

Developing GAP systems for dragon fruit producers and exporters in Binh Thuan and Tien Giang provinces.

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ABSTRACT

In Vietnam, at present, the area for dragon fruit is about 13,500 ha with the production of about 211,000 tones and the average area per household is 0.5- 1 ha. Producers of dragon fruit have seen prices for their fruit decline by about 60% since 2000 as the product is mainly sold for local consumption or to neighbouring countries. Returns from dragon fruit could be significantly improved if small growers and exporters can gain access to new high value markets in Europe and North America. The project has established a private sector working pilot of exporter packer and supplying dragon fruit growers in which the European high value market driven standards of BRC at the packer and EUREPGAP at the farmer level have been implemented. Activities included (i) Field farmers' benchmarking survey completed and a report was prepared by HortResearch personnel and delivered as a PowerPoint presentation to SOFRI personnel, also packers, farmers, MARD and DARD personnel of Binh Thuan in 2007. (ii) Selection of a packer/exporter and farmer group for the Project Pilot confirmed and formalised. (iii) Training of the Pilot members for improvement towards British Retailers Consortium: Global Standard – Food (BRC) for the packer and EUREPGAP for the farmers were carried out to enable them to reach compliance in all areas. (iv) Pilots both for field production and packhouse were implemented and all the corrections have been done and the Certification for EURAPGAP with 80 ha of dragon fruit production has been achieved while the packhouse are being auditing for BRC certification. (v) The dragon fruit quality manuals for the farmer and packer were developed in a way that closely related to the current practices, included appropriate improvements to enable the farmer and packer to meet compliance with the EUREPGAP and BRC standards, and are user friendly. (vi) Translation of the Manual into Vietnamese and distribution to the project the pilot supplying farmers (EUREPGAP “C” section) and to other packers and farmers progressing GAP production, packing and export. (vi) The national personnel capacity building within the project team and in the private sector has seen practical GAP proficiency developed to a high level which will ensure the continued development of the pilot and the subsequent distribution of the model to many more small-holder fruit crop producers. (vii) High value markets have been identified and are due to be tested following Certification of the pilot. (viii) The CARD dragon fruit project continued to be well publicised in the local and national newspapers and television during the project implementation.

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I. INTRODUCTION

In Vietnam, at present, the area for dragon fruit is about 12,000 ha with the production of about 211,000 tones and the average area per household is 0.5 – 1 ha (Nguyen

Minh Chau, 2007). Producers of dragon fruit have seen prices for their fruit decline by about 60% since 2000 since the product mainly sells for local consumption or to neighbouring countries. Returns from dragon fruit could be significantly improved if small growers and exporters can gain access to new high value markets in Europe and North America. However, the Vietnamese exporters will need to find alternative markets for their products. High-value markets of Japan, Europe and North America have been non-receptive to Vietnamese dragon fruit due to perceptions of poor quality and lack of legal and food safety accountability. The project (037/04VIE - *Developing GAP systems for dragon fruit producers and exporters in Binh Thuan and Tien Giang provinces*, which was aimed at developing quality systems for export market access for dragon fruit has established a private sector working pilot of exporter/packer and supplying dragon fruit growers in which the European high value market driven standards of BRC at the packer and EUREPGAP at the farmer level have been implemented. The project was carried out with 2 main objectives:

Objective 1: *To increase small holders' competitiveness and capacity to supply dragon fruit to high-value international markets, introducing new concepts of food safety, environmental responsibility, sustainability and worker safety into their production practices.*

Objective 2: *To provide technical support and training for Vietnamese extension/researchers to improve their capacity in group training procedures for GAP implementation in dragon fruit.*

II. METHODOLOGY

The overall approach to project dissemination within the project is reliant on the major assumption "that returns for each stakeholder from high value export markets using GAP are far greater than the returns generated during the pre-GAP status". High returns from GAP dragon fruit production, packing and export will ensure growth and sustainability in the dragon fruit industry. The growth will also ensure increasing numbers of small-holder dragon fruit growers have access to participation in the programme and improved living standards will result.

It is intended that the development of the Vietnamese personnel, both in the public and private sectors, will be through the practical application of:

- To establish the current status of the dragon fruit industry against EUREPGAP standards through a benchmarking survey. The Field observation for the farmers' benchmarking survey both at Binh Thuan and Tien Giang – Long An was carried out as the standard method for EUREPGAP benchmarking. The survey form has been developed and the result was analysed by HortResearch scientists.
- To improve the current understanding of dragon fruit agronomy within SOFRI and establish the systems for constant improvement and problem solving.
- To develop the pilot models of EUREPGAP-compliant Farmer groups in the field and the packhouse pilot model of BRC – compliant for Exporter/Packer. The market driven quality standards are complex and must be continuously maintained and improved, often beyond the capability of the small-holder farmer, so groups of farmers need to be formed and to be functional. With the establishment of the quality systems, responsibilities in the packhouse compliance issues, training and support can be provided to the farmer by the project team.
- Establishing manuals, Codes of Practice and the development of training material that is appropriate, user friendly, developed by the Vietnamese extensionists, and

- appropriate to the dragon fruit industry for transfer to subsequent “models” and ultimately other crops
- Establishing the required quality systems for the dragon fruit industry to adopt and obtain proof of the system robustness, by obtaining EUREPGAP certification for the pilot model
 - Maximising the impact of current initiatives to develop GAP in the dragon fruit industry through full participation in the Dragon fruit GAP Project.
 - Building the capacity for further GAP implementation on other crops in Viet Nam.

III. RESULTS AND DISCUSSION

3.1 Benchmarking

The field work for the benchmarking survey was completed by the SOFRI team in late July 2005. Some 124 farmers from Binh Thuan and 30 farmers from the Tien Giang Province were questioned. The SOFRI team recorded farmer information for the formal EUREPGAP oriented questionnaire and also recorded additional current agronomic and technical information relating to the surveyed farmers’ dragon fruit production practices.

The benchmarking survey data were analysed at HortResearch by Dr Jim Walker and Patrick Connolly who also prepared a PowerPoint presentation for delivery during the scheduled March 2006 visit. It was originally planned for Dr Walker to travel to Vietnam to make the PowerPoint presentations, but this was not possible because of his other work commitments. As a consequence, the benchmarking PowerPoint presentations were delivered by John Campbell during his March/April 2006 visit, initially to the staff of SOFRI then to DARD and some industry personnel in Binh Thuan. The presentation has subsequently been used as a training tool for the farmers and packers in the area.

During the PowerPoint presentations, care was taken to emphasise the standards observed in the survey and to relate those conditions to the standards required to meet the high value customer-driven demands.

The PowerPoint presentation and other information contained in the benchmarking survey database are being used by the SOFRI scientists during their research work.

3.2. GAP Manual Development

The Dragon fruit Quality Manual has been completed in English and translated into Vietnamese. The manual has been developed specifically to meet the needs of the quality systems of the project pilot. The manual has been developed at the farmer level to the EUREPGAP Standard and in the packhouse to the BRC Standard and apart from being a living document, has been completed in the final form. Future use and adaptation of the manual to other dragon fruit packhouse/farmer group (and other crops) will have the advantage of a manual that is the actual documented quality systems of a working model.

Full verification of the appropriateness of the Dragon fruit Quality Manual to address the specific standards of BRC and EUREPGAP and the requirements of the customer, the pilot packer and farmers have been confirmed by the Independent Certifying Body. Compliance assessment by the Certifying Body was planned take place during December 2006 however the pilot was not ready and significant modifications were

planned/being implemented for the pilot packhouse to better comply with the standards.

3.3. Establish pilot GAP programme for year one

Choice of quality system standards:

The project chose the existing BRC and EUREPGAP quality standards as the most suitable to meet the demands of the target customer while protecting the interests of the Vietnamese stakeholders. At the farmer level the EUREPGAP Standards are being applied and at the packhouse the BRC Standards are implemented. Both standards complement each other to ensure the dragon fruit produced and packed is confirmed as safe, legal and of the quality expected by the high value market customer.

The choice of the two standards has been determined by the access conditions to high value markets identified in the project document. The project is very “customer driven” and the quality system will meet all the customer’s requirements when fully implemented and will specifically provide documented proof of compliance for safe, legal quality control and traceability for the entire product during the production and packing processes. The quality systems developed will easily respond to any additional requirements from specific customers.

The quality checking and documentation systems being employed in the pilot can also protect the farmer and packer from claims for damage to product (non-compliance issues) subsequent to the product leaving the packhouse.

For the packhouse: Mr Hiep’s packhouse was identified to be the project’s pilot for packing dragon fruit. Subsequently project personnel negotiated with Mr Hiep to define the level of commitment to and cooperation with the project for the development of his packhouse to meet the BRC Standards and project expectations. In the middle of year 2006, a contract between Mr Hiep and Dr Chau as Project Champion was generated and signed.

Mr Hiep of Queen Farm, Hoang Hau Dragon Fruit Farm Co Ltd committed his resources and staff to the project pilot development. As well as committing the packhouse to the project, Mr Hiep also committed his 50 hectare dragon fruit producing farm to the pilot to be developed for compliance with the EUREPGAP Standard.

In February 2007, Mr Hiep indicated that he was proposing development of a large packhouse modelled on the pilot packhouse for future expansion, indeed construction for buildings to house the packing facilities was well advanced in May 2007. The Dragon fruit Quality Manual was presented to Mr Hiep, in both the English and Vietnamese language.

During this time the project team continued to conduct intensive training/mentoring sessions with the pilot’s staff holding responsible positions within the packhouse and participating farm owners/managers. The areas of training and guidance covered included: The project scope and delivery; The customer and customer demands, Quality systems, their purpose, structure, establishment and management; Defining

the “Process” of the quality assurance from on-farm through the packer to the exporter; Linkages between farmer and packer and responsibilities and expectations; The dragon fruit quality manual, its development, scope and application; Feedback to ensure the “appropriateness/workability/fit” of the manual for the intended purpose; Identification, guidance and purpose for physical improvements required by the project pilot facilities, both on-farm and at the packhouse, to comply with the dragon fruit quality manual and adopted standards; Identification of positions in the “process” and ensure responsibilities had been correctly documented in the position descriptions within the manual; Provide training to people designated for positions of responsibility in the pilot; The role of the internal audit; The responsibilities of the Internal Auditor; Process corrective action and initiative sustainability

Progress in developing the documented quality systems and preparation for certification has been significant and robust. Of particular note is the traceability system employed by the pilot packhouse from the farm through to the market – the packhouse can instantly identify the specific origin (farmer, block, date of harvest, day of packing, export date, etc.) of any dragon fruit in the market place as well as all supporting documentation if challenged by the market. The packer and farmers documentation can also verify all inputs to production, quality and handling.

For Field Implementation:

The project had established the group of small-holder farmers and provided training in quality systems that would benefit from adopting GAP. The project has become more focused and addresses the specific needs of the farmers of the pilot to enable them to meet compliance with the standards before the proposed assessment visit by the Certifying Body. However, the group failed to go ahead because lack of capital investment, the lack of scale, uncertainty about returns, and was very much depended on the middle man.

3.4. Review Compliance

The project team negotiated with Société Générale de Surveillance (SGS Vietnam), (in Vietnam, Regional Indonesia and New Zealand) an International Certifying agency, to provide an estimate for certification evaluation of the project initiatives. Internal reviews of the pilot have been undertaken in the form of BRC/EUREPGAP Internal Audits. The data collected has been used to determine the compliance status of the project pilot development and to initiate/tailor corrective action and training. It is intended that the learning process of the pilot development will be adapted for subsequent training during the outreach programme.

3.5. Expanded Year 1 Programme and delivery to additional farmer groups

Although the project has had difficulty in encouraging small-holder farmers to complete GAP development to the EUREPGAP Standard the project has continued to provide encouragement and training to this sector in an endeavour to enhance their GAP capability in line with the project document requirements. It is expected when the greater returns from GAP produced dragon fruit exported to high value markets become known then the small-holder farmers will be motivated to lift their operations to compliance with the standards. A basic understanding of GAP and some implementation within this sector forms a great foundation for subsequent pilot expansion.

3.6. Implement Year 2 Training

Farmers and packers showing an interest in the project have been included through invitation to training sessions being undertaken, or were mentored separately as time permitted. Following success of the pilot it is expected that this training will become more formal and serious. The training will be done utilising the “increasing” capability of the Vietnamese personnel.

Leading dragon fruit farmers and packers in the Binh Thuan province and packers wishing to develop GAP production and packing units in Tien Giang and Long An based on the project pilot were identified and also received assistance and training. At project end more than one packhouse was being constructed and one independent farmer group had been certified compliant with EUREPGAP.

3.7. Smallholder Benefits

A high priority was given to all aspects of National Capacity Building to ensure sustainability upon project completion. The project tried very hard and expended a lot of project time on the identification of small holder farmers and to subsequently provide quality training to fulfil the project document’s obligations. It remained that the small-holder farmers will not commit themselves in a sustainable way to GAP at the level required by the customer and the project. For this reason the project had accelerated the development of the pilot to demonstrate that GAP is viable at the small holder farmer level. All farmers were welcomed into the project training programme when they expressed they could step up to the required commitment to customer standards.

As the project developed the pilot towards the quality Standards of BRC and EUREPGAP high value markets were identified. It is intended that product from the pilot will be, following negotiations with the customer, exported in a form that can go directly to the high value market and not be subject to any rework in the country of destination. It is the desire of the project to maximise returns and reduce waste from product exported to ensure increased revenue for the farmer and sustainable returns for the service operators such as the packer and exporter. Higher values for dragon fruit product will be sought in negotiation with the customer as proficiency in the pilot GAP becomes settled. For example: add-on quality requirements; nature’s choice, reduction of carbon footprint; sea-freight verses air-freight; packaging types, etc.

Every effort was made by the project to facilitate ease for entry and management of GAP dragon fruit production through housing the quality systems in the packhouse. The pilot model quality system coordinates the completion of all appropriate farmer section standards so they meet compliance, provides technical advice as required by the customer such as grade standards, chemical application, withholding periods, marketing, improvement, corrective action, etc. in a transparent and honest way.

By now, there is no doubt that the project pilot now has the capacity to attract many more supply contracted smallholder farmers. There is also no doubt that when high returns for GAP dragon fruit exported to high value markets become known by non-GAP farmers they too will seek admission to the certified systems. The envisaged replication of the project pilot will see rapidly increasing numbers of small-holder dragon fruit farmer’s greatly improving their living standard.

The project has observed three major perceived constraints preventing small-holder farmers from participating in GAP to the EUREPGAP standard. They included:

1. A lack of resource to enable the small-holder farmer to make the physical changes to their property and meet the standards:
It is expected that when the compliant pilot high value dragon fruit returns become known and demand for product increases then credit will become available.
2. The technical requirements of the standards were beyond the capability for the small-holder farmer to understand and sustainable implement:
The project had housed the quality system management in the packhouse for the major purpose of making it technically easy for the farmer to meet compliance, for the quality system to be “in control” at all times and for the system to be the most economical model to implement.
3. It had been previously thought that the small size of small-holder properties (0.3 to 1.0 hectare) was a constraint to their inclusion in a large packhouse GAP operation: ***This is not the case as large farms supplying the packhouse do in fact subdivide their properties into even smaller units with many blocks as small as 0.2 hectare.***

3.8. Capacity Building

Capability building of Vietnamese project collaborators has again advanced dramatically over the projecting period. Dr Chau has set up an environment at SOFRI that is encouraging his staff to adopt the GAP initiative. This environment is greatly assisting the writer to transfer his quality skills to the project team and subsequently to farmers and packers. The Vietnamese project team have an excellent understanding of GAP, and are showing confidence in delivering the project training to farmers and the packer. Dr Chau's enthusiasm for the CARD project's success continues to lead to the establishment of GAP support facilities being developed at SOFRI, while outside the scope of the project, are required by a future GAP-driven horticultural industry and will ultimately be of benefit to the project and its sustainability.

A formal Introductory Internal Auditor Course was presented to eight appropriate SOFRI staff by the project leader and Mr Nguyen Huu Hoang. The New Zealand Organisation for Quality (NZOQ) gave official approval for the project leader John Campbell to use a percentage of the same course material as that used during Internal Auditor training in New Zealand. This is the same material as the two day course that Mr Hoang attended during his New Zealand study tour in June 2006. Due to the requirement of NZOQ to only use a portion of their course material the SOFRI training was done over one day and was called an “Introduction to Internal Auditing”. The Internal Auditor training has been continued and its principles incorporated into much of the training programmes.

The horticultural Good Agriculture Practice initiative in Vietnam has gathered momentum during the life of this project. It is important to note that the dragon fruit project pilot is the only working model for Good Agricultural Practices in fruit in Vietnam. The SOFRI national capability, the quality manual developed for the pilot and the pilot working model are available to be used for further expansion of GAP into the dragon fruit industry and across other crops.

The project and project trained personnel are making a major contribution to this initiative in a positive and quality approach. For example:

- Project trained personnel have an understanding of the customer driven concept which, accompanied with their quality practitioner skills, can apply the GAP technology at any appropriate level of:
 - VietGAP at the local market level
 - AsiaGAP and EUREPGAP at the close neighbour export level
 - EUREPGAP plus BRC at the high value market level of the United Kingdom and Europe
 - Specific elevated standards to enable elite markets to be accessed (through special packaging; market access protocols – disinfestation for the Japan, North America South Pacific markets)
- The project Dragon Fruit Quality Manual has been prepared in a form so that it can be easily adapted to the different quality standard levels and also applied when installing quality systems to the selected standards across other crops.
- Material generated by the project for training stakeholders is relevant for many other applications in horticulture in Vietnam.
- A measurement of the capability built within the project team at SOFRI over the life of the project is clearly demonstrated by the respect of colleagues and management and the responsibilities assumed which have included:
 - Dr. Nguyen Minh Chau, Dr. Nguyen Van Hoa and Mr. Nguyen Huu Hoang have great contributed to the VietGAP general regulation draft, which has been delivered on January 28th, 2008 by the MARD.
 - Dr Nguyen Van Hoa involved in a MARD funded national project developing GLOBALGAP systems in mango at SOHAFARM in the Mekong Delta, and the pilot at SOHAFARM are being audited on 30 June, 2008 for GLOBALGAP certification.
 - Mr Nguyen Huu Hoang involved in a MARD funded national project developing GAP systems in dragon fruit in the Mekong Delta
 - Mr Nguyen Huu Hoang travelled to Cuba as a consultant to evaluate horticulture
 - Mr Nguyen Huu Hoang accompanied Dr Nguyen Minh Chau and others to Malaysia to attend a International Tropical Fruit Networks (TFNet) conference – Market and Marketing of Tropical and Sub-Tropical Fruit 16-18 July 2007.
 - Dr Hoa and Mr Hoang attended a workshop: Increasing Quality of Vegetable and Fruit (BRC Standard) for EU export: Held by VinaFruit and sippo (Swiss Import Promotion Programme) held at SOFRI 12/13 July. Workshop material has been subsequently used during training
 - The project team participated in the SOFRI dragon fruit clinic in the Tien Giang Province on 23 August 2007.
 - Dr. Hoa has prepared the speech to tell the experience in building GAP system in fruit in the South to present at Workshop for Tomato CARD Project and Mr. Nguyen Huu Hoang has delivered at La Thanh Hotel, Ha Noi.
 - Dr. Hoa also required to present experience in building GAP system in fruit for audient at Cantho University on September 23, 2007 and to many Provincial DARDs.

3.9. Publicity

During project time, many publications have been delivered; the main publications mentioned here are:

- + Hand book for Fruit Production based on GAP standards. National Agricultural Press. 2007.

- + Hand Book for TOT training on GAP National Agricultural Press. 2008.

Beside that, Dr. Nguyen Van Hoa also participated in the CARD – IPM project on citrus as the main author for the Manual quality production of citrus based on GLOBALGAP standards (First Draft completion).

The Nelson Mail printed an article on the NZ project leader and his involvements with aid projects in July. The Dragon fruit GAP project and donor recognition were included in the article. The article subsequently resulted in the project leader presenting a lecture at the Nelson Marlborough Institute of Technology on 10 August 2007 to 7 Vietnamese, 4 Cambodians, 4 Lao and 1 from Myanmar; all were government officials, some senior: – included Mr Bui Chi Kien from the International co-operation Department of MARD in Hanoi.

IV. CONCLUSION

The CARD project on dragon fruit, as implemented, is appropriate for development of GAP in the dragon fruit industry. The ultimate outcome sought was based on the development of a demonstration “package” of Exporter/Packer/Farmer group with quality system standards compliance as a working model for subsequent expansion of GAP in both the dragon fruit and other fruit sectors in Vietnam.

The pilot development has enabled the quality manual to be completed, BRC Standards to be installed in the packhouse to complement EUREPGAP Standards developed on supplying farms, quality systems to be installed and staff trained in identified position responsibilities.

The major highlight of the project is the external audit of the pilot by the Certifying Body, SGS Vietnam and the EUREPGAP Certification for Farmers group and on going of the BRC certification for packhouse.

Acknowledgement:

The Project team wishes to thank CARD for funding this project and the new extension project.

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RESULTS OF THE ESTABLISHMENT OF GLOBALGAP STANDARDS ON CAT SONG HAU MANGO

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ATRACT

SOHAFARM^() has 7.000 ha of land for houses, agriculture and other uses. There are 150.000 Cat Song Hau mango trees of 7 – 8 years old planted at SOHAFARM, which produces 3000 tones of fruit per year. In the project, to establish the pilot of Cat Song Hau Mango for GLOBALGAP standards at SOHAFARM, a group of 7 farmers with 18 ha mango were chosen to implement the GLOBALGAP production model. The project started on August, 2006. First a farm survey was completed and the results showed that the area is suitable for GAP production, but, there were many things that needed to be improved or changed to meet the customer requirements. Secondly intensive training/mentoring sessions were conducted in different aspects such as GLOBALGAP standards and regulations, plant protection and safe chemicals use, harvesting and post-harvest toward GAP requirements and first aid, etc. When implementing the pilot a GLOBALGAP manual for Cat Song Hau mango was developed to build the protocol for mango production including fertilizers and chemicals used, which the farmers accepted to use. In addition, together with the staff of Fruit club at SOHAFARM a quality management system (QMS) was developed, which helped to manage the group working properly from the Group to individual farmers. With consultancies from SOFRI staff, the farmers changed their ways to produce mango in line with GAP requirements including building stores for fertilizers, chemicals, equipments and so on. After one year of implementation, two farmers with 3 ha failed to follow with the group due to their capacity. On June 30th and 1st – 2nd July 2008, the external auditor from SGS audited both the group management and field production on 5 farmers farm with 15 ha. The results showed good results for the group quality management system, quality manual, procedures and documentation. However, there were some non-conformities such as the hygiene system in one place and some minor things that needed to be improved. The group is helping each other to do corrective actions for GLOBALGAP certification within 28 days.*

(*): SOHAFARM: Song Hau Farm Co. Ltd belonging to Thotnot district, Cantho City.