

THE INTRODUCTION OF SAFE AND SUSTAINABLE AGRICULTURE  
CERTIFICATION: A CASE STUDY OF CHERRY GROWERS IN THE  
SOUTHERN INTERIOR OF BRITISH COLUMBIA

by

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## Abstract

GlobalGAP (previously EurepGAP) is a voluntary business-to-business standard for food audit that has recently achieved the greatest acceptance worldwide (Campbell, Lawrence & Smith 2006) boasting implementation numbers of over 80,000 farms in 80 countries<sup>1</sup>. Compliance with the standard is verified by means of the third party certification (TPC) audit, and is designed to (GlobalGAP 2008) assure European retailers that exporting producers have met their criteria for safe and sustainable agriculture (GlobalGAP 2007b). In 2004, cherry growers in the Southern Interior of British Columbia became the first GlobalGAP certified producers in Canada. This novelty afforded a unique opportunity to observe the introduction of the standard in an industrialized country with well-established regulations and where the capacity of producers to undertake the process was relatively high. A qualitative methodology was used in case studies of two communities to inductively study the implementation of 'safe and sustainable agriculture' certification and generate relevant research questions for deeper examination. Sensitizing concepts emerging from observations of the TPC audits (n = 20) evolved into two primary research objectives; 1) to understand the practical application and diffusion of a TPC standard and 2) to explore the efficacy of the TPC standard as a mechanism to promote sustainable agriculture within certain pre-existing contexts. Forty-four follow up interviews were conducted with growers that chose to certify (n = 24), those that did not (n = 14), and other key actors (n = 3). This thesis examines the research objectives over three chapters. The introduction provides the local and global context along with a review of GlobalGAP, agri-food governance and the role of private certification and retailer power. Chapter two presents the technological and sociological factors that influenced the stages of the diffusion of GlobalGAP TPC and compares these factors and outcomes to the technological and sociological components of sustainable agriculture. In the conclusion, policy strategies are offered to maximize the potential for this tool to promote sustainable agriculture along with suggestions for future research on the topic.

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<sup>1</sup> See [http://www.globalgap.org/cms/upload/Resources/Publications/Facts\\_and\\_Figures](http://www.globalgap.org/cms/upload/Resources/Publications/Facts_and_Figures)

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## List of Abbreviations

ABs	Accreditation Bodies
AESs	Agri-Environmental Schemes
B2B	Business-to-business
BCFGA	British Columbia Fruit Growers' Association
BCGAP	British Columbia Good Agriculture Practices
CBs	Certification Bodies
CCPs	Critical Control Points
CFIA	Canadian Food Inspection Agency
EFP	Environmental Farm Plan
FAO	Food and Agriculture Organization
GAPs	Good Agricultural Practices
GATT	General Agreement on Tariffs and Trade
GMOs	Genetically Modified Organisms
MRLs	Maximum Residue Limits
OKCGA	Okanagan Kootenay Cherry Growers' Association
PMRA	Pest Management Regulatory Agency
SPS	Sanitary and Phytosanitary
TPC	Third Party Certification
WHO	World Health Organization
WTO	World Trade Organization

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*To Fred & Teana Kramer*

*And*

*Emil and Martha Friemark*

# 1 Introduction

Public health scares, environmental degradation, air and water contamination, habitat loss, worker rights abuses – it seems oxymoronic for a consumer to associate these terms with the fresh food that we require to nourish our bodies. More and more however, even the most urban of consumers are being made aware of the potential negative externalities of food production through food recalls, media stories, popular books, and environmental campaigns to name a few (Lang, Barling & Caraher 2002; Lang & Heasman 2004, p.135; Arce & Marsden 1993; Walley, Custance & Parsons 2000; van der Meer & Ignacio 2006).

For the most part, until recently, consumers in developed countries have been assured that government laws, standards and agencies establish and enforce appropriate agricultural practices to ensure the safety and security of their food supply (Jill E. Hobbs, Spriggs & Fearn 2001; Hatanaka & L Busch 2008). While this knowledge has been sufficient for most consumers, increasingly others are seeking added assurances of the non-use or non-quality related attributes of their food. A plethora of certification and labelling standards have been growing since the 1990's to provide this 'niche market' consumer with greater product information. In doing so, these standards should help correct past failures of the market by allowing consumers' to reflect their health and environmental concerns through their purchasing choices (Dimitri 2003). The trend toward private certification is occurring all over the world, but Western European consumers have lead the demand for certified products. As this region imports the majority of their fresh produce, many exporting countries' farmers and growers are directly impacted by this governance trend. Cherry growers in the Southern Interior of British Columbia, Canada are an example of producer's being introduced to this new form of agri-food governance. Their experience in the global food system with the introduction of the GlobalGAP standard for 'safe and sustainable agriculture' is the focus of this thesis.

The organization of the thesis is as follows. Section 1.1 provides the global context and relevance for this research. The three objectives for the research are presented in section 1.2. Section 1.3 provides the necessary background for the case study. The first of the research objectives is addressed as part of the literature review in section 1.4. Chapter 2 expands on the discussion of the mechanism of third-party certification (TPC) to further clarify necessary definitions and the assumptions made in the subsequent sections of the thesis. The results and discussion for objective two are presented in Section 2.5 with a summary of the technological

and sociological factors of diffusion for GlobalGAP over a four-year period. The implication of these factors on GlobalGAP's governance to promote a sustainable agriculture system is discussed in Section 2.6. Chapter 3 concludes the thesis with a summary of the strengths and weaknesses of this research, policy suggestions, and areas for future investigation.

## **1.1 STATEMENT OF THE PROBLEM**

The power of large food retailers in industrialized countries has become such that they are able to shape global food systems (Fulponi 2006; Ilbery & Maye 2006). For example, five large European retailers account for over 50% of sales in France, Germany and Spain (Soler 2005) and in the UK, Fulponi (2006) estimates over 70% of retail food sales can be attributed to 17 major food retailers. Blythman (2004, p.xi) points out that in the UK, retailers control nearly 80% of all food consumed. While this trend may have begun in Europe, it has spread internationally and supermarkets now represent 50% of food retail sales in countries such as Brazil, South Africa, Korea and Columbia (Reardon et al. 2003) .

Retailers, keenly aware of consumer concerns and the liability issues they could face in the event of an incident, have become involved in the creation of their own private certification standards (van der Meer & Ignacio 2006). They have also used their power to further these standards by requiring producers certify to them (Vorley 2007). GlobalGAP is an example of such a standard and is categorized as a private, retailer-driven, business-to-business (B2B) third-party certification (TPC) standard. In other words, there is no government involvement and no label to communicate to the end consumer that the product has been GlobalGAP certified. Aside from being a certification standard, GlobalGAP itself is also an organization that Campbell (2005, p.1) describes as an “alliance of food retailers, NGOs, producer organizations, consumer groups, agri-industry and the science community”, indicating that the priorities of the alliance are largely steered by retailer interests. Campbell (2005) also posits that GlobalGAP represents an example of social authority that has never before existed as it is able to circulate its vision of ‘safe and sustainable agriculture’ to producers across the globe without the need for any state or supra-state sanction.

While the literature regarding supermarkets and their use of TPC standards as a governance mechanism is growing, there are few studies of how TPC standards such as GlobalGAP function in practice in an agricultural setting (Hatanaka & L Busch 2008; Campbell 2005). This research contributes to the knowledge by presenting a grounded empirical case study of how

GlobalGAP TPC operates in practice and what this implies for the efficacy of this form of TPC as a governance mechanism to ensure the sustainability of agriculture.

## 1.2 RESEARCH OBJECTIVES

Examine various aspects of TPC for safe and sustainable agriculture

Examine the stages of diffusion of GlobalGAP and how it functions in practice

Examine the efficacy of the GlobalGAP TPC mechanism to govern towards a sustainable agriculture system

## 1.3 BACKGROUND

### 1.3.1 GlobalGAP (previously EurepGAP)

It is necessary to step back and look at the history that laid the foundation for GlobalGAP. Of key importance was the success of the WTO as a global governance body to define the rules of international trade through agreements such as the SPS<sup>2</sup> (sanitary and phytosanitary) agreement annexed in the Marrakesh agreement signed in 1994. These agreements reduced non-tariffs trade barriers and were instrumental in aiding the dramatic increase in trade of agricultural products (Friedmann & McNair 2008; L. Busch et al. 2005; Skogstad & Carruth 2006). It is under the context of these international agreements and the liberalization of trade that a new permutation of global agri-food governance quickly began to emerge in 1997. The organization was named Eurep<sup>3</sup>, which stood for **E**uropean – **R**etailers – **P**roduce working group. Eurep was a private organization established by retailers to create the criteria that would define a new standard for agricultural products. The criteria were deemed to promote GAPs, or **G**ood **A**gricultural **P**actices, hence the name of the standard was originally EurepGAP. While EurepGAP was built upon many of the same fundamentals as Codex's<sup>4</sup> food safety and quality standards, it surpassed Codex by including social and environmental criteria. EurepGAP also

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<sup>2</sup> It was agreed at these negotiations that the international movement of food products and plant material was to be governed under the stipulations set out by the WTO SPS Agreement. This agreement was seen as being vital to the promotion of liberalized global trade by prohibiting protectionist behaviors while at the same time ensuring importing countries retained the right to safe, disease-free imports.

<sup>3</sup> For a comprehensive history on EurepGAP (GlobalGAP) see (Campbell 2005).

<sup>4</sup> Codex is the international standard for food safety as noted in GATT (General Agreement on Trade), now the WTO. Codex (Codex Alimentarius Commission) was established in the 1960s by the UN but

differed from other private standards (i.e. organic and fair-trade) as it did not include a labeling component, and was designed to address 'safety and sustainability' simultaneously. Now operating under the trademark name of GlobalGAP, the standard is seen as being retailers' response to waning consumer trust in the ability of national and multi-national organizations to ensure food safety and mitigate the negative environmental impacts of agriculture (Fulponi 2006).

Although the GlobalGAP standard was the invention of thirteen European supermarkets, it now includes a governing board of ten elected members, a non-profit secretariat body, and three sector committees (crops, livestock and aquaculture)<sup>5</sup>. The secretariat, FoodPLUS GmbH, is a private non-profit company that is 100% owned by a 'scientific institute of the retail industry', the EHI Retail Institute<sup>6</sup> which is based in Cologne, Germany. FoodPLUS oversees all administrative aspects of the standard whereas the sector committees are tasked with the technical aspects of setting the criteria that define the standard. The committee is on a three year rotation and its members are elected by GlobalGAP members.

GlobalGAP works as a governance mechanism via a chain of TPC and audit. Details on the structures that facilitate GlobalGAP TPC are presented in section 2.1.1.

### **THE GLOBALGAP CRITERIA**

The GlobalGAP criteria are structured similar to that of the HACCP<sup>7</sup> audit system, which ranks criteria based on an assessment of risk. The level of risk or importance of an issue is reflected by the GlobalGAP compliance type associated with the criteria (called Critical Control Points or CCPs). Figure 1.1 below provides an example of the CCP criteria for worker health, safety and welfare.

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was, and continues to be, managed jointly by the WHO and the FAO.

<sup>5</sup> See [http://www.globalgap.org/cms/front\\_content.php?idcat=15](http://www.globalgap.org/cms/front_content.php?idcat=15)

<sup>6</sup> See <http://www.ehi.org/en.html>

<sup>7</sup> HACCP is a science and risk-based approach that identifies, prevents, reduces or eliminates the potential for food safety hazards. It was standardized by the Codex Alimentarius Commission. See [http://www.omafra.gov.on.ca/english/food/inspection/haccp/haccp\\_principles.htm](http://www.omafra.gov.on.ca/english/food/inspection/haccp/haccp_principles.htm)

<b>EUREPGAP®</b>		<b>CONTROL POINTS AND COMPLIANCE CRITERIA FRUIT AND VEGETABLES</b>	Code Ref.: FP 2.0 CP Version: 2.0Jan-04 Section: CPCC Page: 21 of 25
<b>ENGLISH VERSION</b>			
<b>Nº</b>	<b>CONTROL POINT</b>	<b>COMPLIANCE CRITERIA</b>	<b>LEVEL</b>
<b>12.4 Crop Protection Product Handling</b>			
12.4.1	Are the workers who handle and apply crop protection products trained?	All personnel who physically handle or apply crop protection product products can demonstrate their competence and knowledge via official qualifications or specific training course attendance certificates. No N/A.	Minor
12.4.2	Are all staff which has contact with crop protection products submitted voluntarily to annual health checks in line with guidelines laid down in local codes of practice?	If applicable, health checks to which all staff which has contact with crop protection products are voluntarily submitted comply with national, regional or local codes of practice.	Recom.
<b>12.5 Protective Clothing/Equipment</b>			
12.5.1	Are workers (including subcontractors) equipped with suitable protective clothing in accordance with label instructions?	Complete sets of protective clothing, (e.g. rubber boots, waterproof clothing, protective overalls, rubber gloves, face masks etc.) which enable crop protection product label instructions to be complied with are available and in a good state of repair. No N/A.	Major
12.5.2	Is protective clothing cleaned after use?	There are procedures in place to clean the protective clothing after use.	Minor
12.5.3	Are farmers able to demonstrate that they follow label instructions with regard to use of protective clothing and equipment?	There are appropriate recommendations or procedures for the use of protective clothing and equipment, and are available and used by all workers handling or applying crop protection products, according to the label recommendations. No N/A.	Minor

Source: (EurepGAP 2004)

Figure 1.1 Sample of EurepGAP (GlobalGAP) criteria 2004 version.

The ‘Major Must’ compliance type CCPs (labeled as ‘Level’ in the Figure 1.1 example) are associated with practices that must be adhered to in order to meet the GlobalGAP standard’s acceptable level of risk. ‘Minor Musts’ are also requirements, but the producer can fail on up to 5% of the minor must criteria, and ‘Recommendations’ (labeled as ‘Recom’) are non-compulsory criteria. Table 1.1 illustrates the breakdown of the number of criteria in the 2004 version of the standard by compliance type.

Table 1.1 Level of control point compliance

Critical Control Point (CCP) – Compliance Type	Compliance Requirement	Number of CCPs for Compliance Requirement
Major Must	100%	47
Minor Must	95%	98
Recommendations	Not Compulsory	65

Source: (EurepGAP 2004)

The 210 GlobalGAP CCPs are divided into 14 groups, herein referred to as control point criteria groups (CCP groups). Figure 1.2 shows the percentage of CCPs in each CCP group that fall under the three compliance types. It is clear from the graph that the 2004 version of the standard is most strict on issues of documentation (such as traceability and record-keeping) and chemical handling (as represented by the crop protection group).

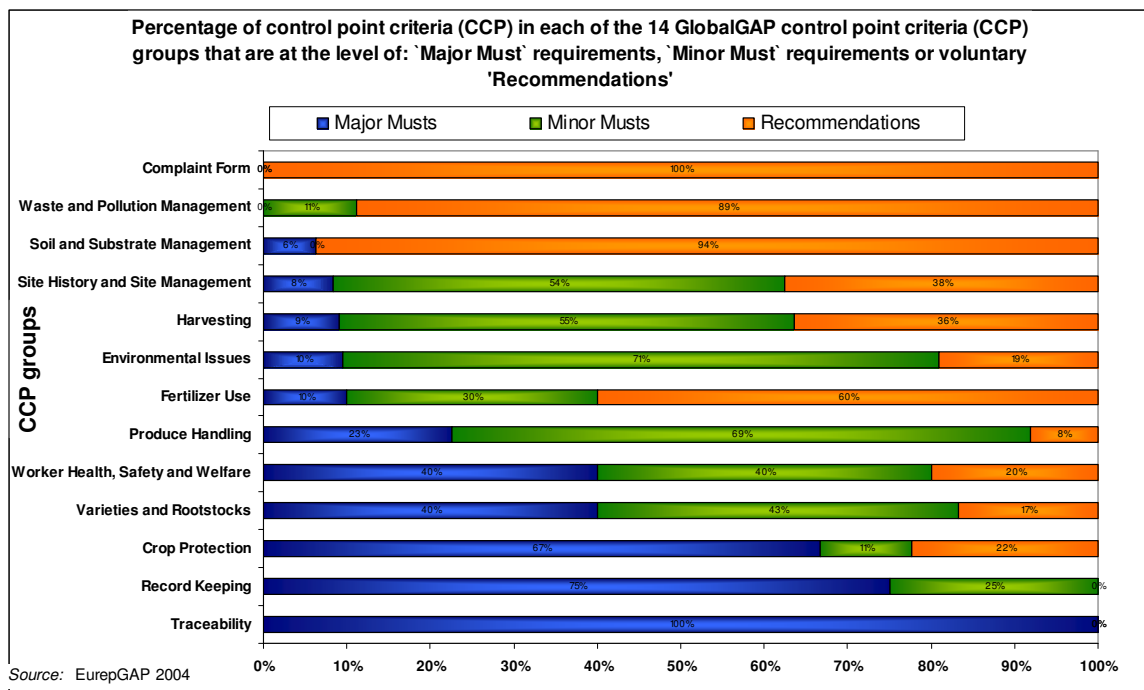


Figure 1.2 Breakdown of Control Point Criteria Groups by Compliance Type

The CCP groups where GlobalGAP seems to be most lenient is on issues of soil and pollution management and dispute resolutions. Figure 1.3 provides another approach to view the breakdown of the 'recommended' CCPs. Represented by the chart is the number of CCPs from each CCP group that comprise the sixty-five CCPs in the 'recommended' compliance type. From this chart it is evident that the vast majority of recommendations are related to practices in agriculture that have a direct impact on the environment. CCP groups such as documentation, harvesting or produce handling generally have less direct impact on the environment and are more strongly related to food safety. Similar charts for the 'Major Musts' and 'Minor Musts' are provided in Appendix A.

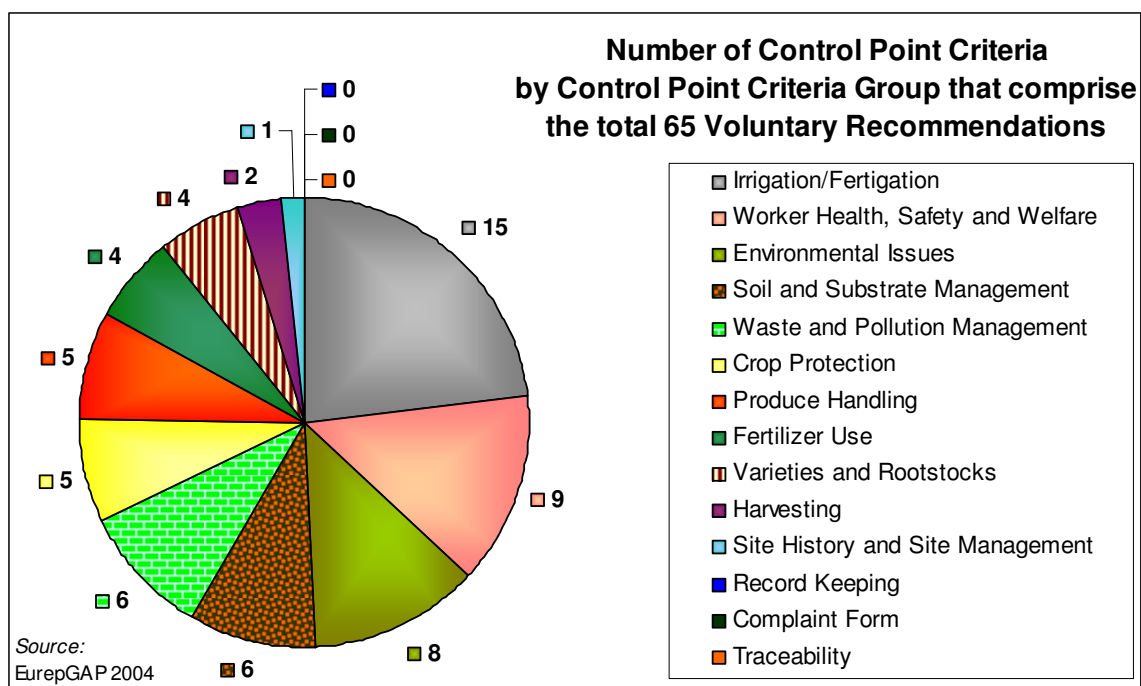


Figure 1.3 Recommendation compliance type by control point criteria group

In defense of GlobalGAP, the standard's CCPs are "...subject to a three year revision cycle of continuous improvement to take into account technological and market developments."<sup>8</sup> The term 'continuous improvement' acknowledges that many of the changes required may take significant effort and allow a reasonable time for producers to make the transition to new practices.<sup>9</sup> GlobalGAP's statement however does not explicitly define the nature of technological or market developments, nor does it state what priorities will be considered in setting the future CCPs. Concerns are raised regarding what GlobalGAP specifically envisions to be a model of a sustainable agriculture system, especially as the breadth of the term 'sustainable agriculture' makes it highly vulnerable to being manipulated to serve advertising claims of promoting sustainability (Buttel 1992).

### 1.3.2 Tree Fruit Industry in the Interior of British Columbia

The southern interior of British Columbia has always been known as Western Canada's prime fruit producing region. Throughout the latter half of the 20<sup>th</sup> century apple orchards were the dominant crop with an estimate of 66% of the acreage in 1971 (Lusztig 1990). Since this time

<sup>8</sup> See: [http://www.globalgap.org/cms/front\\_content.php?idcat=2](http://www.globalgap.org/cms/front_content.php?idcat=2) accessed: October 30, 2008

<sup>9</sup> See Appendix B for an example of how the GlobalGAP standard has been revised since the 2004 version used in this research.



however, there has been a steady trend away from apples and other traditional fruits due to consistently poor returns (Lusztig 1990). Cherry production has taken up some of this production and increased in acreage by 67% for several reasons. First, the improvement of growing techniques and the development of later maturing varieties allowed growers to produce cherries of exceptional size and quality<sup>10</sup>. Second growers that chose to replant cherry trees received financial assistance<sup>11</sup>. Third, the establishment of overseas markets and reliable distribution networks made it possible to sell cherries into a lucrative market and garner higher prices as domestic prices had been declining throughout the 80s and 90s (Lusztig 1990)<sup>12</sup>.

### 1.3.3 The Growth of the 'Export Cherry' Business

The initial growers in the 1990s that undertook the significant time and financial costs of replanting their orchards realized stunning returns as the new planted varieties came into production. For example, the five-year average return on cherries from 1994 – 1998 was estimated at \$0.948/lb (British Columbia Ministry of Agriculture and Food & Terra Incognita Communications Inc. 1999), whereas growers shipping overseas were receiving prices as high as \$2.65/lb<sup>13</sup>. As cherries are a highly perishable fruit they require expert harvesting and specialized packing facilities. A minimum level of guaranteed production was needed to meet certain economies of scale and justify the level of investment required. Therefore to continue to build the cherry industry in British Columbia, orchardists were encouraged by a variety of sources to replant cherries over other fruits and the export cherry business became the focus for many growers in the region.

The certifications and documents required to import or export have continued to evolve rapidly since the boom of the export cherry business in BC, however until recently, the requirements were a result of the government regulations or agreements between the countries involved<sup>14</sup>.

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<sup>10</sup> The unique climatic regions in British Columbia coupled with the later varieties also gave producers a timing advantage over their global competitors.

<sup>11</sup> Under the B.C. Ministry's Tree Fruit Revitalization Strategy in 1991, growers received funds through the Orchard Replant Program to assist them in replanting the traditional orchards using new planting techniques and fruit varieties

<sup>12</sup> Contributing to the inability for growers to sell their produce locally was the competition faced from U.S. producers.

<sup>13</sup> Taken from participant comments; May 4, 2004 – orchard audit observation.

<sup>14</sup> For example, exporters were familiar with meeting *quality* standards stipulated by regulations such as 2001/1148/EC (European Commission 2001) that require fresh fruit imports to Europe be accompanied by a certificate of conformity. Cherry imports into the EU continue to be regulated under the EU marketing standards which include requirements such as the presence of stems on the fruit, virtual

The expansion of multilateral agreements on food *safety*, such as the WTO SPS Agreement added another dimension of product requirements. However, Canada is a member of Codex and had been active in harmonizing national agriculture standards to facilitate international trade (Skogstad & Carruth 2006). Therefore growers were already operating in a system that shared the norms and scientific-based approach endorsed by this standard<sup>15</sup>. Fruit growers, through their compliance with national standards, were therefore already ‘world-class’ in terms of quality and safety. Inspections and other administrative requirements were generally handled by packinghouses or marketers and government agency representatives. Consequently, growers were largely shielded from these matters and encouraged by their marketers to simply focus on growing the highest quality fruit possible.

#### **1.3.4 The Arrival of EurepGAP (now GlobalGAP)**

GlobalGAP became a reality for most BC cherry growers in February 2004. This new condition of the export cherry business was different for them in that it; 1) was entirely market driven with no government involvement, 2) required their direct participation and an on-site audit of the orchard operations, and 3) included components that went beyond safety and quality issues and ventured into areas such as worker hygiene and environmental considerations.

Although growers were aware that GlobalGAP was a voluntary standard, many of them were already beginning to recognize that their timing advantage was beginning to narrow<sup>16</sup> and that maintaining access to as many markets as possible was the best way to hedge against the threat of increasing cherry production locally and world-wide. Many growers therefore chose to certify in 2004 and this research commenced to examine how GlobalGAP would function at the grower level.

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absence of blemishes and use of acceptable packaging (European Commission 2004)

<sup>15</sup> Canada has long been recognized as a country with advanced quality of living standards including clean water, soil, and modern farming and food handling practices.

<sup>16</sup> New packaging technologies emerged, such as MAP (modified atmosphere packaging), that were rumored to extend the shelf life of cherries up to ten weeks, thereby eroding BC growers’ timing advantage. The late maturing varieties (such as Lapins) developed in BC, were also now being planted in Washington and Europe as PICO (Okanagan Plant Improvement Company), the organization responsible for the production and sale of fruit tree varieties, began marketing late varieties around the world (British Columbia Ministry of Agriculture and Food & Universal Management Consulting Firm 1999).

## 1.4 LITERATURE REVIEW

As this research followed the Grounded Theory methodology, the literature review was conducted after data had been analyzed. The relevant literature is shown divided into four primary areas in Figure 1.4. The map illustrates the interdisciplinary nature of the topic and the literature reviewed.

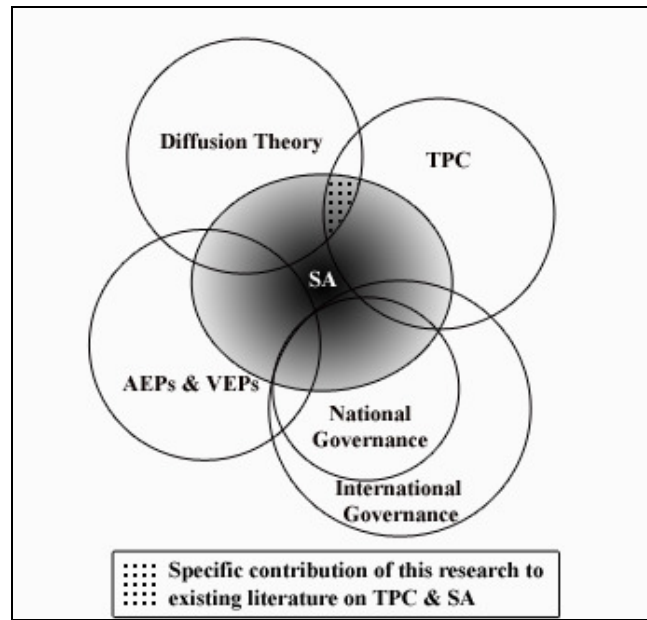


Figure 1.4 Literature map

Literature from the four areas; 1) diffusion of innovations theory, 2) third-party certification, 3) voluntary agri-environmental and environmental programs (AEPs & VEPs), and 4) governance of agriculture and food, provided important background, irrespective of whether the focus was directly related to sustainable agriculture. A brief introduction to the literature is provided here, with a more in depth consideration of particular aspects being provided in Chapter 2.

### GOVERNANCE

Searches for literature on GlobalGAP lead almost exclusively to the recent body of work regarding the role of TPC standards in the governance of the agri-food industry, much of which has come out of the field of rural sociology. Publications have considered the governance role of TPC schemes or standards from various angles; from a general political economy perspective (Campbell, Lawrence & Smith 2006; Lawrence Busch & Carmen Bain 2004; Hatanaka, Carmen Bain & Lawrence Busch 2005; Carmen Bain, Deaton & Lawrence Busch 2005; Raynolds, Murray & Heller 2007), using global value or supply chain analysis (Gereffi,

Humphrey & Sturgeon 2005; Bessel, JE Hobbs & Kerr 2006) in combination with convention theory (Ponte & Gibbon 2005; Bitzer, Francken & Glasbergen 2008; Klooster 2006) and using network analysis (Hughes 2000; Higgins, Dibden & Cocklin 2008). Valuable insights provided by the governance literature are referenced throughout the analysis as points for comparison, and enhance the utility of this research to suggest policy directions. This literature also contributes to the analysis as it establishes the global conditions and contextual factors in which TPC has become a reality for the growers.

## **DIFFUSION OF INNOVATIONS**

Diffusion theories have been used to understand social change phenomena such as the uptake of new ideas or beliefs, knowledge, practices, programs, policies, technologies or any other shift to a different or novel way of perceiving or acting for the past 110 years (Dearing 2008). These social changes are commonly referred to as 'innovations' and the majority of diffusion research has examined the factors influencing the adoption or non-adoption of the innovation in question. Theories regarding a particular facet of diffusion theory, such as the importance of social dynamics on the quality of implementation (Mallett 2007; Dattee & Birdseye Weil 2007; Defrancesco et al. 2008; Ankem 2003), or innovation characteristics (E. M. Rogers 1995, pp.204-251) were particularly relevant in comparing findings.

### Diffusion of agricultural practices

Diffusion theory gained popularity and use in practical applications with the well cited study on the adoption of hybrid seed corn by farmers in Iowa by Ryan and Gross in 1943 (Everett M. Rogers & Ban 1963). It continued to be of particular importance in the agricultural realm throughout the 40's and 50's in developing strategies to speed the adoption of modern agricultural methods and thereby, the promulgation of the productionist paradigm (Lang & Heasman 2004, p.19; Colman 1968; Everett M. Rogers & Ban 1963; E. M. Rogers 2004). Perhaps it was a testament to this success that diffusion studies in agriculture dropped off in the 1960s (E. M. Rogers 2004).

It is evermore interesting now, that in the last decade, there has been a resurgence in diffusion studies aimed at understanding how to promote the adoption of technical practices commonly identified with past agricultural systems (Knowler & Bradshaw 2007; Pheasant 2003; Edwards - Jones 2007; Gelcich, Edwards-Jones & Kaiser 2005; Nazarko et al. 2004; Upadhyay et al.

2003). The wealth of diffusion studies in agriculture however does not preclude the notion that there are significant gaps in our understanding with respect to diffusion and adoption of certain agricultural practices. Studies have produced a range of independent variables to predict whether an innovation will be adopted<sup>17</sup> but underscore the importance of the broader sociological context to comprehend the 'why' and 'how' of diffusion (Edwards - Jones 2007; Knowler & Bradshaw 2007). Therefore, although the traditional theories of diffusion provide a framework, the reality of agriculture today is very different from that of the 1950's. Further, the unique nature of the innovation of GlobalGAP TPC<sup>18</sup> considered in this case study necessitates the identification of what factors influence its adoption.

### **VOLUNTARY ENVIRONMENTAL PROGRAMS (VEPs) AND AGRI-ENVIRONMENTAL PROGRAMS (AEPs)**

Literature on voluntary AEPs and VEPs contribute to this study as these programs are voluntary and are designed to address the impacts of production (not only product) on society and the environment. AEPs are generally government run and assist producers in identifying and addressing negative externalities of agriculture through the implementation of a set of criteria (Jones 2005). Unlike TPC standards, AEPs and VEPs either rely on self-monitoring or the presence of an extension worker or local agent to verify compliance through direct experience with the producers (Nazarko et al. 2004). Studies on VEPs and AEPs integrate the literature on diffusion and governance as they have been analyzed both in terms of their adoption and for their ability to achieve the targeted policy (whether government or corporate) results.

This literature highlights the importance of several key factors to ensure compliance with voluntary standards and the promotion of behavioral change; namely an economic incentive (Osterburg 2005) (or penalty), education and encouraged innovation through participation (Defrancesco et al. 2008; Burton, Kuczera & Schwarz 2008; Stonehouse 2004; Hall, Morriss & Kuiper 1999). The factors equate to independent variables that are able to predict outcomes of voluntary initiatives such as TPC within certain contexts.

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<sup>17</sup> These factors will be discussed in more detail in Chapter 2.

<sup>18</sup> Diffusion theories examining agricultural innovations have traditionally looked at practices having a direct and visible impact on the volume of production, features of the commodity or methods used in production (E. M. Rogers 1995, pp.42, 52 - 62). In contrast, 100% of the responses given by growers in this study clearly indicate that certification had absolutely no impact on product quality, safety, yield or the production methods employed.

## STANDARDS AND TPC

There is a longer history of non-agricultural forms of TPC that provides evidence of the environmental performance of the mechanism. One of the most global and recognizable standards is the ISO Standard<sup>19</sup>. ISO 14001 allows companies to set their own policies and objectives that are subsequently subjected to a TPC audit. These independent third-party audits are the strength of TPC as they monitor and validate compliance (Melo & Wolf 2005; Liu, Andersen & Pazderka 2004; Campbell 2005; Hatanaka & L Busch 2008). Results from the corporate world however have been mixed (Sambasivan & Fei 2008; Prakash & Potoski 2006; Prakash & Potoski 2007; Vogel 2008). Some show that as ISO 14001 focuses on the creation of policies and not specific standards, it can be difficult to substantively measure whether any targets have actually been met (Delmas 2002; Kimerling 2001). This is a significant point as the structure of GlobalGAP is based upon the ISO structure and therefore may also have debatable outcomes.

Aside from having a similar structure, GlobalGAP is like ISO as many of the criteria are designed to defer to local regulations or the practices deemed as 'GAP' by the producers themselves or based on judgments of the auditor. Another key similarity is that there is no product labeling component to either GlobalGAP or ISO 14001 (Delmas 2002; ISO Central Secretariat 2005). Delmas (2002) concludes that if improved visibility by the customer is not a motivating factor for the firm to pursue this certification, then the motivation is clearly to gain profits through efficiency and to improve environmental compliance with government standards. GlobalGAP producers do not receive a price premium, therefore this research tests whether growers intention to certify are similar to those of manufacturing firms (efficiency gains and regulatory compliance), or if new theories may be needed to understand motivations for certification and compliance in an agricultural setting.

As TPC standards based on the ISO system evolve, their use by environmental NGOs and civil society organizations has also blurred the independent nature of TPC as these organizations both create and often partner with producer groups in developing countries to provide technical assistance to meet the standards (Melo & Wolf 2005; Bitzer, Francken & Glasbergen 2008;

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<sup>19</sup> ISO, the International Organization for Standardization, produces a suite of standards that companies, NGOs or governments can certify to. These standards were primarily focused on management of processes and quality in manufacturing and services, but have expanded to include standards for product certification schemes. <https://www.iso.org>

Raynolds, Murray & Heller 2007). NGOs, donors and export companies have gone further by providing financial assistance to producers in developing countries attempting to meet GlobalGAP standards (Deepa Thiagarajan, Lawrence Busch & Mark Frahm 2005; Carmen Bain, Deepa Thiagarajan & Lawrence Busch 2004; Graffham, Karehu & MacGregor 2006; Graffham & MacGregor 2006). In other cases governments are creating standards which they subsequently benchmark (harmonize) against private standards like GlobalGAP. As TPC and private standards gain prominence, the arrangements and agreements between levels of governments, NGOs and retailers appears to be ever-evolving and indicates a move towards “less *government* and more *governance*” (Campbell, Lawrence & Smith 2006) (*italics in original*).

## **1.5 CASE STUDY ETHICAL APPROVALS**

The research and data collection methods used in this case study directly involved human participants. All participants were informed of the nature of the research prior to observations or taped interviews and participation was voluntary. Consent was provided by participants in the form of signed consent forms. The study was classified as having negligible risks to participants. Ethics approval for this research was granted by the University of British Columbia Behavioural Research Ethics Board (BREB File # H07-00455, Appendix C).

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## **2 Examining the ‘Gap’: A comparison of the diffusion of GlobalGAP certification and sustainable agriculture.<sup>20</sup>**

Increasingly the governance of all matters related to the production, processing and sale of food is moving out of the hands of governments and becoming the responsibility of private bodies (Hatanaka & L Busch 2008; Lawrence Busch & Carmen Bain 2004; Liepins & Bradshaw 1999). This change is largely attributed to the conspicuous trend worldwide towards neoliberal government policies (Campbell, Lawrence & Smith 2006; Drummond et al. 2000; Le Heron 2003), and a decline in the public's confidence that government policies are adequate to prevent food scares and environmental issues that threaten the sustainability of agricultural production (Lang & Heasman 2004, p.291; J. Cooper & Graffam 2007). Private European retailers have a particularly strong incentive to ensure the supply and safety of food, (Fulponi 2006) and are becoming significant players in the global governance of agriculture (IIED & NRI 2008; Vorley 2007; L. Busch et al. 2005; Melo & Wolf 2005; Bray, Plaza Sanchez & Murphy 2002). Specifically, retailers' role in the governance of global value chains is intensifying as they increasingly demand that producers have some form of third-party certification (TPC) that guarantees production methods have met certain standards (Hatanaka, Carmen Bain & Lawrence Busch 2005; Campbell, Lawrence & Smith 2006; Konefal & Carmen Bain 2007). Because of the increased globalization of agricultural trade, the implications of this governance change has a significant impact at a local scale in exporting countries and the importance of assessing TPC is evident. This paper focuses on examining the sustainability claims of GlobalGAP, a particular form of TPC that is designed to address both the safety and sustainability of agriculture.

Many forms of TPC standards have been evaluated based upon their organizational characteristics (i.e. the type of organization responsible for their administration)<sup>21</sup> and technical criteria (i.e. whether they focus on environmental (organic) or social (fair-trade) issues)<sup>22</sup>. GlobalGAP however is a relatively new and ambitious standard and therefore few empirical studies on this form of TPC have been conducted (Hassell 2005; Campbell 2005). Furthermore,

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<sup>20</sup> A version of this chapter will be submitted for publication. Ardiel, Jennifer. Examining the ‘Gap’: A comparison of GlobalGAP certification and sustainable agriculture.

<sup>21</sup> For example see: (Friedmann & McNair 2008; Renard 2005; Bitzer, Francken & Glasbergen 2008)

<sup>22</sup> For example see: (Raynolds, Murray & Heller 2007) (Vorley 2007; Lawrence Busch & Carmen Bain 2004; Campbell 2005)



up to this point, research examining private TPC for agriculture has approached the topic from a broader policy perspective<sup>23</sup> (Hassell 2005), or has conducted grounded empirical research specific to developing countries<sup>24</sup>. This research fills a gap in knowledge by focusing on the GlobalGAP standard and how it works in practice not only at the producer level, but from the producers' perspectives, in order to examine if it can achieve its ambitious claims of promoting sustainable agriculture. Empirical research at this level is fundamental as producers are the interpreters and users of the certification, and are responsible for executing the practices that are the basis of a sustainable agriculture system.

The necessary background for this paper is provided in the following three sections. First, the key technological and organizational components of GlobalGAP, a retailer-based organization with a private transnational standard for 'safe and sustainable agriculture, and GlobalGAP's third-party certification (TPC) standard provide the global context for this paper. Second, GlobalGAP's specific role in an agricultural context is explored and a framework is presented for assessing this role. Finally, the local context for the specific case study of cherry grower's in Canada is introduced. The results and discussion are presented in two phases. The first section presents the factors that illustrate how GlobalGAP TPC functioned in *practice* and influenced the outcomes observed in the case study. The second section then comparatively analyzes these factors against the literature that defines sustainable agriculture systems.

## **2.1 GLOBALGAP AS GOVERNANCE**

In the past, the role of retailers in the 'governance' of food was typically limited to issues of basic quality, presentation, supply volumes and timing (Lawrence Busch & Carmen Bain 2004; Dimitri 2003). Over the past two decades this role has evolved to the point where retailers are now defining the methods of how food is produced to meet their parameters for sustainability and food safety (Hutter 2006; Campbell 2005; Burch & Lawrence 2005). GlobalGAP is the retailer-driven organization (Campbell 2005) that is leading this movement and fits comfortably in this reality, where it is at the same time able to dictate terms of trade, evade impingement of WTO terms, create a means to encourage consumer confidence and a steady supply of reliable quality, and make claims of promoting food safety, security and environmental sustainability (Vorley 2007; Konefal & Carmen Bain 2007; Campbell, Lawrence & Smith 2006).

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<sup>23</sup> For example see: (Maxey 2006; Drummond et al. 2000; Campbell 2005)

<sup>24</sup> For example see: (Graffham et al. 2007; Deepa Thiagarajan, Lawrence Busch & Mark Frahm 2005;

GlobalGAP defines what is safe and sustainable agriculture through criteria, called ‘critical control points’ (CCPs) (Campbell 2005) and the current version of the GlobalGAP CCPs are prefaced with “The Global Partnership for Safe and Sustainable Agriculture” (GlobalGAP 2007). In short, GlobalGAP aims to address a wide range of areas such as irrigation, soil management, worker hygiene, crop protection, wildlife conservation and harvesting hygiene via a checklist of over 200 CCPs (EurepGAP 2004). The producer must comply with the majority of the CCPs to obtain certification, however over one-third of the CCPs are only ‘recommendations’. Many of the criteria specific to addressing environmental concerns such as biodiversity fall into the recommendation category and are therefore not required to pass certification. Analyzing the specifics of the GlobalGAP criteria is beyond the scope of this paper<sup>25</sup>, however Campbell’s (2005) assessment is that the CCPs are based on a European-centric perspective that assumes the producer has the preexisting technological, economic and social systems necessary to interpret and implement the criteria.

GlobalGAP however is more than just a standard for agriculture practices. GlobalGAP states their aim “...is to establish ONE standard for Good Agricultural Practice (G.A.P.) with different product applications capable of fitting to the whole of global agriculture”<sup>26</sup>. In other words, GlobalGAP’s mission is to design the foremost standard for agriculture to which all other agricultural standards across the world are compared. How might the GlobalGAP organization achieve these goals with essentially one harmonized standard?<sup>27</sup> One primary aspect of GlobalGAP that advances its status as the global standard is its sophisticated system of benchmarking<sup>28</sup> to allow other standards to be harmonized with GlobalGAP<sup>29</sup>. As other standard setting organizations pursue harmonization with GlobalGAP, the notion that GlobalGAP is the overarching global standard is legitimized. As noted however, this paper focuses on another particularly important component that facilitates the operation of the GlobalGAP standard and lends to its credibility as a certifier of sustainable agriculture – the Third-Party Certification (TPC)<sup>30</sup>.

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Melo & Wolf 2005; Raynolds 2008; Bray, Plaza Sanchez & Murphy 2002; Vorley 2007)

<sup>25</sup> Campbell (2005) explores the details of the GlobalGAP criteria in more depth.

<sup>26</sup> See: [http://www.globalgap.org/cms/front\\_content.php?idcat=2](http://www.globalgap.org/cms/front_content.php?idcat=2) accessed: October 23, 2008

<sup>27</sup> The GlobalGAP standard as of 2007 is comprised of five elements common to all agricultural operations along with components that address specifically the various commodity groups. Refer: [http://www.globalgap.org/cms/front\\_content.php?idcat=3](http://www.globalgap.org/cms/front_content.php?idcat=3) accessed: August 21, 2008

<sup>28</sup> For a detailed history and examination of benchmarking see (Lang & Heasman 2004, p.291)

<sup>29</sup> See: [http://www.globalgap.org/cms/front\\_content.php?idcat=2](http://www.globalgap.org/cms/front_content.php?idcat=2) accessed: October 23, 2008

<sup>30</sup> For a detailed history and analysis of TPC in agri-food governance see: (Stefano Ponte & Gibbon 2005;

### 2.1.1 Third-Party Certification

Voluntary TPC schemes are considered to be one of the market-based mechanisms available to promote the transformation to an “ecologically integrated” paradigm (2004, pp.285-304)<sup>31</sup>, or to address negative environmental externalities (Delmas & Montiel 2008; Melo & Wolf 2005; Khanna 2001; Klooster 2006). In order to examine GlobalGAP TPC it is necessary to first identify some of the fundamental characteristics of the TPC mechanism and how it is being applied in the GlobalGAP case.

#### THE STRUCTURES OF TPC

Many different organizations with agriculture standards use the TPC mechanism to ensure compliance with standards including governments, NGOs and retailers (Hatanaka & L Busch 2008). Common across all forms of TPC however is the structure of the system and the role that participants play that gives TPC legitimacy as an independent, effective and objective mechanism for governance. For example, because the certification bodies (CB) that perform the audits are not part of the agriculture supply chain, they are seen as being objective and independent assessors. The particular interest here is the retailer organization of GlobalGAP’s use of TPC, and a simplified diagram of its structure is shown in Figure 2.1.

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Giovannucci & S. Ponte 2005; Deepa Thiagarajan, Lawrence Busch & Mark Frahm 2005; Hatanaka & L Busch 2008)

<sup>31</sup> The values integral to this paradigm are similar to the principals of a sustainable agriculture system listed by (Curtis E. Beus & Riley E. Dunlap 1990).

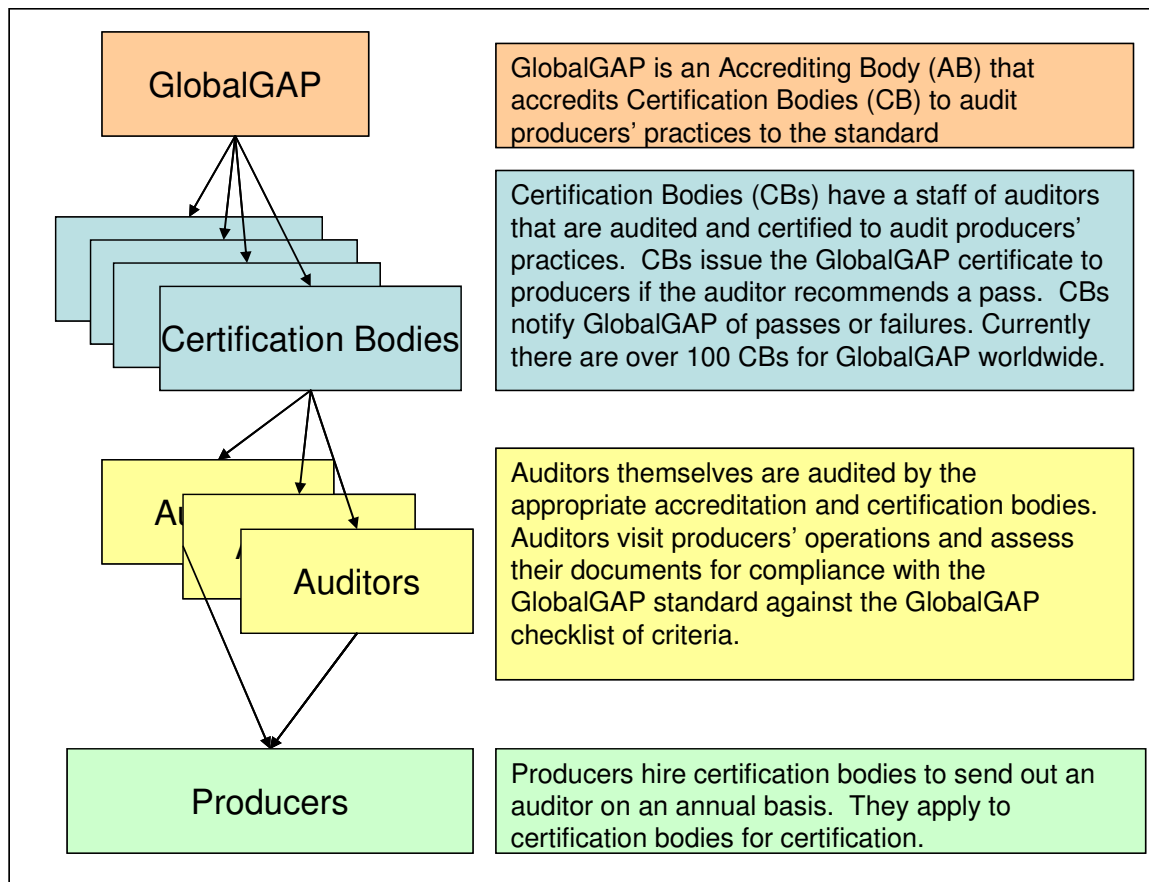


Figure 2.1 The TPC organizational structure for GlobalGAP

The depiction in Figure 2.1 is not the only structure that verifies TPC systems. There are a set of highly complex hierarchical and horizontal structures that work to ensure the integrity of the bodies and standards at all levels. At the top of the chain for verifying the quality of standards themselves is the International Organization for Standardization (ISO). The bodies that verify standards such as GlobalGAP meet ISO standards are usually national accreditation bodies (AB) such as the United Kingdom Accreditation Service, the Standards Council of Canada and the American National Standards Institute. Then there are also organizations comprised of member ABs, such as the International Accreditation Forum (IAF), that conduct peer reviews of private ABs to facilitate the harmonization and benchmarking of ABs standards<sup>32</sup>. While some research has been published on these structures, very little is known about how TPC operates in practice or whether it is able to function as independently and objectively as it was designed to at the producer level (Hatanaka & L Busch 2008).

<sup>32</sup> For further details on this topic refer to Hatanaka and Busch (2008).

## TPC AS A GOVERNANCE MECHANISM

A point to be stressed is that GlobalGAP's use of TPC as a governance mechanism transcends national borders and is what allows supermarkets to achieve their marketing and supply chain goals, and producers to potentially access a pool of buyers represented by large retailers. As Campbell (2005) aptly states, GlobalGAP represents "...virtual governance organized [organised] outside the traditional sphere of mass democratic authority." It is also important to recognize that TPC is an active form of governance and therefore is expensive. TPC requires a high degree of coordination that previously only governments could afford (Lawrence Busch & Carmen Bain 2004). Figure 2.2 illustrates the two important distinctions of 'who pays' for and 'who sees' GlobalGAP certification. This diagram shows how private TPC standards have emerged in the governance of the agri-food system and evolved from their traditional roots in organic (or fair-trade) certification to become a mainstream governance tool not limited to specialty products or niche markets.

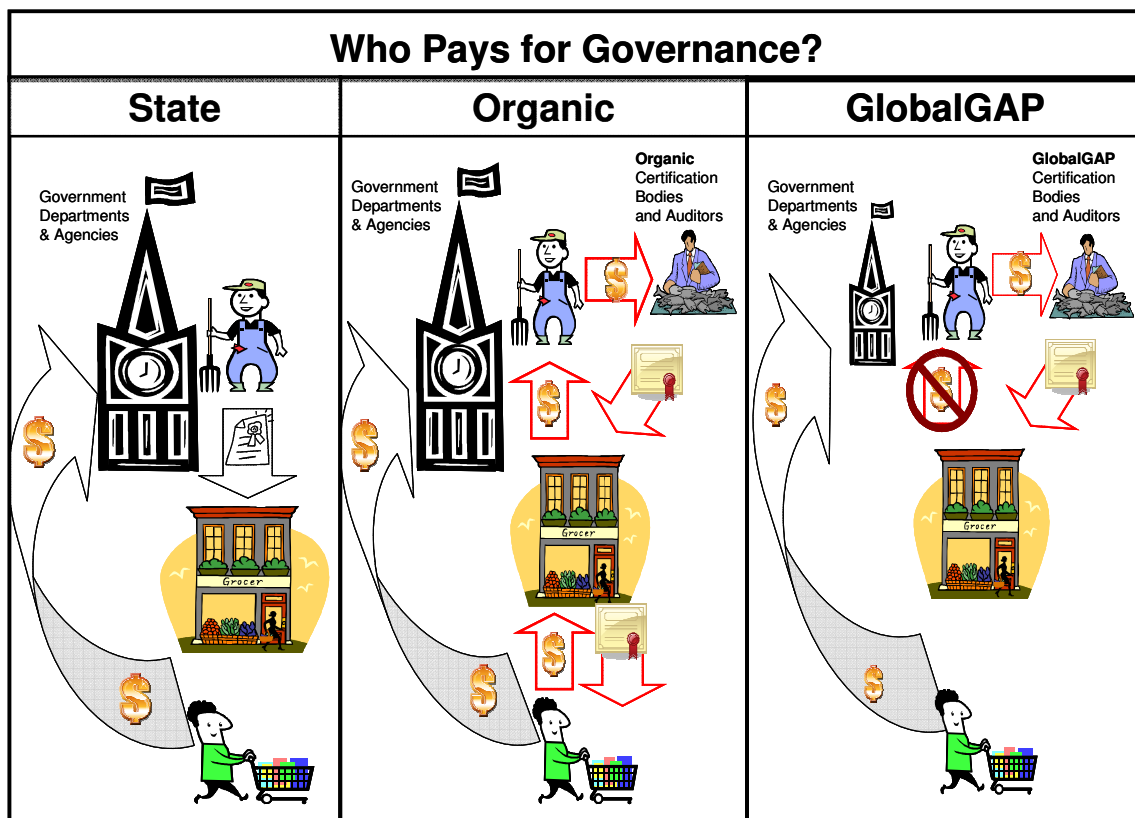


Figure 2.2 Three models of 'who' pays for governance

The fundamental difference between GlobalGAP certified produce and organic or 'fair-trade' products is that GlobalGAP is a business-to-business (B2B) standard and does not have a

labelling component. Consumers do not 'see' GlobalGAP certification – only the wholesale buyers and retailers do. Therefore, GlobalGAP differs dramatically from other types of certification, such as organic or fair-trade, which guarantee producers a higher price for certified products to offset the costs of certification.

This arrangement benefits retailers as it allows retailers to improve reputation on quality without raising prices. Because there is no labelling component to GlobalGAP, retailers are able to communicate the product features to customers using their own specific branding messages (should they so choose) and cultivate their reputation of superior store-wide quality<sup>33</sup> at competitive prices<sup>34</sup>. This strategy then leads to higher profits for retailers by increasing sales through strong customer loyalty and maintaining profit margins on produce by keeping costs low (Fulponi 2006).

Figure 2.2 also clearly depicts the economic burden that is being placed on producers under the GlobalGAP system. Compounding the inherent economic inequities of this system is the drastic reduction in the number of invaluable local extension services available to producers in Canada. Ironically, at the same time that safety and environmental concerns are growing, state support is shrinking and producers are being required to pay for additional certification programs. The further trend towards self-regulation and the privatization of food inspection will add yet another strain on producers as they need to take on not only the additional costs, but also the added roles that were once a regulatory responsibility of governments (such as research, extension services, self-inspections & certifications).

Given the model presented, why would producers voluntarily choose to certify when there is clearly no economic benefit of doing so? The reason is that with the birth of standards such as GlobalGAP, private TPC is becoming a requirement for producers to sell to some retailers. In fact, should this trend continue, it may result in all foods being sold in supermarkets requiring some form of private certification (Fulponi 2006). Traditional commodity chain theory predicts this scenario of mounting power of retailers (buyers) to govern over producers (sellers) in the

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<sup>33</sup> Retailers also may find B2B certification standards an effective marketing option as studies have shown that as shoppers are presented with too many labels, they become overwhelmed by conflicting or vague information (Caswell & Padberg 1992; Teisl, Roe & Levy 1999; Teisl 2003; van Amstel, Driessen & Glasbergen 2008) and revert to selecting products based on the lowest price (Teisl 2003; Liu, Andersen & Pazderka 2004).

<sup>34</sup> Where there is already low margins and inelastic demand, it is in retailers' best interest to compete on quality rather than price.

food chain (Gereffi, Humphrey & Sturgeon 2005; Stefano Ponte & Gibbon 2005). It is precisely this privileged position of control that enables retailers to shift the costs of GlobalGAP certification to the producers<sup>35</sup> without any compensation or increase in the farm-gate price (Campbell, Lawrence & Smith 2006).

## **2.2 GLOBALGAP AS AN AGRICULTURAL INNOVATION**

Aside from being a governance tool for global agriculture, in its application at the producer lever, GlobalGAP TPC is an example of a new agricultural technology. For example, it is a new practice or method of documenting production processes. It is also an innovation that, through its use, is intended to encourage the adoption of other agricultural technologies or methods that are more sustainable. It is well documented that the introduction of a new innovation or technology is often the catalyst for the transformation of an agricultural system. For instance, innovations such as the use of chemicals and heavy machinery were the technologies that transformed subsistence agriculture, to what we now consider the conventional system of agriculture. Therefore, if GlobalGAP is to meet its sustainability mandate, the diffusion of GlobalGAP TPC should promote the conditions that will increase the likelihood of the diffusion of sustainable agriculture technologies.

Diffusion theories have had a wealth of success in studying the adoption of agricultural technologies that have transformed one agricultural system to another (i.e. subsistence to conventional) (Lang & Heasman 2004, p.19; Colman 1968; Everett M. Rogers & Ban 1963; E. M. Rogers 2004). From this success, an established framework has developed for the systematic study of the technological (characteristics of the innovation), sociological (the household, farm structure, social factors), and ideological (characteristics of the farmer) factors that promote or impede diffusion of these agricultural innovations (Edwards - Jones 2007). Similarly these same set of factors identify where one system is on the agricultural spectrum (i.e. subsistence vs. conventional or conventional vs. sustainable). Therefore, examining the diffusion of GlobalGAP TPC over the five phases of diffusion (i.e. awareness, persuasion, decision, implementation and continuance) allows the identification of the factors that indicate what form of transformation occurred and why.

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<sup>35</sup> Where GlobalGAP has been implemented in developing countries, small producers have found it impossible to meet the costs. Graffham and Cooper (2008) recommend fees be paid by exporters or marketers. In many cases costs have been covered by local or international NGOs, exporters, or anonymous donors to encourage the participation of smaller producers.

## 2.3 CASE STUDY CONTEXT

In February 2004, cherry growers in the Southern Interior region of British Columbia were informed for the first time that GlobalGAP certification was a requirement to retain access to the UK, and potentially European market, for the upcoming harvest. As shown in Figure 2.3, there has been a strong trend towards exporting cherries since 2000.

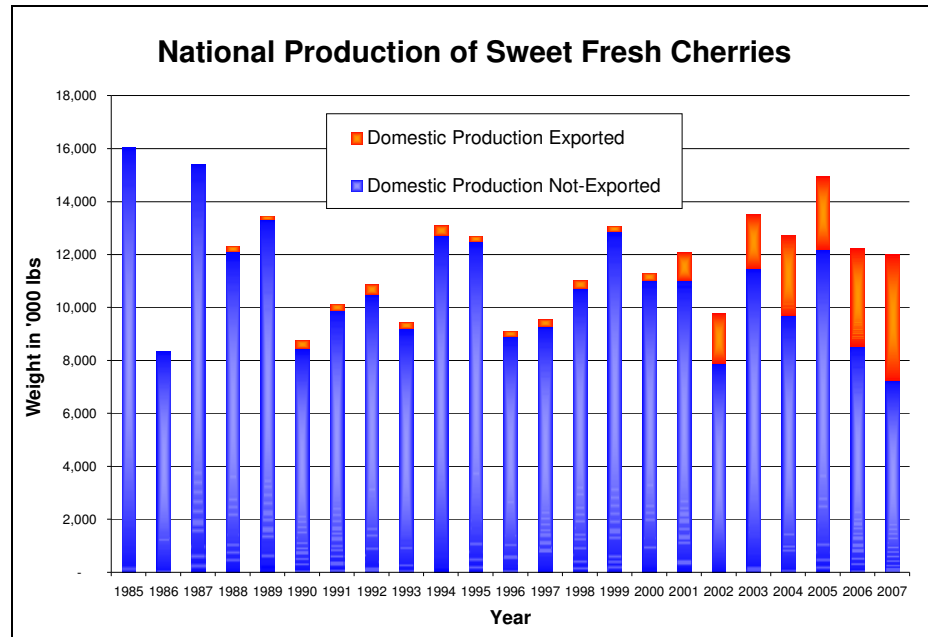


Figure 2.3 Trend of national cherry exports

These export markets have traditionally been among the most lucrative for growers<sup>36</sup>.

Therefore, approximately 60% of the export growers represented by the top bar in Figure 2.3 chose to certify in 2004. The study population for this research includes all of the growers represented by the domestic production that is exported. There are approximately forty<sup>37</sup> growers in the Southern Interior that produce export quality cherries and the sample population of forty-three growers was considered to be exhaustive.

As the trend towards the use of private TPC gains influence in the governance of 'mainstream' agriculture, there is more urgency to understand TPC's efficacy as a governance tool. In the case of GlobalGAP specifically, will GlobalGAP TPC lead to a more sustainable agricultural

<sup>36</sup> Low to medium quality cherries traditionally are marketed via roadside stands and through domestic chains. High quality fruit is destined for the global market as growers can receive a much higher price. Large volume imports from US producers are a significant factor in keeping domestic prices low. See: <http://bccherry.com/documents/November2006OKCGANewsletter.pdf>

<sup>37</sup> Estimate provided June 29<sup>th</sup>, 2008 – Telephone communication with Graem Nelson of Graem Nelson



system as claimed? Can CCPs based on Western European model, designed by an alliance headed by retailers, lead to a more sustainable system of agriculture? These are questions that can only be answered by long-term research as issues of measurement make proving or disproving claims of beneficial environmental and social outcomes over the short-term tenuous (Melo & Wolf 2005)

However by looking at the factors of diffusion of GlobalGAP, as derived from the participant perceptions and experiences, this study answers some questions based on empirical data. For example, what was growers' intent in certifying to the GlobalGAP standard and what consequences did this have in how the standard was implemented? How and what information did they access to meet the GlobalGAP requirements and what did they change? Similarly, how did growers in this case study view GlobalGAP and how did they *'go about'* implementing GlobalGAP?

These examples can be condensed into two salient questions regarding private transnational standards using a longitudinal case study in a developed country context: 1) How does the regulation, monitoring and enforcement mechanism of GlobalGAP TPC function *in practice*? and 2) What does this then imply about how effective this form of private governance may be in achieving its stated goal of enhancing the *sustainability* of agricultural production? The first question is addressed by using qualitative research methods to establish the factors that were most relevant across the five stages of diffusion of GlobalGAP. The use of diffusion theory in this study is unique as it includes the post-adoption phases of 'implementation' and 'continuance'; thereby making *diffusion* here synonymous with *practice*. Therefore, the second question is addressed by comparing the technological or sociological consequences of the practice of GlobalGAP to two systems of agriculture (conventional vs. sustainable) to identify which system GlobalGAP TPC promotes.

## **2.4 METHODOLOGY**

### **2.4.1 Data Collection**

Snowball sampling was used to identify participants in the target communities of the Creston and Okanagan valleys<sup>38</sup>. Qualitative methods of participant observation and semi-structured

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Assoc., International Fruit Marketer.

<sup>38</sup> Interview data from one grower from the Similkameen valley was pooled with the data from the

interviews<sup>39</sup> were used to collect data over a four-year period and the events are shown in Table 2.1. The size of the participating orchards ranged from 1 to 63 acres providing a broad selection of the smallest to the largest operations. The primary criterion for selecting non-adopting participants was their potential to export and a basic awareness of GlobalGAP. Details on the data collection methodology can be found in Appendix E.

Table 2.1 Data collection events

Chronology of Data Collection Events			
Event Timing	Type of Collection Event	Selection Criteria	# of Events
Spring 2004	Audit Observation	Certifying Grower	20
	Meeting Observation	All Growers & Change Agents	1
Summer 2004	Participant Observation	Certified Grower	1
Autumn 2004	Interview	Certified Grower	24
	Interview	Non-Certified Grower	14
	Meeting Observation	Certified Growers & Change Agents	1
	Interview	Marketer (non-grower)	1
Summer 2005	Interview	Auditor	1
Summer 2007	Participant Observation	Certified Grower	1
Spring 2008	Interview	Certified Growers	2
	Interview	Change Agent (non grower)	1
	Interview	Auditor	1

## 2.4.2 Data Analysis

Observation field notes and verbatim interview transcripts were coded using qualitative coding techniques as outlined by Charmaz (2006) and Strauss and Corbin (1990). Additional information on data coding and a sample of the coding hierarchy is provided in Appendix F. The data analysis consisted of two parts. First, the primary technological and sociological factors were identified from the coded data. Second, these factors and the consequences of diffusion were then compared with the literature on the factors that characterize systems of sustainable agriculture. A rationale for comparing the factors of the two separate processes; certification and transitioning to sustainable agriculture, is provided in Appendix G.

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Okanagan due to the relative proximity of this valley to the Okanagan.

<sup>39</sup> See Appendix D for an example of the interview script.

## 2.5 RESULTS & DISCUSSION PART I - GLOBALGAP DIFFUSION IN PRACTICE

### 2.5.1 Sample Characterization

An initial community level observation was that growers could roughly be divided into two groups along the lines of with whom they marketed their fruit. Marketers appeared to predominantly control either one sub-region of the Southern Interior or the other; with M1 primarily representing growers in valley V1 and M2, to a lesser extent, representing growers in valley V2. It was also observed that marketers had an exclusive affiliation with packing houses<sup>40</sup>, as all growers packing at a particular co-operative or large private packing house generally sold their fruit through the same marketer. Within marketing groups, growers' associations in the process could be further subdivided by where their fruit was packed. Based on these arrangements, the most prominent social organizations or networks that were shown to play a role in the diffusion of the GlobalGAP standard are represented in Figure 2.4 as RG1, RG2 and RG3<sup>41</sup>.

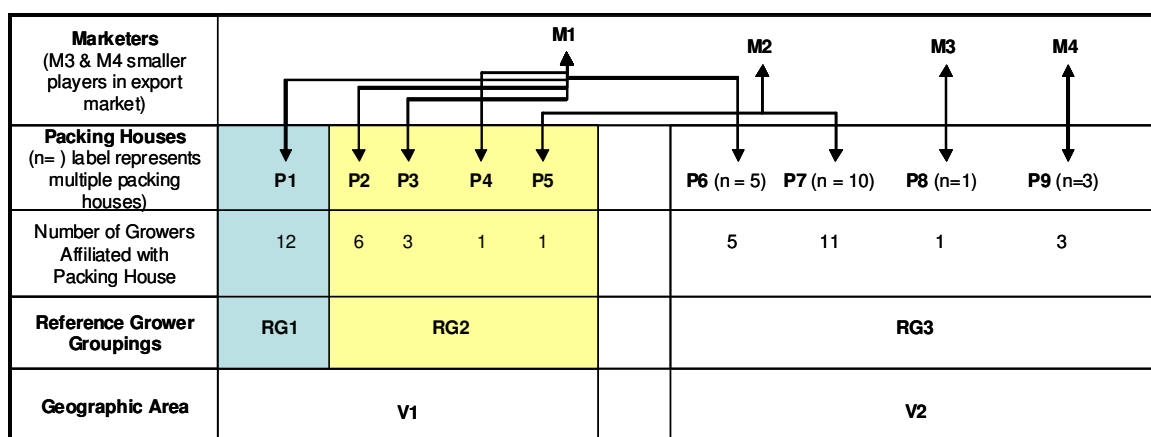


Figure 2.4 Organization of grower groups and change agents

RG1 was observed to be a heterophilous network tightly coordinated by a very active opinion leader<sup>42</sup> (OL1) who had business connections with M1. RG2 was observed to be a heterophilous network loosely coordinated around an opinion leader (OL2). RG3 was observed to be a highly heterophilous network that had minimal group coordination with respect to

<sup>40</sup> Packing houses are facilities where cherries are brought immediately after picking for washing, sorting and cooling prior to distribution.

<sup>41</sup> A commodity network approach was used to identify the important power relations between actors. Certain key actors with particular influence and position in the commodity network were found to have a profound effect on the realization of GlobalGAP in these communities.

<sup>42</sup> Opinion leaders were identified using all four methods of measurement; sociometric, informant rating, self-designation and observation.

GlobalGAP. Export growers in this larger geographical region are more vertically integrated and therefore RG3 differed markedly from RG1 and RG2 in that growers maintained a much higher degree of autonomy in the decision and implementation stages.

## 2.5.2 Factors of Diffusion of GlobalGAP

Table 2.2 presents the primary factors differentiated as either technological or sociological factors of diffusion of GlobalGAP. These factors can be classified as intervening conditions or contextual factors (i.e. governance structures, orchard size) that acted as barriers (B) or motivators (M) of diffusion or strategies (i.e. sharing information) (S) taken in the diffusion process. Some factors acted as both a motivator and barrier to diffusion depending upon other contextual factors. Tracking the influence that factors had over the stages helps to identify the factors that remained most relevant for continued certification and what new factors emerged as grower's level of knowledge changed through repeated interactions with certification. The factors shown in the following table will be discussed in detail throughout the remainder of the results and discussion sections.

Table 2.2 Factors of diffusion for GlobalGAP over five stages

<b>Factors of the Stages of Diffusion for GlobalGAP</b>					
	<b>1. Awareness</b>	<b>2. Persuasion</b>	<b>3. Decision</b>	<b>4. Implementation</b>	<b>5. Continuance</b>
<b>Technological</b>		<sup>P</sup> Relative advantage (M)  <sup>S</sup> Information gaps (M&B)	<sup>P</sup> Relative advantage (M)  <sup>S</sup> Information gaps (M&B)	High compatibility (M)  Information gaps (B)  Uniformity (M & S)	<sup>P</sup> Relative advantage (M or B)  <sup>S</sup> High compatibility (M)
<b>Sociological</b>	Required by export network (M)  Foreign competition in domestic market (M)	<sup>P</sup> Focus on export markets (M)  <sup>S</sup> Weak external networks (M)	<sup>P</sup> Power of other actors in supply chain (M)	Existing gov't regulations & standards (S)  GlobalGAP & TPC structures (B)  Interpersonal networks (S)	<sup>P</sup> Size of operation (M or B)  <sup>S</sup> Privatization of governance (M)

P = Primary Factor, S = Secondary Factor

### 2.5.3 Influential Technological Factors (characteristics) of GlobalGAP Diffusion

#### RELATIVE ADVANTAGE

The relative advantage of GlobalGAP TPC had a significant impact on the persuasion, decision and continuance phases of diffusion, but the nature of the relative advantage in the continuance phase of diffusion was different for some growers as explained below.

##### Negative Incentives for Non-Adoption

In the persuasion and decision phase, the relative advantage of GlobalGAP took the form of a strong negative economic incentive for non-adoption. In other words, growers would be relatively better off if they certified as they would not face the loss of a potentially lucrative export market. Therefore, although GlobalGAP is a 'voluntary' standard, in practice during the persuasion stage and decision phase, growers perceived that certification was essentially mandatory for their economic health. Table H.5 in Appendix H confirms this observation as over 90% of growers said they initially certified in 2004 because GlobalGAP was presented as mandatory by others (namely packinghouses, marketers and wholesalers) further up the supply chain. One grower quote illustrates the general comments on the pressure to certify:

They said it was going to take 8 weeks, we are going "holy crap, how are we going to do that?" So we kind of all worried - and I worried. "Why does it have to be this year?" But it was pretty much mandatory - that they were gonna put it down our throats.

Another grower provided the reasoning why having access to as many markets as possible is vital in the cherry business:

Like if you don't have market access you are out of business right away. Because you have a perishable product that you know becomes a liability rather than an asset over night. You know in the [cherry] business you have to move a product basically within 24 hours and try to get it to market and if you don't achieve that you know, your quality is diminishing and your risk is increasing...

Observations and interviews from 2005 – 2008 revealed a high rate of de-adoption<sup>43</sup> in the continuance phase of diffusion. The high rates of de-adoption demonstrated the strength of the negative incentive over all other factors typical in diffusion studies and an example of what can

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<sup>43</sup> Nearly half of growers that certified in 2004 did not recertify in 2005. As of 2007, none of the non-adopters interviewed in 2004 had decided to certify despite 67% of them reporting that they would certify in the upcoming year.

occur when a negative incentive is removed. Potential reasons for de-adoption were explored by referring to earlier observations of this group, their interview responses, and information provided by key informants. The finding was that when growers realized that there was no relative advantage (in the form of the negative incentive)<sup>44</sup>, many of them chose not to recertify in 2005. In this way, the absence of relative advantage acted as a disincentive to certification in the continuance phase for some growers.

There continues however to be pressure to certify for those growers that rely on certain packinghouses or marketers. As expected, these growers have continued with certification. However, rather than GlobalGAP being presented as a retailer requirement, it is now marketers and private packinghouses that are insisting that growers are certified. The use of GlobalGAP by marketers in this way is an example of how innovations are 're-invented' by actors in their implementation and repeated use.

### Competitive Advantage

Contrary to those growers that are certifying as a requirement to maintain supply chain relationships, some independent and vertically integrated growers have voluntarily continued to certify with GlobalGAP. The growers that continued voluntarily show characteristics more in line with traditional diffusion theory and fit the profile of innovators as shown by this quote taken from a grower interview in 2008:

They are the ones that are out there using the new pesticides and using, you know they are always looking for new equipment or different practices, you know they are the ones always pushing the envelope. Trying to stay ahead, you know and new varieties, they are the ones planting the new varieties and doing the creative stuff out there, coming out with new good ideas and stuff eh.

### **INFORMATION GAPS**

Another secondary factor in the persuasion and decision phase was a lack of information being available regarding GlobalGAP. This factor was found to promote adoption of GlobalGAP as growers had limited information on which to confidently reject certification. In contrast, for those growers that chose not to certify in 2004, information gaps acted as a barrier during the decision phase. This opposite effect (barrier vs. motivator) can be explained by looking at the other factors that influenced these stages. For example, if growers felt that certification was required

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<sup>44</sup> Non-certified cherries were found to have been sold into markets that growers had been told would be

and were dependent on the markets requiring GlobalGAP, having relatively no knowledge of GlobalGAP TPC or the GlobalGAP organization promoted certification. On the contrary, non-adopters were told GlobalGAP was going to be required, but had enough confidence that they would be able to find other markets and therefore would wait to certify in the following year. This 'wait and see' approach was interpreted as being a strategy taken by non-adopters under the conditions of not having sufficient information to accurately assess if GlobalGAP would indeed be required and what it would entail. Therefore, while information gaps enhanced the 'urgency' around certification and motivated some growers to certify, they also acted as barriers for others that were less susceptible to the threat of losing access to markets. The role that information gaps played in the initial diffusion is succinctly supported by the fact that in the continuance phase, when growers knew more about the GlobalGAP standard, many of them chose not to recertify.

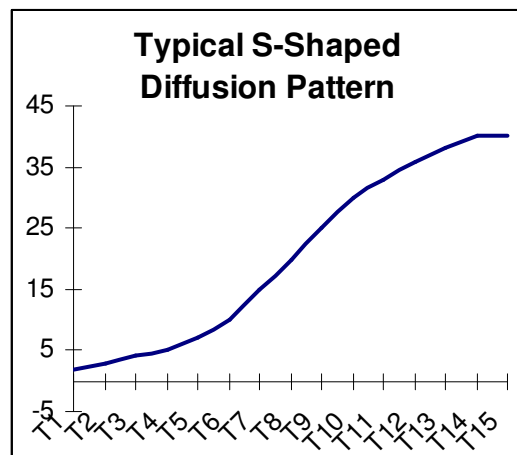


Figure 2.5 Typical diffusion pattern

Therefore, while the typical diffusion adoption pattern for innovations (Figure 2.5) is an s-shaped curve, the diffusion pattern for GlobalGAP adoption in this case study (Figure 2.6) is irregular. This result reflects the ambiguousness of GlobalGAP being required, and then not required by certain markets. Considering however that over 90% of growers felt that some form of certification would be necessary in the future, the adoption of GlobalGAP is anticipated to increase as it becomes a requirement in many markets.

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closed to them without GlobalGAP certification.

### Effects of Information Gaps in Implementation

The 'unknown' and seemingly 'unknowable' nature of GlobalGAP was also a prominent factor in how GlobalGAP was implemented as 80% of growers articulated that they had difficulties interpreting the standard and that there were no resources or means for resolving their questions. The most pressing information gaps were regarding accessing accurate and timely information to clarify the complexities of the standard. Examples of how information gaps manifested in the implementation is shown by the exam analogy of the audit observations provided in Figure 2.7.

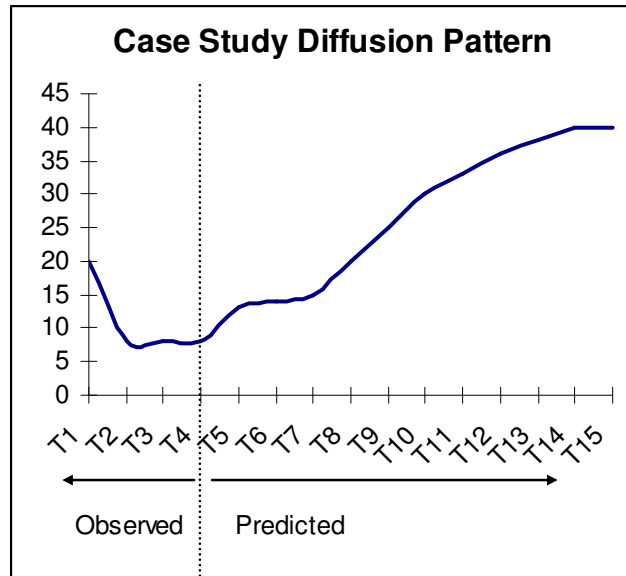


Figure 2.6 Case study diffusion pattern:  
observed & predicted

### **UNIFORMITY**

Most growers (over 90%) reported to have dealt with the lack of information by sharing information. Growers copied what worked for others to ensure they would pass certification. This example shows how uniformity was important factor in the implementation phase. There was general agreement that everyone needed do things in a very similar way; there was a right way to do things (as was put forward by OL1) and deviations were considered subpar. The tendency towards uniformity increased where there was a higher degree of coordination within the network. For example, the RG1 network was highly coordinated and growers in this group implemented GlobalGAP in a very uniform fashion.

#### **The Audit 'Exam'**

The 2004 observations gave the impression of a community of people preparing for an exam. RG1 growers were given the answers or an 'open book' test, RG2 growers knew what the questions on the exam would be and were collectively cramming for the exam under the guidance of OL2, and RG3 growers had yet a different approach – 'cramming' more autonomously - relying on their own interpretations or personalized, one-on-one assistance from CA3.

There was an 'exam' atmosphere evidenced by the prevailing sense of apprehension and nervousness that generally surrounded each audit. Growers during audits often asked the auditor if 'they had gotten it right' or asked him 'what he wanted them to do'. This observation also demonstrated that growers, even where they had the benefit of hearing how others had fared in the audits, were often uncertain of what was required and if the auditor would accept their documentation or answers.

Figure 2.7 Audit observation: Exams



The TPC audit, the process of verifying the implementation of GlobalGAP, was also particularly uniform. Figure 2.8 illustrates the typical approach of the auditor through an account taken from audit observation field notes. Interview results also showed that growers strongly felt that the auditor focused on documentation and traceability (Appendix H, Table H.4) over all other components of the standard. For example, while topics such as orchard biodiversity, strategies for reducing external inputs or the sustainability of local water resources are listed in the criteria (EurepGAP 2004), the items were treated perfunctorily by the auditor. Growers commonly mimicked the motion of ‘ticking off boxes’ when referring to the auditor’s role.

The auditor may have taken this approach as the aforementioned criteria were only ‘recommendations’ and not mandatory to attain certification. However, other ‘recommendations’, such as providing documented analysis of irrigation water quality, received far more attention. A general conclusion drawn from the observations was that certain criteria posed a more comfortable area for the auditor to direct his questioning as they could be more objectively determined through the uniform and standardized documentation. Uniform information inherently has a lower degree of complexity making it easier to verify as it is less dependent on expert knowledge of local conditions and growing practices.

### **Sticking to the Checklist**

Bob proudly tries to show his soil biology books that he is researching to the auditor. The auditor is silent and does not show any interest in this information. He looks down at his checklist and fidgets with his sideburns. Others in the room smile and laugh nervously at this awkward silence. It is clear that they had anticipated a different reaction from the auditor – perhaps that he would be impressed or question Bob further on his soil expertise. The auditor’s face remains stern and he continues to look down at his checklist. Bob stops discussing his interest in researching soil health and the auditor moves onto the next question.

Figure 2.8 Audit observation: Checklist

### **HIGH COMPATIBILITY**

In terms of practical changes that were required to meet GlobalGAP standards, 96% of growers stated that the majority of the work centered on documentation. Over 90% of growers expressed any changes to their practices were minor and that GlobalGAP requirements were compatible with their existing practices and/or beliefs.

So then what did change for the grower’s that continued with certification? Based on the auditor’s comments;

They are getting organized, more safety wise, improving their skills, not only as growers but as managers.

While over 65% of growers interviewed in 2004 insisted that GlobalGAP did nothing to make them safer or better growers, one grower interviewed over three years later noted that GlobalGAP 'kind of' helped in motivating the move towards using fewer pesticides.

...we have better pesticide storage facilities, as part of the auditing process you are examined about how you make decisions about pesticide applications and ... we have looked to our professional consultant to do those things for us and in doing so we have been able to do a better job and use less pesticide. And so I think that GlobalGAP 'kind of' helped in that process in 'kind of' pushing that.

While there is no question as to whether this grower has a strong commitment to reducing pesticide use, his tone in the interview indicated that GlobalGAP's impact on this decision has been secondary to other factors (i.e. on the advice of his consultant).

#### **2.5.4 Influential Sociological Factors on the Diffusion of GlobalGAP**

##### **GLOBALIZATION OF TRADE**

The globalization of trade and neoliberal policies were shown in this case study to be the over-riding causal condition that influenced the awareness and persuasion phases of diffusion. The following grower's quote clearly communicates why growers are focused on the export markets.

...the reality is that Canadians, as an entirety, still want cheap food. And that is the real big one. Okay, what I am hoping is the 'buy local' or '100 mile diet' - that whole spirit - like it, it doesn't do me any good just to sell my cherries, I have to sell them for a profit, so I can be sustainable economically. And I am not talking about ripping people off, but the reason we went to the international market is because that is the only market we could get, that could pay enough money for us to grow these cherries the way that we grow them.

This grower's comment also illustrates that being part of the global market is not so much an option, as it is now a requirement in order to remain economically viable.

##### **NETWORKS**

Networks, in various forms, were important sociological factors in the persuasion, decision and implementation phases of diffusion.

##### Power of Actors in Supply Chain

For the majority of growers, their contact with retailers and other external networks is very limited. Almost all growers rely on M1 and M2 for their connection to the export markets.

Weak external networks particularly influenced diffusion in two ways. First, it made them reliant

upon actors (i.e. marketers) further along the supply chain for information, thereby intensifying information gaps and misinformation. For example, marketers were the initial source of information on GlobalGAP but they did not provide information to support growers through the process of certification. Secondly, the privileged information and contact with external networks placed marketers in a position of power over growers and continues to be an important factor in the continuance phase. Despite 92% of growers reporting that there was no business advantage of certification, many growers have continued with certification because marketers or packinghouses have been able to enforce participation.

### Interpersonal Networks

The important role that interpersonal networks played is illustrated best by the differences in how the standard was implemented in the different groups (RG1, RG2 & RG3). RG1 Growers, who had received 'the binders' prepared by OL1 had most of their work done for them. These growers relied heavily on OL1 and as a result there were several instances in the audits where they were not familiar with the documents they were presenting to the auditor or the purpose of having such documentation.

In the time between the initial audits of RG1 growers in May, and the audits of RG2 and RG3 growers in June and July, there was a significant amount of last minute preparations and sharing of information among individuals in the RG2 and RG3 group. OL2 (who was also a grower member in RG1) worked with members of RG2 to gather the appropriate documents that, based on the experience of growers in RG1, would be accepted by the auditor. Growers in RG3 relied either on networks or a private consultant.

These slightly different approaches to gathering the documents were reflected in their familiarity with the standard and infers a great deal about the quality of the implementation. In general, growers in RG2 seemed to be most prepared to answer questions and confident in providing their documents. Most interestingly however is that the RG2 group had the largest number of de-adopters in 2005.

## GOVERNANCE STRUCTURES

### State Regulations and Standards

Documents were compiled from various reports and publications that had been produced by federal and provincial government organizations (i.e. Workers Compensation Board & British Columbia Ministry of Agriculture and Lands). As Canada is a member of Codex<sup>45</sup> and has been active in harmonizing national agriculture standards to facilitate international trade, growers were already operating in a system that shared the norms and risk-based approach of GlobalGAP. However, as no government staff members were designated to assist growers specifically with this process, the importance of strong external networks and contacts again was an important factor as only a few growers knew who to contact in the government to access this information. Regardless, government funded services and departments were invaluable to growers meeting GlobalGAP requirements.

### GlobalGAP Organizational Structure

The organization of GlobalGAP continues to be perceived by growers as distant and top-down, even with repeated interactions and despite GlobalGAP's branding as an inclusive partnership. For example, even a grower that has been a leader in GlobalGAP and has notably strong external networks made this comment in 2008 about 'who' GlobalGAP is:

Grower: I have heard, but I can't remember. I don't really know. But they are big guys.

Interviewer: Are they fruit growers?

Grower: I think everything, big growers, big packers; I think it is quite a hierarchy thing you know.

The importance of this factor should not be underestimated, especially given their power to set and seemingly enforce agricultural production standards. Of the growers that did certify, 75% of them at some point during the interviews revealed their concern that these types of standards may one day take control over how their farm is managed. Over 90% of growers thought that certification would become an industry standard, or in other words, a mandatory form of

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<sup>45</sup> Codex was the international standard for food safety as noted by GATT (General Agreement on Trade), now the WTO. Codex (Codex Alimentarius Commission) was established in the 1960s by the UN but was, and continues to be, managed jointly by the WHO and the FAO.

governance. They (over 90%) also expressed that a local or national version of the standard would improve the relevancy and resolve some of the information gaps and cost issues that made certification difficult.

### **SIZE OF OPERATION**

While almost all growers interviewed in 2004 shared the viewpoint that certification would be required at some point, once the immediate threat of loss of market access was removed, primarily larger growers continued voluntarily with certification.

They tend to be the bigger growers. The bigger producers, there is a larger investment there of course so you are more anxious to protect it and build on it.

Therefore the primary sociological factor that consistently explains voluntary adoption in the continuance phase is the size of the operation. Part of the reason for this is GlobalGAP is more affordable for larger growers, as they can distribute the costs over a larger acreage. For example, over 85% of all growers expressed that GlobalGAP is expensive (i.e. estimates provided were \$20,000 in the initial year and \$3,000 annually), and 75% felt that the time and monetary costs of certification are prohibitive for small growers.

## **2.6 RESULTS & DISCUSSION PART II – COMPARING GLOBALGAP IN PRACTICE TO SUSTAINABLE AGRICULTURE**

The technological and sociological or organizational factors that played the most prominent role in the stages of diffusion of GlobalGAP TPC provide insight into how it is used in practice and therefore what role it can be expected to have on sustainability. The implementation and continuance phases in particular show the potential intended and unintended consequences of GlobalGAP certification.

### **2.6.1 Comparing Sustainable Agriculture Systems Characteristics & Factors**

Answering the second question of this research and testing GlobalGAP's claim is to promote 'sustainable agriculture' is difficult as a precise and easily measurable definition of sustainable agriculture can be elusive (Padgitt & Petrzela 1994; Fairweather & Campbell 2003). However, a definition is needed to facilitate the assessment. GlobalGAP specifically tries to address sustainability based on criteria developed from a European agricultural model (Campbell 2005)

which may or may not be socially, technically or economically sustainable in all situations. Therefore the GlobalGAP criteria is not used here to assess sustainability.

Rather, the definition for sustainable agriculture systems used herein for comparison purposes is one that is rooted in the principals of agroecology. The agroecological model contrasts the current conventional model that relies on technological innovations (such as new chemicals and GMOs) and larger operations to ensure the sustainability of our food supply (Gliessman 1998). Furthermore, proponents of the agroecological model agree that the current conventional system of agriculture requires a fundamental transformation if it is to be truly sustainable (Lang, Barling & Caraher 2002; Lang & Heasman 2004, pp.285 - 304; Padgitt & Petrzeka 1994, p.265; White, Braden & Hornbaker 1994; Curtis E. Beus & Riley E. Dunlap 1990). Table 2.3 provides examples of the factors that characterize two agriculture systems along a 'conventional' and 'sustainable' spectrum and allow a comparison of the technological and sociological factors shown to be integral to the *practice* of GlobalGAP along this continuum.

Table 2.3 Characteristics of conventional and sustainable agriculture

<b>Comparison of General Factors that Characterize Sustainable Vs. Conventional Agriculture Systems</b>		
Component	Conventional Systems	Sustainable Systems
Technological <sup>1</sup>	Petrochemical fertilizers Zero tolerance for pests Chemical pesticides Monoculture Heavy irrigation systems	High organic matter inputs Habitat for beneficial organisms Integrated pest management Diversity/Polyculture Selection of geographically appropriate crops (i.e.: drought prone)
Sociological or Organizational <sup>2</sup>	Large commercial producers Uneven access to knowledge Loss of rural communities Uneven power distribution Uniform knowledge	Smaller farms Equity Self-sufficiency & bioregionalism Cultural stability & social capital 'Sustainable' Regulation Participatory education

Sources: 1. (Gliessman 1998; Funes et al. 2002; Padgitt & Petrzeka 1994; Curtis E. Beus & Riley E. Dunlap 1992; Fairweather & Campbell 2003); 2. (Pretty 2005; Pretty 2003; Pretty 1995; R. E. Dunlap et al. 1992; Curtis E. Beus & Riley E. Dunlap 1992; Gliessman 1998; Álvarez 2002; García 2002)

## **2.6.2 Assessment of Technological Factors**

GlobalGAP's TPC appears to have two purposes if constrained in terms of sustainability; 1) to provide objective evidence that sustainable agriculture technologies have been used through a system of independent auditing of documents and 2) to promote the use of more sustainable technologies or practices. In other words, to analyze the technological sustainability of TPC, we must look at whether this mechanism is able to verify compliance with certain practices, and how the nature of the practices being complied to compare with the components of sustainable agriculture as defined here.

### **VERIFYING COMPLIANCE**

In this case study, the data shows consistently that GlobalGAP was a technological method for providing uniform documentation that could be easily interpreted and verified by the auditor. The growers' approach to the certification process was to do what was necessary to satisfy the auditor and pass the audit in order to retain market access. The auditor perceived his role in TPC was to focus on maintaining his 'objectivity' and base his decisions upon documents. To this end, he performed his function perfectly as many growers indicated in the interviews. The fact however that he also knew in many cases the documents had been provided to them from OL1 or had been copied from another grower leads one to question the integrity of the audits. Furthermore, the following quote from the auditor interview in 2004 shows that auditor was acutely aware that most growers had a very low level of awareness of the purpose for the audit or the fundamentals of sustainable agriculture. When asked to provide his estimate of the number of certified growers in 2005 that he believed understood the principals of sustainable agriculture he responded:

I would say, 20%, between 20 and 10....20%. They kind of understand, the other, the rest no.

Nevertheless, all of these growers passed the audits and were certified. As a comparison, it is difficult to imagine an auditor of organic practices overlooking the fact that a grower didn't realize they were being audited for having organic practices – so long as their documentation was in order. One grower made a comparison between organic and GlobalGAP certification:

...this is the other part. He never, he looked at our packing sheds and stuff but he never walked around the land. He, an organic inspector, if they are doing their job - walk the whole property, check out everything, he ... but he, they just wanted him, you know, it is a safety liability thing. The environmental thing is just tacked on for window dressing. You know, you know. He (making ticking gesture) "oh, yeah, you got it", and, and it was obvious that he was doing his job, I am not [saying he didn't do a good job], he was exactly doing what he was hired to do.

The auditor however is in a difficult position. A true audit of technological sustainability would require an auditor to have expert knowledge in agroecological principals in combination with an excellent understanding of the local conditions. As this auditor had limited knowledge in both of these areas, his approach to rely on documentation was the most appropriate and defensible one. This reliance on documentation as evidence of compliance however ultimately means that auditors must 'trust' that growers have implemented the most sustainable practices and that these practices will occur post-audit (Hatanaka & L Busch 2008). The 'trust' that auditors must rely on is fragile, as the design of this technical instrument is unlikely to support a continuance of the desired practices in the absence of the auditor's presence;

"The practice of designing and implement interventions without involving local people can only succeed with coercion. Such enforced responses may appear technically appropriate, but are commonly rejected by local people when external pressure is removed."(Pretty & Shah 1997, p.53)

Furthermore, it is particularly telling that growers consistently expressed a lack in trust of each other's practices and that group certification<sup>46</sup> was infeasible for this reason.

The assessment from this case study is that although the third-party independent audit component of TPC is critical to the legitimacy of TPC, it is also perhaps the Achilles heel of the system. Growers and the auditor both have an incentive to use the TPC in a way that maintains its legitimacy. Auditors are rewarded for the number of audits they perform. As the growers themselves pay the auditor's fees, there is a tension between maintaining neutrality and the incentive to continue to grant certification. Certified growers have an incentive to protect the pretense that audits are valid, as it maintains the value of the certificate that they have paid for and put effort into. This tendency was illustrated by several of the comments made by growers in interviews in 2008. As a grower with a history of certification reflected;

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<sup>46</sup> GlobalGAP provides growers an option to certify as a group to save on audit and certification costs. One GlobalGAP certificate is issued for the group. This system requires that the group be self-audited and administered. Annually, a third-party inspector randomly audits a selection of growers in the group to check for compliance. Should one grower fail to comply, the entire group forfeits certification. See: [http://www.globalgap.org/cms/upload/The\\_Standard/IFA/English/GRs/General\\_Regulations\\_complete\\_ENG\\_071008.pdf](http://www.globalgap.org/cms/upload/The_Standard/IFA/English/GRs/General_Regulations_complete_ENG_071008.pdf)



...by the time we put so much work in it we just convinced ourselves, oh yeah, this is worthwhile, but in retrospect, I think you get co-opted by what you do. I bought it, I spent so much time on this; it must be worthwhile.

Therefore, similar to Hatanaka and Busch's (2008) summation of TPC; operational independence<sup>47</sup> is an illusion in practice. This finding challenges TPC's legitimacy as a mechanism that can effectively govern from a position of externality and independence.

### **COMPLIANCE? WITH WHAT?**

In terms of the diffusion of certification, the characteristics of GlobalGAP that had the most influence on the adoption stage had little to do with the relative advantages or benefits it could provide growers in terms of technological sustainability defined in agroecological terms. Rather, the technological factors that most influenced the implementation stage of diffusion were that most growers did not have to change their practices and reported a high degree of compatibility with their existing beliefs and practices. Furthermore, the high rates of de-adoption support that the practices and effort expended on certification did not necessarily result in significant changes that required a sustained commitment. As these growers are for the most part conventional growers that rely on pesticides and chemical fertilizers, it shows that they were not challenged by this standard to question their existing technologies.

Beyond this, several of the technological diffusion factors (which include strategies, intentions (or motivating factors) and barriers) actually work against the adoption of more sustainable agriculture practices. Take for example the focus on food safety and traceability. Because growers were extremely sensitive to this issue and viewed it as the main purpose for the audit (over 90%), they were overwhelmingly preoccupied with ensuring that they were perceived by the auditor as following the commonly accepted practices. Growers favored uniform and proscriptive approaches to demonstrate safe practices, especially given the inability for growers to clarify information gaps regarding what would be acceptable. The codified and standardized system of conventional agriculture also is simpler for the auditor to objectively assess. Again, evaluating agro-ecological (sustainable agriculture) practices on the basis of food safety would be challenging for an auditor as they do not come with an industry label to indicate a producer has used a technology in a safe and correct manner. While most of the growers that

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<sup>47</sup> 'Independence' gives TPC its objectivity and therefore legitimacy. Operational independence is the ability for this mechanism to remain an objective form of governance in *practice*.

participated in this study voiced a strong desire to reduce chemical and pesticide use, the conventional approach was still perceived as safer and preferred because of reasons of efficiency and practicality.

Growers also seemed keenly attuned to the inability for the auditor to accept their experience or specific local knowledge as sufficient. For example (see Figure 2.9) one of the uniform question and answer interchanges common during the audits was the auditor asking growers whom they sought advice from when making

decisions on what to spray and when. Growers knew in advance to reference individuals' names that the auditor would accept as qualified due to their education and/or professional

designations. The irony of this was that many of these growers had decades of experience and in reality were themselves an invaluable source of knowledge in the community.

#### **The 'Correct' Source of Knowledge**

The auditor asks Mick if OL1 is a source of information for them in their practices.

Mick says, "Oh yes! OL1 is definitely! OL1 is the major source for ALL of us."

Figure 2.9 Audit observation : Information source.

Therefore, due to the uniform nature of audits, the top-down authoritative characteristic of TPC (a relationship of coercion rather than cooperation), the lack of information about the standard and the infringement of operational independence, the TPC mechanism is not shown here as being an appropriate technological component for, or of sustainable agriculture.

### **2.6.3 Social/Operational Components of Sustainability**

The inclination towards uniformity was amplified by growers' perceptions of GlobalGAP as a top-down authority with no channels of communication for resolving questions or accessing information about what practices would be acceptable. As such, growers were more confident to copy what they saw as working for others, rather than risking a different approach that might not be acceptable. This organizational characteristic is completely divergent from how technologies to promote sustainable agriculture should be encouraged to gain longevity in implementation. Furthermore, even those growers that have continued to certify fear that these

mechanisms are usurping control over how they farm. Actors that espouse these types of predictions are unlikely to be willing participants in the social transformations to which they are referring (Pretty & Shah 1997).

A supporting factor for the continuation stage of certification was the size of operation and level of vertical integration. Numerous studies and publications have raised the concern that GlobalGAP excludes smaller growers by making it operationally infeasible for them to participate. The findings here concur that this a valid criticism of GlobalGAP, even within a developed country context where growers have higher education and greater resources. GlobalGAP has acknowledged that the standard is difficult for small growers and encourages growers to certify as a group to share the costs of certification. No growers in Canada however have found this to be a feasible option. These factors taken together indicate that GlobalGAP does not promote the sociological characteristics of a sustainable system of agriculture, are in fact, divergent from these principals.

## **2.7 CONCLUSION**

Voluntary market-based instruments like certification are designed to be a cost effective and less bureaucratic means to achieve society's goals through the pursuit of economic gain. This research has provided evidence for skepticism that the market can be relied upon to address its own failures, such as the imbalances in power and information failures, though the use of TPC. While the technology of GlobalGAP TPC may be diffusing, the question of whether sustainable agriculture is diffusing alongside it requires closer scrutiny. At face value GlobalGAP's TPC may contain the technical criteria that imply sustainability, but in *practice*, the mechanism can not be relied upon to guarantee or promote the transformation to a sustainable system of agriculture without the other required sociological components of sustainability. Sustainability can not be regulated in a top-down fashion, and for a fundamental transformation to occur, education and local leadership on sustainable practices needs to be fostered in rural communities. As private TPC gains momentum as a critical piece of the neo-liberal alternative to active government involvement in agriculture, a new 'gap' appears to be forming. This is the 'gap' between what the consequences of these TPC standards truly are as they are put into practice, and what the global consumer may be lead to believe.

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### 3 Conclusion

#### 3.1 COMPARATIVE ANALYSIS WITH THE CURRENT RESEARCH

##### AT THE MACRO SCALE: GLOBALGAP & GLOBAL GOVERNANCE

The assertion of a possible trend towards a *buyer-driven chain* (Ponte & Gibbon 2005; Gereffi, Humphrey & Sturgeon 2005) was shown to be the current reality for producers in this case study. The results from interviews show that retailers have been able to transfer the cost of governance to producers through the mechanism of TPC (Lawrence & Burch 2007) and that it has been a burden for many growers. This situation implies this form of governance is highly inequitable. Further, as Busch (2005) points out, the voluntary nature of these certification standards will depend on the existence of other attractive markets that do not require certification. As TPC becomes less voluntary and more of a requirement, and if producers are expected to continue to bear the costs of this form of governance, it will become more likely that only the 'big' producers will be able to remain profitable. As supermarket power continues to be concentrated in fewer hands, and non-state actors continue to have more direct influence on the governance of agriculture (Cheshire & Lawrence 2005) it is critical that these new forms of governance are assessed for their ability to result in the 'best' social, environmental and economic outcomes for society.

The case study here provided evidence that grower's were much more willing to comply with existing government regulations when it was circuitously enforced by a market-driven mechanism such as TPC. While the relationship between state and private governance is still evolving, what is clear is that they are evolving together, and a future where private certification standards trump government standards - from a producer perspective - is possible.

##### AT THE MICRO SCALE: GLOBALGAP & TPC

As other researchers have found (Graffham & Cooper 2008; Carmen Bain, Deaton & Lawrence Busch 2005) TPC is not scale-neutral despite the efforts of GlobalGAP to encourage the option of group certification. Issues with lack of information, difficulties in interpreting requirements and inappropriate criteria are all criticisms that growers in this study voiced. These findings

correspond closely to micro-scale studies conducted in developing countries in Africa (Graffham et al. 2007) particularly for smaller growers. One aspect that was absent from the studies in Africa was information on how growers or farmers felt about the 'sustainable agriculture' aspect of GlobalGAP. The only use of the term 'sustainability' was in reference to the fact that small farmers found GlobalGAP certification unsustainable. It is interesting that this sentiment was also commonly expressed by Canadian growers. Clearly there is a paradox.

### **SUSTAINABLE AGRICULTURE PRACTICES & AEPs**

The literature on what defines sustainable agriculture systems, practices and the adoption of AEPs designed to address negative externalities of agriculture were crucial to establish a basis for examination of the outcomes of GlobalGAP certification and the factors that influenced its diffusion. The literature on sustainable agriculture systems stressed the important role that both technological and sociological factors play in supporting a system sustainable agriculture and determining outcomes. These components were very applicable to the results found here and made the difficult assessment of 'sustainability' possible. In particular, the importance of sociological or organizational structures to influence the sustainability of a technology in practice was relevant at the global scale in analyzing the importance of GlobalGAP's structure, but also at the interpersonal scale in considering grower dynamics in information sharing.

### **DIFFUSION OF AGRICULTURE INNOVATIONS**

The diffusion of innovations research predicted that while strong incentives for adoption of an innovation may result in higher adoption numbers, the quality of the implementation may be lower. The findings here corroborate this phenomenon to a degree, as when the negative incentive was found to be false (i.e. growers were able to sell fruit into the UK and EU market without GlobalGAP), de-adoption occurred. However, this result is not conclusive as while de-adoption did occur, it is possible that some growers continued following all the practices required to retain certification; with the exceptions of the certification fee payment and the annual audit. As de-adopters were not interviewed after 2004, it was not possible to make this determination. Therefore, strong incentives can act as a confounding factor in determining the outcomes of the diffusion of voluntary TPC and must be considered when assessing this mechanism for its ability to produce the intended consequences. This reiterates the importance

that intentions play on the quality and longevity of implementation of an innovation. It also highlights the importance of sociological factors, as it was also growers' inferior external networks and the top-down nature of GlobalGAP that perpetuated the belief that GlobalGAP would be mandatory to export to the UK in 2004.

### **3.2 DISCUSSION AND CONCLUDING REMARKS**

Based on the analysis of this research compared to the current research in the field, several conclusions can be noted.

1. Much of the research on TPC has focused on presenting the power relationships in private agri-food governance as a developed vs. developing country dichotomy (Bitzer, Francken & Glasbergen 2008; Liu, Andersen & Pazderka 2004; Friedmann & McNair 2008). This bias likely originates with the fact that agri-food related standards in developed countries are well established, previously negating the need for TPC for exporters from developed countries. However, as retailers are beginning to request TPC of producers in developed countries, this case study shows that many of the difficulties faced by Canadian producers are similar to those of smaller producers in African countries. It is clear based on the research conducted by Graffham et al. (2007), that many of the exporters in developing countries are receiving a substantial amount of assistance not only from NGOs, but also marketing agents. Therefore in some ways small Canadian producers are potentially at even more of a disadvantage than some of their counterparts in the developing world. This has implications and is suggested for future research, specifically in recognition of the drastic reduction of government extension services since the late 1990's.
2. The findings support what is proposed by Hatanaka and Busch (2008); that TPC is not operationally independent and that the motivations and self-interests of either party can impact the legitimacy of the audit. Producers have an incentive to endorse the audit as rigorous and valid to lend credibility to their certification; and auditors have an incentive to increase the number of growers they audit. As TPC relies on the validity of the audit and 'trusts' that compliance continues post audit, this result has significant implications for the credibility of this mechanism. The point is compounded if the auditor lacks sufficient knowledge on the criteria within the specific local contexts as he will be less able to identify potential infringements.

3. It is implied in some of the literature that the presence or absence of criteria in a standard is the determining factor of whether it will be addressed. (Hassell 2005; Raynolds, Murray & Heller 2007). The findings here indicate that if the auditor and producer are not already educated or informed on a particular aspect, these items in practice will continue to be overlooked or receive only perfunctory attention. This result could be predicted by referring to Pretty (1995, p.1249); “What the positivist paradigm<sup>48</sup> does not recognize is that all data are constructed within a particular social and professional context. This context affects the outcomes and can have a profound impact on policy and practice in agricultural development”. If the desired social or environmental outcomes are not being observed as a result of GlobalGAP certification, it may be a misconception to assume that the appropriate response would be to simply change the criteria to specifically address these elements.

### **3.3 OUTCOMES FOR RESEARCH QUESTIONS**

Two research questions were presented; 1) to examine how GlobalGAP’s TPC mechanism functions in practice and 2) to explore the efficacy of GlobalGAP TPC to promote sustainable agriculture within the context of a case study. The findings from this research were able to address these questions and first identified important sociological factors that influenced how GlobalGAP functioned and diffused. Grower knowledge, operation size and network affiliations influence sustainable outcomes of the practice of TPC more than the quality of the standard’s criteria. Similarly, the auditor’s knowledge and approach also impacted the outcomes of certification. Therefore, TPC in practice does not exhibit operational independence. Further, the aforementioned sociological factors and technological factors influenced the diffusion of GlobalGAP in such a way as to reinforce the existing conventional agricultural system. This result should not be considered as a criticism of the growers observed or interviewed in this study. It should be stressed that these individuals are conscientious growers that abide by the

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<sup>48</sup> The positivist paradigm is based on notion of objective realities (Pretty 1995) and it is therefore poignant that this thesis challenges the ability for an auditor to verify sustainable agricultural practices based upon ‘objective evidence’.

highest conventional agricultural standards in the world. Furthermore, they are a heterogeneous group that include both traditional conventional growers and growers that since 2004, have transitioned to organic production.

### **3.4 RESEARCH CONTRIBUTION**

#### **CONTRIBUTIONS TO DIFFUSION RESEARCH**

Meyer (2004) suggests the diffusion of a social change phenomenon could be better understood by expanding the approaches to include; 1) qualitative methods, 2) adoption from the point of view of the non-adopters, 3) a longitudinal study of diffusion over time, and 4) research on the diffusion in the 'process' of 'diffusing', rather than post-hoc. Due to the nature of the data collection and methodology, this thesis incorporates these suggestions to varying degrees. Contributions to this research however are in confirming the existing theories rather than providing new insights. In particular, the results demonstrated the influence that information networks and incentives play in the adoption and continuation stages. Had the research concluded in 2004, this finding would have been less apparent as the high rates of de-adoption would not have been observed.

#### **CONTRIBUTIONS TO RESEARCH ON TPC & GLOBALGAP**

The primary contribution to the research on TPC is that this research provides empirical data of the application of a particular form of TPC in practice in the context of a developed country. A unique aspect of this research is that the researcher was granted permission by growers and the auditor to observe the inaugural round of audits that represented the introduction of the GlobalGAP standard in Canada. A secondary contribution is that the data collected can be used for comparison with future studies in developed or developing country contexts.

### **3.5 RESEARCH LIMITATIONS & STRENGTHS**

#### **3.5.1 Limitations**

1. The research would have benefited from revisiting the interview participants or the use of a follow up survey to capture both exporting and non-exporting growers. However due to time and funding constraints this option was not feasible.
2. The scope of this thesis limited the ability of the researcher to address any particular topic to the level of detail that was originally intended. A preferred approach would have been to restrict the interview questions to only one of the themes that had emerged from the audit observation rather than attempting to pursue a selection themes. This weakness produced an over-abundance of data for coding and analysis which weighed-down the analysis. Several components of this research therefore have been left under or unexplored. In particular, data coded for a statistical analysis of the correlation between grower or community variables with the outcomes of diffusion has not been examined.
3. V1 is a much smaller community in population and land area than V2. Although the total number of growers interviewed from each valley was proportionate, the percentage of growers interviewed in each of the valleys was skewed. Furthermore, both participant observations of harvests were conducted in V1. Therefore the sample was more representative of V1 than the larger, more cultural diverse community of V2.
4. This study faced immense challenges in attempting to assess the ability of certification to achieve sustainable agriculture outcomes as they are not measurable over the time scale of the research. While attempts were made to predict changes in behavior or attitudes, over the short-term, the results could only provide evidence that had to be analyzed in combination with the chosen body of literature to have meaning. Therefore, while the conclusions are based upon current literature cited in this thesis, and efforts were made to be as inclusive as possible with the literature chosen, an analysis using a different body of literature would possibly yield different conclusions.

#### **3.5.2 Strengths**

1. The use of grounded theory was laborious but was a strength of this research as the intention was to focus on the perceptions and experiences from the perspective of the



grower. All of the findings from this research were based on themes and codes that emerged from the data. This research strengthens the existing literature where there were concurrent themes.

2. The time over which the research took place demonstrated how intentions are integral to the implementation and continuance stages of diffusion.
3. This research provides baseline documentation of the introduction of this standard in Canada.

### **3.6 APPLICATION OF FINDINGS: SUGGESTIONS FOR POLICY**

While this study has produced a number of criticisms of the GlobalGAP TPC standard, there are several important sociological and organizational factors that if addressed, could dramatically improve this mechanism's ability to promote sustainable agriculture systems. The experiences from this research study coincide with the arguments put forth by many agri-environmental and food policy researchers; that unbalanced neoliberal policies of governments can exacerbate current food and environmental crises (Lang, Barling & Caraher 2002). It is important to accept the neoliberal political slant of our current government and the rapid growth of private governance of the global agri-food system and address the less than optimal outcomes to the objectives of this system (Le Heron 2003; Campbell, Lawrence, and Smith 2006; Drummond et al. 2000). Despite the claim of governments that their optimal role in agriculture is to not meddle in producers' business and focus on promoting trade liberalization, it is exactly this policy approach that is making it more and more difficult for producers to focus on being good food producers and environmental stewards.

While it is true that producers generally show distaste for government regulations, all growers that participated in this study expressed that government has a critical role to play in promoting sustainable agriculture. Growers were asked at the end of each interview what government could do to make agriculture more 'sustainable' or to help them be better growers. Notably nearly 100% of growers expressed that while subsidies are 'nice', they emphatically stressed that the provision of local extension and research services are invaluable and are the most important areas that government should be supporting. Ironically, local extension services have been one of the programs to be cut back dramatically under the current provincial and federal governments.

The importance that growers place on extension services does not appear to be based on an emotional reaction to having recently lost these services. In fact, the importance of extension services in agriculture is very well established in both the literature on conventional and sustainable agriculture systems. A New Zealand paper examining the effects of the privatization of extension services<sup>49</sup> stresses the important role that education plays in adoption of sustainable agriculture practices. A survey conducted by Bradshaw (1996) to establish the uptake of a policy for more sustainable management of dairy shed waste in New Zealand found 100% of compliant farmers were motivated to action only by the fear of penalties or fines. What is further implied is that those aspects of sustainable agriculture that are not recognized as being enforceable by producers may not be complied with if the risk for discovery of non-compliance is low. Therefore, they hypothesize that education on the environmental implications of poor practices, and the “know-why” as opposed to just the “know-how” (Morgan & Murdoch 2000, p.159) of sustainable practices are important determinants of securing permanent voluntary changes in attitudes and practice.

A similar result could also be expected in the case where standards are non-governmental. The strongest determining factors in adoption of practices are consistent with those emerging from observations and interviews; education and/or the threat of enforcement.

Therefore, the following policy options are suggested:

1. Increase and commit long-term funding to the Environmental Farm Plan (EFP)<sup>50</sup>.
2. Government should pursue (through the EFP or another program) harmonization with the GlobalGAP standard<sup>51</sup>.

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<sup>49</sup> The movement towards neoliberal policies and the establishment of GATT promoted the removal of government programs deemed to be subsidies, which included education and incentive programs. (Hall, Morriss & Kuiper 1999; Ponte & Gibbon 2005)

<sup>50</sup> The EFP is a Canadian example of an AEP which sponsors workshops and provides advisors that assist producers in developing an environmental management plan tailored to their operations. Under this program, producers are partially reimbursed for some of the costs of the physical infrastructure improvements made as a result of their implementation of an EFP. The EFP structure is very congruent with the structure of GlobalGAP, therefore completing the EFP with the assistance of a qualified advisor would rectify the information gaps and interpretation issues that growers faced in implementing GlobalGAP.

<sup>51</sup> Some AEPs have tested the benefit of incorporating independent audits. In a recent Australian example, a national AEP added audits as a component in an attempt to capture the attention of global markets (Higgins, Dibden, and Cocklin 2008). TPC in this case was found to be of little benefit to farmers as the national AEP was not harmonized with a recognized global standard.

3. Reinvest in local extension programs. To improve the success of the extension program and best serve producers given the current complexities of agriculture, a variety of extension workers with specific expertise are needed to fulfill a variety of roles namely; “information provider, landscape planner, facilitator, technical expert and community organizer”. (McNeely & Scherr 2003, pp.241-243).

### **3.7 SUMMARY OF SUGGESTED AREAS FOR FUTURE RESEARCH**

The general body of literature on the topic of private TPC and GlobalGAP suggested the following research areas:

Hassel (2005) compiled a comprehensive listing of suggested areas for research into methodologies to evaluate the consequences of certification programs: 1) conduct longitudinal studies with time series data, 2) conduct research that examines both the macro and micro scale, 3) collect participatory data, 4) assess certifications on multiple levels of criteria, 5) examine relevance of demographic factors, 6) examine certification as a process rather than an outcome. Campbell (2005) also suggested a need for sociological research examining GlobalGAP, however since 2005, there have been several studies conducted in developing countries that were referenced throughout this thesis.

#### **3.7.1 Proposal for Future Research**

The relative novelty and rapidly growing popularity and power of GlobalGAP undoubtedly will continue to provide a wide plain of rich research opportunities. The following proposals are based upon interests generated from this particular case study.

#### **EXPANSION OF EMPIRICAL GROUNDED RESEARCH ON GLOBALGAP**

Continued research of GlobalGAP at the producer level is needed to provide a more complete picture of how this standard is evolving and will continue to transform and be transformed by the global and local contexts in which it operates. The standard is now being implemented by producers in greater numbers in the United States, the Antipodes and Europe. Therefore a logical starting point would be to conduct grounded research with fruit or vegetable growers in these regions for comparison with the findings presented here. As there is an already

established history with the community of cherry grower's in British Columbia, it would be interesting to address some of the limitations of this research and conduct comprehensive followup surveys or interviews. The use of surveys on a periodic basis to follow the continued 'process' of certification would also provide more conclusive information on the consequences that GlobalGAP is having in communities. Also, as GlobalGAP has now developed standards for the certification of coffee, aquaculture, crops and livestock a possible avenue for exploration would be assessing the differences between the factors influencing the diffusion of GlobalGAP in each of these different commodities.

### **COMPARISON OF ORGANIC & GLOBALGAP THIRD-PARTY CERTIFIED GROWERS**

One of the criticisms in this research of GlobalGAP is that it does not promote the components of sustainable agriculture systems as defined in this research. A system that perhaps addresses these components more fully is organic agriculture. It would therefore be interesting to perform a multiple comparison between the motivations and ideologies of growers that are newly pursuing organic certification, those conventional growers pursuing GlobalGAP certification, and those organic growers that have been certified organic for over 10 years. This would facilitate the comparison of the motivations, ideologies and behaviours of GlobalGAP, 'new' organic certified growers and the 'original' organic growers. It may also be insightful to compare the organic audits with GlobalGAP audits to determine the differences in how TPC functions in practice under different standards.

As another criticism of GlobalGAP was that growers perceived it negatively as a top-down organization, it would be interesting to compare GlobalGAP and Organic certified growers' perceptions of the organizational bodies that govern the standards. This research program might yield especially insightful results regarding global agri-food governance as new structures have been emerging in organic agriculture that, like GlobalGAP, attempt to homogenize and standardize practices at a national and/or global scale.

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## Appendices

### APPENDIX A GLOBALGAP CRITERIA BREAKDOWN BY COMPLIANCE LEVELS

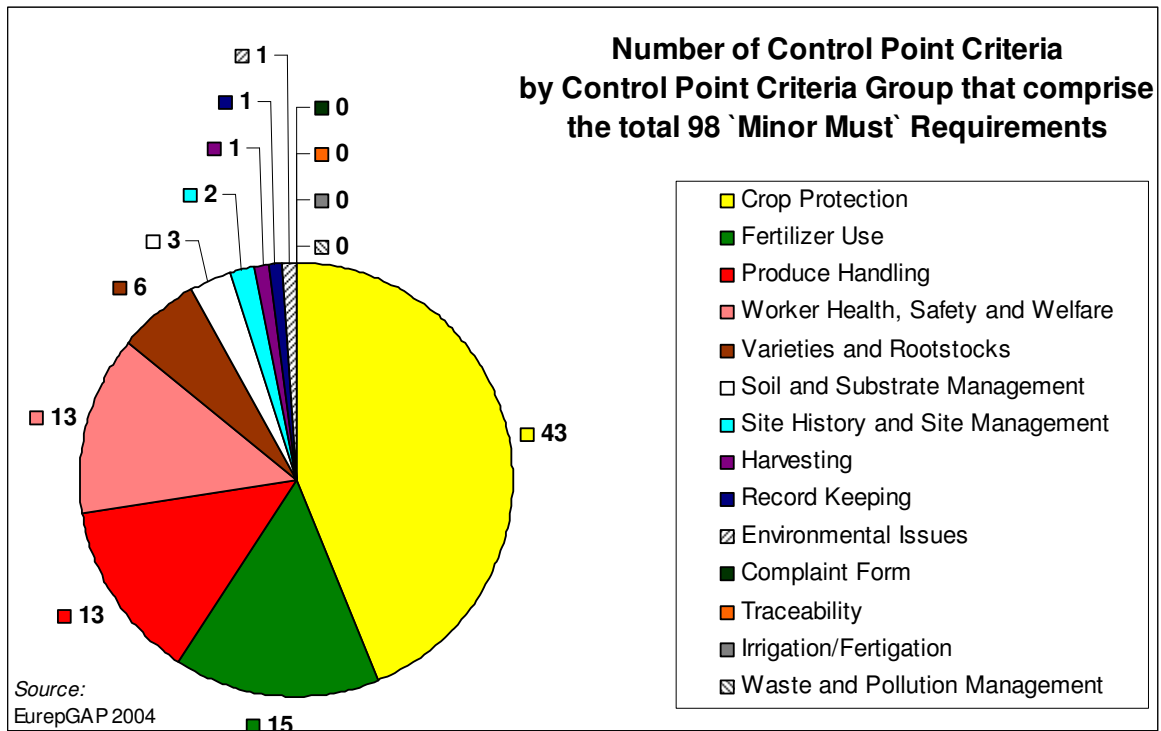


Figure A.1 'Minor Must' compliance type by control point criteria group



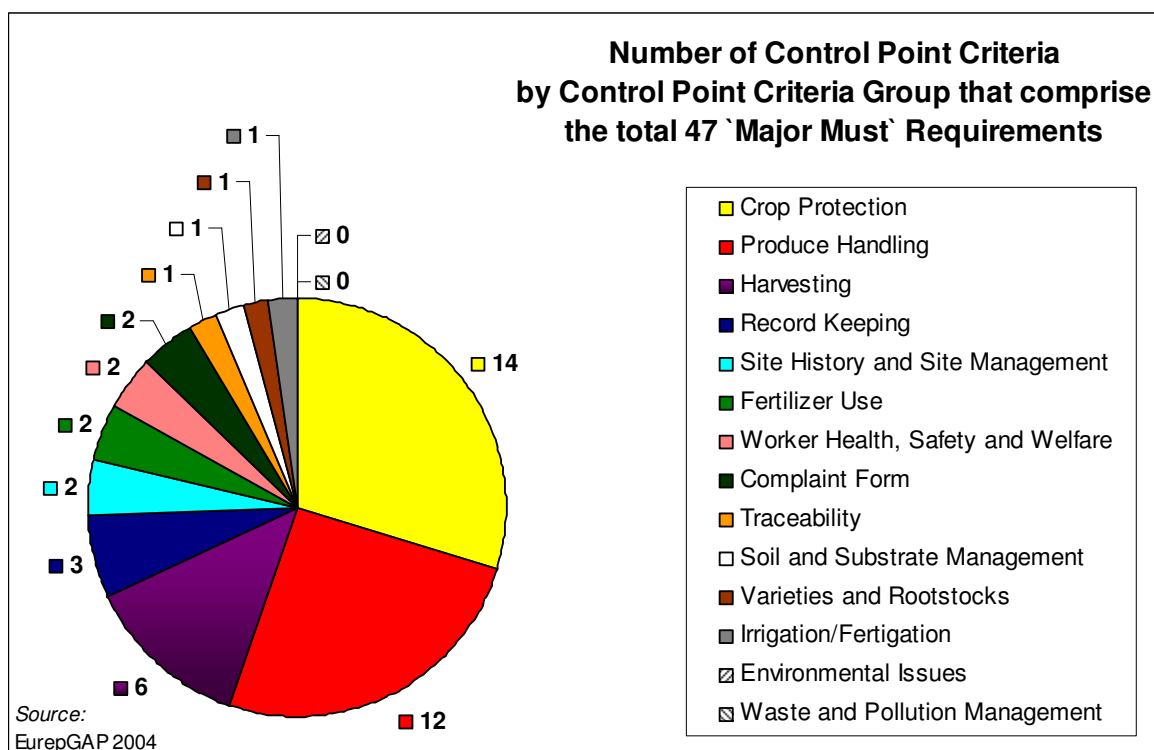


Figure A.2 'Major Must' compliance type by control point criteria group

## APPENDIX B SAMPLE OF GLOBALGAP CRITERIA VERSION CHANGES

Code Ref.: IFA.3.0-2 CP  
Version: V3.0-2\_Sep07  
Section: FV  
Page: 7 of 13

CONTROL POINTS AND COMPLIANCE CRITERIA  
INTEGRATED FARM ASSURANCE | FRUIT AND VEGETABLES  
ENGLISH VERSION

**GLOBALG.A.P.**  
(EUREPGAP)

N°	Control Point	Compliance Criteria	Level
FV . 5 . 2 . 3	Are all workers wearing outer garments that are clean and fit for purpose for the operation and able to protect products from contamination?	All workers wear outer garments (e.g. smocks, aprons, sleeves, gloves) that are clean and fit for purpose for the operation according to the risk analysis. This will depend on the product and operation.	Recom.
FV . 5 . 2 . 4	Are smoking, eating, chewing and drinking confined to designated areas segregated from products?	Smoking, eating, chewing and drinking are confined to designated areas and are never allowed in the produce handling or storage areas. (Drinking water is the exception).	Minor Must
FV . 5 . 2 . 5	Are signs clearly displayed in the packing facilities with the main hygiene instructions for workers and visitors?	Signs with the main hygiene instructions must be visibly displayed in the packing facility.	Minor Must
FV . 5 . 3	<b>Sanitary Facilities</b>		
FV . 5 . 3 . 1	Do workers in the packing facility have access to clean toilets and hand washing facilities in the vicinity of their work?	Toilets in a good state of hygiene must not open directly onto the produce handling area, unless the door is self-closing. Hand washing facilities, containing non-perfumed soap, water to clean and disinfect hands, and hand dry facilities must be accessible and near to the toilets (as near as possible without the potential for cross-contamination).	Major Must
FV . 5 . 3 . 2	Are signs clearly displayed instructing workers to wash their hands before returning to work?	Signs must be visible with clear instructions that hands must be washed before handling products, especially after using toilets, eating, etc.	Major Must
FV . 5 . 3 . 3	Are there suitable changing facilities for the workers?	The changing facilities should be used to change clothing and protective outer garments as required.	Recom.
FV . 5 . 3 . 4	Are there lockable storage facilities for the workers?	Secure storage facilities should be provided at the changing facility to protect the workers' personal belongings.	Recom.
FV . 5 . 4	<b>Packing and Storage areas</b>		
FV . 5 . 4 . 1	Are produce handling and storage facilities and equipment cleaned and maintained so as to prevent contamination?	To prevent contamination, produce handling and storage facilities and equipment (i.e. process lines and machinery, walls, floors, storage areas, pallets, etc.) must be cleaned and/or maintained according to the cleaning and maintenance schedule, with defined minimum frequency. Documented records of cleaning and maintenance must be kept.	Minor Must
FV . 5 . 4 . 2	Are cleaning agents, lubricants, etc. stored to prevent chemical contamination of produce?	Cleaning agents, lubricants etc. are kept in a designated area, away from where produce is packed, to avoid chemical contamination of produce.	Minor Must

Source: (GlobalGAP 2007a)

Figure B.1 Sample of current GlobalGAP criteria

## APPENDIX C BREB CERTIFICATE OF APPROVAL



The University of British Columbia  
Office of Research Services  
Behavioural Research Ethics Board  
Suite 102, 6190 Agronomy Road, Vancouver, B.C. V6T 1Z3

### CERTIFICATE OF APPROVAL - MINIMAL RISK

<b>PRINCIPAL INVESTIGATOR:</b> Milind Kandlikar	<b>INSTITUTION / DEPARTMENT:</b> UBC/College for Interdisciplinary Studies/Asian Research	<b>UBC BREB NUMBER:</b> H07-00455
<b>INSTITUTION(S) WHERE RESEARCH WILL BE CARRIED OUT:</b>		
Institution N/A		Site N/A
Other locations where the research will be conducted: Interviews will be conducted at either public locations such as coffee shops or at the study participant's home or office.		
<b>CO-INVESTIGATOR(S):</b> Jennifer Ardiel		
<b>SPONSORING AGENCIES:</b> N/A		
<b>PROJECT TITLE:</b> The Introduction of European Sustainable Agriculture Certification Standards: A Case Study of Cherry Growers in the Southern Interior of British Columbia.		

**CERTIFICATE EXPIRY DATE:** March 29, 2008

<b>DOCUMENTS INCLUDED IN THIS APPROVAL:</b>		<b>DATE APPROVED:</b> March 29, 2007	
<b>Document Name</b>	<b>Version</b>	<b>Date</b>	
<b>Consent Forms:</b>			
2007 Consent Form	Version 1	February 15, 2007	
<b>Questionnaire, Questionnaire Cover Letter, Tests:</b>			
2007 Sample Script	Version 1	February 15, 2007	
The application for ethical review and the document(s) listed above have been reviewed and the procedures were found to be acceptable on ethical grounds for research involving human subjects.			
<p>Approval is issued on behalf of the Behavioural Research Ethics Board and signed electronically by one of the following:</p> <p>_____</p> <p>Dr. Peter Suedfeld, Chair Dr. Jim Rupert, Associate Chair Dr. Arminee Kazanjian, Associate Chair Dr. M. Judith Lynam, Associate Chair Dr. Laurie Ford, Associate Chair</p>			

## APPENDIX D INTERVIEW SCRIPT

Draft Pilot - Interview Guide – Growers that Chose EurepGAP Certification September 20, 2004

### Key Comparison Items

Experience	
Produce shipped to...	
Packs through...	
Organic?	
Markets through...	

### Interview Script

1. Please tell me what you know and think about the Eurepgap standard and certification

1.1. The organization itself

1.1.1. Where is Eurepgap located and how farm reaching is it?

1.1.2. All types of agriculture?

1.2. The certification body – SGS

1.3. The retailers in Europe

1.4. How and when was the grower first introduced to Eurepgap?

1.5. Why do you think Eurepgap exists?

1.5.1. Do you think Eurepgap will be around in 5 years, 10 years, 50 years?

Why or why not and what would be the organization's role with respect to the growers that are Eurepgap certified?

2. What do you see as business risks in cherries?

2.1. How do you see voluntary certification programs such as Eurepgap changing these risks?

2.2. Increasing/decreasing competitive advantage, marketing power etc.

3. Are there any health risks in growing cherries? What are they? [Personal/community?]

4. Do you feel the decision for you to undergo Eurepgap certification was voluntary?

Why or why not?

5. Are you aware that the Eurepgap certification is for “safe and sustainable” agriculture practices?
  - 5.1. What does this imply to you? From where do you get this definition? How do you compare/contrast sustainable agriculture with organic agriculture?
  - 5.2. What things do you feel makes your agricultural practices more or less safe?
  - 5.3. More or less sustainable?
  - 5.4. Do you think that the control points or requirements of the Eurepgap standard promote safer and more sustainable agriculture? Examples?
  - 5.5. Did you need to institute any changes to your practices as a direct result of the certification? Why or why not?
6. How did you find the process of getting ready for the audit? What sort of effort was required on your part?
  - 6.1. What were the most difficult criteria to meet? Why?
  - 6.2. What were the easiest to meet?
  - 6.3. Did you attempt to meet the recommendations in addition to the major and minor musts? Why or why not?
7. Did you receive any assistance in preparing for the certification?
  - 7.1. What sources (information/funding etc.) were the most help?
  - 7.2. What sources (information/funding etc.) were the least help?
  - 7.3. Did you discover **new** sources of information or assistance as a result of going through this process? Do you feel like a more “educated” grower as a result of the process? Please elaborate on why or why not.
8. Would you say there is any difference in the quality of the product that you exported last year compared to this year? Compared to previous years? To what would you attribute these changes?
9. After going through the certification process, what changes if any would you note in comparison to your pre-certification procedures or practices. Did anything change?
  - 9.1. How are you finding keeping up with the procedures that you laid out in your documentation? Are you finding that they need to be revised or updated for next year? Why or why not?
  - 9.2. Have you given much thought to next year’s audit? What are your expectations about this? Do you think there will be any surprises or changes? How are you keeping up to date on this?
10. How would you describe the audit itself?
  - 10.1. What were your expectations about the audit? The auditor?
  - 10.2. Was the audit/auditor what you expected? Why or why not?
  - 10.3. Did you feel that the auditor was qualified to make any experienced or educated assessments of your practices? In what ways.

11. Would you recommend this certification to other grower's? Why or why not?
  - 11.1. Would you recommend this certification to other farmers? Why or why not?
12. Are you familiar with BCGap and the environmental farm plan? What can you tell me about them?
  - 12.1. Are you aware that BCGap is attempting to get Eurepgap equivalence?
13. How do you think the government is or should be involved in supporting growers to achieve safe & sustainable agriculture practices?
  - 13.1. Do you think that government regulation or specific policies would be a good idea? Why or why not?

## **APPENDIX E DETAILS OF DATA COLLECTION METHODOLOGY**

Data collection can be characterized as having three main phases occurring over the period May 2004 to March 2008. In phase one, twenty audits performed by an independent auditor from an accredited certifying body were observed. During this phase in August, 2004, the researcher actively took part in a GlobalGAP certified grower's harvest in Creston, BC. Participant observation techniques were used to document the characteristics of the community and the realities faced by growers in getting this highly perishable fruit to market. Concepts generated from phase one field notes were used to draft a semi-structured interview script for use in the second phase. Interview questions pertained to the growers' knowledge and perceptions of the certification process, GlobalGAP and sustainable agriculture. In the fall of 2004, forty interviews were conducted over a two month period. One interview was conducted with a non-grower that was a change agent to the process of the diffusion of certification.

Phase three consisted of observations and interviews conducted at three points over the years following the certification (2005 – 2008) and produced data for comparison to verify earlier findings. To ascertain the effect and status of GlobalGAP in the communities one year later, the auditor was interviewed in July, 2005 regarding his perceptions of the second annual audit. Only one interview was conducted due to time constraints, however as the auditor had experience with all growers certified in the initial year, and a position of objectivity, his perceptions were found to be an efficient and relatively unbiased proxy to conducting another intensive interview program. The auditor's experience also provided valuable insights as he was able to make relative comparisons between the growers given several variables.

To facilitate comparison with the harvest observation in 2004, participant observation was conducted in the community of Creston in 2007 to identify any observable changes in the local community or to pertinent external factors. Four final interviews were conducted in spring 2008. This phase of the data collection represents the substantive "theoretical sampling" stage of grounded theory where emergent hypotheses and conclusions are tested and refined. An interview was conducted with one certified grower from each valley that had previously participated in phase two. Following the same rationale as in 2005, a second interview was conducted with the auditor and another with a change agent that had been instrumental in assisting growers with the interpretation and implementation of the standard.

## APPENDIX F SAMPLE OF SELECTIVE CODING HIERARCHY

Data collected from all events of the research were maintained in a Microsoft Access database. Field notes of audit observations were open coded for general concepts and themes. Codes from the observations were sorted and a hierarchy was established by linking related codes in a tree structure. Interview transcripts (verbatim) from interviews conducted in 2004 and 2008 were then selectively coded utilizing the resulting hierarchy of sorted codes. Through this process validity was tested and primary findings emerged. Secondary findings or contradictory codes were maintained in the database for potential relevance during the final analysis.

Figure F.1 provides an example of the coding hierarchy with a particular example shown in yellow. The primary code is the process of diffusion.

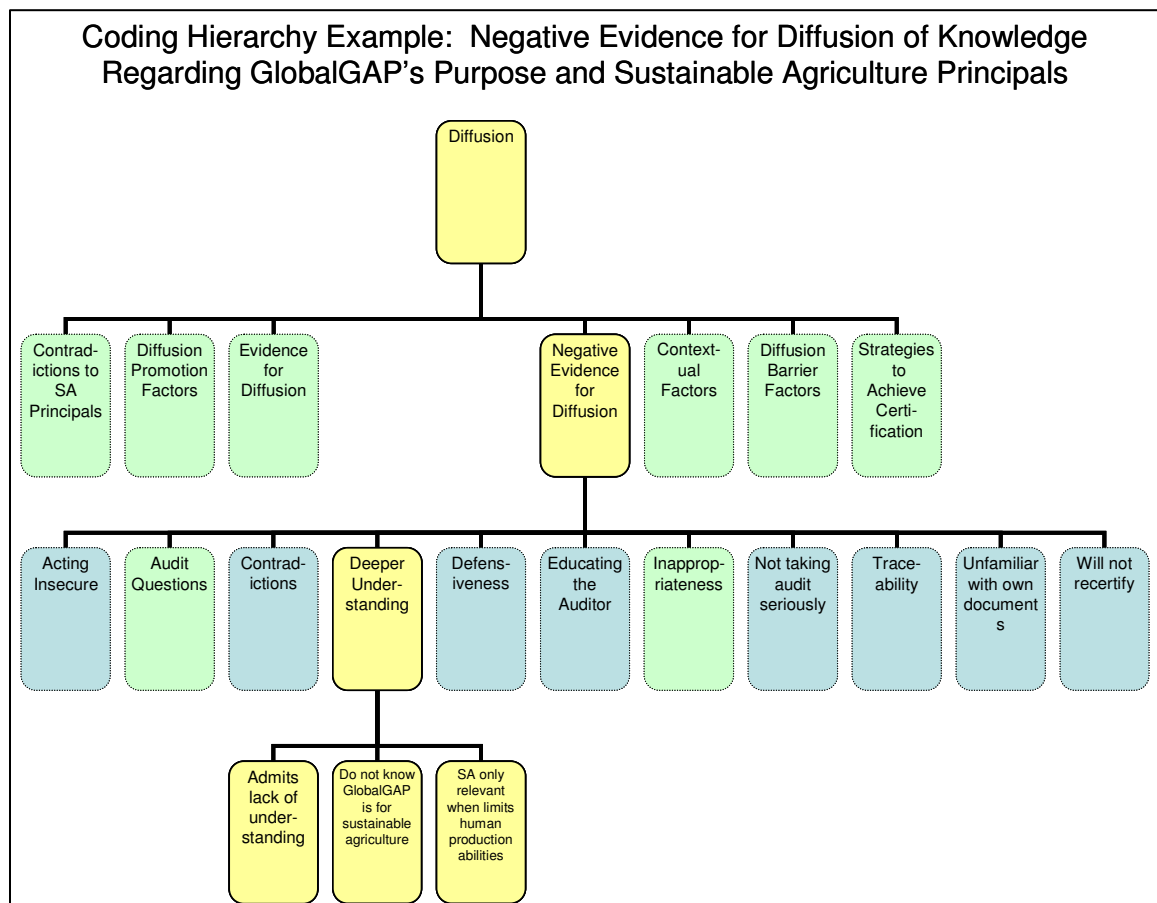


Figure F.1 Coding hierarchy example



A sub-code of 'diffusion' is 'negative evidence' that diffusion occurred. This code is classified (not specified here in the diagram) as an outcome or consequence of the process and is further subdivided by observed outcomes that support 'negative evidence'. The final level of coding again is supporting evidence for the code above it. The codes shown in green have additional levels or sub codes not shown in the diagram whereas the blue codes terminate at the level displayed.

## **APPENDIX G METHODOLOGY: COMPARING TWO PROCESSES**

### **CERTIFICATION AS A PROCESS**

This paper used a Grounded Theory methodology to uncover growers' perceptions of certification. From the results of the research it is clear that GlobalGAP certification is a process that can be described using diffusion theory. For example, GlobalGAP is an agricultural innovation, the process of 'certifying' is the implementation of this innovation, the intended outcome is 'being certified', and the consequences are varied, subjective, and warrant examination. Certification therefore should not only be evaluated on the basis of its associated characteristics and variables (i.e. criteria), but also as a *process*. Using diffusion theory to study the factors that influenced all stages of the diffusion of GlobalGAP achieves this goal. Furthermore, the combination of qualitative techniques and diffusion theory provides unique insights on how growers interpret, and 'go about' attaining certification.

### **TRANSITIONING TO A SUSTAINABLE AGRICULTURE SYSTEM**

Transitioning to a more sustainable agriculture system is also a process. Therefore, the crux of this research is to compare one process to another. The novel approach of using diffusion theory and comparing two processes satisfies a recommended direction for diffusion research (Meyer 2004), and is recognized for its potential value in study of social processes (Glaser 1978). In particular, this approach expands diffusion research to begin to examine a "set of interrelated innovations that complement each other in a way that adoption of one innovation might naturally lead to adoption of one or more of the other innovations" (Meyer 2004, p.60).

Glaser (1978) notes that by analyzing these processes separately, one can better understand how integral a process may be in promoting or influencing the other. The process that is the focal point of this research is GlobalGAP certification, therefore the first step taken to assess if one process (certification) might promote another process (sustainable agriculture), was to examine certification separately from sustainable agriculture. The results of this examination were the factors and consequences of GlobalGAP certification. To facilitate the comparison of processes, then the factors and characteristics that are indicative of an agricultural system in

transition to a more sustainable one were identified. This understanding of sustainable agriculture was provided by referring to the literature on agroecology.

Both the processes of certification and 'becoming more sustainable' imply the implementation of many complex changes to practices and social structures. As all of these changes and specific technologies are far too numerous to consider individually, for simplicity, they are referred to collectively within each of the broader processes. For example, GlobalGAP certification requires the adoption and use of new forms of personal protective equipment, documentation, harvesting practices etc. Similarly, the process of transitioning to a sustainable agriculture system would include changes such as a focus on integrated pest management (IPM), a reduction on the reliance on inputs created from non-renewable resources, and strong producer empowerment and participation in finding innovative solutions. However, all of these individual practices or innovations combined define the process of certification and becoming more sustainable in agriculture terms respectively.

An important distinction between the two processes should be made. As Glaser discusses (1978, p.P. 103), basic social processes (or BSPs) can be divided into those that refer to "social psychological processes" (BSPPs) and those that refer to "social structure in process" (BSSPs). It is posited here that certification is a BSSP, a growing social mechanism that has an unclear relationship with the BSPP of agriculture 'becoming' more sustainable. On one hand, GlobalGAP can be seen as an example of the BSSP of certification that has resulted from a preexisting broader BSPP of the world awakening to the need for safe and sustainable food systems. On the other, the process of certification is the exercise through which growers should begin the process of becoming more safe and sustainable as defined by the GlobalGAP criteria. From this perspective, a retailer contrived organization is interpreting and dispersing the larger social physiological process of sustainable agriculture. In reality however some growers are embracing the ideals of sustainable agriculture, to varying degrees, despite the existence of GlobalGAP. A clear framework is therefore required to comprehensibly examine the linkages between the two processes. Here, this framework takes the form of a comparison of the differences and similarities in the factors or characteristics of the two processes (i.e. practices, technologies, governance structures, social organization). In doing so, conclusions can be drawn about whether certification, in this case study, may influence the diffusion of more sustainable agriculture practices and structures.

## **APPENDIX H SEMI-QUANTITATIVE RESULTS TABLES**

A summary of the findings from the interviews conducted throughout September to November of 2004 are presented in the following tables. Growers' responses were sorted into thematic groups that represent perceptions and experiences with certification. These groups are 1) perceptions of GlobalGAP, 2) perception of certification in general, 3) perceptions of the audit process 4) primary factors influencing the certification decision, 5) comments on the implementation of the standard, 6) strategies used to meet the standard requirements, 7) perceived outcomes from certification, 8) thoughts on sustainability and 9) opinions on government's role to promote sustainability process. The responses were collectively grouped according to adopter/non-adopter status and also presented by community with percentages for de-adopters. De-adopters are defined as those growers that went through the certification process in 2004, but chose not to recertify in the following years.

The tables highlight the importance of a wide range of factors that influence perceptions and the process of certification. The most prominent themes were first identified based on the frequency with which they appeared in the coded data. Code frequency within each individual interview was also tracked to provide a quantitative measure of the importance of a particular issue to a grower. Information presented in the tables below reflects the presence (or absence) of that perception (or experience) in an interview. Many recorded responses were based on open-ended questions with some exceptions as are shown in the interview script provided in Appendix C. Special reference should be made to the table Thoughts on Sustainability. Growers were specifically asked if they were aware that GlobalGAP was for sustainable agriculture certification. This question was posed directly as a yes or no answer as without this specific question, growers would not otherwise associate GlobalGAP with the term sustainable agriculture. There were two exceptions where growers did associate GlobalGAP with sustainable agriculture without a directed question.

Table H.1 Thoughts on GlobalGAP

Case	Combined Total		Creston Valley			Okanagan/Similkameen		
Category	Initial Adopters	Non-Adopter	Adopter	De-Adopter	Non-Adopter	Adopter	De-Adopter	Non-Adopter
	n=24	n=14	n=9	n=6	n=3	n=4	n=5	n=11
Top-Down/No feedback mechanism (far removed & distant)	96%	71%	100%	83%	100%	100%	100%	64%
Food safety focus	88%	93%	89%	83%	67%	75%	100%	100%
Traceability limits retailer liability	83%	71%	89%	67%	100%	100%	80%	64%
Marketing tool	67%	93%	78%	17%	100%	100%	80%	91%
Non-tariff trade barrier/inequitable	58%	64%	67%	67%	67%	50%	40%	64%

Table H.2 Thoughts on certification

Case	Combined Total		Creston Valley			Okanagan/Similkameen		
Category	Initial Adopters	Non-Adopter	Adopter	De-Adopter	Non-Adopter	Adopter	De-Adopter	Non-Adopter
	n=24	n=14	n=9	n=6	n=3	n=4	n=5	n=11
Certification will become an industry standard	92%	93%	78%	100%	67%	100%	100%	100%
Local or national TPC would be more relevant/verifiable	88%	93%	89%	100%	100%	50%	100%	91%
Prefer market driven as opposed to government	75%	71%	89%	67%	67%	100%	40%	73%
Express concern over potential for loss of control over farm management	75%	57%	89%	67%	67%	50%	80%	55%

Table H.3 Thoughts on the audit process

Case	Combined Total		Creston Valley			Okanagan/Similkameen		
Category	Initial Adopters	Non-Adopter	Adopter	De-Adopter	Non-Adopter	Adopter	De-Adopter	Non-Adopter
	n=24	n=14	n=9	n=6	n=3	n=4	n=5	n=11
Audit of documents	96%	71%	100%	100%	67%	100%	80%	73%
Auditor was qualified	67%	n/a	56%	100%	n/a	25%	80%	n/a
Specified Certification (audit & certification cost) high	67%	57%	56%	100%	0%	50%	60%	73%
Auditor needs relevant education/experience to be qualified	63%	79%	56%	50%	100%	75%	80%	73%
Validity relies on auditor qualifications and/or impartiality	63%	29%	67%	33%	33%	75%	80%	27%

Table H.4 Comments on the implementation of the standard

<b>Case</b>	<b>Combined Total</b>		<b>Creston Valley</b>			<b>Okanagan/Similkameen</b>		
<b>Category</b>	Initial Adopters	Non-Adopter	Adopter	De-Adopter	Non-Adopter	Adopter	De-Adopter	Non-Adopter
	<b>n=24</b>	<b>n=14</b>	<b>n=9</b>	<b>n=6</b>	<b>n=3</b>	<b>n=4</b>	<b>n=5</b>	<b>n=11</b>
Bulk of work is documentation (distate for 'paperwork')	96%	86%	100%	100%	67%	100%	80%	91%
Requires minor changes/agrees with practices & beliefs	92%	86%	89%	100%	100%	100%	80%	82%
Expensive	88%	86%	89%	100%	67%	75%	80%	91%
Bulk of work/expense is related to chemical handling facilities	79%	64%	78%	83%	67%	75%	80%	64%
Interpretation difficult, unclear and accessible information poor	79%	36%	89%	67%	67%	50%	100%	27%
Prohibitive for small producers	75%	64%	100%	33%	100%	100%	60%	55%
Required (or will require) significant effort	46%	29%	56%	17%	0%	50%	60%	36%

Table H.5 Primary factors affecting the decisions to certify

<b>Case</b>	<b>Combined Total</b>		<b>Creston Valley</b>			<b>Okanagan/Similkameen</b>		
<b>Category</b>	Initial Adopters	Non-Adopter	Adopter	De-Adopter	Non-Adopter	Adopter	De-Adopter	Non-Adopter
	<b>n=24</b>	<b>n=14</b>	<b>n=9</b>	<b>n=6</b>	<b>n=3</b>	<b>n=4</b>	<b>n=5</b>	<b>n=11</b>
Want to keep access to as many export markets as possible	96%	100%	100%	83%	100%	100%	100%	100%
Was presented as mandatory by actors up the vertical chain	92%	71%	100%	100%	67%	50%	100%	73%
Other markets still exist	83%	86%	67%	100%	100%	75%	100%	82%
Time constraints cited as reason for not certifying	n/a	57%	n/a	n/a	67%	n/a	n/a	55%
Will certify in upcoming year	50%	64%	44%	33%	67%	50%	80%	64%

Table H.6 Strategies to meet certification requirements

<b>Case</b>	<b>Combined Total</b>		<b>Creston Valley</b>			<b>Okanagan/Similkameen</b>		
<b>Category</b>	Initial Adopters	Non-Adopter	Adopter	De-Adopter	Non-Adopter	Adopter	De-Adopter	Non-Adopter
	<b>n=24</b>	<b>n=14</b>	<b>n=9</b>	<b>n=6</b>	<b>n=3</b>	<b>n=4</b>	<b>n=5</b>	<b>n=11</b>
Community networking (meetings, share information)	96%	93%	89%	100%	67%	100%	100%	100%
Follow example of what worked for other producers	96%	86%	89%	100%	67%	100%	100%	91%
Reliance on services provided by non-producers	92%	86%	78%	100%	67%	100%	100%	91%
Defer to government standards & guides	79%	50%	78%	83%	67%	100%	60%	45%
'Paperwork' is managed by female head of household	58%	n/a	67%	83%	n/a	50%	20%	n/a

Table H.7 Stated outcomes from GlobalGAP certification

<b>Case</b>	<b>Combined Total</b>		<b>Creston Valley</b>			<b>Okanagan/Similkameen</b>		
<b>Category</b>	Adopter	Non-Adopter	Adopter	De-Adopter	Non-Adopter	Adopter	De-Adopter	Non-Adopter
	<b>n=24</b>	<b>n=14</b>	<b>n=9</b>	<b>n=6</b>	<b>n=3</b>	<b>n=4</b>	<b>n=5</b>	<b>n=11</b>
No economic or business advantage in 2004	96%	100%	89%	100%	100%	100%	100%	100%
Majority of risks are already dealt with by existing legislation	79%	71%	78%	67%	100%	100%	80%	64%
Awareness raising process	79%	64%	78%	100%	67%	75%	60%	64%
Does not reduce risks (further) as does not address 'real' risks	67%	50%	56%	67%	67%	75%	80%	45%
Risks are related only to use of chemical sprays	63%	71%	56%	67%	67%	25%	100%	73%
Does reduce risks or accidents by being aware and organized	54%	29%	44%	100%	0%	25%	40%	36%

Table H.8 Thoughts on sustainable agriculture

<b>Case</b>	<b>Combined Total</b>		<b>Creston Valley</b>			<b>Okanagan/Similkameen</b>		
<b>Category</b>	Initial Adopters	Non-Adopter	Adopter	De-Adopter	Non-Adopter	Adopter	De-Adopter	Non-Adopter
	<b>n=24</b>	<b>n=14</b>	<b>n=9</b>	<b>n=6</b>	<b>n=3</b>	<b>n=4</b>	<b>n=5</b>	<b>n=11</b>
Sustainable until event or situation limits ability to produce	38%	50%	33%	33%	100%	25%	60%	36%
Aware GlobalGAP is a standard for 'sustainable' agriculture	21%	21%	11%	17%	0%	25%	40%	27%
Agriculture is sustainable or it will not be profitable	21%	14%	22%	17%	0%	25%	20%	18%

Table H.9 What government services help producers become more sustainable?

<b>Case</b>	<b>Combined Total</b>		<b>Creston Valley</b>			<b>Okanagan/Similkameen</b>		
<b>Category</b>	Initial Adopters	Non-Adopter	Adopter	De-Adopter	Non-Adopter	Adopter	De-Adopter	Non-Adopter
	<b>n=24</b>	<b>n=14</b>	<b>n=9</b>	<b>n=6</b>	<b>n=3</b>	<b>n=4</b>	<b>n=5</b>	<b>n=11</b>
Extension Services/Research	92%	79%	89%	100%	100%	100%	80%	73%
Government funds are nice, but do not motivate change	63%	79%	78%	33%	100%	50%	80%	73%

## APPENDIX I APPENDIX REFERENCES

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