plant pests and diseases of banana across Australia. The QBAN scheme is managed by the Australian Banana Growers' Council (ABGC).

The QBAN scheme was originally developed in 1994 as an initiative of the National Banana Plant Health Improvement project supported by the Australian Banana Growers' Council, Banana Industry Committee (NSW), the Banana Industry Protection Board (Qld), Horticulture Australia Limited, NSW Department of Agriculture and Queensland Department of Primary Industries.

In 2009, Horticulture Australia Limited funded a review and update of the QBAN scheme. A number of organisations were involved in the update of the scheme, including the Department of Industry and Investment NSW, Queensland Primary Industries and Fisheries, part of the Department of Employment, Economic Development and Innovation and the Australian Banana Growers' Council (ABGC).

In addition, a number of organisations and individuals reviewed and provided feedback on the updated QBAN scheme including the Department of Agriculture and Food Western Australia and the Northern Territory Department of Regional Development, Primary Industry, Fisheries and Resources.

International sources of banana planting material require an import permit from the Australian Quarantine Inspection Service (AQIS) and fulfilment of strict conditions of entry and post-entry quarantine as determined by AQIS.

2.2 What legislation applies?

The QBAN scheme manual and protocols have been developed in line with the following authorising legislation in relevant States and Territories:

- New South Wales – *Plant Diseases Act 1924 No. 38*
- Queensland – *Plant Protection Act 1989* and *Plant Protection Regulation 2002*
- Northern Territory – *Plant Diseases Control Act 2000*
- Western Australia – *Plant Diseases Act 1914* and regulations in 1989
- Tasmania – *Plant Quarantine Act 1997 (Tasmania)*
- South Australia – *Plant Health Act 2009*
- Victoria – *Plant Health and Plant Products Act 1995*

2.3 What is the role of the QBAN nursery?

A nursery is an area in which tissue culture banana plantlets are deflasked and transferred into pots for growing prior to field planting. The nursery is responsible for maintaining the health status of the plant in accordance with the QBAN scheme requirements.

Adherence to the QBAN scheme requirements is crucial to the success of achieving the outcomes of the QBAN scheme. An analysis of potential risks at this step in the process identified a number of critical hazards that may occur. Risks include disease being introduced to plants in the nursery:

- via potting media, surrounding soil or water source
- by inappropriate practices and infrastructure (e.g. growing plants on ground)
- by poor operator hygiene or close proximity to neighbouring banana plants

3 QBAN scheme requirements

3.1 Training requirements

- 3.1.1 The QBAN Compliance Officer, appointed by the laboratory, must be trained in the requirements of the QBAN scheme.
- 3.1.2 The QBAN Administrator is responsible for ensuring the QBAN Compliance Officer is trained to this protocol.
- 3.1.3 A record of all training received by the QBAN Compliance Officer is maintained by the QBAN Administrator and must include:
 - Date of training
 - Name and signature of the trainer
 - Name and signature of the QBAN Compliance Officer
- 3.1.4 When trained, the QBAN Compliance Officer is responsible for ensuring all personnel in the laboratory that work with banana are trained in the requirements of the QBAN scheme and the implementation of required QBAN protocols on commencement of their employment.
- 3.1.5 A record of this training will be maintained by the QBAN Compliance Officer, and must include:
 - Date of training
 - Description of training
 - Name and signature of the trainee
 - Name and signature of the trainer
- 3.1.6 A record of external training will be kept and made available upon request.

3.2 Register

- 3.2.1 The QBAN Compliance Officer must provide the following information to the QBAN Administrator when requested, or when changes occur:
 - Name of facility
 - Location address of facility
 - Owner of facility
 - Name of QBAN Compliance Officer
 - Postal address (if different from location address)
 - Contact details
- 3.2.2 The QBAN Compliance Officer is the key point of contact for all QBAN associated activities and correspondence, and will have a nominated delegate in case of absence.

3.3 Resources for QBAN facilities

- 3.3.1 The QBAN Compliance Officer must request additional copies of relevant forms from the QBAN Administrator in a timely manner.

3.4 Ongoing assessment of nursery facilities

- 3.4.1 The nursery will conduct a self-assessment against the requirements of the QBAN scheme at least annually. Records of this self-assessment will be kept.
- 3.4.2 If non-conformances are identified, corrective actions will be taken. Records of corrective actions will be kept, and made available to the QBAN Administrator upon request.
- 3.4.3 The QBAN Administrator will coordinate internal audits of each accredited QBAN nursery at least annually to ensure that they are operating in accordance with the QBAN Scheme.
- 3.4.4 Additional internal audits or checks may be undertaken by the QBAN Administrator or nominated delegate to monitor compliance with the QBAN scheme. At least 24 hours notice will be given.

3.5 Nursery design requirements

3.5.1 The QBAN facility must:

- be designed and operated so as to prevent contamination of the banana plants with soil, surface water and priority pests and diseases carried in soil and water
- be located more than 1000m away from detections of priority pests and diseases
- have a restricted parking location for workers and visitors to prevent introduction of soil from vehicles into the nursery
- ensure vehicles are restricted to hard standing surfaces (e.g. compacted gravel) and do not come into contact with soil on the property
- be designed to restricted unauthorised access
- be equipped with hygiene stations, such as footbaths, hand wash or sanitiser spray, located at nursery entry points to prevent introduction of soil via boots or hands
- have a clean source of irrigation water (free from plant pathogens)

3.6 Nursery process requirements

3.6.1 A QBAN Compliance Officer must be appointed. This person is responsible for ensuring the nursery and staff comply with QBAN scheme requirements.

3.6.2 Good overall record keeping systems and nursery management systems must be established and maintained.

3.6.3 High standards of hygiene must be employed.

3.6.4 Only banana plants that have been procured within the QBAN scheme can be grown.

3.6.5 Other plant genera known to carry banana disease (described in Schedule 2) will not be grown.

3.6.6 Hygiene stations will be maintained in good condition.

3.7 Material traceability

3.7.1 A nursery recording system must be in place, which will allow all plants to be identified accurately and traced back to a registered banana clone and traced forward to the recipient.

3.7.2 This can be done by identifying the materials throughout the process using a unique code.

3.7.3 The code should then link directly to the QBAN clone number.

4 Work instruction

4.1 Receival of plantlets

4.1.1 Movement of banana plantlets from QBAN accredited facilities must comply with the requirements as outlined in the *QP05 – Movement and transport*.

4.1.2 Upon receival of plants / plantlets, the QBAN Compliance Officer or delegate is responsible for inspecting the condition of the package, ensuring that:

- the package has not been tampered with or damaged in such a way that may have exposed the plantlets or affected the health of the plantlets
- the package is accompanied by:
 - o details of supplier and quantity of plants sent
 - o information describing the cultivar names and QBAN clone number for all of the plants
 - o relevant movement documentation
- plants are labelled to ensure traceability of each individual plantlet to the corresponding QBAN clone number
- quantity and details on labels match receival documentation

4.1.3 If the package does not meet the criteria listed above, the QBAN Compliance Officer is required to follow actions outlined in Section 5 of this document.

4.2 Nursery practices

- 4.2.1 All QBAN nurseries must develop and implement good nursery practices to satisfy the QBAN scheme requirements.
- 4.2.2 These practices must be documented, with documentation made available to all nursery personnel.

4.3 Potting requirements

- 4.3.1 The potting mix must be a soil-less medium.
- 4.3.2 Soil must not be introduced through the process of mixing i.e. composted material (not derived from banana plant material) must be mixed with other material on a cleaned down surface such as concrete and should never sit on soil.
- 4.3.3 A list of ingredients in the potting mix must be available. Documentation detailing the production process of the potting mix should also be retained by the nursery.
- 4.3.4 The potting mix must be stored to avoid contamination with bacteria and fungi through contact with soil, surface water run-off or plant materials.
- 4.3.5 Areas used to store potting mix must be regularly cleaned.
- 4.3.6 Any tools and equipment must be sterilised. These procedures must be documented and made available to all nursery personnel.
- 4.3.7 Potting areas must be clean and tidy, with no piles of old mix or discarded plant material in the area.
- 4.3.8 Only clean pots to be used. Pots must be new, or sanitised by chlorination. This process must be documented, and made available to all nursery personnel.
- 4.3.9 Pots must be kept in a clean area.

4.4 Water supply

- 4.4.1 The nursery must not source water that may be contaminated with plant pathogens.
- 4.4.2 The nursery will be located in, or the source of the water is from, a catchment that does not currently or historically contain commercial, residential or feral stands of bananas. If this is not the case, the water supply will be chlorinated, obtained from deep bore or treated under an approved water treatment process that is able to destroy pathogens, such as slow sand filtration.
- 4.4.3 The water supply must be subjected to routine tests that demonstrate the efficacy of water treatment used.
- 4.4.4 Nozzles must not touch the ground. Contamination of nozzles with soil or surface run off must be prevented.
- 4.4.5 A record of equipment calibration must be maintained as required e.g. calibration of water chlorination unit.

4.5 Nursery beds, benches, floors and paths

- 4.5.1 Nursery beds and paths must avoid contact with soil and surface water.
- 4.5.2 Plants must be grown in such a way to prevent contact between the soil, surface water or splash from soil.
- 4.5.3 The area under benches and around the nursery should be periodically cleaned and treated with an anti-fungal agent.
- 4.5.4 A cleaning plan must be documented, made available to all nursery personnel and implemented.

4.6 Security

4.6.1 The nursery must:

- have a restricted parking location for workers and visitors to prevent introduction of soil from vehicles into nursery
- be designed to restricted unauthorised access
- have signage warning the public and visitors of restricted access
- restrict unauthorised vehicle access to the nursery

4.6.2 The nursery must have a separate area where plants are packaged and stored ready for distribution.

5 Addressing, correcting and preventing non conformances

5.1 Plants / plantlets in unsuitable condition upon arrival to nursery

- If samples are considered to be unsuitable, it is the responsibility of the QBAN Compliance Officer or delegate to inform the QBAN Administrator of the condition of the plants / plantlets.
- Plants / plantlets may be considered unsuitable if:
 - o the package has been tampered with or damaged in such a way that may have exposed the plantlets or affected the health of the plantlets
 - o the package is not accompanied by:
 - details of supplier and quantity of plants sent
 - information describing the cultivar names and QBAN clone number and associated laboratory code (if applicable) for all of the plants
 - relevant movement documentation
 - o plants / plantlets are not labelled to ensure traceability of each individual plantlet to the corresponding QBAN clone number
 - o quantity and details on labels do not match receipt documentation
- The QBAN Compliance Officer or delegate will record all details on the Corrective Action Record (CAR), and will also include:
 - o Date sample received
 - o Name of nursery
 - o Name of supplier
- Details of actions to be taken regarding disposal (if necessary) will be completed by the nursery.
- The CAR must be forwarded to the QBAN Administrator as soon as possible after completion.
- The QBAN Administrator may include additional actions to be completed.
- The QBAN Administrator is responsible for ensuring the actions have been addressed in a timely manner, at which point the CAR can be closed.
- Copies of all CAR's will be retained by the QBAN Administrator.



QP05

Movement and transport

1 Introduction

1.1 Purpose

The purpose of this protocol is to detail the requirements for movement and transport of:

- propagation materials collected by a QBAN Inspector
- plants and plantlets from QBAN accredited facilities to QBAN accredited facilities
- plants from QBAN accredited facilities to non-QBAN accredited nurseries or other retail outlets
- plants and plantlets from QBAN accredited facilities to growers and residential plantations

1.2 Scope

This protocol includes a description of the requirements that are required to be adhered to by all individuals and businesses involved in the QBAN scheme for movement and transport of banana plants and plantlets.

1.3 Definitions

Term	Definition
Approved supplier	A supplier who is approved by the business to supply materials and services that meet agreed specifications.
Audit	A systematic examination of compliance, to determine whether practices that have been introduced are being followed and to ensure that the system achieves its aims.
Australian Banana Growers' Council	ABGC – Australian banana industry's peak national agripolitical organisation established in February 1961.
Autoclaving	30 minutes at 121° Celsius
Banana	Plants of the genera <i>Musa</i> and <i>Ensete</i> (family Musaceae) used in production of food and fibre or for ornamental purposes. They include plants known as Plantain, abaca and Ensete.
Banana Industry Committee	Statutory body reporting to the NSW Minister for Primary Industries. Now trading as BananasNSW.
Corrective Action Record (CAR)	A written record of an issue, or issues, which must be addressed to demonstrate compliance with this QBAN scheme. CARs may be raised during self assessment, at internal audit, or during routine activities.
Fungi	A member of a large group of eukaryotic organisms that includes microorganisms such as yeasts and moulds, as well as the more familiar mushrooms.
Hazard analysis	The method of identifying potential hazards, assessing the significance of the risk and determining the good agricultural practices that prevent or minimise the risk of the hazard occurring.
Indexing	The testing of banana material for the presence or absence of pathogens
Indexing laboratory	An laboratory set up to test banana material for the presence or absence of pathogens

Term	Definition
Multiplication	The act of producing offspring
Non conformance	A failure to comply with the requirements of the QBAN scheme
Nursery	An area in which tissue culture banana plantlets are de-flasked and propagated into pots for field planting.
Priority plant pests and diseases	Any pest or disease that obliges a person who has knowledge or a suspicion of the presence of that pest or disease to notify the relevant State Authority inspector
Plantlet	A tissue cultured banana plant grown in a sterile tissue culture medium in a sealed flask.
Plant	A banana plant produced directly from tissue culture then de-flasked and grown-on in pots.
Propagation material	Suckers or bells from banana plants to be used to generate tissue culture.
Plant pathogens	An organism (generally a bacterium, virus or fungus) that causes disease in plants.
QBAN Administrator	A suitably trained person authorised by the ABGC as responsible for administering and managing the QBAN scheme. Reports to the CEO of the ABGC.
QBAN clone number	A number assigned to all suckers and plantlets derived from a mother plant and that has tested negative to virus.
QBAN Compliance Officer	A suitably trained person representing a QBAN accredited laboratory or nursery responsible for the implementation of the QBAN scheme.
QBAN database	A database (maintained by the QBAN Administrator) containing all clone numbers issued to a QBAN facility and showing clone numbers assigned to plantlets that have been indexed virus free.
QBAN facility	A banana plant nursery or laboratory accredited under the QBAN scheme by the QBAN Administrator.
QBAN Inspector	A suitably trained person authorised by the QBAN Administrator to collect propagation materials for indexing and multiplication.
Sterilisation	The act of making an object free of live bacteria or other microorganisms (usually by heat or chemical means).

2 Background

2.1 What is QBAN?

The primary purpose of the Quality Banana Approved Nursery (QBAN) scheme is to prevent the introduction, establishment, and spread of priority plant pests and diseases of banana across Australia. The QBAN scheme is managed by the Australian Banana Growers' Council (ABGC).

The QBAN scheme was originally developed in 1994 as an initiative of the National Banana Plant Health Improvement project supported by the Australian Banana Growers' Council, Banana Industry Committee (NSW), the Banana Industry Protection Board (Qld), Horticulture Australia Limited, NSW Department of Agriculture and Queensland Department of Primary Industries.

In 2009, Horticulture Australia Limited funded a review and update of the QBAN scheme. A number of organisations were involved in the update of the scheme, including the Department of Industry and Investment NSW, Queensland Primary Industries and Fisheries, part of the Department of Employment, Economic Development and Innovation and the Australian Banana Growers' Council (ABGC).

In addition, a number of organisations and individuals reviewed and provided feedback on the updated QBAN scheme including the Department of Agriculture and Food Western Australia and the Northern Territory Department of Regional Development, Primary Industry, Fisheries and Resources.

International sources of banana planting material require an import permit from the Australian Quarantine Inspection Service (AQIS) and fulfilment of strict conditions of entry and post-entry quarantine as determined by AQIS.

2.2 What legislation applies?

The QBAN scheme manual and protocols have been developed in line with the following authorising legislation in relevant States and Territories:

- New South Wales – *Plant Diseases Act 1924 No. 38*
- Queensland – *Plant Protection Act 1989* and *Plant Protection Regulation 2002*
- Northern Territory – *Plant Diseases Control Act 2000*
- Western Australia – *Plant Diseases Act 1914* and regulations in 1989
- Tasmania – *Plant Quarantine Act 1997 (Tasmania)*
- South Australia – *Plant Health Act 2009*
- Victoria – *Plant Health and Plant Products Act 1995*

2.3 Why is approval for movement of banana plant material so important?

Each state and territory has legislation regarding the introduction and growing of plant materials (including samples, propagation materials, plants and plantlets). This legislation is in place to prevent the spread of diseases and pests affecting plants. Each state and territory may have different regulations. Movement documentation is a clear indication that the relevant state or territory legislation has been followed, and that relevant regulatory bodies are aware of, and have approved the movement of plant materials into their state or territory.

2.4 Why is it important that banana plant materials are transported correctly and in a timely manner?

Banana plant materials must be transported correctly and in a timely manner to ensure the viability of the materials. Damage to the materials may lead to incorrect indexing results and may affect the long-term growth or yield of the plants. Damage may mean that the sample is unsuitable for testing or initiation which may lead to the needless destruction of samples, propagation materials, plants or plantlets. Damage to the outer packaging or unsuitable outer packaging may allow the infection of plants in transit.

3 Transporting materials, plants and plantlets

3.1 Banana propagation material – from collection to laboratory

- 3.1.1 Upon completion of a collection of banana propagation material, the QBAN Inspector is required to package and seal the material ready for dispatch.
- 3.1.2 The package must contain a completed copy of the *Certification of Banana Material for Tissue Culture Initiation* form.
- 3.1.3 Packaging and labelling requirements are detailed in QP01 – QBAN Inspector.
- 3.1.4 If the materials are to be stored for longer than 2 hours, the package must be kept in a cool, dark location until transport can be arranged.
- 3.1.5 Samples must be transported within 12 hours of collection.
- 3.1.6 The QBAN Inspector will organise for transport of the materials.
- 3.1.7 There is no preferred method of transport for the collected materials, but materials must be received by the relevant laboratory within 48 hours of collection.
- 3.1.8 During transit, packages should be kept upright and out of direct sunlight.
- 3.1.9 Records of dispatch (e.g. consignment note, delivery docket) must be retained by the QBAN Inspector.

3.2 Banana issue culture plantlets – from laboratory to other QBAN laboratory for further multiplication

- 3.2.1 The QBAN Compliance Officer is required to package and seal the plantlets ready for dispatch.
- 3.2.2 The plantlets must be visually healthy and free from contamination.
- 3.2.3 Each container of plantlets must be labelled with either:
 - the QBAN clone number; or
 - a unique laboratory code. A document must accompany the samples describing the link between the laboratory codes to the QBAN clone number on the *Certification of Banana Material for Tissue Culture Initiation* form.
- 3.2.4 The package must contain a copy of the *Certification of Banana Material for Tissue Culture Initiation* form completed by the QBAN Inspector including the linked laboratory code if applicable.
- 3.2.5 The package must be clearly labelled with the address of the laboratory.
- 3.2.6 The QBAN Compliance Officer will organise for the transport of the plantlets.
- 3.2.7 There is no preferred method of transport for the plantlets, but plantlets must be sent using a method that ensures the relevant laboratory receives the plantlets within 3 days.
- 3.2.8 During transit, packages should be kept upright and out of direct sunlight.
- 3.2.9 Records of dispatch (e.g. consignment note, delivery docket) must be retained by the person responsible for transporting plantlets.

3.3 Banana plantlets – from laboratory to nursery, retail outlet, grower or residential plantation

- 3.3.1 An authorised person from the laboratory is required to package and seal the plantlets ready for dispatch.
- 3.3.2 The plantlets must be visually healthy and free from contamination.
- 3.3.3 Each container of plantlets must be labelled with either:
 - the QBAN clone number; or
 - a unique laboratory code. A document must accompany the samples describing the link between the laboratory codes to the QBAN clone number on the *Certification of Banana Material for Tissue Culture Initiation* form.
- 3.3.4 The package must be clearly labelled with the address of the nursery.
- 3.3.5 The QBAN Compliance Officer will organise for the transport of the plantlets.
- 3.3.6 There is no preferred method of transport for the plantlets, but plantlets must be sent using a method that ensures the relevant laboratory receives the plantlets within 3 days.
- 3.3.7 During transit, packages should be kept upright and out of direct sunlight.
- 3.3.8 Records of dispatch (e.g. consignment note, delivery docket) must be retained by the person responsible for transporting plantlets.

4 Movement protocols

4.1 Obligations to obtain a Movement Certificate

- 4.1.1 QBAN accredited facilities MUST obtain a written Movement Certificate (Permit or Approval) to:
 - introduce a banana plantlet or a banana plant into another state or territory
 - move a banana plantlet or a banana plant into, within, between or out of any banana quarantine area in New South Wales or Queensland
 - move a banana plant produced by a QBAN accredited facility, that has been grown-on in a pot and has been indexed free of notifiable diseases and is maintained free of bacterial or fungal diseases, particularly *Fusarium oxysporum* f.sp. *cubense* (Panama disease), subject to the clone being registered, the laboratory and nursery being QBAN accredited and subject to being indexed negative for notifiable pests.

4.2 Obligation to comply with the conditions of a Movement Certificate (Permit or Approval)

- 4.2.1 All persons must comply with a written Movement Certificate (Permit or Approval), unless the person has a reasonable excuse from non-compliance.
- 4.2.2 Failure to comply without reasonable excuse may result in the person being prosecuted for an offence against the relevant state legislation.

4.3 Movement of tissue cultured nursery plants

- 4.3.1 The movement of a banana plant into, within, between or out of any banana quarantine area in New South Wales, or Queensland is as follows:
 - All movement of tissue cultured nursery plants within banana quarantine areas will be subject to a Movement Certificate (Permit or Approval) issued by a QBAN Inspector.
 - The movement of tissue cultured nursery plants between quarantine areas in Queensland and New South Wales is subject to:
 - o a Movement Certificate (Permit or Approval) from a QBAN Inspector where the plants are derived; and
 - o written approval from the State Authority receiving the plants
- 4.3.2 An exception to the above will be permitted when plants are to move between banana

quarantine areas or zones as specified in Schedule 1, in which case the movement will be subject only to a Movement Certificate (Permit or Approval) issued by a QBAN Inspector.

- 4.3.3 All other movements of tissue cultured nursery plants will be approved by the relevant State Authority.
- 4.3.4 The introduction of tissue cultured nursery plants into a banana quarantine area from an area outside of any banana quarantine area, or the movement of banana plant material between banana quarantine areas other than as listed above, is prohibited without both:
- a Movement Certificate (Permit or Approval) from a QBAN Inspector; and
 - written approval from the State Authority receiving the plants
- 4.3.5 Approval of the State Authority may be granted only if the State Authority considers that there are exceptional reasons to move the plants for research, education, or testing under quarantine control.
- 4.3.6 The movement of tissue cultured nursery plants from a QBAN accredited facility into the Northern Territory or Western Australia:
- is subject to the issue of a Movement Certificate (Permit or Approval) by the QBAN Administrator
 - is accompanied by a Plant Health Certificate (Q1), endorsed as 'Meets NT condition 8' or 'Meets WA Condition 24'
- 4.3.7 The movement of tissue cultured nursery plants between accredited facilities is subject to the issue of a Movement Certificate (Permit or Approval) by the QBAN Administrator.
- 4.3.8 Tissue cultured nursery plants must meet the following conditions prior to movement from the facility:
- in a soil-less mix
 - no visible signs of leaf disease of any kind
 - shipped in insect-screened containers or sealed van, and it is recommended that the plants transported in a vehicle direct to a loading area at the property over a formed road or driveway, without entering another banana plantation or nursery
 - subject to an inspection by the State Authority on arrival at the property or other such inspection arrangements as determined
- 4.3.9 Where approval is issued by the Banana QBAN Administrator for movement of tissue cultured banana plants from the Northern Pest Quarantine Area to the sub tropical areas, inspection of the plants by a QBAN Inspector must occur prior to shipment and on arrival by a local QBAN Inspector.
- 4.3.10 QBAN nurseries, particularly in the Northern Pest Quarantine Area, will also be required to maintain zero banana leaf disease of any kind within and surrounding the nursery.
- 4.3.11 Plants grown-on from tissue culture material will be eligible for planting only in the area indicated on the Permit to Move and **MUST NOT** be offered for sale.

4.4 Timing and application for a movement certificate (permit or approval)

- 4.4.1 A QBAN accredited facility must apply for a Movement Certificate (Permit or Approval) to the local Inspector or relevant State Authority before movement of tissue cultured plantlets or tissue cultured plants grown-on in pots occurs.
- 4.4.2 A grower who wishes to move, plant and cultivate a banana plant must apply to the QBAN Inspector for a Movement Certificate (Permit or Approval) to move and plant before movement of the tissue cultured material occurs.
- 4.4.3 An accredited QBAN facility must sight the Permission to Plant before plantlets or plants are issued. In this regard, a copy of the Movement Certificate (Permit or Approval) and Permission to Plant issued to the grower by a QBAN Inspector will be provided to the QBAN facility to allow the movement to occur.

4.5 Movement between QBAN and non QBAN research facilities

- 4.5.1 A QBAN accredited facility may move tissue cultured plantlets or plants grown on in pots to a Non QBAN research facility subject to the guidelines above and a Movement Certificate (Permit or Approval) issued by the QBAN Administrator.

4.6 Nursery plants from a non QBAN accredited facility

- 4.6.1 It is strictly prohibited to introduce non-QBAN banana plants into New South Wales, Queensland the Northern Territory and Western Australia except with the prior written approval of the relevant State Authority.

4.7 Refusal to move

- 4.7.1 A Movement Certificate (Permit or Approval) will not be issued if:
- satisfactory horticultural standards have not been maintained for the previous 6 months, including de-suckering, cutting up spent stems, deleafing, and controlling banana pests and diseases
 - the QBAN Nursery has received written directions from an Inspector to comply with legislation for the control of pests, diseases, and weeds in the Nursery plantation within the previous 2 months
 - the tissue cultured plantlets and plants are from a State or Territory other than New South Wales or Queensland
 - the tissue cultured material is not in a flask from a QBAN accredited facility
 - the materials are not indexed free of banana bunchy top, other virus diseases, and other notifiable pests
 - the material does not have a QBAN clone number
 - the tissue cultured material grown-on in pots is not from a QBAN accredited facility
 - it is a Pest banana

Quality Banana Approved Nursery (QBAN) scheme



Collection Request

Business requesting collection to complete

Business name		
Postal address		
Physical address of block		
Contact person		
Contact number		
Email address		
Destination QBAN tissue culture laboratory		
Proposed timeframe for collection(s)		
Additional comments		
Signature:		Date:

Once completed, please forward to QBAN Administrator

QBAN Administrator to complete

QBAN database ID		
QBAN Inspector contacted		
Date contacted		
Collection approved?	Yes ☐ No ☐	
Signature:		Date:

Once completed, please forward to QBAN Inspector

QBAN Inspector to complete

Date of collection:					
Physical address of collection block confirmed?	☐	Propagation material availability confirmed?	☐	No presence of unusual pest or disease?	☐
Additional comments					
Signature:		Date:			

Once completed, please forward to QBAN Administrator

Quality Banana Approved Nursery (QBAN) scheme

Certification of Banana Material for Tissue Culture Initiation



Doc no.

Collection site details – QBAN Inspector to complete

Business name

Postal address

Physical address of block

Contact person Contact number

Collection details – QBAN Inspector to complete

Sample number	1	2	3	4	5	6	7	8	9	10
Mother plant ID										
Laboratory code										
Comments										

QBAN facility details – QBAN Inspector to complete

Laboratory name

QBAN laboratory? Yes ☐ No ☐ QBAN Number Total

Postal address

Invoice to

Contact person Contact number

Inspector certification – QBAN Inspector to complete

I, being an inspector authorised under the QBAN scheme, certify that I have inspected the mother plant/s on the date indicated below, from which the accompanying pieces of banana material was / were taken, and that the inspection and collection was completed, to the best of my ability, in accordance with QBAN protocol QP02.

Inspection date

Approval is hereby given for the banana material to be moved from the specified mother plant site to the specified laboratory, and for samples to be moved to the approved indexing laboratory for testing.

Inspector name Inspector signature

Test results – QBAN Compliance Officer or delegate to complete

	BBTV	BSV	CMV	Other	Signature of QBAN Compliance Officer or delegate	Date

Sample number	1	2	3	4	5	6	7	8	9	10
Clone number										

Quality Banana Approved Nursery (QBAN) scheme

Inspection Checklist



Section 1 – Collection block details

Certification of Banana Material for Tissue Culture Initiation - document number

Date of collection

Start time

Section 2 – Visual assessment of collection block

	Y / N	Comments / action taken
Are there symptoms of priority pest and diseases (as outlined in Schedule 1)?		
Are there any other symptoms present that may indicate ill-health?		
Additional findings / comments		

Section 3 – Inspection of mother plants

Do any of the sampled mother plants show symptoms of banana bunchy top virus (BBTV), banana streak virus (BSV), cucumber mosaic virus (CMV) and Panama diseases?		
Are any of the sampled mother plants in poor cultural condition or not true to type?		
Additional findings / comments		

Section 4 – Completion of the collection

Additional findings / comments		
Signature of QBAN Inspector		Finish time

QBAN Inspector register

[illegible]

Quality Banana Approved Nursery (QBAN) scheme

QBAN facility register



Business details		Physical address		Contact details		QBAN Compliance Officer name	Previous internal audit date
Trading name		Physical address		Phone			
				Fax			
Owner		Postal address		Mobile			
				Email			
Trading name		Physical address		Phone			
				Fax			
Owner		Postal address		Mobile			
				Email			
Trading name		Physical address		Phone			
				Fax			
Owner		Postal address		Mobile			
				Email			
Trading name		Physical address		Phone			
				Fax			
Owner		Postal address		Mobile			
				Email			
Trading name		Physical address		Phone			
				Fax			
Owner		Postal address		Mobile			
				Email			
Trading name		Physical address		Phone			
				Fax			
Owner		Postal address		Mobile			
				Email			
Trading name		Physical address		Phone			
				Fax			
Owner		Postal address		Mobile			
				Email			
Trading name		Physical address		Phone			
				Fax			
Owner		Postal address		Mobile			
				Email			

Quality Banana Approved Nursery (QBAN) scheme

Management and HACCP review



Present

Apologies

Date

Management review	Key points	Actions (including who is responsible and timeframe)
Previous Management Review meetings - Review previous minutes - Outstanding actions		
Internal audits - QBAN Administrator summary - Review audit schedule - Issues identified - Corrective Action Records raised		
External audit - Review audit schedule - Issues identified - Corrective Action Records raised		
Review Corrective Action Records - Outstanding actions - Core or recurring issues		
Legislative changes / emerging issues - Legislative changes / emerging issues relevant to QBAN scheme? - Changes required to QBAN scheme		
Training review - QBAN Inspector training - QBAN Administrator training - QBAN facility training		

Management review	Key points	Actions (including who is responsible and timeframe)
Approved Suppliers - Review supplier inspections - Review new suppliers		
Impending process changes Is HACCP review required?		
HACCP review	Key points	Actions (including who is responsible and timeframe)
Scope and purpose Is the scope and purpose still relevant to the QBAN scheme?		
Flow chart Are the steps in the flow chart correct?		
Hazard analysis - Are all steps included in the hazard analysis? - Are there any additional hazards that have not been identified?		
Monitoring - Is monitoring in place for all CCP's? - Is monitoring of CCP's appropriate?		
Scheme review	Key points	Actions (including who is responsible and timeframe)
Scope and purpose Is the QBAN scheme achieving its purpose?		

Quality Banana Approved Nursery (QBAN) scheme

Corrective Action Record (CAR)



Date CAR raised:		Person raising CAR:	
What is the problem?			
What is the cause of the problem (short-term fix)?			
What will be done to fix this problem?			
Person responsible:		Proposed completion date:	
Signature when completed:		Actual completion date:	
What will be done to prevent this problem from happening again (long-term fix)?			
Person responsible:		Proposed completion date:	
Signature when completed:		Actual completion date:	
Have the changes made been effective (circle one)?		YES	NO
Reviewed by (signature and date):			

Quality Banana Approved Nursery (QBAN) scheme

Internal audit / self-assessment checklist – Tissue culture laboratory



Business name

Date

Audit completed by

No.	Element	Yes / No / NA	Yes = Evidence No = Actions to be taken, including responsible person and proposed completion date NA = Justification
QBAN Tissue culture laboratory requirements			
3.1.1	Has a QBAN Compliance Officer been appointed?		
	Is the QBAN Compliance Officer trained in the requirements of the QBAN scheme by the QBAN Administrator or delegate?		
	Is a record of this training available?		
3.1.4	Are all personnel that work with banana trained in the requirements of the QBAN scheme and the implementation of required QBAN protocols on commencement of their employment?		
3.1.5	Is a record of this training available?		
	Does this record include:		
	• Date of training		
	• Description of training		
	• Name and signature of the trainee		
	• Name and signature of the trainer		

No.	Element	Yes / No / NA	Yes = Evidence No = Actions to be taken, including responsible person and proposed completion date NA = Justification
3.1.6	Are records of external training kept?		
3.2.1	Has the QBAN Compliance Officer provided the following details to the QBAN Administrator?		
	• Name of facility		
	• Location address of facility		
	• Owner of facility		
	• Name of QBAN Compliance Officer		
	• Postal address (if different from location address)		
	• Contact details		
3.2.2	Has a delegate for the QBAN Compliance Officer been nominated in case of absence?		
3.4.1	Has a self-assessment against the requirements of the QBAN scheme been conducted within the last 12 months?		
	Is a record of this self-assessment available?		
3.4.2	If non-conformances were identified during the self-assessment, have corrective actions been taken?		
	Are records of corrective actions available?		
3.4.3	Has an internal audit against the requirements of the QBAN scheme been completed by the QBAN Administrator or delegate in the last 12 months?		
3.5.1	Has this facility been designed and managed to prevent the introduction of contaminants and pest and disease agents into or out of the facility?		
	Has this facility be designed to prevent contamination of the plantlets and media both inside the facility and from outside sources?		
	Does this facility contain a secure culture room?		

No.	Element	Yes / No / NA	Yes = Evidence No = Actions to be taken, including responsible person and proposed completion date NA = Justification
	Does this facility have adequate disinfection and sterilizing capabilities using tested / validated equipment?		
	Is this facility physically secure to prevent unauthorised access?		
3.5.2	Are plants not grown within 5 metres of air intake points?		
3.6.2	Are good overall record-keeping systems and laboratory quality culture management systems established and maintained?		
3.6.3	Are high standards of hygiene employed to avoid cross-contamination and to minimise overall contamination?		
3.6.4	Have decontamination processes must be developed for employees or visitors that enter the laboratory after visiting areas where banana plants are grown?		
	Have these decontamination processes been implemented?		
3.6.5	Are tools and equipment sterilised between cultures and different source accessions?		
3.6.6	Has a process been developed and implemented to prevent clones being mixed or mislabelled?		
3.6.7	Is only propagation material that has been collected by a QBAN Inspector following QBAN collection protocols initiated?		
3.6.8	Are other plant genera known to carry banana disease (described in Schedule 2) not cultured?		
3.6.9	Is physical segregation, as well as segregation of subculture practices, enforced to prevent cross contamination between indexed and non-indexed cultures?		
3.6.10	Are fungicides, biocides and antibiotics not used in culture media as a means of suppressing the growth of fungi and bacteria?		
3.6.11	Are any cultures showing visible evidence of contamination with fungi destroyed by autoclaving?		

No.	Element	Yes / No / NA	Yes = Evidence No = Actions to be taken, including responsible person and proposed completion date NA = Justification
3.6.12	Is excess banana material and packing material disposed of by autoclaving or direct placement into bags into waste bins?		
	Is banana material not dumped in an exposed environment?		
3.6.13	Are Insect screens and air conditioning filters clean?		
3.7.1	Is a tissue culture plantlet recording system in place?		
	Does this system allow all plantlets to be identified accurately and traced back to a registered banana clone and traced forward to the recipient labelling system?		
4.2.1	Upon receipt of the propagation materials, does the QBAN Compliance Officer or delegate check the suitability of the materials?		
4.2.2	If the samples is assessed as unsuitable for indexing or initiation, has the QBAN Compliance Officer or delegate implemented prescribed actions (QP03 – Section 5)?		
4.2.3	Is propagation material awaiting initiation into culture kept segregated from each other and from all other banana plantlets?		
4.3.2	Are tools and equipment sterilised prior to and between each initiation material extraction?		
4.3.3	Are suckers must be examined during culture initiation?		
	Is internal discolouration running through the sucker recorded?		
	Is the sucker kept for further examination?		
	Is the QBAN Administrator advised?		
4.3.4	Is a unique laboratory code assigned to the initiation material?		
	Are containers labelled with this code?		

No.	Element	Yes / No / NA	Yes = Evidence No = Actions to be taken, including responsible person and proposed completion date NA = Justification
	Is the code recorded on the <i>Certification of Banana Material for Tissue Culture Initiation</i> form and on all subsequent cultures generated from this initiation material?		
4.3.5	Are newly initiated plantlet cultures awaiting virus results kept segregated from each other and from all other banana plantlets?		
4.3.6	Is this segregation maintained until the laboratory has received written notification of the QBAN clone number from the QBAN Administrator?		
4.3.7	Is any culture that has fungal contamination discarded and destroyed by autoclaving?		
4.4.1	Are QBAN clone numbers communicated via a copy of the completed <i>Certification of Banana Material for Tissue Culture Initiation</i> form?		
4.5.1	Are banana suckers used to initiate cultures not removed from isolation until they have had a QBAN clone number issued, and have shown no fungal contamination?		
4.5.2	Do these cultures retain a unique code that links them to the QBAN clone number?		
4.6.1	Is excess banana plant material destroyed by one of the following methods: • Autoclaving • High temperature incineration • Deep burial or capped landfill		
4.6.2	Have any positive results for a disease from virus indexing been received?		
	If so, were directions issued by the relevant plant health authority or by the QBAN Administrator followed?		
4.6.3	Was the directed method of waste disposal documented, and are procedures available to all laboratory personnel?		

No.	Element	Yes / No / NA	Yes = Evidence No = Actions to be taken, including responsible person and proposed completion date NA = Justification
QBAN scheme requirements			
1	Are completed records filed appropriately to enable easy retrieval should they be required, and stored to prevent damage and deterioration in a central location at the QBAN facility?		
2	Are records retained for a minimum period of two years?		
3	Has the QBAN Compliance Officer signed a declaration to indicate they have understood their responsibilities, and will ensure all participants from within the business they are representing are trained to the requirements of the QBAN scheme?		
4	Is a copy of this declaration available at the QBAN facility?		
5	Are actions taken to address non conformances recorded on the Corrective Action Record or equivalent?		
	Do these records include:		
	• Date non-conformance identified?		
	• Details of the non-conformance (including what the issue is and how it occurred)?		
	• Quick fix (what can be done to fix the non-conformance now)?		
	• Long term fix (what can be done to prevent the non-conformance from recurring)?		
	• Expected dates of completion?		
	• Date and signature upon completion?		
6	• Review to ensure the actions taken have been effective in fixing the problem?		
	Does the QBAN Compliance Officer review CARs annually to ensure actions have been completed, and that the actions were effective in addressing the issue?		

Quality Banana Approved Nursery (QBAN) scheme

Internal audit / self-assessment checklist – Nursery



Business name

Date

Audit completed by

No.	Element	Yes / No / NA	Yes = Evidence No = Actions to be taken, including responsible person and proposed completion date NA = Justification
QBAN Tissue culture laboratory requirements			
3.1.1	Has a QBAN Compliance Officer been appointed?		
	Is the QBAN Compliance Officer trained in the requirements of the QBAN scheme by the QBAN Administrator or delegate?		
	Is a record of this training available?		
3.1.4	Are all personnel that work with banana trained in the requirements of the QBAN scheme and the implementation of required QBAN protocols on commencement of their employment?		
3.1.5	Is a record of this training available?		
	Does this record include:		
	• Date of training		
	• Description of training		
	• Name and signature of the trainee		
	• Name and signature of the trainer		
3.1.6	Are records of external training kept?		

No.	Element	Yes / No / NA	Yes = Evidence No = Actions to be taken, including responsible person and proposed completion date NA = Justification
3.2.1	Has the QBAN Compliance Officer provided the following details to the QBAN Administrator?		
	• Name of facility		
	• Location address of facility		
	• Owner of facility		
	• Name of QBAN Compliance Officer		
	• Postal address (if different from location address)		
	• Contact details		
3.2.2	Has a delegate for the QBAN Compliance Officer been nominated in case of absence?		
3.4.1	Has a self-assessment against the requirements of the QBAN scheme been conducted within the last 12 months?		
	Is a record of this self-assessment available?		
3.4.2	If non-conformances were identified during the self-assessment, have corrective actions been taken?		
	Are records of corrective actions available?		
3.4.3	Has an internal audit against the requirements of the QBAN scheme been completed by the QBAN Administrator or delegate in the last 12 months?		
3.5.1	Has this facility been designed and operated so as to prevent contamination of the banana plants with soil, surface water and priority pests and diseases carried in soil and water?		
	Is this facility located more than 1000m away from detections of priority pests and diseases?		
	Does this facility have a restricted parking location for workers and visitors to prevent introduction of soil from vehicles into the nursery?		

No.	Element	Yes / No / NA	Yes = Evidence No = Actions to be taken, including responsible person and proposed completion date NA = Justification
	Are vehicles restricted to hard standing surfaces (e.g. compacted gravel)?		
3.5.1 <i>cont'd</i>	Are vehicles restricted from coming into contact with soil on the property?		
	Is this facility designed to prevent unauthorised access?		
	Are hygiene stations, such as footbaths, hand wash or sanitiser spray, located at nursery entry points to prevent introduction of soil via boots or hands?		
	Does the facility have a clean source of irrigation water (free from plant pathogens)?		
3.6.2	Are good overall record-keeping systems and laboratory quality culture management systems established and maintained?		
3.6.3	Are high standards of hygiene employed to avoid cross-contamination and to minimise overall contamination?		
3.6.4	Are only banana plants that have been procedure within the QBAN scheme grown?		
3.6.5	Are other plant genera known to carry banana disease (described in Schedule 2) not grown?		
3.6.6	Are hygiene stations maintained in good condition?		
3.7.1	Is a nursery recording system in place?		
	Does this system allow all plants to be identified accurately and traced back to a registered banana clone and traced forward to the recipient?		
4.1.2	Upon receipt of the propagation materials, does the QBAN Compliance Officer or delegate check the suitability of the plants / plantlets?		
4.1.2	If the samples is assessed as unsuitable for indexing or initiation, has the QBAN Compliance Officer or delegate implemented prescribed actions (QP04 – Section 5)?		

No.	Element	Yes / No / NA	Yes = Evidence No = Actions to be taken, including responsible person and proposed completion date NA = Justification
4.2.1	Have good nursery practices to satisfy the QBAN scheme requirements been developed and implemented?		
	Are these practices documented, and is documentation available to all nursery personnel?		
4.3.1	Is potting mix a soil-less medium?		
4.3.2	Is soil not introduced through the process of mixing?		
4.3.3	Is a list of ingredients in the potting mix available?		
	Is documentation detailing the production process of the potting mix available?		
4.3.4	Is the potting mix stored to avoid contamination with bacteria and fungi through contact with soil, surface water run-off or plant materials?		
4.3.5	Are areas used to store potting mix regularly cleaned?		
4.3.6	Are tools and equipment sterilised?		
	Have procedures for sterilising tools and equipment been developed, and are these procedures available to all nursery personnel?		
4.3.7	Are potting areas clean and tidy, with no piles of old mix or discarded plant material in the area?		
4.3.8	Are only clean pots used (pots must be new, or sanitised by chlorination)?		
	Have procedures for using clean pots been developed, and are these procedures available to all nursery personnel?		
4.3.9	Are pots kept in a clean area?		
4.4.1	Does the nursery source water that is free of contaminated with plant pathogens?		

No.	Element	Yes / No / NA	Yes = Evidence No = Actions to be taken, including responsible person and proposed completion date NA = Justification
4.4.2	Is the nursery located in or is the source of the water from a catchment that does not currently or historically contain commercial, residential or feral stands of bananas?		
	If no, is the water supply chlorinated, obtained from deep bore or treated under an approved water treatment process that is able to destroy pathogens, such as slow sand filtration?		
4.4.3	Is the water supply subjected to routine tests that demonstrate the efficacy of water treatment used?		
4.4.4	Are nozzles not touching the ground?		
4.4.5	Is a record of equipment calibration maintained as required?		
4.5.1	Do nursery beds and paths avoid contact with soil and surface water?		
4.5.2	Are plants grown in such a way to prevent contact between the soil, surface water or splash from soil?		
4.5.3	Is the area under benches and around the nursery periodically cleaned and treated with an anti-fungal agent?		
4.5.4	Has a cleaning plan been documented, made available to all nursery personnel and implemented?		
4.6.1	Does the nursery have a restricted parking location for workers and visitors to prevent introduction of soil from vehicles into nursery?		
	Is the nursery designed to restricted unauthorised access?		
	Does the nursery have signage warning the public and visitors of restricted access?		
	Does the nursery restrict unauthorised vehicle access to the nursery?		
4.6.2	Does the nursery have a separate area where plants are packaged and stored ready for distribution?		

No.	Element	Yes / No / NA	Yes = Evidence No = Actions to be taken, including responsible person and proposed completion date NA = Justification
QBAN scheme requirements			
1	Are completed records filed appropriately to enable easy retrieval should they be required, and stored to prevent damage and deterioration in a central location at the QBAN facility?		
2	Are records retained for a minimum period of two years?		
3	Has the QBAN Compliance Officer signed a declaration to indicate they have understood their responsibilities, and will ensure all participants from within the business they are representing are trained to the requirements of the QBAN scheme?		
4	Is a copy of this declaration available at the QBAN facility?		
5	Are actions taken to address non conformances recorded on the Corrective Action Record or equivalent?		
	Do these records include:		
	• Date non-conformance identified?		
	• Details of the non-conformance (including what the issue is and how it occurred)?		
	• Quick fix (what can be done to fix the non-conformance now)?		
	• Long term fix (what can be done to prevent the non-conformance from recurring)?		
	• Expected dates of completion?		
	• Date and signature upon completion?		
6	• Review to ensure the actions taken have been effective in fixing the problem?		
	Does the QBAN Compliance Officer review CARs annually to ensure actions have been completed, and that the actions were effective in addressing the issue?		

Quality Banana Approved Nursery (QBAN) scheme

Internal audit / self-assessment checklist – QBAN scheme requirements



QBAN Administrator name

Date

Audit completed by

<i>Element</i>	<i>Yes / No / NA</i>	<i>Yes = Evidence No = Actions to be taken, including responsible person and proposed completion date NA = Justification</i>
Quality policy		
Has a quality policy been developed and documented?		
Does the quality policy list all current plant health legislation for each state?		
Has the quality policy been signed by the current ABGC CEO?		
QBAN Facility register		
Is a QBAN facility register available?		
• Name of facility		
• Location address of facility		
• Owner of facility		
• Name of QBAN Compliance Officer		
• Postal address (if different from location address)		
• Contact details		

<i>Element</i>	<i>Yes / No / NA</i>	<i>Yes = Evidence No = Actions to be taken, including responsible person and proposed completion date NA = Justification</i>
Document control		
Have all QBAN-generated documents been made available to staff at locations where operations essential to effective functioning of the scheme are carried out?		
Have all QBAN-generated documents been approved by the QBAN Administrator prior to distribution?		
Are all QBAN-generated documents identified with a date of issue and version number?		
Are all multi-paged QBAN-generated documents paginated with the total number of pages noted?		
Are completed records filed appropriately to enable easy retrieval should they be required, and stored to prevent damage and deterioration in a central location at the QBAN Administrator's office?		
Are records retained for a minimum period of two years?		
Does the QBAN Administrator authorise all changes to documents and records?		
Have changes to documents been recorded on the amendment register?		
Is a current document list available?		
Does the current document list include:		
• Document name?		
• Date of issue?		
• Version number?		
• Authorisation?		
• Location?		

Element	Yes / No / NA	Yes = Evidence No = Actions to be taken, including responsible person and proposed completion date NA = Justification
Is a list of externally-generated documents relevant to the QBAN scheme available?		
Are actions taken to address non conformances recorded on the Corrective Action Record or equivalent?		
Are adequate resources available to ensure the QBAN scheme runs efficiently and effectively?		
Training		
Has the QBAN Administrator been trained in the QBAN scheme manual and QBAN Administrator protocol?		
Has the QBAN Administrator signed a declaration indicating they have understood their responsibilities?		
Is a signed copy of this declaration kept on file at the QBAN Administrator's office?		
Is a register of QBAN Inspectors available?		
Have all QBAN Inspectors listed on the register been trained in the QBAN scheme requirements and the relevant QBAN protocols?		
Have all QBAN Inspectors signed a declaration indicating they have understood their responsibilities?		
Is a signed copy of this declaration kept on file at the QBAN Administrator's office?		
Is a register of these QBAN Compliance Officers available?		
Have all QBAN Compliance Officers listed on the register been trained in the QBAN Scheme manual and relevant protocols?		
Have all QBAN Compliance Officers signed a declaration indicating they have understood their responsibilities?		
Is a signed copy of this declaration kept on file at the QBAN Administrator's office?		
Is the organisation chart in the manual current?		
Are the responsibilities for each participant in the QBAN scheme listed in the manual current?		

<i>Element</i>	<i>Yes / No / NA</i>	<i>Yes = Evidence No = Actions to be taken, including responsible person and proposed completion date NA = Justification</i>
Approved suppliers		
Is a list of approved suppliers available?		
Is the approved supplier list current?		
Are specifications available for all approved suppliers?		
Is a copy of an internal audit or self-assessment for each approved supplier against the relevant specification completed within the last 12 months available?		
Traceability		
Have QBAN clone numbers been issued in accordance with the QBAN Administrator protocol?		
Has a mock traceability exercise been completed by the QBAN Administrator in the last 12 months?		
Are records of the traceability exercise available?		
Auditing / corrective actions		
Has an internal audit of each QBAN facility been completed in the last 12 months?		
Are records available for each internal audit?		
Have non-conformances raised as a result of the internal audit been addressed?		
Are records of these corrective actions available?		
Has an external audit of the QBAN scheme been completed within the last 12 months?		
Are records of this external audit available?		
Have non-conformances raised as a result of the external audit been addressed?		
Are records of these corrective actions available?		

<i>Element</i>	<i>Yes / No / NA</i>	<i>Yes = Evidence No = Actions to be taken, including responsible person and proposed completion date NA = Justification</i>
Does the QBAN Administrator review CARs every six months to ensure actions have been completed, and that the actions were effective in addressing the issue?		
Management Review		
Has a Management Review been held in the last 12 months?		
Do the Management Review include a review of:		
• Follow-up actions from previous Management Review meetings?		
• Internal and external audit findings?		
• Corrective Action Records?		
• Relevant legislative changes and emerging issues that may impact on the QBAN scheme?		
• Impending changes to the QBAN process?		
• Approved supplier performance?		
• The effectiveness of the QBAN scheme?		
Are minutes of Management Review available?		
Have copies of minutes been made available to all attendees within 2 weeks of the meeting?		