VG97056

Optimising fresh bean quality through the production, distribution & marketing chain (as a model for other vegetable industries)

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Know-how for Horticulture™

VG97056

This report is published by the Horticultural Research and Development Corporation to pass on information concerning horticultural research and development undertaken for the vegetable industries.

The research contained in this report was funded by the Horticultural Research and Development Corporation with the financial support of the vegetable industries.

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**HORTICULTURAL
RESEARCH &
DEVELOPMENT
CORPORATION**
Partnership in
horticulture

Optimising Fresh Bean Quality through the Production, Distribution and Marketing Chain (as a model for other vegetable industries)

HRDC Project Number: VG97056

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This report has been written to outline this model and details key success factors in the design, development and implementation of projects aimed at quality improvement in Australian horticulture. It is envisaged that this report may be of assistance to individuals and/or teams within Australian horticulture and related industries involved in the planning, funding or direct development of quality improvement initiatives.

Contents

Industry Summary

This project was developed due to concerns over significant product quality problems throughout the distribution and marketing chain. The Australian fresh bean industry viewed these problems as serious threats to their future prospects.

Although the existence of product quality problems was obvious in terms of too frequent product breakdown, short shelf life and poor quality at the point of sale, what was less apparent were the actual causes of these problems, yet alone possible solutions. Evidence and information was primarily anecdotal and sometimes contradictory as to where quality was being lost, why it was happening and who was involved. Therefore, to be really successful, any project aimed at improving fresh bean product quality had to focus on firstly defining the actual *causes* and *extent* of the problems. This needed to be done in an objective, justifiable way that allowed all industry sectors to be confident in the outcomes.

A common consensus amongst all individuals involved was that unless consumers were able to purchase good quality fresh beans 'every time' then the entire industry suffered. There was an acceptance that unless product quality could be achieved in first growing the product and then maintained to the final point of sale then the industry as a whole had failed, regardless of whose 'fault' it was. Essentially, the industry was starting to acknowledge that supply chain management was a key to their future prosperity.

The project team established that the most appropriate project output based on current industry gaps was a series of market driven training and management resources that identified and dealt with current problems within the industry. Resources developed would need to suit the specific functions of growers, packhouses, transporters, wholesalers and retailers.

A set of Ready Reference Guides was researched and produced for each sector. These guides were supported by posters as required and implemented across all industry sectors. The resources generated by this project complemented and 'built on' the quality initiatives already developed (usually independently) by industry leaders.

The fresh bean project was always seen as a model for other vegetable industries. It has shown that it is possible and desirable to deal with the management of a specific product within an overall, multi-product, multi-sector business context. The logical follow on to this project is to extend the program to create an overall suite of quality improvement and system management resources covering additional major lines of fresh vegetables. The unsolicited demand from industry that emerged during this project for such an initiative was strong and enthusiastic, provided future initiatives were "done properly".

Building on the fresh bean project in this manner would be a logical, market driven, cost-effective quality improvement strategy that all participants in the Australian vegetable industry would derive direct benefit from.

Technical Summary

Research in this project demonstrated a general lack of objective, accurate monitoring of either product or handling systems throughout supply chains from production through to retail sale. This meant that the actual causes, extent and frequency of quality problems couldn't and hadn't been clearly identified – particularly at an industry wide level.

The project methodology was to:

☐ Determine whom we were going to work with based on determining industry leaders

☐ Having decided on the participants, systematically review their existing product handling and management policies and practices and likely requirements

☐ Follow up these assessments with further desk research as required

☐ Produce industry training resources based on this consolidated information

☐ Review then effectively implement these resources

To be successful, resources produced during the project needed to meet clearly defined criteria. The Ready Reference Guides and support posters were required to be:

☐ commercially relevant to a range of business types and sizes

☐ technically sound, up-to-date, practical and easy to assimilate

☐ useable and appropriate for the intended audience

☐ compatible with existing documentation and training resources in each industry sector

☐ designed and formatted to be relevant to businesses which produced, distributed or marketed a range of horticultural products in addition to fresh beans

☐ able to be updated and/or reformatted as required

☐ appealing to the audience and 'enticing' as an educational tool

Any recommendations made had to be commercially achievable. Commercial realities had to be recognised and dealt with by way of acceptance of the best possible compromise wherever compromise was necessary.

The bean industry like all others is dynamic and changing, with the pace of change accelerating. To maintain relevance the resources will need to be updated and improved as required, including reformatting into electronic (or other) formats, when appropriate.

Introduction

Project development

The fresh bean industry is worth over A$50 million per year to the Australian economy. It is an industry that could be said to be typical of many Australian horticultural industries in that it displays the following characteristics:

- ❑ The product produced and marketed is inherently variable due to a range of factors. These include the varieties produced, seasonal fluctuations, climate, the geographic spread of production areas, production and handling variances and the large number of individuals involved in the processes from production through to consumption. A particular characteristic of the bean industry is that the product is either mechanically or manually harvested. This has an actual and perceived impact on product quality and market prices, which in turn is traded off against production costs.

- ❑ Businesses producing fresh green beans range in size from traditional 'small' family businesses up to large volume production units. Production may be either highly labour intensive or highly mechanised depending on the production systems employed. Marketing outlets range from traditional, independent fruit and vegetable shops through to supermarket chains. The vast majority of food retailers offer fresh green beans for sale

- ❑ Very few people in the fresh bean industry grow, handle or market beans only. The vast majorities of businesses produce or handle a range of horticultural crops.

- ❑ Coupled with the inherent variability of the product itself and the differing way it is produced is the variation between the many supply chain structures. In most instances, producers, packers, distributors and marketers operate independently of each other with limited understanding and consideration of each other's activities, constraints and management systems. This generates only limited and incomplete understanding of customer requirements and market segmentation.

- ❑ Actual knowledge of producing and managing fresh green beans both before and after harvest differs widely and is often contradictory. There is evidence of a fair degree of 'folklore' in all sectors of the fresh bean industry. Management practices are technically incorrect in many instances and obtaining technically sound yet commercially applicable information is difficult.

- ❑ There are both very good and very poor examples of quality management systems in the fresh bean industry – at all levels. Many businesses have inherent systems in that they operate and rely on accumulated experience and operator knowledge and there is little or no quality management documentation in place. Other systems are more formal referencing product specifications, written procedures and records and may sometimes be certified to quality, food safety and/or quarantine standards.

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Interestingly in assessing businesses during this project, those having a certified quality management system in place weren't necessarily the most reputable, efficient and quality conscious in the industry. Some of the businesses without certified quality systems that were assessed had very consistent, quality product in the market place and had very strong business reputations.

Identifying the cause of problems, not just the symptoms

The issues that initially drove the development of the fresh bean project were concerns over significant product quality problems throughout the distribution and marketing chain. Key commercial growers, the service sector and marketers were continually seeing these problems. The Australian fresh bean industry viewed these problems as serious threats to their future prospects.

Although the existence of product quality problems was obvious in terms of too frequent product breakdown, short shelf life and poor quality at the point of sale, what was less apparent were the actual causes of these problems, yet alone possible solutions. Again, evidence and information was primarily anecdotal and sometimes contradictory as to where quality was being lost, why it was happening and who was involved. The chain of events and circumstances leading to these quality losses had not been researched and established – only the dismal resultant problems.

For example, many people believed that quality problems with fresh beans stemmed mainly from lapses in control of the post-harvest cool-chain. That is, cooling the product to an optimum temperature and humidity after harvest and then maintaining that environment through to the final point of sale was not happening.

Conversely, others in the industry believed that the existence of post-harvest cool-storage, particularly in the wholesale and retail sectors resulted in product being stored for too long too often. The cause of this was thought to be poor ordering systems and stock control and market pressures on peak supplies arriving from producers.

Research in this project demonstrated a general lack of objective, accurate monitoring of either product or handling systems throughout supply chains from production through to retail sale. This meant that the actual causes, extent and frequency of quality problems couldn't and hadn't been clearly identified – particularly at an industry wide level. As a result there was a degree of suspicion and blame being leveled among industry sectors, with little or no objective information to support these concerns or provide opportunities for improvement.

Therefore to be really successful, any project aimed at improving fresh bean product quality had to focus on firstly defining the actual *causes* and *extent* of the problems. This needed to be done in an objective, justifiable methodology that all industry sectors could relate to with confidence.

The project team assessed existing systems from the farm to final point of sale in an open-minded, critical manner. Assumptions were not made purely on anecdotal evidence as each industry sector was seen to have its own preconceptions and biases based on their particular experiences, limitations and business pressures.

Facilitating a team approach

Given this industry situation, an independent facilitator was required who was prepared and able to bring key people together within the industry so as to begin to address these issues. This initial facilitation exercise led to some open, meaningful communication between some key industry players and became the first vital step in developing a pertinent, relevant program.

In the case of the fresh bean project, the Queensland Fruit and Vegetable Growers organistion (QFVG) acted as the project facilitator and was initially responsible for pooling the ideas, concerns and experiences of key industry participants from all sectors.

Based on these early discussions, QFVG also played a leading role in putting together a suitably qualified, experienced and diverse project team whose brief it was to develop and carry out a project to tackle these issues.

From that point onwards, the project team maintained close communication with this initial network of key industry participants, whose role it was to critique and endorse the development and implementation of the project.

This meant that the original objective of the project to improve product quality and consistency throughout all sectors of the industry was paramount at all times. Most importantly, the content and outputs of the project were most likely to deal with the real problems of the fresh bean industry, not just the symptoms.

Satisfying the end customer - consistently

A common consensus amongst all individuals involved was that unless consumers were able to purchase good quality fresh beans 'every time' then the entire industry suffered – be they producers, distributors or marketers.

There was an acceptance that unless product quality could be achieved in first growing the product and then maintained to the final point of sale then the industry as a whole had failed, regardless of whose 'fault' it was. Essentially, the industry was starting to acknowledge that supply chain management was a key to their future prosperity.

Project outputs

The project team established that the most appropriate project output based on current industry gaps was a series of market driven training and management resources that identified and dealt with current problems within the industry.

Resources developed would need to suit the specific functions of growers, packhouses, transporters, wholesalers and retailers.

It was decided that a set of Ready Reference Guides would be researched and produced for each sector. These guides would be supported by posters as required.

The resources generated by this project would complement and 'build on' the quality initiatives already developed (usually independently) by industry leaders.

Materials and Methods

Set up and initial research phase - key success factors

The fresh bean industry like all horticultural industries is composed of 'good, bad and indifferent' operators – be they producers, distributors, marketers or service personnel such as researchers, re-sellers, extension officers or consultants.

Although the objective of the project was to achieve improvements in product quality and consistency within the industry as a whole, the only way we believed that this could be realistically achieved was by first identifying and working with the industry leaders in each sector.

Industry leaders are the most progressive, customer driven, innovative, resourceful and consistently successful in their sector. They are not necessarily well known, the 'biggest' or the most politically active.

Working with industry leaders allowed us to identify existing best practices as well as any system limitations and impediments to maintaining fresh bean quality. It also allowed limited project resources in terms of time and money to be expended as efficiently as possible.

Promoting positive changes through raising industry benchmarks

Horticultural industries can be notoriously reluctant to change. By working with industry leaders the objective was to raise existing industry performance benchmarks so as to provide commercial incentives for change within the industry as a whole.

In terms of leading growers, we identified and worked with people in each major growing region who had the 'runs on the board' in terms of market reputation for quality and consistency, regardless of business size. Often these people were seen and recognised as industry leaders within their districts. The activities and practices of these growers are closely monitored by their industry peers.

In several instances these producers had targeted and successfully marketed product in the most discerning local and export markets, including Japan. This meant compliance with often stringent product and delivery specifications. It also meant engaging in relatively high-risk business activities due to the cost of failure in not meeting these specifications and high on-costs such as packaging and transport.

Invariably these people had the most detailed and in-depth product knowledge. Without this knowledge they wouldn't have been able to access and consistently satisfy high value markets. They were also highly vulnerable to failure costs. For example, product arriving in an export market, grown and packed to stringent product specifications will have been costly to produce, sort, package and transport.

If this product fails to meet market requirements in any way resulting in it being discounted or rejected the failure costs are significant.

This vulnerability was a driving force for these businesses to achieve and maintain high quality, consistent out-turns via well thought through and implemented quality management programs.

Involving a representative cross-section of business types in each sector

We also ensured that we surveyed and worked with a representative cross section of industry in terms of business size, production techniques, market segment and location.

For example, the problems and management challenges of a multi-grower packhouse were noticeably different to those of a single grower operation. Mechanical harvesting held different challenges and opportunities to manual harvesting operations.

The research and service sectors of the fresh bean industry were consulted and from a marketing point of view we worked with top independent retailers, not just the supermarket chains. Again, their inherent strengths and weaknesses were significantly different and needed to be considered.

Horticultural networks

Growers, although responsible for growing or essentially 'manufacturing' the product were but one industry sector that we needed to consider. We identified leaders within this sector and worked with them to develop improvement strategies.

The Australian horticultural industry is by nature an informal series of networks involving (depending on circumstances) individual growers, grower groups, transporters, wholesalers, retailers, researchers, government agencies (such as AQIS), professional advisors, industry bodies (such as QFVG) etc.

In real terms, any individual 'player' in this food chain is reliant upon and interacts with a broad and diverse range of other business entities and organisational systems, whether they are consciously aware of it or otherwise.

More often than not, these networks are loosely structured but reasonably well established.

An example might be a relatively stable relationship between a grower and a merchant who in turn has a relatively stable relationship with a retailer based on degrees of trust and confidence built up over time. All these parties also interact with a range of service organisations and government agencies to varying extents.

Having identified some leading growers, we also needed to identify their primary distribution and marketing networks and work within these networks towards the objective of satisfying the end consumer and creating positive growth and changes throughout the chain.

We could have chosen to identify leading fresh bean retailers and 'work back' in terms of establishing the horticultural networks that existed. However, growers as the manufacturers of the product and financial backers of the project were seen to have the most at stake and were therefore most motivated to progress the project, especially in the early stages.

Identifying and working with horticultural networks gave the project greater credibility and impetus. Participants within a network whether they were growers, distributors or marketers took the project far more seriously once they understood the team approach and were made aware of the contributions and inputs of other companies with whom they traded. The greater the understanding of each sector's particular problems and constraints, the greater the willingness within a network to work towards common, shared goals.

This total network approach also meant that the project resources 'flowed' from sector to sector and were successfully inter-linked.

Focusing on inter-linking quality systems

The fresh bean project developed a series of Ready Reference Guides that systematically covered fresh bean production and marketing activities and emphasised the need for 'seamless' management of product from the farm to final point of sale. This helped to promote inter-linking of quality systems within horticultural networks, thereby improving communication and efficiencies between industry sectors.

One of the extra benefits of the project has been a number of instances of greater co-operation and awareness between industry sectors due to a greater understanding of each other's business objectives and systems.

During the course of the project a number of misconceptions and biases were broken down amongst people participating in the project resulting in a more open-minded, honest approach to system development and less mistrust between parties.

The project developed into a relationship building and strengthening exercise.

Project methodology

The project methodology was to:

1. First determine whom we were going to work with based on the criteria above

2. Having decided on the participants, review their existing systems and likely requirements

3. Follow up these assessments with further desk research as required

4. Produce resources based on this consolidated information

5. Review then effectively implement these resources

System assessments

Having identified the horticultural networks and people with whom we were going to concentrate our energies, the next step was to undertake system assessments of each individual operation as well as of representative fresh bean production, distribution and marketing networks.

This involved spending time with growers, packhouses, transporters, wholesalers, and retailers and at distribution centres undertaking planned assessments and reviews.

Assessments were made of how each operation functioned, what pressures and problems they encountered and what strengths and weaknesses were evident in their existing management systems, especially in the area of product management.

As well as on-site assessments of operating systems, people were interviewed as to their experiences and knowledge pertinent to the project. They were surveyed as to what their short and longer term industry objectives were and how any resources produced within the project could best complement their existing and future requirements for quality management and training resources.

Assessment technique

When monitoring or assessing systems, it is critical that the business environment is focused on as much as the product itself. Aspects researched included:

❑   how the product was being produced/handled

❑   under what conditions the product was being produced, stored or displayed

❑   company policies and how these policies were reflected in the practices in place

- why these policies/practices were employed

- variances between what people thought was happening and what actually happened

- the skills and knowledge of the people working in the system

- the appropriateness or otherwise of facilities and equipment

- training, supervision and management systems that were in place

Really effective systems assessments are planned, thorough, totally objective and investigative. Any anecdotal evidence or comment needs to be cross-referenced and proven or disproved as appropriate.

Desk research

Concurrent with the on-site system assessments the project team researched available published information on fresh bean production and management (both pre-harvest and post-harvest). This research covered technical data and standard recommended commercial practices, both within Australia and internationally.

In reality there was a dearth of useful, product specific information – something many industry leaders had experienced in their own investigations. For the size of the industry the limitations in terms of published research results and technical information was disappointing and frustrating.

To exacerbate this, this information was often (again) contradictory.

For example, published recommendations for optimum pod temperatures during fresh bean storage varied widely. Chilling damage was said to occur (depending on the source) anywhere from "below 3 degrees Celsius" to "below 7 degrees Celsius".

Careful analysis was required given differences such as these and the variance in conditions and techniques under which such recommendations were likely determined.

Much of the technical information ultimately included in the project resources was finalised by way of full consideration of published data. This was then further refined by way of extensive verification of commercial best practices in the Australian fresh bean and vegetable industries generally.

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Management of the overall system

Again, researching the product itself was just part of the process. Also researched were best practices in regard to:

❑ Quality system design and implementation within all sectors of the food industry

❑ Fresh produce transport, storage and distribution systems

❑ Training programs and resource design within each industry sector

❑ International trends regarding all of the issues above, including supply chain management

Although this project focused on fresh product, much was also learned from consultation with the bean processing industry. Specifically, processors provided valuable information in areas such as crop monitoring, maturity assessments, monitoring procedures, product safety and supplier/customer relations.

Throughout the project the emphasis was on a Quality Management approach (management of the overall system) as opposed to simply a Quality Assurance approach (management of the product).

This approach was different to many previous quality initiatives in Australian horticulture. These have usually focused primarily on maintenance of the product with little consideration to or guidelines for the management and improvement of overall business activities, economic performance and supplier/customer relationships.

The Quality Management approach within the project led to a far greater benefit and impact within the fresh bean industry than a Quality Assurance style program would have achieved.

Results and Discussion

Development of Resources - Success Factors

To be successful, any resources produced during the project needed to meet clearly defined criteria. The Ready Reference Guides and support posters were required to be:

- commercially relevant to a range of business types and sizes

- technically sound, up-to-date, practical and easy to assimilate

- useable and appropriate for the intended audience

- compatible with existing documentation and training resources in each industry sector

- designed and formatted to be relevant to businesses which produced, distributed or marketed a range of horticultural products in addition to fresh beans

- able to be updated and/or reformatted as required

- appealing to the audience and 'enticing' as an educational tool

Commercial relevance

The Ready Reference Guides were developed specifically to be used by the commercial production, distribution and marketing sectors.

Any recommendations made had to be commercially achievable. Commercial realities had to be recognised and dealt with by way of acceptance of the best possible compromise wherever compromise was necessary.

For example, an optimum storage temperature for beans may not be achievable for a retailer with only one or two coolrooms who is handling multiple fresh product lines with different requirements.

What is required in a case such as this is information on what temperatures would actually damage the product in terms of chilling damage (too low) or rapidly reduced shelf life (too high) and any time frames and storage life associated with the onset of damage.

The retailer or retailer's employees also need to know what products are compatible or incompatible with beans in terms of short and medium term storage.

If all relevant data is presented in a retrievable, non-confusing user-friendly format, he or she can then use the information to make a commercial decision on how best to store the product. This includes any compromise necessary due to lack of facilities, limited options or other priorities.

User-friendliness and relevance of project resources

An interesting and consistent observation of many people surveyed during the project (from all industry sectors) was that published information and materials too often failed to meet commercial requirements.

One common fault of available information was that it was overly simplistic and two dimensional, dealing with one product or issue in isolation. Such material is also likely to be impractical or too ideal and fails to recognise commercial realities, complexities and interaction of practices.

Conversely, sound technical information was sometimes too technical in presentation and/or language to be easily understood or referenced by anyone but an expert in the field (many research papers fell into this category).

The authors identified that what was needed was presentation of information in a style that was technically correct yet also complete. The industry wanted the resources to reflect that overall commercial management systems were considered and presented - logically and sequentially.

It was also seen as critical that the material presented be able to be absorbed by the target audience quickly, with a minimum of fuss and no confusion. This meant clear definition of the target audience for each Ready Reference Guide or poster produced.

Examples of the diversity of persons potentially utilising these resources might be farm workers (experienced or otherwise), teenage trainees in a supermarket produce department, transport operators and drivers, wholesalers perhaps with years of experience, technical resource people working for a supermarket chain... and many others.

Compatibility with existing systems and resources

Some of the more progressive fresh bean growers, packhouses, transport companies, wholesalers and retailers surveyed had documented quality and training programs in place, to varying extents and with varying success. It was therefore important that any resources produced in this project complemented and advanced (as far as possible) existing programs.

Often, the requirement was for material that could be incorporated into existing programs.

For example, a number of leading growers used the Ready Reference Guides and posters as training appendices to their existing quality manuals. Larger retail chains were keen to incorporate technical data in the fresh bean guides into already existing on-site staff training and reference tools.

Promoting quality improvement

One aim of the guides was to stimulate thinking even amongst the leading people in the industry as to possible system refinements or improvements within their businesses. On the other hand, many within the industry hadn't developed formal quality systems, but were interested in doing so for their own commercial benefit or in some instances to satisfy retail and/or quarantine certification requirements.

The Ready Reference Guides therefore challenged managers not to be complacent. The guides also included material on developing and implementing quality systems within a horticultural business. The systems suggested in the guides were designed to be market driven, add value not cost, be practical and sustainable.

Formatting and design

The Ready Reference Guides were published in a written (although highly graphic) printed format, for use in a workplace environment.

Although thought was given to presenting the materials in an electronic format, many people in the industry thought that this would be premature for most industry participants. Such formatting will be a logical progression however in the near future based on the speed of development of electronic systems and the rapid pace of industry uptake of new technologies.

Technology Transfer

Implementation of resources - key success factors

At the beginning of the project we needed to identify the leaders within the industry, assess their systems and learn from their experiences. The same principle applied in terms of identifying the right people with whom to implement the resources produced.

The Ready Reference Guides have a technical component, promote development and improvement of quality management systems and are also able to be used as training resources.

It was therefore critical that the people we targeted within each organistion to promote the implementation of these resources were people with drive, responsibility and authority in these areas.

In small businesses this was usually straightforward although the dynamics within small businesses and family businesses wasn't always obvious and needed to be considered. Who really made decisions and took responsibility in these areas needed to be carefully analysed.

In larger organisations (such as the major supermarket chains) finding the key people meant identifying the persons with ultimate responsibility for training, quality systems and product management and ensuring that the 'filter down' occurred from there to a state, regional, store and staff level.

Although obviously limited by time and financial resources, we looked to meet and talk with as many key people as possible - to spell out the thinking behind and content of the program and to 'sell' the project.

Our implementation strategy included discussions focusing on areas of need within each business and then suggestions as to how the resources might help address those needs.

Industry motivation

The project was only ever going to be successful if people really wanted to take on the resources produced and use them willingly in their business environment.

The project team encouraged this by promoting the worth and relevance of the resources with the key people identified. It was then up to the organisations themselves to utilise the resources effectively.

Communication and implementation methods

Most of the people with whom we worked or communicated were extremely busy. If we wanted to get our message across we not only had to consider who we needed to meet with but when and how. This meant considering when people were likely to be most responsive and how we could best communicate with them.

Seasonal factors such as peak harvesting times for growers, peak sales periods for marketers etc. had to be taken into account (and avoided).

The means of communication had to again consider the makeup of the target audience in terms of how best they would relate to the program, see the relevance of the resources produced and adopt these resources within their businesses. We also had to extend the program as cost-effectively as possible.

On that basis we decided on a range of communication and implementation strategies.

These included:

- One-on-one site visits, especially with the people with whom we had worked previously in terms of system assessments and discussions

- Meetings and seminars involving a range of growers, distributors and marketers – many of whom were being exposed to the program for the first time

- Individual letters, mail-outs of guides and telephone calls to key industry people who we couldn't meet with personally, for whatever reason

- Promotion of the project and the availability of the resources via industry media

Each part of the extension strategy was successful in its own way.

There is no doubt that on-site discussion and implementation is a highly effective method to achieve adoption and positive change. However the other strategies employed complemented this approach and resulted in wide exposure of the project resources. Demand for and uptake of resources was beyond our initial expectations.

Response to the Ready Reference Guides

Feedback on the value and relevance of these resources was almost universally positive, with extra guides printed to meet demand.

Although this response was gratifying it wasn't surprising due to the consultation approach taken during the research and design process. This meant that people's expectations had every chance of being met.

Following initial development of the resources, drafts had been circulated to carefully selected people to critique. We believed these people were best placed to give appropriate feedback regarding the validity of the content from a technical and management perspective and the appropriateness of the presentation style for the intended audience.

This meant that the guides had been carefully reviewed by an appropriate cross-section of people prior to finalising and printing.

Recommendations

Marrying science and commerce

It was interesting to note the response to the extensive use of graphics in the documents, the range of subject matter and the systems approach.

The commercial sector, that is the people who actually had to use the documents almost universally endorsed the presentation style and content, suggesting that the resources overcame some of the current limitations of industry resources previously published.

Some researchers and government extension people were less enthusiastic about the document style, but weren't able to explain the reasons for their reservations. This is possibly a reflection of the differing personality types, objectives and mind-sets that occur across the scientific and commercial sectors.

From a quality improvement and project management perspective this is something that needs to be considered. When people working in primarily scientific or technical areas and people operating in a commercial business environment interact in a project management, extension or advisory capacity, then the profile and needs of the target audience needs careful consideration. The presentation of resources and style of extension program should suit the audience.

We believe the make-up of the fresh bean project team and the diversity of people who contributed to the project was a primary strength of the program. What we were able to achieve was the successful incorporation of technical information within a total management systems context, presented as commercially relevant and appropriate workplace references.

It is important to note that any technical content included in the guides was positioned to fit into the systems approach being presented. This was based on the assumption that consistent quality products would only eventuate when the overall business and operating systems functioned appropriately, holistically and consistently.

Keeping resources up-to-date

The Ready Reference Guides developed during the fresh bean project were as relevant as the project team could achieve given the information available and existing industry best practices. However, the bean industry like all others is dynamic and changing, with the pace of change accelerating.

What the fresh bean project wasn't able to achieve because it 'finished' at the end of 1998, was establishment of a mechanism to update these resources in terms of content, style and format as required.

To be useful and maintain relevance, not just now but into the future, the resources will need to be updated, modified and improved as required. Refining the materials within a reasonable time frame would include not only updating the resources as required but reformatting them into electronic (or other) formats, if or when appropriate.

Maintaining the momentum

The fresh bean project was always seen as a model for other vegetable industries to learn from. It has shown that it is possible and desirable to deal with the management of a specific product within an overall, multi-product, multi-sector business context.

The logical follow on to this project is to extend the program to create an overall suite of quality improvement and system management resources covering additional major lines of fresh vegetables.

The unsolicited demand from industry that emerged during this project for such an initiative was strong and enthusiastic, provided future initiatives were "done properly".

Building on the fresh bean project in this manner would be a logical, market driven, cost-effective quality improvement strategy that all participants in the Australian vegetable industry would derive direct benefit from.

It would also be necessary to maintain the relevance of the materials by building into the program an effective mechanism for regularly revisiting, reviewing and updating these resources as required, so as to maximise program benefits and returns on the investment to date.

Appendix

Project Resources:

'Producing Quality Fresh Green Beans – A Quality Systems Guide for Producers and Post-harvest Operators'

'Fresh Green Beans, Maintaining Quality – A Ready Reference Guide for Transporters, Distributors and Marketers'

'Designing Quality Improvement Programs for the Australian Vegetable Industry – A Case Study'

'Fresh Green Bean Product Management Guide' (poster)