



PILOT PROJECT ON THE TRACEABILITY OF HORTICULTURAL PRODUCE IN QUÉBEC

CASE STUDY ON STRAWBERRIES

CONTEXT

In 2007, a traceability initiative for horticultural produce was launched by different actors in the fruits and vegetables sector following work carried out between representatives of the Canadian and American industries. Since then, this initiative, titled Initiative sur la traçabilité des fruits et légumes (ITFL), and known in English as PTI (Produce Traceability Initiative), put forward an action plan for a common standard for the entire industry to be adopted on a voluntary basis. In the coming years, this standard will be a determining factor for the export of Canadian horticultural produce to the United States.

The PTI has as its objective the implementation of a harmonized traceability system that will allow for the rapid and efficient electronic tracking of cases of fruits and vegetables between the different links in the supply chain. This system will principally target improvements in the capacity to retrace and recall produce in the case of a health crisis. PTI is composed of the following organizations: The Produce Marketing Association (PMA), United Fresh (UF) and the Canadian Produce Marketing Association (CPMA).

In Québec, Agri-Traçabilité Québec (ATQ) was mandated by the Comité Sectoriel sur la Traçabilité Horticole (CSTH*) to undertake a pilot project on the traceability of fruits and vegetables for

three crops, these being strawberries, potatoes, and greenhouse tomatoes. In addition, during the course of the 2012 and 2013 production seasons, field testing was carried out for strawberry production amongst several participants across the province.

Amongst the horticultural produce put forward for the study, strawberry production was retained as it was the most representative of the groups of crops with the following characteristics:

- marketed immediately after harvesting;
- long and short distribution channels;
- a short shelf-life after harvesting;
- a very perishable product;
- manual methods of harvesting;
- packaged directly in the field.

OBJECTIVES

The pilot project aimed to test the identification equipment and assess the flow of produce as it circulated within the various distribution channels (short and long), as well as the transfer of information between the different segments of the supply chain.

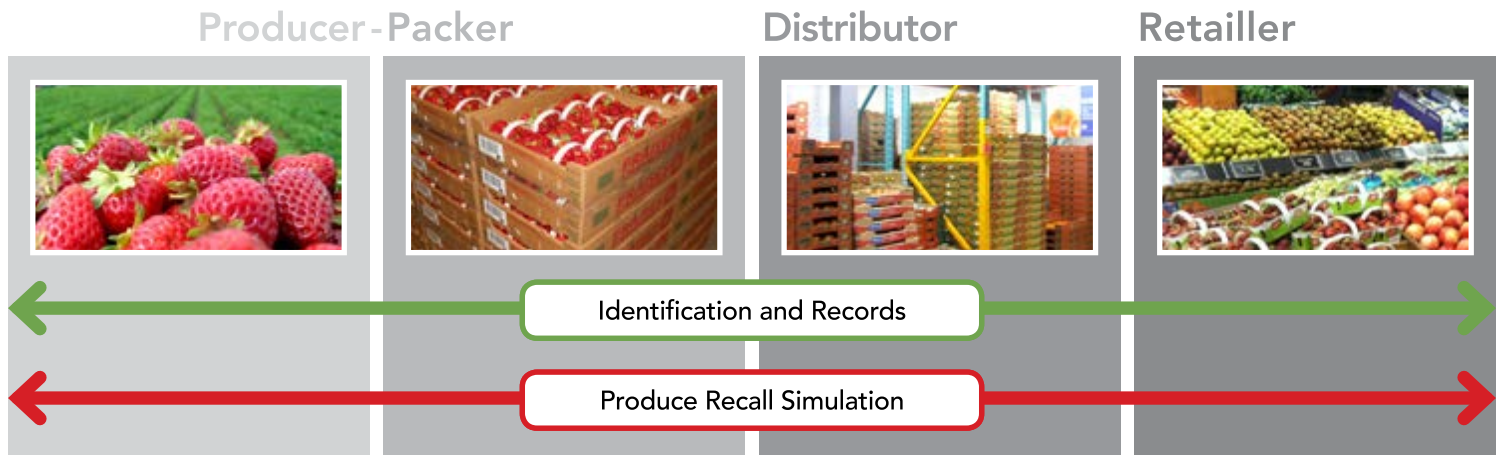
*CSTH: Comité sectoriel sur la traçabilité horticole groups together the following partners: the Conseil québécois de l'horticulture (CQH), the Fédération des producteurs de pommes de terre du Québec (FPPTQ), the Association des producteurs de fraises et framboises du Québec (APFFQ), the Association québécoise de la distribution des fruits et légumes (AQDFL), the Syndicat des producteurs en serre du Québec (SPSQ), the Union des producteurs agricoles (UPA), the Canadian Food Inspection Agency (CFIA), the Ministère de l'Agriculture, des Pêcheries et de l'Alimentation du Québec (MAPAQ) and Agri-Traçabilité Québec (ATQ).



*Traceability and Technology in
Service of the Horticultural Sector*



Distribution Chain for Horticultural Produce



METHODOLOGY AND MEANS EMPLOYED

The technology used to carry out the trials is a “bar code label” identifier set to the GS1 standard. This model, chosen by the Canadian-American distribution industry as part of PTI, is used only on cases and pallets of horticultural produce. It should be noted that PTI does not recommend the use of standardized labels on single unit produce packaging that goes to the end consumer. The pilot project was carried out over two production seasons in commercial situations with a total of six strawberry-producing operations participating.

The GS1 International Standard

FRAISES 12 chopines

← Produce / Quantity

← **Bar Codes GS1-128:**
(01) = GTIN Code
(10) = Produce Code/
Lot Number

← Voice Pick Code

(01) 10333830010039
(10) 380B0411

13 94



CHOICE OF PARTICIPATING OPERATIONS

The participating operations were selected in a manner that gave the widest possible representation and characteristics of strawberry production in Québec. The selection was carried out in concert with different partners such as the Association des producteurs de fraises et de framboises du Québec (APFFQ), the Conseil québécois de l'horticulture (CQH), and the Ministère de l'Agriculture, des Pêcheries et de l'Alimentation du Québec (MAPAQ).

The chosen operations had to meet certain basic criteria, notably:

- being a supplier of strawberries to an enterprise participating in the project downstream in the subsequent supply chain;
- being available to test and comment on the deployed solutions, trial traceability equipment and the feasibility of PTI recommendations with regard to the traceability process;
- having a volume of production sufficient within a short harvesting period such that the solutions and equipment can be tested within a short time span;
- having a CanadaGAP or other type of certification with the aim of being able to respond to traceability technical elements required by the quality specifications;
- being able to actively participate in the observation process in the field and for data collection.

SUMMARY OF RESULTS

During the 2012 and 2013 production seasons, the equivalent of more than 80 days of testing in the field were carried out with the strawberry producers, divided amongst the six participants. The mobilization of at least two resource persons per participating operation was necessary in order to carry out the bar coding tests, the placement of labels on produce and the collection and entry of data. The resource persons were also used to ensure the continuous harvesting and shipping of the produce being tracked, especially during high volume periods.

For the three crops (strawberries, potatoes and tomatoes), more than 48,000 cases, or about 580 shipping pallets, were identified with bar code labels conforming to GS1 nomenclature and essential traceability information was recorded according to the model called for by PTI.

A labeler was used to place the bar codes on the cases of strawberries. According to the observations made in the field, this tool required a certain amount of dexterity in order to be used in an optimal fashion. The use of a portable printer in the field did not

Technological solutions tested as part of the pilot project

TYPES OF SOLUTION	CHARACTERISTICS
Hosted solution - complete/ integrated	• Generation of bar code labels for cases and pallets of fruits according to the model recommended by PTI; • Capture of bar code data with the assistance of an optical reader at entry and exit; • Integration of the following information on: - buyers - destinations - quantities - types of packaging • Electronic sharing of information with the next link in the distribution chain.
Locally-based solution	• Generation of bar code labels for cases and pallets according to the model recommended by PTI; • Exchange of data with the next affected links in a non-computerized manner using documentation (invoices, purchase orders, delivery slips, etc.); • Collection and hand-written entry of data.

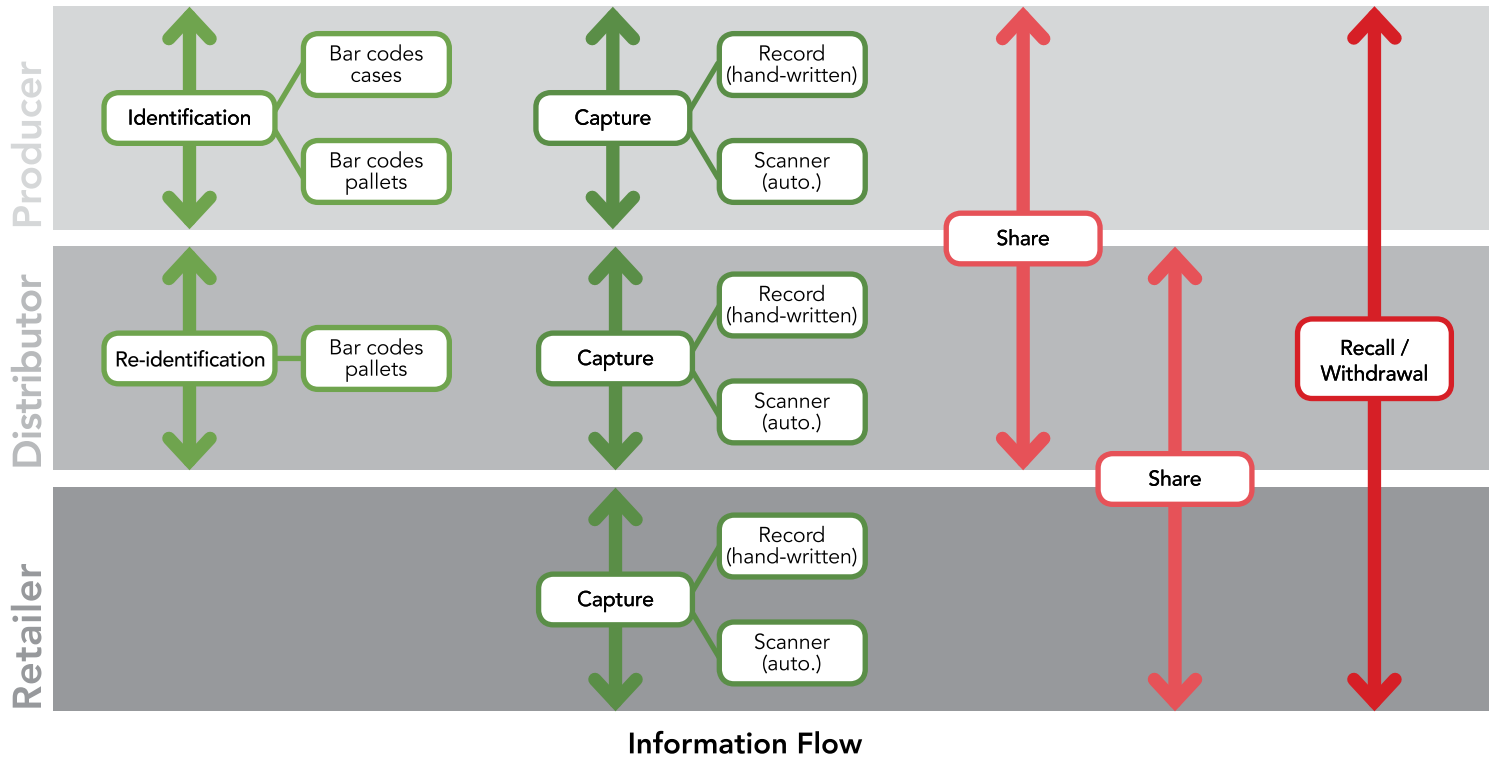
produce the anticipated results. The slow speed and poor quality of printing were the main disadvantages noted for such equipment.

Three packaging formats were tested during the pilot project on strawberries, these being cases containing 8 clamshell containers of 1 lb each, 8 baskets of 1.5 litres each and 12 pint containers. Regardless of the packaging used, it seems that the label format suggested by PTI (2 inches by 4 inches) was judged as too large by the participants as they caused the aeration holes present in the strawberry packaging to clog up which reduced the air circulation and, as a consequence, the risk of shortening the shelf-life of the fruit.

The rate of data capture using the optical reader on the bar code labels placed on the cases and pallets was 100 %. The nature of the strawberry packaging, a rigid cardboard, allowed for the labels to be stuck in a satisfactory manner and to carry out perfect readings of the bar codes even after being refrigerated, transported by truck and handling at public markets.



The proposed traceability system in three stages: produce identification, information capture and sharing.





RECALL SIMULATION

Recall simulations for produce having been afflicted by a hypothetical contamination were carried out under the supervision of advisors from the Ministère de l'Agriculture, des Pêcheries et de l'Alimentation du Québec (MAPAQ). These simulations consisted of tracing back the produce starting with their lot numbers taken at random from the records of a producer for a given date. A comparison was made between the two procedures, that is the model of produce identified with bar codes using a technological solution for recording data with an optical reader, and the model using the lot number encoded by the producer and with the recording of hand-written information in existing paper records.

The evaluation of the results was carried out taking into account the following parameters:

- the portion of the contaminated produce which was traced back;
- the time necessary to carry out the recall or the destruction of the produce.

The tests demonstrated that it is possible to trace back to the origin of the produce and to verify the destination of the produce when the records (computerized or hand-written) are complete and exact. In addition, the tests showed that a traceability system based on computerized produce coding is more efficient than one that is hand-written. The origin and movements of produce are the types of information that are easy to obtain in a relatively short amount of time with a computerized traceability system.

FINANCIAL PARTNERS

The project was carried out as part of the Programme de soutien aux stratégies sectorielles de développement (PSSSD).



A part of the financing for the project was provided by:



FINDINGS

The tests carried out for strawberry production confirmed the feasibility of a harmonized traceability system in this sector. Moreover, the participants in the pilot project believe that the PTI recommendations could be implemented in their operation in the event that buyers are obliged to label produce and record precise data. In reality, several of the elements recommended by PTI are already part of the operation's activities, notably the use of produce codes, lot numbers and the GS1 enterprise prefix. However, in most cases, the tools are used manually and the information on lots is hand-written. These data are recorded in preset registers and furnished as per the specifications cited in quality guides such as CanadaGAP.

The introduction of a harmonized traceability procedure using bar code labels for the capture and recording of data is technically possible and feasible. The recall simulations carried out by MAPAQ advisors at producer-packers and distributors demonstrated a net increase in response time efficiency in the case where the technological solution was used to locate the produce under investigation and carry out withdrawal or destruction procedures as appropriate. However, the majority of participants noted that these recommendations were economically difficult to support as part of their operation as they require supplementary labour costs and investments in equipment without any pay-back to their operation's revenues. They fear that this will be an obstacle in the development of their business.

CATALOGUE OF AVAILABLE TOOLS AND TECHNOLOGIES

Within the framework of the pilot project, a bulletin cataloguing the tools and technological solutions for traceability was also produced.

This guide also provides a general approach to be taken by an operation in choosing a solution adapted to its needs and its position in the supply chain for fruits and vegetables. This guide is distributed and made available to producers and distributors through their associations.