

**VG429**

**Queensland tomato quality management**

**John Maltby, Scott Ledger, *et al***

**QLD Department of Primary Industries**



*Know-how for Horticulture™*

**VG429**

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# PROJECT SUMMARY

## Implementation Process

### Action Learning

The implementation process was based on the concept of action learning where growers plan for improvement, act on the plans, review what happened/consider new information, plan and the cycle repeats. The role of the project team was in the review process (providing new information - knowledge, skills and resources). The role of the growers was in sharing experiences, planning new actions and acting on the plans. The advantage of the action learning concept was it focused the project team on ensuring the plan, act, review cycle completed. Otherwise the project would have just been another information delivery QA project without necessarily any action/outcomes in growers management systems.

### Workshops

An initial awareness meeting was held in each of the production districts and interested growers were invited to attend following workshops. A total 23 workshops were carried out over the two years of the project. The workshop format was considered an efficient process to deliver information to a large audience and allowed growers the opportunity to share information with other growers. Not all districts received the same number of workshops, this being dependent on grower numbers, amount of district production, project team availability and the level of commitment growers were allocating to quality management.

### Workbooks

Two workbooks of written reference material were produced. Modules written were:

- Module 1 Getting started in quality management 1
- Module 2 Getting started in quality management 2
- Module 3 Controlling production and distribution
- Module 4 Monitoring the production system
- Module 5 Involving staff in quality systems
- Module 6 Working with customers and suppliers
- Module 7 Setting objectives for improving quality management
- Module 8 Internal auditing

### Farm visits

Farm visits were carried out to assist growers to tailor quality management principles to their business and allow project team members to audit the 'success' of the workshops.

### Tomato Quality Guide

A five stage process was used to develop a tomato quality guide for industry that provided specific, measurable descriptions of tomato fruit quality for three style (grades) classifications. Colour photographs of defect allowances with written descriptions for the three styles were included in the guide. The guide was published as a saleable DPI publication.

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## **Evaluation Report**

The evaluation used a mail questionnaire to all participants, followed by semi-structured interviews of a stratified sample of participants.

### **How Effective Was The Training Project**

Participants generally found the training project to be very useful. It gave them a very good understanding of QM, it encouraged a relatively high rate of implementation of QM and left most participants with a positive attitude towards QM.

#### **How have participants reacted to the training?**

There was a strong positive reaction to the project. 91% of respondents to the questionnaire strongly recommended the training to other growers and 91% were positive about how well information was presented.

Practise exercises were also viewed positively (69%). Review sessions were not as clearly accepted, because some of the more advanced participants found them tedious.

The training workbook was not widely used at home, even though it was found to be clear and useful by most.

#### **How has the training affected participants attitude to QM?**

91% of respondents to the questionnaire said they had a better understanding of QM as a result of the training. This was strongly supported by interview responses.

In interviews, there was generally a positive reaction to the concept of QM, but general dismay at the amount of work involved in implementing QM. Most participants had a limited understanding of QM before the project.

The attitude to QM was generally positive by the end of the project, although a few did not see it as relevant for their operations.

#### **To what extent have participants implemented QM?**

This is the real measure of how effective the training project has been. 82% of respondents to the questionnaire said they had implemented some aspects of QM. 17% of businesses who participated in the training are in the process of developing certified quality systems. These figures indicate the project has been very successful.

The major barriers to QM implementation were lack of time and staff turnover.

#### **What impact has QM had on businesses?**

It is too early to collect objective data, but respondents opinions collected in the questionnaire indicate 88% had received some benefits from QM.

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## Comments on Project Effectiveness

The project strategy was to highlight quality systems as a tool to improve business performance, rather than concentrate on certification as an objective for all businesses. The strategy in no way discouraged businesses from pursuing certification.

Many small to medium sized businesses did not have the resources to aim for a certified system, but did implement parts of a quality system to meet their perceived needs. These businesses identified many and varied benefits implementing parts of a quality system.

## How Could The Training Project Be Improved?

The questionnaire and interviews highlighted a lot of issues and improvements that trainers can use to plan future QM training programmes. The key points are:

### Subject Matter

- The first awareness session is critical as a foundation for further training.
- Product quality and inspection is a good starting point. It is something growers are familiar with.
- Emphasise the **process** of developing specifications, rather than suggesting quality standards.
- In-business staff training in leadership and team work should only be given to supervisors and potential supervisors.
- Place more emphasis on pre-harvest issues where appropriate.
- Need to emphasise the simplest and most concise way of documenting a quality system.
- Include a session on overcoming problems and barriers to QM implementation.

### Timing Of Workshops

- Avoid peak harvest times. Check for each region and crop.
- Can use off-peak harvest periods for workshops during harvest.
- Check with each region and crop for most suitable time of day. Four-hour workshops is enough for most people.
- Keep spread of workshops to about one month between workshops, with some workshops over two days during slack times.

### Workshop Environment

- Group training is an important aspect of learning. Participants value sharing with other growers.
- An informal environment is preferred by most.
- Allow sufficient time for informal general discussion between growers.
- Include visits to businesses operating QM.
- One radical suggestion. Put participants in a packhouse for a day and run it using QM principles.

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## **Presentation Methods**

- Keep reviews short and to-the-point. Some found them tedious.
- Split participants into more advanced and less advanced (implementation) for discussions as workshops progress.
- Keep presentations short, active, hands-on and relevant as possible.
- Keep material as simple and easy to understand as possible.
- Be sensitive to involve everyone in discussions.
- Emphasise that information needs to be adapted for each business.
- Have each grower make a short presentation about their business when planning workshops.
- Set a clear agenda of workshops, activities and expectations.
- Use lots of practical exercises. Explain clearly what is needed for each exercise. Make exercises relevant.
- Use workshop exercises to develop on-farm systems.
- Make procedure writing a group exercise.
- Make visual aids large and clear. Be aware that some people have poor eyesight. Find out and adapt.
- Make videos and examples relevant. For example, do not use videos depicting office situations when discussing farm worker training.

## **Workbook**

- Keep the information brief and to the point.
- Use lots of examples in the workbook.
- Keep the page numbering system simple for ease of reference during workshops.
- Use language familiar to audience.
- The workbook could not be used easily as a stand-alone training document.

## **Farm Visits**

- If more than one person visits on separate occasions, be sure information is consistent. Preferably same person to one farm.
- Agree on objectives of visit with grower. Prepare beforehand so time is not wasted, particularly if the grower has not implemented any aspects of QM.

## **Implementation Between Workshops**

- Do not slow down rate of workshops if participants are not implementing much, keep up the momentum.
- Help participants develop action plans after about 3 or 4 workshops. Review and develop new action plans towards the end of the workshops.

## **Latecomers To Workshops**

- Ensure latecomers are presented with information from the awareness workshop as soon as possible. They need a clear idea of QM and its benefits and how to develop it in their business.

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## **Who From A Business Should Attend?**

- All the key decision makers should attend the first awareness workshop (husband and wife, sons and daughters, senior managers).
- Owners or senior managers needs to attend subsequent workshops, perhaps with a key staff or family member.
- Participants should not delegate attendance at workshops to an employee.
- Sons and/or daughters should attend if they are in the process of taking over the business.
- Presenters need to raise this issue at the awareness workshop, and perhaps follow-up individual businesses before the next workshop.

## **Learning Styles**

- Presenters need to be conscious of different learning styles in a group.
- Explore the use of a learning styles inventory.

## **Documenting A Quality System**

- Most people wanted outside help with documentation.

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## General Introduction

The Queensland tomato industry produces 75% (10.5 million cartons) of Australia's fresh market tomatoes. Fresh market tomatoes is a mature industry facing major challenges of reduced profitability, product quality and a need to increase demand both domestically and export. The Queensland industry through the Tomato Sectional Group Committee of Queensland Fruit and Vegetable Growers (QFVG) recognised these challenges and decided that one process to address them was through improved quality management. Consequently the committee supported a Queensland Department of Primary Industries project to conduct industry wide training in quality management.

The first phase of this project was a case study with the Queensland company SP Exports located near Bundaberg. At the end of the case study the company had achieved ISO 9002 and AQIS CA (Certification Assurance) accreditation.

The second phase was an industry wide training project carried out in the major Queensland tomato producing areas of Bowen, Bundaberg, Lockyer Valley and Stanthorpe. The focus of the training was to increase the knowledge and skills of growers so they could improve their own quality management systems to whatever level they desired. The international standard ISO 9002 was used as the model on which the training was based.

As the project evolved an industry guide to quality standards was developed.

The Tomato Sectional Group Committee of QFVG appointed a sub committee to oversee the project in liaison with the project team. Meetings were held half yearly with fax reports sent to members regularly. The committee was instrumental in development of the final draft of the Tomato Quality Guide.

The project team consisted of DPI officers John Maltby (Bundaberg Research Station), Scott Ledger and John Bagshaw (Horticulture Post Harvest Group Hamilton, Brisbane). Extension staff in the major producing areas were involved in running the workshops and farm visits. Terry Rudge of Rudge Produce Systems, Melbourne was employed on a consultancy basis as required.

Evaluation of the project was considered a priority with continuous evaluation being carried out with participants throughout the course of the project and a detailed evaluation carried out at the end of the project by John Bagshaw.

This report is divided into two separate sections, the first section dealing with the implementation process and the second with the evaluation.

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# **SECTION 1**

## **IMPLEMENTATION PROCESS**

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## **1.1 Introduction**

The implementation process had to take account of the following objectives for the project:

1. Design, implement and evaluate management systems within the Queensland tomato industry.
2. With growers design objective industry quality standards.
3. Put in place processes for individual growers to develop the quality management system they wanted based on the ISO 9002 model.
4. Provide quality assurance training for DPI regional officers.

To achieve the objectives the implementation process was based on an action learning cycle. The implementation process is reported under the following headings:

- 1.2 Case study - SP Exports
- 1.3 Project districts
- 1.4 Action learning
- 1.5 Action learning review process
- 1.6 Module delivery
- 1.7 Workshop timing
- 1.8 Task training
- 1.9 Industry quality standards

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## 1.2 Case study - SP Exports

The first phase of this project was a case study with the company SP Exports located near Bundaberg. The objectives of the case study were:

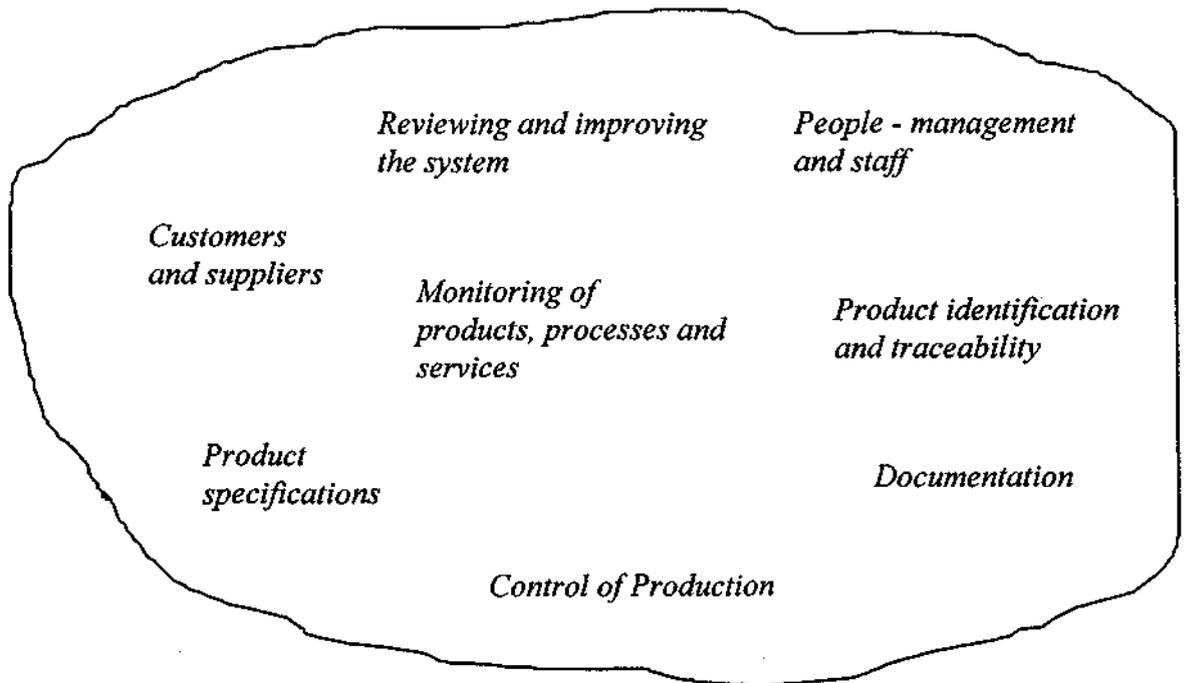
1. To assist SP Exports in developing their quality management system.
2. To provide the project team with the knowledge, skills and resources in developing a quality management system to the ISO 9002 standard for sharing with other growers in an industry wide quality management project.

All objectives were attained and are reported elsewhere (HRDC Final Project Report VG 330).

From learning gained in the case study the project team developed the following vision and model for the industry wide quality management project:

*Vision: "At the completion of the project be able to observe actions occurring in growers management systems that can be traced to the application of principles from the project and growers to be committing resources to further enhance their quality management systems".*

*Model: Components that constitute a quality management system:*



### 1.3 Project districts

The project was carried out in the major tomato producing districts of Queensland, shown in table 1.

Table 1: Estimated production of tomatoes in Queensland districts

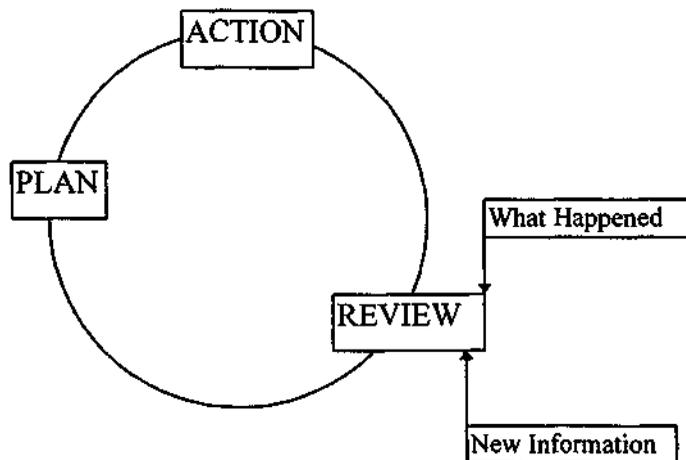
District	Estimated Total Production (cartons)
Bowen	5.5 million
Bundaberg	3.8 million
Lockyer Valley	0.6 million
Stanthorpe	0.6 million
Total	10.5 million

### 1.4 Action learning

The methodology used in the project to achieve improvement in growers quality management systems was based on the concept of action learning: “Without action there is no learning, and without learning there is no action” (Revens 1983).

The action learning concept as defined by the project team is shown in figure 1 as an action learning cycle.

Figure 1: Action learning cycle



In this concept of action learning, growers aim for improvement (plan), implement plans (action), look at what happened and consider new information (review), and the cycle repeats. It does not matter where one enters the cycle provided the cycle completes.

The primary role of the project team in the action learning cycle was in the review process. New information in terms of knowledge, skills and resources were shared with growers plus growers were assisted in reviewing what had happened in their management systems. The primary role of the growers was in planning and putting the plans into action in their management systems.

## 1.5 Action learning review process

The review process was implemented in a workshop format in each of the districts. The workshop format was considered an efficient process to deliver information to a large audience and allowed for growers to share information with other growers thereby taking advantages of group processes.

An initial awareness meeting was held in each of the production districts and interested growers were invited to attend following workshops.

### Awareness meeting

This was a two hour meeting to introduce growers to the concepts of quality management and outline to growers what the project was about. An awareness booklet titled "Introduction to Quality Management" was distributed to all participants at the meeting.

Topics covered were:

1. Forces driving business improvement - discussed the many forces driving the need for horticultural businesses to improve quality management.
2. Quality journey - outlined the concept that all businesses are on a quality journey and the different types of quality systems represent different stages along the journey.
3. What's in it for me - discussed the costs and benefits of quality management.
4. Where do I start - discussed the basic steps to getting started in improving quality management.
5. Quality System Model - discussed using ISO 9002 as a model for improving quality management.
6. Developing a plan - began the process of defining the scope of a quality management system and development of objectives.
7. What's next - the process to be used in the project.

To develop a plan for improvements growers were asked to list what caused them most stress in their business. The principle behind this process was to assist growers to develop quality management objectives to overcome this stress. Grower responses for each of the production districts were collated and grouped under five common headings (table 2).

Table 2: What causes stress for growers.

People (managers & staff)	Customers & Suppliers	Monitoring	Control of production	Other
Staff stupidity	Agent/customer demands	Monitoring effectiveness	Communication generally	Weather
Staff turnover and performance	Transport	Variability in fruit quality	Lack of communication	Financial pressures
Staff productivity	Customer complaints	Machinery breakdown	Lack of control	Overheads high, profit margins low
Staff training and availability	Price		Communication with field	Inspectors
Work/leisure ratio	Government regulations		Pest/disease	Managing change
Staff availability and quality	Marketing for a profit			Maintain standard of living
Co-operative marketing	Direct selling			Oversupply from interstate
	Monopoly by chain stores			No minimum grade standards

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## **Workshops**

Following the awareness meeting, workshops were held in each of the production districts. At each workshop information relating to the quality management model was presented and written resource material given to each participant to place in a workbook. The written information was divided into modules with each module divided into sections relating to specific aspects of the quality management model. Two workbooks were produced, the contents of which are shown below:

### **WORKBOOK 1**

#### **Module 1: Getting Started in Quality Management 1**

- Quality System Model
- Document Structure
- Analysing Your Business
- Developing Product Specifications
- Final Product Inspection
- Action Plans

#### **Module 2: Getting Started in Quality Management 2**

- Job Descriptions
- Hazard Analysis
- Quality Standards Training
- Reject Analysis
- Action

#### **Module 3: Controlling Production and Distribution**

- Preparing Procedures

#### **Module 4: Monitoring The Production System**

- Deciding What to Monitor
- Steps Involved in Monitoring
- Monitoring Product
- Developing a Sampling Plan
- Monitoring Plant and Equipment
- Product Identification and Traceability

### **WORKBOOK 2**

#### **Module 5: Involving Staff in Quality Systems**

- Leadership for Quality
- Effective Communications
- Motivating Staff
- Team Building
- Staff Training
- Quality Policy and Management Review

#### **Module 6: Working with Customers and Suppliers**

- The production and Marketing Chain
- Who are our Customers and Suppliers
- Discovering What Customers Want
- The Role of Specifications
- Satisfying Customers Requirements
- Customer - Supplier Agreements
- ISO 9002 Requirements for Contract Review and Purchasing

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**Module 7: Setting Objectives for Improving Quality Management****Module 8: Internal Auditing**

Audit Process

Planning the Audit

Preparing the Audit

Performing the Audit

Reviewing the Audit

Audit Nonconformance Report

Audit Report

Audit Follow Up

**1.6 Module delivery**

Modules were first tested in the Bowen district. For the other districts modules were delivered in response to grower requests, project team availability, level of knowledge of the growers and the potential of the module to realise objective outcomes in grower management systems. The number of workshops in each district and the modules/sections delivered are shown in table 3 and 4 respectively.

Table 3: Number of workshops in each district (excludes awareness meeting).

District	No. of Workshops
Bowen	9
Bundaberg	5
Lockyer Valley	5
Stanthorpe	4
TOTAL	23

Table 4: Modules/sections delivered in each district

	Bowen	Bundaberg	Lockyer Valley	Stanthorpe
<b>Module 1</b>				
Quality System Model	✓	✓	✓	✓
Document Structure	✓	✓	✓	✓
Analysing Your Business	✓	✓	✓	✓
Developing Product Specifications	✓	✓	✓	✓
Final Product Inspection	✓	✓	✓	✓
<b>Module 2</b>				
Job Descriptions	✓	✓		
Hazard Analysis	✓		✓	
Quality Standards Training	✓	✓		
Reject Analysis	✓	✓		✓
<b>Module 3</b>				
Preparing Procedures	✓	✓	✓	
<b>Module 4</b>				
Deciding What to Monitor	✓	✓		
Steps Involved in Monitoring	✓	✓		
Monitoring Product	✓			
Developing a Sampling Plan	✓			
Monitoring Plant and Equipment	✓			
Product Identification and Traceability	✓			
<b>Module 5</b>				
Leadership for Quality	✓		✓	✓
Effective Communications	✓		✓	
Motivating Staff	✓		✓	
Team Building	✓		✓	
Staff Training	✓			
Quality Policy and Management Review	✓			
<b>Module 6</b>				
The production and Marketing Chain	✓			
Who are our Customers and Suppliers	✓			
Discovering What Customers Want	✓			
The Role of Specifications	✓			
Satisfying Customers Requirements	✓			
Customer - Supplier Agreements	✓			
ISO 9002 Requirements for Contract Review and Purchasing	✓			
<b>Module 7</b> Setting objectives				
	✓			✓
<b>Module 8</b> Internal auditing				
	✓			

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## Farm visits

On farm visits were carried out by the project team to assist growers to tailor quality management principles to their businesses. This in fact became an audit process for the project team to see what action was occurring on farms as a result of the workshops. A checklist of quality management elements was developed from the model and growers were 'audited' against the checklist. The checklist proved to be a very useful audit tool.

### 1.7 Workshop timing

Timing of workshops was primarily determined by growers availability and secondarily by project team and resource availability. One of the problems encountered was in timing where growers wanted workshops to occur in 'slack' periods but the best time to put plans into action was in busy periods. The issue of timing is outlined in table 5 which outlines the time in days between workshops for the Bowen district

Table 5: Time between workshops in Bowen

District	Days between workshops
Bowen	0, 65, 26, 92, 21, 71, 43, 258, 164

The 258 day delay between workshop 7 and 8 was due to workshop 7 occurring on 21<sup>st</sup> July 1995 which is the beginning of the very busy harvest period for Bowen, and workshop 8 occurring on 5<sup>th</sup> February 1996 which allowed for growers to finish the season, have their break and come back in February ready for another year of tomatoes. Workshop 9 did not occur for another 164 days. This was due to the workshop being on internal auditing and for action to occur at the workshop, it had to be held when growers were picking fruit.

### 1.8 Task training

The Queensland Rural Task (Training and Skills) Project was a scheme aimed to assist drought affected primary producers and their employees. The training course was developed (by John Bagshaw) to complement the Quality Management project for tomato growers in the Lockyer Valley. In the quality management project participants had identified staff management and staff development as one of the key areas needing improvement.

The Task training program consisted of half-day sessions on staff management and development conducted on farm by a private consultant. Training under Task funding also occurred in the Bowen district with three Bowen tomato businesses participating.

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## 1.9 Tomato industry quality standards

Development of industry quality standards was addressed in five stages.

### *Stage 1: Development of draft tomato quality standards poster*

The poster contained photographs of Quarantine, Major and Minor defects:

- Quarantine defect - pest or disease that prevents entry into Australian states or importing countries
- Major defect - causes loss or decay and leads to fruit being unsound
- Minor defect - detracts from the appearance of the fruit

No defect allowances were written onto the poster with growers being encouraged to develop their own. An allowance is the maximum level of a defect on a single fruit that is acceptable

### *Stage 2: Tomato quality defects booklet*

A number of photographs of each defect were taken with each photograph showing an increasing area of the fruit surface being covered with the defect. The photographs were collated into a booklet. Growers were encouraged to select the photograph with the defect area that corresponded to the maximum amount of defect they would allow on a piece of fruit in each of their quality grades. This then became their defect allowance for their different quality grades.

### *Stage 3: Written defect allowances*

At workshops in Bowen and Bundaberg, growers were asked to either select from the tomato quality defects booklet the photograph that best described their defect allowance for each of their quality grades or provide their own written allowances. These results were collected and a first draft of quality standards for the tomato industry was developed.

The draft industry quality standards were then used to objectively measure the quality of tomatoes being offered for sale to buyers in Brisbane. The major aim of the study was to determine how achievable the draft standards were.

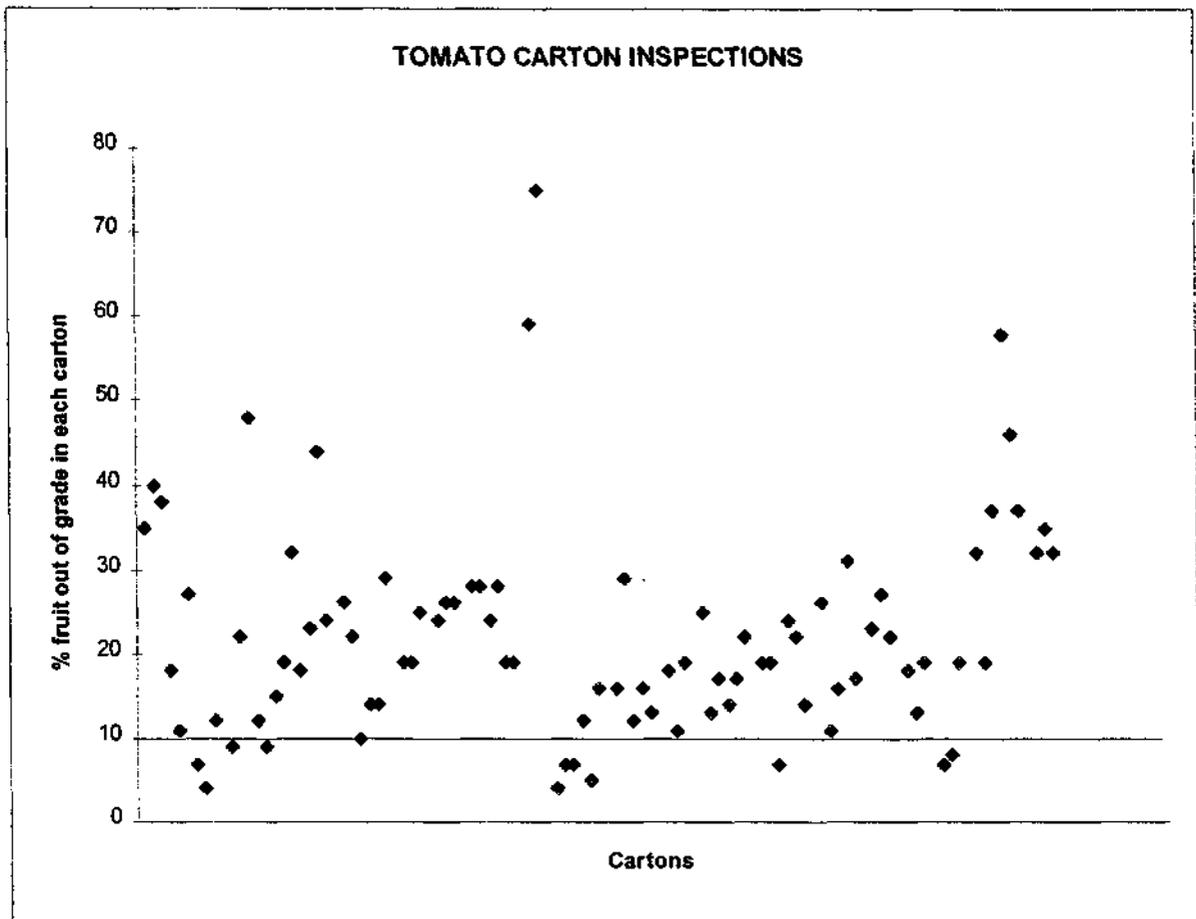
### *Stage 4: Draft standards*

Cartons of tomatoes were inspected in Brisbane at Woolworths distribution centre and the wholesale market on July 25, 31 and August 4, 7, 10 (1995).

A total of 90 cartons were inspected. The 90 cartons were sourced from 18 growers (15 from Bowen and 3 from Bundaberg).

All tomatoes in the cartons sampled were examined to see if they were within the defect allowance for No 1 grade fruit as outlined in the draft industry standards. The results are shown in figure 2.

Figure 2: % fruit out of grade in each of the 90 cartons examined.



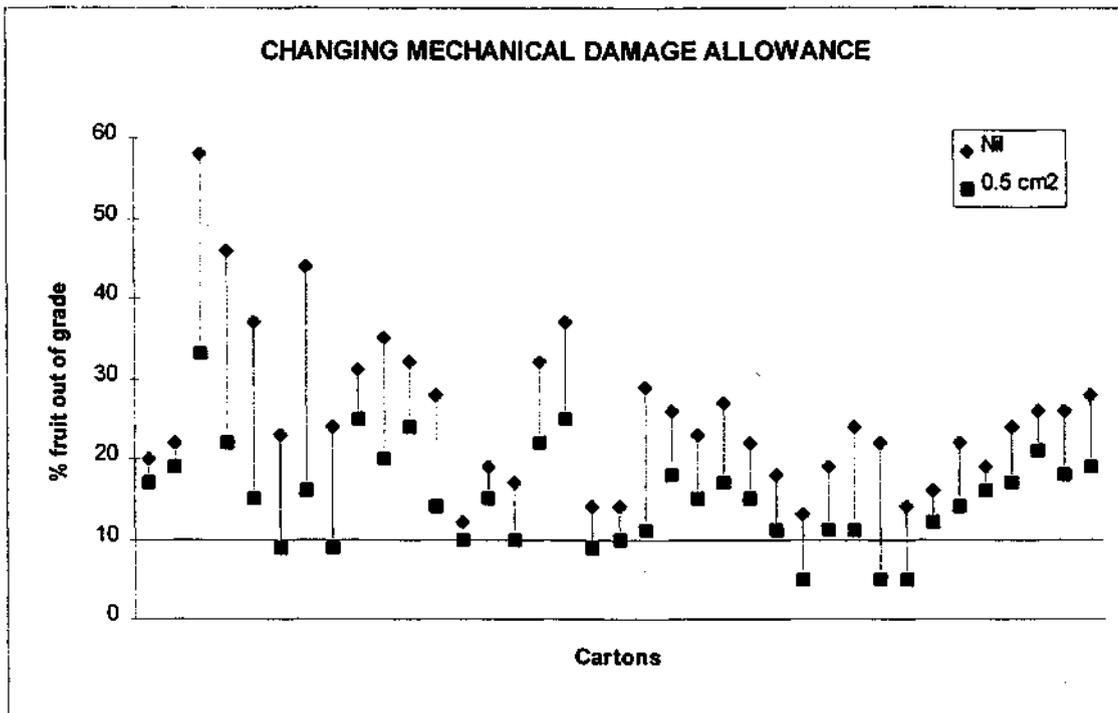
All of the cartons contained some tomatoes with some level of defect above the allowance for No 1 grade fruit (shown by the % of fruit out of grade in each carton). The % fruit out of grade in each carton ranged from a low of 4% to a high of 75%. The majority of cartons were within the range 10% to 30%.

In the tomato quality management project, the concept of Acceptable Quality Level (AQL) or tolerance was outlined. The AQL is the maximum acceptable level of out of grade fruit in a carton. Since there will always be human error, the AQL must be defined. The AQL recommended was 10% for major + minor defects. In the current study only 12 of the 90 cartons (13%) were below an AQL of 10%.

The question then asked was: "Why were 87% of the cartons above the 10% AQL?". Is it that the industry is not providing an acceptable quality of tomatoes to customers OR is it that the defect allowances used were too 'tight' and did not reflect commercial reality.

In an attempt to answer the second question (whether the allowances were too tight) the allowance for mechanical damage was relaxed from Nil to 0.5 cm<sup>2</sup>. This meant that a piece of fruit could have a shallow, dry and healed mechanical damage up to 0.5 cm<sup>2</sup> area and still be classified as No 1 grade. Those cartons where mechanical damage was a significant cause of the cartons being above the 10% AQL were then re-graded. The results are shown in figure 3.

Figure 3: Change in % fruit out of grade for mechanical damage.



Thirty-seven cartons were re-graded using the defect allowance of 0.5 cm<sup>2</sup> allowance for mechanical damage. The chart shows a significant reduction in the % of fruit out of grade in each carton with nine cartons (24%) falling to below the 10% AQL.

The aim of the re-grading exercise was not to develop allowances for the sake of being below the 10% AQL but to develop allowances that are achievable by sorting staff and are acceptable to customers. It was suggested that a defect allowance of 0.5 cm<sup>2</sup> was acceptable to consumers and is achievable by sorting staff where as a nil allowance is not consistently achievable.

#### Stage 5: Tomato Quality Guide

The draft quality standards were reviewed by the tomato quality management subcommittee of QFVG. The committee examined each suggested allowance in detail and their suggestions were sent to all districts for grower comment.

All comments were then collated into a tomato quality guide for industry that provided specific, measurable descriptions of tomato fruit quality for three style (grades) classifications. Colour photographs of defect allowances with written descriptions for the three styles were included in the guide. The guide was published as a saleable DPI publication with printing costs being funded by the Tomato Sectional Group Committee (QFVG).

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# **SECTION 2**

# **EVALUATION**

**John Bagshaw** Queensland Horticultural Institute, Brisbane

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## **Acknowledgments**

This evaluation would not have been possible without the help and support of my colleagues in DPI. I wish to thank Scott Ledger and John Maltby for their ideas and help in designing the questionnaire.

Special thanks to Marney McCullough for conducting the semi-structured interviews in Bowen, and for her ideas on recording and analysing interview information. Also for her help in interpreting the information gathered in the interviews.

The methods and ideas for conducting the evaluation came from an evaluation course conducted by Jeff Coutts and Arnold Wissemann at the Rural Extension Centre, Gatton.

I would particularly like to thank those tomato growers who made the time available to contribute to this evaluation, by completing and returning the questionnaire and/or being interviewed. Each interview was about an hour long.

John Bagshaw

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## **Introduction**

The tomato quality management project was the first time that DPI had conducted industry-wide training in quality management. The focus of the project was to increase the knowledge and skills of growers so they could develop their own QM systems.

The reason for this evaluation was to see how effective the training project had been and to identify improvements for future QM training.

### **Terminology**

In this section, participant quotes refer to both quality management (QM) and quality assurance (QA). Their use of one or the other depends on their previous exposure to quality language. They are all talking about the same quality system principles.

---

## Key Questions

The key questions that were addressed in the evaluation were:

### 1. How effective was the training project?

- How have participants reacted to the training?
- How has the training affected participants attitude to QM?
- To what extent have participants implemented QM into their businesses?
- What impact has QM had on their businesses?
- What conclusions can be drawn about the effectiveness of the training, based on the data collected?

Bennett's Hierarchy was used as a guide to developing the above key questions.

### How could the training project be improved?

- What have been the constraints to participants taking action to improve their quality systems?
- What suggestions do participants have on how the training could be improved?

## Methods

This evaluation used a qualitative methodology in two stages:

### Stage 1 - Mail Questionnaire

A questionnaire was designed, then tested with two of the participants. Changes based on the test were incorporated before distribution to all Bowen and Bundaberg participants. A follow-up letter with a questionnaire enclosed was sent three weeks after the first mailing. This questionnaire is reproduced in **appendix 1**.

The questionnaire was adapted slightly for the Lockyer Valley and Stanthorpe based on responses from the questionnaire sent to Bowen and Bundaberg. The adapted questionnaire and follow up were then sent to Lockyer Valley and Stanthorpe growers.

The mail questionnaire was designed primarily to answer the first key question, 'How effective was the training project?'

### Stage 2 - Semi-Structured Interviews

A stratified sample of five growers from Bowen, two growers from Bundaberg and three growers from the Lockyer Valley/Stanthorpe region were interviewed by one person using a semi-structured interviewing technique. Stratification was based on size of business and our perception of level of implementation of QM by the growers. **Appendix 2** shows the guide questions used for the semi-structured interviews.

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The interviews were used primarily to answer the second key question, 'How could the training project be improved?'. The interviews also provided a check on information received from the questionnaires (a method of triangulation for trustworthiness).

All interviews were tape recorded and transposed. The interviewer also took notes of key points during the interviews, using an adapted mind-mapping technique.

Information from the interviews was theme-analysed and coded, then summarised for analysis and interpretation. To determine how effective the training project was, information from questionnaires and interviews were theme-analysed into Reactions, Knowledge change, Attitude change, Aspiration change, Practice change and End results from Bennett's hierarchy.

To determine how the training project could be improved, information was theme analysed according to the various aspects of the project, (subject matter, timing of workshops, workshop environment, presentation methods, workbook and farm visits).

## **Trustworthiness**

The results from the questionnaires was checked against information from the interviews for accuracy (triangulation). Information generated from the interviews with conclusions was sent to the interviewees for comment about accuracy and interpretation (member checking).

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## Results And Discussion

### Proportion Of Queensland Fresh Tomato Industry Involved In This Project

District	Estimated Total Production (Cartons)	Number Of Businesses Attending Workshops	Estimated % of Total Production Packed By Businesses Attending Workshops
Bowen	5.5 million	15	70%
Bundaberg	3.8 million	5	75%
Lockyer Valley	0.6 million	6	40%
Stanthorpe	0.6 million	9	60%
<b>Total</b>	<b>10.5 million</b>	<b>35</b>	<b>69.5%</b>

\* The number of businesses quoted in the table indicates those that attended three or more workshops. There were a number of other businesses that attended only one or two workshops.

### Mail Questionnaire Response Rate

The response rate to the questionnaire was as follows:

Region	Response Rate
Bowen	67%
Bundaberg	75%
Lockyer Valley	67%
Stanthorpe	56%
<b>All Regions</b>	<b>63%</b>

The detailed results of the questionnaire are listed in **Appendix 3**.

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## How Effective Was The Training

### How have participants reacted to the training?

Respondents to the questionnaire rated various aspects of the training project as follows:

	Positive	Neutral	Negative
Would you recommend this training to other growers?	91%	4.5%	4.5%
Presentation of information?	91%	4.5%	4.5%
Workshop review sessions?	50%	8%	42%
Workshop practise exercises?	69%	8%	23%
How much did you use the training workbook at home?	19%	33%	48%
Farm visits?	62%	23%	15%
How much have you used the quality description aids?	52%	16%	32%

Some interview responses to the training project were:

“The workshops overall were excellent.”

“I found all the information presented interesting.”

“We got our money’s worth out of this project.”

Reaction to the training overall was very positive. Presentation of information, practise exercises and farm visits gave the most positive responses. Workshop review sessions and use of quality description aids (quality standard posters and pictorial booklets) were fairly evenly split. The training workbook was not widely used in businesses, even though interview responses indicate the material in the workbooks was clear and useful.

Some of the negative responses are explored in the section ‘How could the training project be improved’.

### How has the training affected participants attitude to QM

#### *Initial reactions to QM (following the first awareness workshop)*

Responses from interviews indicated a positive reaction to QM, but general dismay at the amount of work involved in implementing QM. For example:

“QA was something that was going to be important for the future, but I had a sinking feeling because I knew it wouldn’t take 5 minutes.”

“I thought ‘Oh no, it’s time we started doing something’.”

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“I left the awareness meeting thinking this is good, it’s about time.”

“We were initially overwhelmed, we knew there was a lot of work ahead but felt QM was the way to go.”

“I had no idea QM existed before the workshops, now see it as important for our business.”

Most participants had a limited view of QM before the awareness workshop.

*Has the training increased participants’ understanding of QM?*

Ninety-one per cent of respondents to the questionnaire said they have a better understanding of QM as a result of the training. This was strongly supported by interview responses. For example:

“I used to think QA was about getting A1 tomatoes in a box. I now know it is about monitoring and controlling; QA enables you to look for problems and places to improve.”

“QA was very grey to start with - took a while to understand.”

“I now know that QA is a lot broader than just product quality.”

“No one in our family had any idea what QM was at the start. I didn’t get a good idea until I was about halfway through the workshops.”

“I now have more idea what QM is about.”

“It’s hard to comprehend QM until you do it.”

*Reactions to QM by the end of the project.*

Most people responded positively to QM. For example:

“If we want to be here at the end of the day, this is the way we have to go.”

“After starting the course, I just knew you had to have it if you want to get anywhere in the industry.”

On the other hand, a few people had negative responses to QM. For example:

“You can put in QM and still not make more money. It all depends on prices and weather and so on.”

“We won’t do QM until it is law. We know some companies that supply us with goods that have QM (to ISO 9002) and they still make mistakes - and QM cost them a lot of money to implement.”

Many of the smaller businesses were positive about aspects of QM, but were negative about certification of quality systems. For example:

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“I have no intention of going to ISO 9002 - but I will use parts of QA to improve my business. I want to use QA to help satisfy customers.”

“Is certification going to result in fruit being sold for a higher price? - I would say not. The cost of certification is very high.”

Many growers also felt that formal QM systems demanded excessive documentation. For example:

“QM has a certain madness, documentation taken to the n<sup>th</sup> degree. You would get bogged down with paperwork to meet ISO 9002.

“QA was all too much to implement in our operation, it involved too much paperwork.”

“I don’t think we need to progress further. I don’t want to do the paperwork that goes with QA.”

### *How useful was the training to participants?*

Questionnaire respondents were asked what things they found most useful in the project. The most frequently listed aspects were:

- An understanding of quality systems
- Communication/sharing with other growers
- Writing procedures/developing documentation
- Product quality standards and inspection

Some respondents also said the project:

“Was a good tool for getting started with QA.”

“Showed how to adapt the quality concept to my business.”

“Provided a good outline of steps to follow to get ISO 9002.”

### **To what extent have participants implemented QM?**

82% of respondents to the questionnaire indicated they had implemented some aspects of QM. The most commonly implemented aspects of QM by these respondents were:

packed product inspections  
reject analysis  
regular staff training, and  
use of quality records.

Six of the businesses who participated in the training (17%) are in the process of developing certified quality systems (5 to ISO 9002; 1 to SQF 2000). All except one of these businesses are large (packing more than 200 000 boxes/year).

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Half of the 18% who indicated no implementation said they did have plans to implement some aspects of QM in the future.

Those interviewed who had implemented only a small amount of QM or hadn't started, indicated a commitment to putting in place certain aspects of QM. They said they would do it a little bit at a time as time and resources allowed; they indicated they will adapt QM ideas and principles to their situation and will only implement those aspects they see will benefit them.

Documented product specifications were developed by 80% of growers in Bowen and Bundaberg, but by very few in the Lockyer Valley or Stanthorpe. The Lockyer Valley and Stanthorpe growers expressed a need to have flexible standards that enabled them to adapt to field conditions (hail, rain, disease) and market supply. Hail is common in these areas and growers often have to salvage their crops for the best possible prices in order to remain viable.

Many of the smaller businesses interviewed were using some of the tools and principles of QM, but were not documenting anything. The changes in their business may not have been obvious in documentation, but the change in approach, attitude and practice was real. These changes had become a part of everyday farm activity, a habit that was sustainable. Many felt that formal QM systems over-stressed the value and use of documentation. For example:

“We saw the need for some documentation and now have better records, but formal writing up of QA can be overdone.”

“There are now four to five jobs in the packing shed we keep records for. For me, paperwork in QA is difficult. It's impossible for me to keep up with all the paperwork as I am the only one running the office.”

Two businesses interviewed saw the need for some documentation for the following reason:

“We need to document systems and train staff so someone can do the job if the bosses are away.”

“We are doing QA mainly to document everything in case something happened to my husband or I.”

### ***Barriers To Implementing QM.***

When asked what things limited adoption of QM, the overwhelming response was “lack of time”. Most tomato growing businesses are managed solely by the owners (husband and wife). The larger businesses may have a core of full-time employees with limited delegated responsibility. The extra time needed to plan, implement and maintain a quality system is a major imposition on these already overworked managers.

The obvious way to overcome the time barrier is to delegate management responsibilities to staff and train them for their new responsibilities. However, the second most mentioned factor limiting QM adoption was high staff turnover. Two businesses demonstrated that training staff for a supervision or management role can increase staff turnover. Staff with new-found skills became more employable to other businesses.

Most businesses recognised the need for well-trained staff at all levels to ensure implementation of QM, but were frustrated by the transience of itinerant seasonal workers.

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Other barriers to QM implementation mentioned in questionnaire responses were:

- Security based on the past
- Fear of paperwork
- Lack of capital to improve machinery and equipment
- Weather ruining crop
- QM not relevant.

### **What impact has QM had on their businesses?**

It is too soon to collect objective data concerning impact on businesses, but we did get opinions from growers who had implemented aspects of QM.

One question in the questionnaire was:

'What has been the overall impact of QM on your business?'

Growers responded to this question as follows:

	Percent of respondents
A lot worse than before QM	6%
Moderately worse than before	0
Slightly worse than before	0
No impact at all	0
Slight benefit	18%
Moderate benefit	41%
A lot of benefit	29%
Unsure	6%

88% of respondents indicated they received some benefits from implementing QM. 80% of those who indicated 'a lot of benefit' were progressing toward a certified quality system.

Some specific examples of benefits extracted from interviews are listed in **Appendix 4**.

### **How Could The Training Project Be Improved?**

#### **Subject matter**

Questionnaire respondents were asked what aspects of QM training was most useful to them. The question yielded the following responses pertaining to subject matter:

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### *An understanding of quality systems.*

This indicates the first awareness workshop is critical as a foundation for any further training in QM. Later workshops need to reinforce the philosophy and principles of QM laid down in the awareness workshop.

### *Writing procedures/developing documentation*

Participants listed documentation as important, but found it one of the most difficult aspects to accept. Training in writing procedures and preparing documentation needs to emphasise the simplest and most concise way of effectively documenting a quality system.

Participants valued documentation as an aid to training staff and ensuring continuity of operation in the event of the owner or manager becoming indisposed or leaving the business.

Developing written procedures was seen by some parents nearing retirement as a way to develop their children's skills to take over the business.

Having staff keep records was seen as a way to control key operations performed by them.

### *Product quality standards and inspection*

Most participants perceived QM to be product quality control early in the project and this was one of the first subjects presented. Participants found the subjects 'developing product specifications' and 'end product inspection' to be very useful and relevant. For example:

"Final product inspection was good because we did things just like we would in our (packing) sheds."

Some misinterpreted the 'product specification' session as a quality standard being imposed on them. In future training, we need to emphasise the **process** of developing specifications for each situation. If examples of specifications that others have developed are used, provide clear explanation that each business needs to develop their own specifications.

One principle of adult learning is 'take them from the familiar to the unfamiliar, from the known to the unknown'. Using product quality and inspection as a starting point in QM is consistent with this principle and will help develop positive attitudes to QM early in the learning process. However, participants need to understand that product quality and inspection is only one part of a broader quality system.

One participant felt that product specifications, packed product monitoring, reject analysis and hazard analysis were the "nuts and bolts of a quality system".

### *Staff management and training*

Poorly trained and motivated staff, and staff turnover was the biggest problem facing most of the businesses involved in the project.

We presented a workshop session on 'involving staff in QM' in Bowen and the Lockyer Valley. Emerging out of this, several businesses requested further training in managing staff, teamwork and staff motivation for their own employees.

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Businesses in the Lockyer Valley were presented with six half-day sessions over a period of three months; businesses in Bowen were presented with a once-off two day/one night workshop. Different training consultants were used for the different regions.

In the Lockyer Valley, most owners/managers responded positively to the training. For example:

“I think those training sessions would be some of the most important material for us”.  
“The staff training was very good. Our staff got a kick out of it”.

The training has helped the owners/managers improve their skills in managing staff. One grower now sees the need to conduct regular on-going training for his staff on technology and QM issues. He wants the training “to become sort of a habit, part of the weeks activities”.

One participant found the training gave more problems than benefits. It raised staff expectations and made them more critical of management. Also half the staff who were trained no longer work for the business.

Most participants also suggested the training was only useful to supervisory staff, not general staff. For example:

“Probably 10 to 15% of staff took something in. They were more likely the ones who were in a situation of supervising others. There were some there for the drinks and for the afternoon off”.

In future, leadership and team building skills should only be taught to people in supervisory positions. Training material for other staff would need careful thought.

All businesses had difficulty finding time to fit in all the training sessions. During the three-month period that these staff training sessions were being conducted, we did not conduct any QM workshops. We could not run QM workshops with the staff training sessions concurrently because businesses could not allocate time for both. This caused a disruption in flow of QM information. Much of the earlier QM information had been forgotten by the time we resumed workshops. The disruption meant we could not reinforce and build on QM principles step by step.

In Bowen, the staff training sessions conducted for businesses were a great success. Once again managers and supervisors received the most benefit. In some of the businesses, only managers and supervisors were targeted for training.

The two-day/one-night concept worked well for the businesses, and did not disrupt the flow of QM workshops as it did in the Lockyer Valley. In future, this format should be used.

Another learning is to only offer this type of training to businesses where management have the motivation and capability of maintaining the momentum with continuing staff development activities.

### *Preharvest aspect of QM*

Some growers wanted more emphasis on QM for pre-harvest aspects of their business. For example:

“ The quality of the tomatoes you produce is determined from when seedlings are transplanted. The workshops only covered the grading and packing of tomatoes”.

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“We seem to be starting our quality control half-way down the track by not covering the growing of the product first”.

Our workshops did emphasise the packing shed operations. In future, we need to also include pre-harvest aspects starting with hazard analysis/HACCP onwards. Most growers initially think QM is about product standards and so assume it has most to do with packing shed operations. This was reflected in the make-up of participants in our project. Mostly, the people who were in charge of the packing shed attended, not the field managers. The field managers will need to attend the workshops if preharvest aspects are to be included.

### ***Problems and barriers to implementation***

One grower mentioned that more time was needed to discuss how to overcome problems and barriers to implementation.

### **Timing Of Workshops**

#### ***Time of year***

All participants interviewed would prefer workshops during slack periods (not harvesting) although they saw the value of running workshops when the businesses (including packing sheds) are operating.

Bowen - the best time suggested was February to the end of July. September, October, November are too busy.

Bundaberg - February, March and April are the slack times and best for workshops. August and September are okay because at this time the packing sheds are operating but not at full capacity. May to July and November/December are too busy.

Lockyer Valley - the only slack time is the end of October to mid-November. Many growers holiday at this time. Winter cropping (July to end October) is less busy than summer tomato cropping (mid November to June) and so is more suitable for workshops.

Stanthorpe - the slack time is May to July. The busy harvest period starts in early November (stonefruit) and continues until March (tomatoes). Tomato harvest continues until May, but is not as busy.

#### ***Length of workshops and time of day***

In Bowen, there were mixed feelings about half or full days. Most of the workshops ran between 9 am and 2 pm to suit participants. Bundaberg preferred morning workshops. In the Lockyer Valley and Stanthorpe, afternoon workshops were preferred.

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## **Spread Of Workshops**

Nearly all participants interviewed felt the workshops were spread too far apart. There were big gaps between some workshops such that material was forgotten by the next workshop. A couple of growers said that shorter spans between workshops keeps your mind fresh and motivated. One grower suggested, “You are more inclined to do your ‘homework’ when you are not so busy, and the next workshop is not too far off”.

The general feeling was that, during the preferred slacker periods, run at least one workshop per month, with maybe a two-day workshop in one of the months. Run some workshops during the off peak harvest season, but avoid the very busy months.

Night workshops are an option if no other time is available, but would need to start about 4 pm to fit it in. One grower suggested, “set up a schedule of workshops and topics, then do it. We can then plan to fit in with the schedule”.

During the off-season, make sure workshops don’t clash with other training programs or industry activities. It may be only a matter of selecting a different day in the week.

## **Workshop Environment**

Running group training was an important aspect for learning. The participants greatly valued sharing and communicating with other growers. For example:

“The value of the workshops was in talking to others”

Also a certain amount of peer pressure kept participants motivated.

The use of U-shaped tables encouraged group interaction, but was viewed by some as too formal. They would have preferred tables spread around and people sitting around all sides of the table in groups (“just like at home in the dining room”).

Participants liked the fun atmosphere created by the trainers. They felt it was easier to learn in a light-hearted informal environment.

Several participants suggested visits to operating businesses to see what other people are doing in QM. One participant said “It would be good to have some sessions on-farm so we can apply and practise the concepts immediately in a real situation and relate it to real activities going on”.

Other participants preferred the “neutral” training locations we provided during the project. They were comfortable, air-conditioned and quiet. Packhouses are very noisy and difficult to communicate in.

A radical suggestion was to put workshop participants into an operating packhouse for a day and run it using QM principles. The sticking point was selecting whose packhouse to use.

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## **Presentation Methods**

### *Awareness workshops*

In future workshop planning, the information presented and structure of the awareness workshop needs an overhaul to ensure participants have a clear idea of QM and its benefits, and how to develop it in their business. Most participants did not have a clear, thorough understanding of QM until the fourth or fifth workshop. We need to present a clear, concise but thorough picture of QM at the awareness workshop to reduce the time lag of understanding.

### *Reviews*

Our plan was to run a series of workshops with homework (implementation) between workshops. We ran a session at the start of each workshop to review the material from the previous workshop and review on-farm progress.

Those who were more advanced with QM found the reviews tedious and boring. One person commented;

“We went back over things. The people that hadn’t done anything had nothing to contribute. I found it boring”.

A suggestion was to split participants into two groups for discussions as the training workshops progressed. One group of more advanced growers, and another of those who had implemented very little.

### *Presentation of information*

Even though questionnaire responses were very positive about presentation of information, there were still a number of suggestions for improvement from interviews.

Interview responses about presentations emphasised the need for them to be as active, hands-on and relevant as possible, and to keep ‘lecturing’ to a minimum. Participants also wanted material to be simple and easy to understand.

For example:

“The presenters did too much talking and didn’t extract growers knowledge enough. Get people reacting; make them work.”

“You need to make presentations active and lively. Keep talking by lecturers to a minimum”.

“It is good to do things and see things rather than just sit down all day long.”

“I was bored at times, too much talking. I learn best by doing.”

“The material needs to be made simple and easy to understand - that is important”.

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“I would have preferred concepts to be explained in our own language.”

Participants responded very positively to our use of real fruit in workshops (where appropriate ) for demonstrations and exercises. They also suggested that a variety of presentation styles kept their interest up.

Some participants warned that we needed to be sensitive to involve everyone in discussions - especially those who hadn't implemented any aspects of QM. The dangers of not involving everyone are:

- If non-implementers are ignored during discussions, they will be even less motivated to use QM and will feel a certain amount of guilt.
- Implementers started to feel they “shared a lot, but got little in return from others (non-implementers).”
- Some participants felt that presenters pandered to the implementers during workshops. Presenters need to be sensitive to this issue as it may lead to resentment.

Growers appreciated presenters emphasis that information was a suggestion to try out and adapt for their own businesses. One grower had strong feelings about; “Some college upstart standing up and saying ‘this is what you’ve got to do and this is how you are going to do it’. And that person has never set foot on our farm!”.

Comments from three growers flagged a potential problem about how we present QM concepts and ideas. Do we make simple ideas too complex?

“I did find some of the workshops very confusing, sometimes I thought it might be so simple that I was looking for something more difficult.”

“Procedures writing was good, but maybe not need to be as complicated as you put it. For my staff, need to keep written procedures short and to the point.”

“Final product inspection is really simpler than made out in the workshops.”

### ***Grower presentations***

An idea suggested by one grower was for all participants to give a five minute talk as a planned activity, “to explain what and how they did things”. The presenters may need to interview some growers with specific questions to get them to talk.

### ***Setting a clear agenda for participants***

Many participants in interviews said they would have preferred a clearer program of workshops, activities and expectations. They wanted a clearer idea of the learning journey ahead of them.

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“I wanted a regular measure of how much has been done and how far still to go - a list of topics given at the first workshop and progress measured at each workshop.”

“Set up the schedule for workshops then do it! We will fit in if you avoid our very busy time”.

### *Exercises*

The importance of practical exercises for effective training was highlighted during the interviews. For example:

It's amazing how much we don't pick up until we have had a go at doing it”.

“The television exercise in writing procedures was good, because it was a hands-on thing to do.”

In the questionnaire, 23% of respondents were negative about the exercises we conducted (see ‘How have participants reacted to the training ’ on page 9). Several growers responded in interviews that participants needed clearer, simpler instructions on what to do before starting the exercises. They said time was wasted by some groups chatting. This may be due to groups not knowing what to do, but it could also be due to growers becoming side tracked in talking together. Side-tracking during exercises may be reduced by allowing adequate informal discussion time during breaks.

Participants may also have resisted doing exercises they felt were not relevant. For example, one grower suggested a need to use exercises to develop their on farm systems during workshops so that it gets done. This needs to be balanced against the benefits of group exercises which encourages grower interaction and sharing of ideas.

In Bowen, procedure writing was done as a group exercise. One process was allocated to each participant to develop a written procedure between workshops. The written procedures were then collated and all of them distributed to all participants on computer disk to adapt to their own businesses. Some editing and guidance was provided by a presenter.

This process had the advantage that all participants had a fairly complete collection of procedures to work on and adapt. The process also encouraged some of the less motivated participants to prepare a written procedure for their business which otherwise may not have happened. The danger of this process is that a participant will use a procedure from another business as their own, without adapting it. The presenter has the responsibility of emphasising the uniqueness of each business and running a workshop exercise for participants to adapt another's procedure to their business.

Feedback from one business that is documenting their whole business for certification is as follows:

“Some written procedures we had to completely re-write but others just required a few minor changes. That was helpful, it sped up the process of writing procedures”.

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## ***Visual Aids***

Visual aids were important, and they must have large lettering. In interviews, two participants said they had poor eyesight and could not read overhead projections or writing on boards. They had to rely on notes in the sheets provided at the start of each workshop.

Videos were used by presenters with some groups for staff training. Growers were very critical of videos which were not relevant to tomato growing situations. As one grower put it, "videos about office workers didn't hit the mark. The office situation just doesn't relate for those fellows out in the field".

## **Workbook**

An empty folder was provide to all participants at the start of the first workshop. Notes about a particular topic were provided at the start of each workshop and added to their folder.

In the questionnaire, we asked how much the workbook had been used at home. Only 19% of respondents had used it a lot (positive), but 33% had used it a fair amount (neutral). (see 'How have participants reacted to the training' on page 27)

From interviews, those who had used it at home found the examples most useful. Examples of documentation were most commonly cited. Also mentioned was the example training process for sorters.

The workbook was also seen as a useful reference for later. It was used by some early in the season when planning what to do. It was also used to catch up by some of those who missed workshops. Participants remarked that it was well set out, easily understood and detailed. It may have been too detailed, because one participant commented, "you could put the important information in a much briefer book. There was a lot of unnecessary words in the workbook".

Another participant commented that the language used was sometimes strange. They cited the words 'hazard' and 'analysis' as examples.

A couple of participants commented that the page identification system was too difficult making it hard to find pages when presenters referred them to a particular section. We used document control principles in the workbook, so that each topic had a separate section code, and each section was numbered separately. In future, page numbering should be consecutive for ease of reference during workshops.

All participants interviewed said the workbook could not be easily used as a stand alone document. Much of the material needed clarification and explanation by presenters in a workshop situation. One participant highlighted 'writing procedures', 'job descriptions' and 'hazard analysis' as topics that needed more explanation than the workbook provided. Some of the terminology needed to be explained.

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## **Farm Visits**

Presenters visited individual farms to provide specific guidance and advice to those who requested it. Interview responses indicated these farm visits were helpful to those who were making progress implementing QM, but not so helpful to those making little progress.

For those making progress, the visits helped to keep them on track and provided feedback on implemented processes when packing sheds were operating. Presenters could provide an informal audit of operations. However, it was difficult to find time for discussion when the packing sheds were busy.

Several of those interviewed said the most value of farm visits was to review their written procedures, records and other documentation. The visits provided 'deadlines' for participants. One person commented, "it was good to have someone come in to prod you along".

One criticism of visits was different interpretations of various aspects of QM by different people on different visits. Where possible, try to have the same presenters visit the same farms for consistency. If this is not possible, ensure information is consistent between presenters.

Those who hadn't made much progress found visits to be wasted. There was nothing to evaluate and discuss, and visits made growers feel guilty because they hadn't done anything.

In future, visits need to be better prepared. Objectives for each visit need to be agreed beforehand so time is not wasted by either the presenter or the participant. If participants have made no progress toward implementing QM, then the objective for a farm visit would be to help the business establish an action plan, if the participant was motivated to do so. If not, don't visit.

## **On-Farm Implementation Between Workshops**

The results of the questionnaire indicates that 82% of respondents had implemented some aspects of QM in their business. This would indicate our strategy of running a series of workshops with at least one month between them, providing 'homework' and encouraging implementation between workshops, has been reasonably successful.

A few participants did follow this process very well. For example:

"We tried to keep pace with what was being presented to us. We could see that it would just pile up otherwise and we wouldn't know what to attack first."

"By implementing QM bit by bit, we were achieving it".

These participants allocated extra people (staff or family) to develop their QM system early in the project.

Most participants found it difficult to implement QM between workshops because they could not or didn't want to allocate extra people to implement QM. Also some were not sure of the benefits of QM so didn't want to allocate resources to it early on.

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Our response to lack of implementation early on was to slow down the rate of workshops to allow participants to catch up. However, this may have been counter-productive, as participants then lost momentum for implementation. For example:

“If you know the next workshop is several months off, you put off the homework”.

“It’s better to have workshops more regularly. It keeps us focussed and you keep pushing us.”

These quotes were by participants who had not implemented much.

Also, by slowing down the rate of workshops, those making progress implementing QM become frustrated because they wanted new information more quickly than we provided . For example:

“I got sick of going back over everything all the time.”

Toward the end of the project, presenters visited participants to help them develop an action plan for implementation of QM. This activity would have been more effective if it was run a few times during the project, rather than just at the end. One after six to 12 months, and again toward the end . The second visit can then be used to review progress of the action plan and set new action plans. The process gives concrete direction to individual participants.

### **Latecomers To Workshops**

There were some participants who attended after the awareness workshop. They struggled to understand and catch up until toward the end of the workshops. One latecomer expressed a need to do the workshops again (in a more compact form).

This highlights the importance of the initial awareness workshop. It provides an overall ‘map’ of the quality journey ahead, and should reduce the feeling one participant had;

“Initially, doing the workshops was like walking around blindfolded, you just try to fumble through doing the best you can”.

Latecomers need to have the awareness workshop presented to them as soon as possible (at least in some reduced form).

### **Who From A Business Should Attend?**

Experience from this project indicates the following suggestions:

All decision makers and potential decision makers in a business should attend the awareness workshop. This includes husband and wife and sons and daughters (if they will soon take over running the family business), and perhaps a key manager if they influence business policy. QM can only succeed in a business if all decision makers are committed to it. Commitment only comes from understanding QM and it’s benefits.

The owners or senior managers need then to attend subsequent workshops. Delegating attendance to an employee poses some problems;

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- The employee generally does not have perceived (even if delegated) authority to make major changes in a business. Only the owner/manager does. So the owner/manager needs the information to understand benefits of changes that QM will bring.
  - Employees generally only have responsibility for one section of a business. The owner oversees the whole business. QM is applicable to the whole business, both field and packing shed operations.
  - The employee may resign. The information and experience in QM is then lost to the business.

Many owners attended workshops with one or two supervisory staff. We encouraged this as a quality principle to train and motivate key staff.

In a situation where sons or daughters are in the process of taking over running a farm, they should attend initial workshops with their parents. This is because QM provides them with general management skills, as well as quality skills. After the initial workshops, family members can negotiate for one or the other to continue to attend.

This issue needs to be raised in the awareness workshop, and perhaps followed up individually with participants before the next workshop.

### **Learning Styles**

It became obvious during the interviews that different people have different learning styles. For example;

From:

“I like someone to say ‘by the next workshop I want you to have achieved this’.”,  
and:

“I thought the workshops were a little too casual, I wanted more direction from the lecturers”.

To:

“The light-hearted, informal environment was good.”

Presenters need to be sensitive to the learning styles in a group and meet the various individual needs as much as possible. In future, presenters could explore the use of a learning styles inventory to understand how particular groups best learn.

### **Documenting A Quality System**

Most growers were looking for help to document their quality system. Those developing a certified system have all employed a consultant, particularly (but not only) to help with meeting the documentation requirements of certified quality systems.

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Many of those not interested in certification also expressed a need for an 'outside person' to help with documentation.

The ideal situation is for the grower to write the information with guidance from an outside person, rather than the outside person doing the writing. One advantage is the grower has the knowledge and benefits from thinking about his business as he writes. Another benefit is expressed by a participant:

"I think writing it yourself is certainly more beneficial than if you sit down and explain everything to someone else who then goes away and prepares it. They may misinterpret something and it has to be done again."

## Conclusions

Participants generally found the training project to be very useful. It gave them a very good understanding of QM, it encouraged a relatively high rate of implementation of QM and left most participants with a positive attitude towards QM. 82% of questionnaire respondents said they had implemented some parts of a QM system. 17% of participants are in the process of developing certified quality systems.

Participants raised several barriers to implementation of quality systems, the most mentioned being lack of time and staff turnover. Like any barrier to change, some participants saw them as problems, others saw them as opportunities for improvement. Some barriers mentioned, such as weather ruining crops, are beyond the control of most businesses. Most participants indicated they wanted to be sure the benefits of QM exceeded the costs before they invested heavily in quality systems.

Questionnaire and interview responses raised a lot of issues about how the training project could be improved. It is recommended that each issue raised be investigated to decide how best to incorporate them into future training projects. QM training for horticultural production businesses will be more effective if these issues are seriously addressed.

## References

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2. Bernard, H R (1988) Research Methods In Cultural Anthropology. Sage Publications: London
3. Lenne, B And Hartley, D (1984) Writing Program Objectives. NSW Agriculture Advisory Note Number 16/84
4. Wadsworth Y (1991) Everyday Evaluation On The Run. Action Research Association Inc. Melbourne.

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## Appendix 1: Questionnaire

Some initial questions about your business (to help us categorise the information)

1. Where do you grow tomatoes: (Please circle the appropriate number)

<i>1</i>	<i>2</i>	<i>3</i>	<i>4</i>
Bowen	Bundaberg	Lockyer Valley	Stanthorpe

2. How many cartons of tomatoes do you pack per year:

<i>1</i>	<i>2</i>	<i>3</i>	<i>4</i>	<i>5</i>	<i>6</i>
0-25,000	25,000-50,000	50,000-100,000	100,000-200,000	200,000-400,000	>400,000

### Questions about the project

3. As a result of this project, do you now feel you have a better understanding of what quality management is about?

<i>1</i>	<i>2</i>	<i>3</i>	<i>4</i>	<i>5</i>	<i>6</i>	<i>7</i>
Not at all	Very little	A small amount	A fair amount	Quite a bit	A lot	A great deal

4. Would you recommend the training to other growers?

<i>1</i>	<i>2</i>	<i>3</i>
Yes	No	Unsure

5. List 3 things about the project that were the MOST useful to you.

1. \_\_\_\_\_
2. \_\_\_\_\_
3. \_\_\_\_\_

6. Please list any aspects of the project you have NOT found very useful in your situation.

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7. How well was information presented in the workshops?

1	2	3	4	5	6	7
Very poorly	Quite poorly	Fairly poorly	Just OK	Fairly well	Quite well	Very well

8. How useful were the workshop review sessions (review of progress in quality management by participants)?

1	2	3	4	5	6	7
Not at all	Very little	A small amount	A fair amount	Quite a bit	A lot	A great deal

9. How useful were the workshop practice exercises?

1	2	3	4	5	6	7
Not at all	Very little	A small amount	A fair amount	Quite a bit	A lot	A great deal

10. How much have you used the training workbook at home?

1	2	3	4	5	6	7
Not at all	Very little	A small amount	A fair amount	Quite a bit	A lot	A great deal

11. Did a trainer visit your farm?

1	2
Yes	No

→ Go to Question 13



12. If you answered 'yes' to the previous question, how useful were the visits?

1	2	3	4	5	6	7
Not at all	Very little	A small amount	A fair amount	Quite a bit	A lot	A great deal

13. Did you purchase a Tomato Quality Standards poster?

1	2
Yes	No

→ Go to Question 15



14. If you answered 'Yes' to the previous question, to what extent have you or your staff used the poster?

1	2	3	4	5	6	7
Not at all	Very little	A small amount	A fair amount	Quite a bit	A lot	A great deal

15. Did you purchase the Tomato Quality Defects booklet containing photographs of different levels of defect

1      2  
 Yes   No → Go to Question 17  
 ↓

16. If you answered 'yes' to the previous question, to what extent have you or your staff used the booklet?

1      2      3      4      5      6      7  
 Not at all   Very little   A small amount   A fair amount   Quite a bit   A lot   A great deal

**Questions about Quality Management**

17. Have you implemented any changes to quality management in your business? (Please tick the appropriate box).

1. Yes      [ ]      Go to next question  
 2. No      [ ]      Go to question 21

18. To what extent has this project helped you **plan and implement** changes to quality management in your business?

1      2      3      4      5      6      7  
 Not at all   Very little   A small amount   A fair amount   Quite a bit   A lot   A great deal

19. Please indicate below what progress you have made with the following parts of a quality management system. (Tick the appropriate boxes).

	None	Planning stage	Made a start	Well advanced
a. Product specifications	[ ]	[ ]	[ ]	[ ]
b. Packed product inspections	[ ]	[ ]	[ ]	[ ]
c. Reject analysis	[ ]	[ ]	[ ]	[ ]
d. Written procedures	[ ]	[ ]	[ ]	[ ]
e. Quality records	[ ]	[ ]	[ ]	[ ]
f. Process flow chart	[ ]	[ ]	[ ]	[ ]
g. Regular staff training	[ ]	[ ]	[ ]	[ ]
h. Organisation chart	[ ]	[ ]	[ ]	[ ]
i. Job descriptions	[ ]	[ ]	[ ]	[ ]

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20. What has been the overall impact of these changes on your business? (Please tick the appropriate box):

- 1. A lot worse than before [ ]
- 2. Moderately worse than before [ ]
- 3. Slightly worse than before [ ]
- 4. No impact at all [ ]
- 5. Slight benefit [ ]
- 6. Moderate benefit [ ]
- 7. A lot of benefit [ ]
- 8. Unsure [ ]

21. What things limit the extent to which you have been able to implement improvements to quality management in your business? (Please list them):

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22. If you have any comments about how we could have improved the training, please make them in the following space:

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## Appendix 2

### Interview Questions

#### Subject Matter

Introduction to QM (show topics covered)

What was your initial reaction to this awareness workshop ?

What interested you ?- What didn't ?

Was there a point where you thought 'this is all too much' ?

Other subject areas (show a list of topics covered)

What interested you ? - What didn't ?

Was there something not covered that you would have liked covered ?

#### Workshop Timing

What would suit you best for:

length of each workshop

Time of day

Time of year -Why then?

spread of workshops (period for all workshops to be delivered)

time between workshops

#### Workshop Environment

Venue ? - Meeting room or packhouse or ?

What atmosphere ( formal or informal) is most conducive to you being able to learn ?

How else could conditions be improved to aid learning?

#### Presentation Method

Balance of talking & activities

Visual aids ( OHP, videos, butcher paper etc)

How else could we improve presentations

#### Workbook

How could it be made more useful to you - to find information or follow steps.

Could you use the workbook alone without attending workshops

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## **Trainer visiting farm**

Questionnaire responses indicated visits were generally useful - but why?

How could visits have been made more useful in the time trainer was there?

## **Learning**

How could we have helped you learn about QM faster or better?

What does your spouse/children(if on farm)/staff think about QM?

Where in your business have you applied QM principles? - farm ?, nursery ?, packing shed ?, office ?

Have you taught others the skills you have learnt

Have you spoken to other farmers (who were not at workshops) or them spoken to you about QM ?

## **General**

How could we have made the project more interesting or useful to you?

Has your attitude about QM changed as a result of this training - How?

What further assistance do you think you need to progress - if any?

## Appendix 3: Summary of Questionnaire Responses

### Questionnaire Results - All Regions

Under each question are the choice of responses and the number of responses for each choice.

3. As a result of this project, do you now feel you have a better understanding of what quality management is about?

Not At All	Very Little	A Small Amount	A Fair Amount	Quite A Bit	A Lot	A Great Deal
1	0	1	5	7	5	3

4. Would you recommend the training to other growers?

Yes	No	Unsure
20	1	1

5. List 3 things about the project that were the most useful to you.

Issue	No. Of Responses
Gave an understanding of quality systems	10
Communication/sharing with other growers	10
Writing procedures/developing documentation	8
Product quality - standards and inspection	8
Helped with implementing a quality system	5
Staff management	2
Product traceability	1
Helps with business efficiency	1
Individual farm help	1
Awareness of need for control of all processes	1
On-farm staff workshops (Gatton )	1
Emphasis on system control	1
Visit other businesses	2

6. Please list any aspects of the project you have not found very useful in your situation.

Issue	No. Of Responses
Applying principles to a small business is difficult - staff nos, equipment	2
Workshops too general for help with ISO 9002 certification	1
Standards photographs could have been better	1
High staff turnover made training/application difficult	1
Job descriptions	1
Flow charts/hazard analysis	1
No feedback from instructors	1
Staff training workshops (Gatton) - do not over educate staff	1

7. How well was information presented in the workshops?

Very Poorly	Quite Poorly	Fairly Poorly	Just OK	Fairly Well	Quite Well	Very Well
0	1	0	1	3	9	8

8. How useful were the workshop review sessions (review of progress in quality management by participants)?

Not At All	Very Little	A Small Amount	A Fair Amount	Quite A Bit	A Lot	A Great Deal
0	2	3	1	3	2	1

9. How useful were the workshop practice exercises?

Not At All	Very Little	A Small Amount	A Fair Amount	Quite A Bit	A Lot	A Great Deal
0	0	3	1	1	5	3

10. How much have you used the training workbook at home?

Not At All	Very Little	A Small Amount	A Fair Amount	Quite A Bit	A Lot	A Great Deal
1	2	7	7	0	2	2

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**11. Did a trainer visit your farm?**

Yes No

13 9

**12. If you answered 'yes' to the previous question, how useful were the visits?**

Not At All	Very Little	A Small Amount	A Fair Amount	Quite A Bit	A Lot	A Great Deal
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0	0	2	3	5	0	3
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**13. Did you purchase a tomato quality standards poster? (Bowen and Bundaberg)**

Yes No

11 2

**14. If you answered 'yes' to the previous question, to what extent have you or your staff used the poster?**

Not At All	Very Little	A Small Amount	A Fair Amount	Quite A Bit	A Lot	A Great Deal
------------	-------------	----------------	---------------	-------------	-------	--------------

0	0	3	2	1	2	3
---	---	---	---	---	---	---

**15. Did you purchase the tomato quality defects booklet containing photographs of different levels of defect. (Bowen and Bundaberg)**

Yes No

10 3

**16. If you answered 'yes' to the previous question, to what extent have you or your staff used the booklet?**

Not At All	Very Little	A Small Amount	A Fair Amount	Quite A Bit	A Lot	A Great Deal
------------	-------------	----------------	---------------	-------------	-------	--------------

3	0	4	3	0 7	3	
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## Questions about quality management

17. Have you implemented any changes to quality management in your business?

Yes	No
18	4

18. To what extent has this project helped you **plan and implement** changes to quality management in your business?

Not At All	Very Little	A Small Amount	A Fair Amount	Quite A Bit	A Lot	A Great Deal
0	0	1	6	4	4	3

19. Please indicate below what progress you have made with the following parts of a quality management system. (This question was only presented to Bowen and Bundaberg participants. 3 respondents did not answer this question. Total 10 responses.)

	None	Planning Stage	Made A Start	Well Advanced
A. Product specifications	2	0	3	5
B. Packed product inspections	0	0	4	6
C. Reject analysis	0	0	5	5
D. Written procedures	1	2	3	4
E. Quality records	0	3	2	5
F. Process flow chart	3	0	4	3
G. Regular staff training	0	2	3	5
H. Organisation chart	2	3	2	3
I. Job descriptions	2	1	5	2

20. What has been the overall impact of these changes on your business? (2 respondents did not answer this question)

A lot worse than before	0
Moderately worse than before	0
Slightly worse than before	0
No impact at all	0
Slight benefit	3
Moderate benefit	7
A lot of benefit	5
Unsure	1

21. What things limit the extent to which you have been able to implement improvements to quality management in your business?

Issue	No. Of Responses
Lack of time	9
Staff turnover	3
Weather ruining crop	2
Owner poorly organised	1
Security based on the past	1
Fear of paperwork	1
Lack of capital to improve equipment	1
QM not relevant	1
Heard about companies with ISO 9002 - great expense & product or service not improved.	1
Shortage of funds	1

22. If you have any comments about how we could have improved the training, please make them in the following space:

Issue	No. Of Responses
More variety in presentation methods - use examples	5
More emphasis on pre-harvest operations	4
Have some 2-day workshops - workshops not so spread out	2
Be realistic about work needed to develop quality systems	1
Limit workshops mainly to off-season	1
Adapt QM requirements for small businesses	1
Make participants <b>work</b> - very active sessions needed	1
Include shed visits/activities	1
Farm visits - keep advice consistent with different people	1
Improve the review sessions so not tedious	1
Split into groups based on level of implementation when course is underway	1
Be sure presenters and materials are organised before the workshops	1
Encourage everyone to start somewhere	1

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## Appendix 4

### Some examples of benefits of a QM system.

“Quality management has helped us run things better”

“We have defined everyone’s role a bit more. Everyone has their own thing to do.”

“QM has helped me delegate some jobs and be confident they are done the way I want them done.”

“We had one of our merchants say ‘I have a lot of customers now that don’t even bother to lift the lid, they know the tomatoes in our brand are going to be the same every time.’”

We had some agents ring up and say ‘we need tomatoes’ and we tell them the price. They say we are too dear. Then they ring back and buy them anyway because their customers want our fruit.”

“QM has given us more control of our product.”

“We now have better records”

“We learnt that all defects have names. It’s easier then to explain to staff what to sort for”.

“QM offers some stability, a check on staff. Use of records by staff to prove what has been done is a safety net.”

“QM has made us more efficient in our business. We can find areas to fix up and improve.”

“Other growers supply us with fruit. We have told them about our QA and what we expect of them: fruit quality, hygiene and records.”

“Packed product monitoring has made our staff more aware of quality. It keeps them thinking about it a bit more all the time.”

“I got all the sorting ladies to learn the defects. They get excited when they know the name of a defect.”

“We have two blokes now who are willing to come forward and suggest better ways of doing something, rather than not say anything and just go home.”

“We now keep records of pallet exchange to make sure we don’t come up short at the end of the year. It has proved fruitful, we can identify who has diddled us for pallets.”

“We can now trace our product via a code on the box.”

“We have used records to see why fruit didn’t ripen properly”