

# Methods and Experiences in the Development and Testing of Agricultural Survey Questionnaires

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## 1. Introduction

For over ten years, the Questionnaire Design Resource Centre (QDRC) of Statistics Canada has used cognitive interviews and focus groups in the development and testing of agricultural survey questionnaires, including the following surveys (the years of testing are in parentheses):

- *Farm Financial Survey* (1992, 1995, 2002, 2003 and 2004)
- *Farm Inputs Management Survey* (1995)
- *Survey of Fall Fruits and Vegetables* (1996)
- *Survey of the Aquaculture Industry* (1997)
- *2001 Census of Agriculture* (1998-99)
- *2006 Census of Agriculture* (2003)
- *Wage Survey of Seasonal Employees in the Agriculture Sector* (2003)
- *Cattle Survey* (2004)
- *Crop Protection Survey* (2004-2005)
- *Tillage Practices Survey* (2005)

The cognitive methods most frequently used by the QDRC are concurrent and retrospective think-aloud interviews. Focus groups are often used to complement the cognitive interviews. These methods have been adapted from those used to test household and business survey questionnaires.

## 2. Special Considerations in Testing Agricultural Survey Questionnaires

In the testing of agricultural survey questionnaires, special considerations that the QDRC takes into account are the response process, the complexity of agricultural concepts and terminology, the recruitment of respondents, the appropriateness of using cognitive interviews versus focus groups, and the rural setting and scheduling of the cognitive interviews and focus groups.

### 2.1 Response Process

The model of the response process for questions that are asked in household surveys involves understanding the question, recalling/retrieving the information requested, thinking about the answer and making a judgment about what is the right answer, and responding. As in business surveys, there are differences in this response model for agricultural surveys. The major difference is that agricultural respondents may have to access one or more information sources as farming records and financial statements. The ability of respondents to retrieve the requested information depends upon their familiarity with and understanding of the information source. They must also understand the relationship between the survey questions and the data source. Multiple sources of information add to the difficulty or complexity of this task. Further complexities may be introduced if, instead of accessing records or statements, the respondent has to consult another individual such as a farm manager or an accountant, who can better provide the

requested information.

In testing agricultural survey questionnaires, emphasis is placed on assessing the compatibility of the time reference periods, question wording and response categories with the record-keeping practices used by agricultural operators. Testing determines the extent to which they use memory recall versus their farming records and financial statements as well as the degree of difficulty in accessing these records and providing the requested information.

## **2.2 Type and Complexity of the Information**

The subject matter of agricultural surveys typically involves complex agricultural concepts and terminology that may vary from one type of farming operation to another and from one region to another. It is very important, therefore, to investigate agricultural operators' understanding and interpretation of the survey concepts and terminology. Furthermore, the QDRC consultants who are interviewing respondents and moderating focus groups should be familiar with the relevant agricultural concepts and terminology which are usually unique to a particular survey. In this regard, experience has shown that it is useful to prepare a glossary of relevant agricultural terms and practices. Also, it is helpful to have an observer present at the cognitive interviews and focus groups who is very knowledgeable about the survey concepts and terminology, and who can take accurate notes.

## **2.3 Recruitment of Respondents**

Respondents are selected from Statistics Canada's Farm Register which is a comprehensive listing of all agricultural operations in Canada collected at the time of the most recent *Census of Agriculture* and updated regularly through information collected by other agricultural surveys. The following characteristics are taken into consideration when recruiting respondents. They are determined through the information on the Farm Register and verified through a screening questionnaire at the time of recruitment. In a typical study, characteristics include most or all of the following:

- Type of agricultural operation (e.g., beef, dairy, hog, crops, fruit, vegetable, greenhouse)
- Operating arrangement (i.e., sole proprietorship, spousal partnership, other family partnership, family corporation, non-family partnership/corporation)
- Size of agricultural operation (as defined by the gross farm income, number of employees or number of livestock)
- Geographic region
- Age of agricultural operator (e.g., less than 35 years, 35-54 years, and over 54 years)
- Men and women
- Education (i.e., did not complete high school, completed high school, college/university education)
- English and French

The following types of persons are excluded from testing, although the specific exclusions may vary from one study to another:

- Employees of Statistics Canada and Agriculture and Agri-Food Canada, and members of their immediate families
- Persons who work in market research, marketing, advertising or the media, and members of their immediate families
- Persons who have taken part in a focus group in the previous 12 or 24 months

- Persons who have taken part in previous cognitive interviews or focus groups conducted by Statistics Canada
- Persons who contact the recruiter directly requesting to participate

The specifications for recruiting respondents and focus group participants are determined in consultation with the project team. For each agricultural operation contacted, the person selected to participate in the testing is the person who usually completes questionnaires for Statistics Canada and/or who can best provide the type of information being collected.

In accordance with Statistics Canada's confidentiality requirements, all recruiting takes place on Statistics Canada premises. Participation rates in testing generally range from about 85 to 95 percent. For this reason, some over-recruiting is done. Typically, one or two additional persons per region are recruited for the cognitive interviews. For the focus groups, over-recruiting (i.e., an additional two or three persons) is done to ensure that at least 9 or 10 persons attend each group. Every person recruited is contacted by telephone at least 24 hours in advance of the scheduled interview or focus group time to confirm attendance.

#### **2.4 Appropriateness of Using Cognitive Interviews versus Focus Groups**

A limitation in conducting focus groups with agricultural operators is that most of the participants usually know one another as friends, neighbours or members of agricultural associations. Whereas it is very easy to ensure that participants do not know one another when recruiting household and business respondents for focus groups that take place in urban areas, it is considerably more difficult to ensure this when recruiting persons who live in rural areas. For this reason, and due to the other difficulties in organizing focus groups with agricultural operators such as the travel distances and lack of observation facilities, the QDRC generally prefers to use cognitive interviews during the development and testing of agricultural survey questionnaires. Nevertheless, the QDRC's experience is that focus groups are very useful in complementing the cognitive interview findings. Focus groups are also very useful in studies that involve content determination and investigations into the feasibility of collecting certain types of data and the appropriateness of proposed collection methodologies.

#### **2.5 Rural Setting and Scheduling of Cognitive Interviews and Focus Groups**

The rural setting of the respondent population presents unique challenges. In most situations, a focus group room with observation facilities is not available in rural areas. Due to the relatively lengthy travel distances for respondents to come to a central interview location, cognitive interviews almost always take place at the site of the agricultural operation – usually in the respondent's home or farm office. Furthermore, conducting the cognitive interviews at the farm location makes it easier to schedule appointments and ensures a higher participation rate, especially during the busy seasons of planting and harvesting. It also allows the respondent to have access to records. Interviewing on site provides the interviewer and observer with the opportunity to observe the farming location and, thereby, get a more complete understanding of how well the survey questions capture information about the operation.

In scheduling the cognitive interviews, adequate allowances have to be made to travel between interview sites. Most cognitive interviews take about 60 to 90 minutes, and another 30 minutes is allowed for travelling to the next location. Thus, a typical day of interviewing involves two interviews in the morning and two interviews during the afternoon, for a total of four interviews per day. Interviews may begin as early as 8:00 a.m. and end as late as 5:30 p.m., with at least 60 to 90 minutes scheduled for lunch. Interviews are scheduled to take place in the same general

area each day, so that travelling times are not too long between each appointment. Occasionally, an interview is scheduled during the evening, provided that it is still daylight to make the location easy to find and that the driving distance is relatively short.

When focus groups take place, they are almost always held in a meeting or conference room at a local hotel or motel. A focus group facility is only used if one is located in a nearby urban location. Focus groups last a maximum of two hours and are scheduled to take place during the evening (usually at 7:00 p.m.), which is the most suitable time for agricultural operators who are busy earlier in the day. Evening focus groups also allow the QDRC consultant to conduct at least two cognitive interviews earlier in the day. Focus groups may be held from Monday to Thursday, but Friday is generally not a good day because of family and social activities. On a few occasions, focus groups have taken place on Saturday afternoons in an urban location. Saturday has been well liked by the focus group participants because they can drive while it is still daylight and because it gives them the opportunity to do something else such as shopping or entertainment while they are in the city.

### 3. Examples of Recent Projects

#### 3.1 2006 Census of Agriculture, Modular Content Test

The *Census of Agriculture*, conducted every five years by Statistics Canada, provides data on Canadian agriculture by collecting information on agricultural land use, crops, livestock, land management practices, paid labour, capital and finances. Work on developing the *2006 Census of Agriculture* questionnaire began in the fall of 2002 with the organization of a series of content workshops across Canada. These workshops obtained feedback from data users regarding proposed changes to the 2006 questionnaire in order to meet their projected data needs. Following these workshops, question modules were developed and tested in the Modular Content Test in January and February 2003.

During the Modular Content Test, the QDRC conducted cognitive interviews and focus groups to test the content, wording, question format and response categories for new and revised question modules for the *2006 Census of Agriculture*. Testing took place in two phases. Some modules were only tested during one phase, while others were tested in both phases, with revisions being made following the first modular test.

The Modular Content Test involved a thorough examination and review of the proposed question modules with selected farm operators in 7 regions across Canada. The consultations involved a combination of 106 concurrent think-aloud interviews and 7 focus groups that are summarized in Tables 3.1 and 3.2.

**Table 3.1 Cognitive Interviews 2006 Census of Agriculture, Modular Content Test, Phases 1 and 2**

Phase	Region	No. of cognitive interviews
1	Fredericton-Woodstock area, New Brunswick	14
	Essex-Kent Counties, Ontario	15
	Swift Current area, Saskatchewan	16
	Lethbridge area, Alberta	14
2	Annapolis-Kings Counties, Nova Scotia	16
	Durham County, Ontario	15
	Brandon area, Manitoba	16
<b>Total</b>		<b>106</b>

**Table 3.2 Focus Groups 2006 Census of Agriculture, Modular Content Test, Phases 1 and 2**

Phase	Location of focus group	No. of focus groups	No. of participants
1	Fredericton, New Brunswick	1	12
	Chatham, Ontario	1	10
	Saskatoon, Saskatchewan	1	11
	Lethbridge, Alberta	1	11
2	Wolfville, Nova Scotia	1	11
	Whitby, Ontario	1	9
	Brandon, Manitoba	1	11
<b>Total</b>		<b>7</b>	<b>75</b>

Recruiting was very successful. Among all persons recruited, 96 percent participated in the cognitive interviews and 96 percent attended the focus groups.

Each cognitive interview, conducted by a QDRC consultant, lasted approximately 90 minutes. A representative of the *2006 Census of Agriculture* project team observed each interview. The interviews took place at the site of the agricultural operations. For each agricultural operation visited, the interview took place with the person who usually completes the *Census of Agriculture* questionnaire. In a few cases, cognitive interviews took place with more than one agricultural operator at the same time if this were suggested by the participants themselves (e.g., a husband and a wife, or a father and a son). In these situations, a lot was learned about the completion of the question modules by observing the interaction between the two persons.

During the cognitive interviews, respondents were asked to “think aloud” as they completed each module of the test questionnaire. They provided a running commentary that covered their reactions to the questions and response categories, the ease of completion, the clarity of questions and instructions, the use of terminology, the appropriateness of questions and response categories, and whether the questions were addressing issues that were relevant to them. Modules where difficulties were encountered as well as issues of concern were thoroughly discussed with respondents during and after completion of the form. For certain questions, alternate versions were provided to participants and discussed to determine which version was best. After the interview, every participant received an honorarium of \$40.

Each focus group lasted two hours, and was observed by one to three representatives of the *Census of Agriculture* project team. During the focus groups, participants were given modules to complete one at a time or in combined sets of related modules. Discussion then focused on the modules that had just been completed. The moderator asked probing questions to determine participants’ reactions to the questions and to identify difficulties that they may have encountered while completing each module. As in the cognitive interviews, alternate versions of some of the questions were presented and discussed with the participants. Participants were each given an honorarium of \$60 at the completion of the focus group.

Findings and recommendations from the Modular Content Test led to the development of the Integrated Test questionnaire. This questionnaire covered all the content that was being proposed for the *2006 Census of Agriculture* questionnaire. As a result of the Modular Content Test, it was decided that some of the modules tested would not be included in the 2006 questionnaire. For other modules, revisions were made and they were tested again during the Integrated Test.

### 3.2 2006 Census of Agriculture, Integrated Test

The Integrated Test took place in May 2003 and was designed to replicate the conditions of the *2006 Census of Agriculture* as much as possible, including the month of the year when data collection will take place. The entire questionnaire (i.e., every question module) was tested. The questionnaire was printed in colour and formatted for data capture.

The Integrated Test evaluated the content, wording, question format and response categories of the *Census of Agriculture* questionnaire, determined the willingness and ability of respondents to provide information, and assessed the questionnaire's respondent-friendliness. The mail-back envelope and colour options for the questionnaire were also evaluated.

Testing consisted of 89 retrospective think-aloud interviews and 4 focus groups in 6 regions across Canada. Together with the Modular Content Test, this meant that testing took place in all Canadian provinces with 312 agricultural operators. Tables 3.3 and 3.4 summarize the number and location of the cognitive interviews and focus groups.

A total of 93 percent of the persons recruited for the cognitive interviews and 89 percent of those recruited for the focus groups actually participated. The participation rates, although high, were somewhat less than in the Modular Content Test since the Integrated Test took place during the planting season.

The Integrated Test questionnaire was sent by courier to all respondents about 9 or 10 days prior to the scheduled interview or focus group time. Respondents completed them prior to the interviews and focus groups.

The cognitive interviews took place at the site of the agriculture operation, and were conducted by a QDRC consultant and observed by a representative of the *Census of Agriculture* project team. As in the Modular Content Test, the interview took place with the person who usually completes the *Census of Agriculture* questionnaire. In a few cases, cognitive interviews took place with more than one agricultural operator at the same time.

**Table 3.3 Cognitive Interviews 2006 Census of Agriculture, Integrated Test**

Region	No. of cognitive interviews
Avalon Peninsula, Newfoundland	6
Queens County, Prince Edward Island	17
Chaudière-Appalaches, Québec	18
Montérégie, Québec	17
Bruce County, Ontario	16
Lower Fraser Valley, British Columbia	15
<b>Total</b>	<b>89</b>

**Table 3.4 Focus Groups 2006 Census of Agriculture, Integrated Test**

Location of focus group	No. of focus groups	No. of participants
Charlottetown, Prince Edward Island	1	11
Montmagny, Québec	1	10
St-Hyacinthe, Québec	1	12
Abbotsford, British Columbia	1	9
<b>Total</b>	<b>4</b>	<b>42</b>

During the cognitive interviews, the completed questionnaire was reviewed retrospectively, one module at a time, with each respondent. While reviewing the questionnaire, respondents provided comments about their reactions to the questions and response categories, the ease of completion, the clarity of questions and instructions, the use of terminology, the appropriateness of questions and response categories and whether the questions were addressing issues that were relevant to them. Areas of the questionnaire where difficulties had been encountered as well as issues of concern were thoroughly discussed with respondents. Each cognitive interview lasted about 90 minutes. Every respondent received an honorarium of \$40.

Each focus group lasted two hours, and was observed by one to three representatives of the *Census of Agriculture* project team. During the focus groups, the completed questionnaires were reviewed, one module at a time or in groups of related modules. The moderator asked probing questions to determine participants' reactions to the questions and to identify difficulties that may have been encountered while completing the questionnaire. Each focus group participant received an honorarium of \$60.

### **3.3 2005 Crop Protection Survey (Pesticide Use Survey)**

Statistics Canada is developing a new survey on pesticide use for Agriculture and Agri-Food Canada. The survey will collect information on pesticide use for the 2005 growing season. The QDRC, in cooperation with Études socio-graphiques inc., conducted focus group consultations (Phase 1) on proposed survey concepts and questions for the *Pesticide Use Survey* during November and December 2004. The QDRC later tested the survey questionnaire (Phase 2) using cognitive interviews in March 2005.

Phase 1 investigated the appropriateness and applicability of the survey concepts and content with respondents. A total of 9 focus groups took place in 4 regions across Canada. Focus group participants were a representative selection of the following types of farming operations: field crops, fruit and vegetable, and greenhouse and nursery. Project team members from Statistics Canada and Agriculture and Agri-Food Canada observed all the focus groups.

Focus group participants were asked for their reactions and feedback to specific concepts and terminology being considered for the *Pesticide Use Survey*. Participants were provided with survey topics and data to be collected in order to determine their ability and willingness to report the requested information. An important part of the discussion concerned the availability of information on the use of pesticides and farm operators' record-keeping practices, including how they record information on pesticide use and what type and detail of information they record. The most appropriate data collection methodology that would help ensure the collection of accurate and reliable data on pesticide use was also discussed during the focus groups, as well as what would motivate agricultural operators to participate in the survey.

Table 3.5 summarizes the locations and number of participants at each focus group according to the type of operation. Approximately 88 percent of persons who were recruited attended the focus groups. The main reasons for not attending were hesitancy to participate due to the sensitive subject matter of pesticide use and the time of the year (i.e., winter weather and the Christmas season).

**Table 3.5 Focus Groups Questionnaire Development for the 2005 Pesticide Use Survey, Phase 1**

<b>Location of focus group</b>	<b>Type of operation</b>	<b>No. of focus groups</b>	<b>No. of participants</b>
Saint-Jean-sur-Richelieu, Québec	Field crops	1	8
	Fruit and vegetable	1	8
Welland (Niagara Region), Ontario	Field crops	1	13
	Fruit and vegetable	1	11
	Greenhouse and nursery	1	10
Red Deer, Alberta	Field crops	2	21
Abbotsford, British Columbia	Fruit and vegetable	1	10
	Greenhouse and nursery	1	6
<b>Total</b>		<b>9</b>	<b>87</b>

Each focus group lasted two hours, and was observed by two to three representatives of the project team. Every focus group participant received an honorarium of \$60 after the completion of the focus group.

The focus groups were very successful in identifying important issues about the proposed survey, especially information on the types of records that are kept on pesticide use and the type of data that are possible to collect. The groups also identified concerns relating to the sensitivity surrounding the use of pesticides and response burden. One of the findings of the focus groups was that the survey's title – the *Pesticide Use Survey* – was viewed very negatively by the focus group participants. In one of the early focus groups, someone suggested that the survey should be re-named to be the *Crop Protection Survey*. The name change has subsequently been made and is being received much more positively by agricultural operators.

The findings of the Phase 1 focus groups were then used to develop the questionnaires that were tested during Phase 2. In the second phase, separate questionnaires were tested for field crops, fruit producers, and vegetable producers. Testing of a questionnaire for greenhouse vegetable operations also took place.

A total of 48 concurrent think-aloud interviews in four regions across Canada were conducted during Phase 2. Table 3.6 summarizes the cognitive interviews according to region and the type of operation. Interviews were completed with approximately 96 percent of the persons who were recruited.

**Table 3.6 Cognitive Interviews Questionnaire Testing for the 2005 Crop Protection Survey, Phase 2**

<b>Region</b>	<b>Type of operation</b>	<b>No. of cognitive interviews</b>
Kings County, Nova Scotia	Field crops	2
	Fruit	6
	Vegetable	3
Lanaudière, Québec	Field crops	2
	Fruit	3
	Vegetable	8
Welland (Niagara Region), Ontario	Fruit	5
	Vegetable	3
	Greenhouse vegetable	5
Saskatoon, Saskatchewan	Field crops	11
<b>Total</b>		<b>48</b>

In the actual survey, due to the complex nature and detail of the survey questions and the need to refer to pesticide records, the questionnaire will be mailed in advance to the respondent who will later be contacted and visited by an interviewer to collect the information on a face-to-face basis. During testing, this data collection method was replicated as closely as possible. Respondents were visited at their place of residence or farm operation. When the interview time was confirmed 24 hours in advance by the recruiter, they were asked to have their pesticide use records available for the interview. During the interview, the QDRC consultant provided the respondent with a copy of the questionnaire and asked the questions as the respondent followed along.

The cognitive interviews explored respondents' understanding of the questions and response categories, their ability to retrieve and provide the requested information contained in their records on pesticide use, the flow of the questions, the appropriateness and completeness of the response categories, and the respondent-friendliness and interviewer-friendliness of the questionnaire. Each interview lasted from one to two hours. Respondents each received an honorarium of \$40. A representative of the project team observed every interview.

#### **4. Concluding Remarks**

The use of cognitive interviews and focus groups in the development and testing of agricultural survey questionnaires has been very effective in determining the content for surveys, identifying potential problems with questionnaires, providing recommendations for question wording and response categories, and contributing to the design of respondent-friendly and interviewer-friendly questionnaires. The QDRC's experience is that farm operators are very cooperative in participating in cognitive interviews and focus groups, and that they provide valuable information and insights about how questionnaires are performing. They appreciate the fact that Statistics Canada is consulting with them.

Visiting the farm location has proven to be a very effective part of the cognitive interviewing methodology. However, there is an increasing trend for agricultural survey clients to ask the QDRC to test questionnaires over the telephone instead of visiting the farm site, mainly due to time and budget constraints. Examples are the testing that took place during the last three years for the *Farm Financial Survey* and the *Cattle Survey*. It is the QDRC's experience that attempting a cognitive-type interview over the telephone is not nearly as effective as face-to-face cognitive interviews. Visiting the respondent at the farm location provides more time to consult with the respondent and leads to a more in-depth discussion. Moreover, the QDRC consultant and project team representative are able to directly observe respondents in their own setting as they complete the questionnaire. This is invaluable since it allows them to get an understanding of how well the survey questions capture information about the operation. For future questionnaire testing projects, the QDRC strongly recommends that cognitive interviews be conducted on a face-to-face basis wherever feasible.