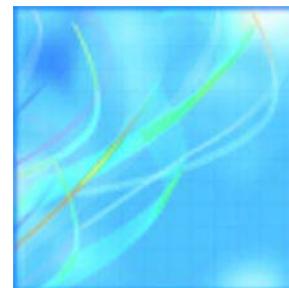


Technical paper

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Agricultural Water Use Survey 2007, Methodology Report



by Marie-Ève Poirier

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Agricultural Water Use Survey 2007, Methodology Report

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- .. not available for a specific reference period
- ... not applicable
- 0 true zero or a value rounded to zero
- 0^s value rounded to 0 (zero) where there is a meaningful distinction between true zero and the value that was rounded
- p preliminary
- r revised
- x suppressed to meet the confidentiality requirements of the *Statistics Act*
- E use with caution
- F too unreliable to be published

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Summary

In 2008, Statistics Canada conducted the first Agricultural Water Use Survey. As part of the Canadian Environmental Sustainability Indicators initiative, this pilot survey was intended to collect information about the volume of water used for irrigation, irrigated area, irrigation practices and the quality of on-farm water. This technical paper describes the methodology used for the pilot survey, including recommendations for future cycles of the survey. Validation of the results suggests that the method used underestimates the volume of water used and the irrigated area. The recommendations in the report are intended to mitigate that bias in future iterations of the survey. The preliminary recommendations are to simplify the level of information collected by the survey; revise the sampling method; and explore other ways of collecting information about the volume of water used for irrigation. This pilot version of the survey is nevertheless a reliable, consistent source of data on agricultural water use.

Agricultural Water Use Survey 2007, Methodology Report

by Marie-Ève Poirier

1 Introduction

Water is an essential input in agriculture. In particular, it is used for irrigation to compensate for insufficient precipitation. It is also used to apply pesticides and other fluids to protect crops, clean equipment and facilities, wash products and process products on site (canning, for example). Water is used in livestock farming to water animals, clean facilities, and wash and disinfect equipment such as milk lines, milking rooms, pails and tanks. It may also be used in harvesting, for example, to flood a cranberry field (Statistics Canada, 2009).

In some areas, crop farming gets its water exclusively from precipitation, while in others, it depends heavily on irrigation. This may be due to climatic factors and crop requirements or to a desire to increase crop yields. According to the most recent national estimates, which date back to 2001, the agricultural sector accounted for about 10% of the water captured in Canada (Beaulieu, Fric and Souldard, 2007).¹ And agriculture has expanded considerably over the last few decades. For example, between 1986 and 2006, cultivated land area grew by 8%, while irrigated area expanded by 13%, according to data from the Census of Agriculture.

Hence, the availability of water resources is essential to agriculture. As is the case for other uses, using water for agricultural purposes can alter its quality. The application of nutrients in the form of chemical fertilizers, manure, compost and sewage sludge to improve the productivity of cultivated land may have an impact on water quality. Run-off from fields and removal of vegetation from the banks of water courses can result in high turbidity (suspended solids), pathogens and pesticide contamination. Between 1980 and 2005, farm expenditures on chemicals such as herbicides, insecticides and fungicides increased by 121%, compared with 54% for chemical fertilizers. Over the same period, the fertilized area grew by 37% to 250,000 km² at the national level (Statistics Canada, 2007, *Canadian Environmental Sustainability Indicators: Socio-economic Information*).

To gain a clearer understanding of the impact of these changes, Statistics Canada conducted its first agri-environmental management survey in 2001.² In particular, the survey examined the methods used to protect natural bodies of water and manage water used directly on Canadian farms for agricultural and domestic purposes, though it did not collect information about the volumes of water used, irrigation systems used, water sources and water quality. In 2007, Statistics Canada published estimates of the volume of water used in agriculture at the national level for the 2001 reference year (Beaulieu, Fric and Souldard, 2007). The volume of water used for irrigation was estimated through modelling, based on 2001 Census of Agriculture data and crop irrigation coefficients. While the census data are some of the most precise data available, the coefficients are based on average weather conditions and are available only for certain types of crops. In addition, the available data vary from province to province, which means that there are some gaps in interprovincial comparability and consistency.

The Agricultural Water Use Survey was developed to remedy some of these statistical gaps. This document is a technical report that describes the survey's objectives and scope in detail, documents its design and the challenges encountered, reviews the sample design, collection process and database, and concludes with the survey's results. The report also contains recommendations for improving the results for future cycles of the survey.

1. In Canada, 40 billion cubic metres of water were extracted from surface and underground sources exclusively for industrial purposes in 2005 (Statistics Canada, 2007, *Industrial Water Use*, Catalogue no. 16-401-X).

2. Statistics Canada, 2001, *Farm Environmental Management in Canada*, "Water Management on Canadian Farms," Catalogue no. 21-021-MIE20070001.

2 Objective and scope of the survey

The Agricultural Water Use Survey (AWUS) is a pilot survey conducted from 2006 to 2008 to collect information about water use in agriculture, including the volume of water used for irrigation, irrigation methods and practices, and the sources and quality of water used for agriculture on Canadian farms. The reference period is the 2007 growing season.

The survey was developed in conjunction with Environment Canada and Agriculture and Agri-Food Canada. The two departments shared their expertise on environmental and agri-food issues, and they took advantage of the opportunity to collect some data for themselves. Data-sharing agreements were concluded with those departments and with various provincial agencies, with a view to maximizing the usefulness of the survey results.

The AWUS is part of the Canadian Environmental Sustainability Indicators (CESI) initiative. Data on the quality of water used in agriculture were collected for use in CESI reports. The data will also be used by Agriculture and Agri-Food Canada to support the development of water use policies and the creation of programs for irrigators in Canada. In addition, Statistics Canada will use the information collected to fine-tune the modelling of irrigation water volumes by crop type, which is used in the system of national water accounts.

3 Design of the survey

3.1 Consultations and questionnaire development

In June 2006, Statistics Canada held consultations with Environment Canada and Agriculture and Agri-Food Canada to determine their needs for statistics on agricultural water use. The purpose of the consultations was to develop a single survey for the three departments, which would reduce the response burden for agricultural operators, who are already heavily surveyed. The consultations showed that the highest demand was for data on the volumes of water used in agriculture, the various uses of water in agriculture, the types of crops that are irrigated, the irrigated area, the types of irrigation systems used, the presence of drainage systems on farms to remove excess water, irrigation practices that save water and energy, the sources of water used for irrigation, and the quality of on-farm water.

After the data needs were determined and the survey method was selected, Statistics Canada's Agriculture Division prepared an initial draft of the survey questionnaire with the assistance of Environment Accounts and Statistics Division and the other departments involved. The team from Statistics Canada's Questionnaire Design Resources Centre was brought in and made recommendations for improving the intelligibility of the questions. The questionnaire was then tested on focus groups of farmers who practise irrigation in several locations across Canada: Kelowna, British Columbia; Lethbridge, Alberta; Brantford, Ontario, and Saint-Hyacinthe, Quebec. The questionnaire was revised in light of the comments received. The second draft of the questionnaire underwent testing. One-on-one cognitive interviews were conducted with irrigators to collect their impressions and make further improvements in the questionnaire. As a result, some questions were reworded to make them easier to understand, and the questionnaire was reorganized to promote recall of the required information.

Because of the questionnaire's complexity, the option of mailing it out was rejected. It was decided that the survey would be conducted by computer-assisted telephone interview (CATI).

3.2 A complex questionnaire for a complex issue

Agricultural practices vary from region to region in Canada. In Alberta, for example, irrigation districts distribute water to most farms that irrigate their crops. In Eastern Canada, on the other hand, there are no irrigation districts; farmers supply their own water. In some provinces, the quantities of water used for irrigation are controlled by a permit system. There are also differences in irrigation systems used, crops irrigated and units of measure across the country. Thus, one of the first challenges was to develop a single understandable questionnaire that would reflect reality in every region, with concepts that could be used in every part of Canada, in both official languages.

Some information remained difficult to obtain, despite efforts to develop a questionnaire that would be intelligible to all respondents. That was the case for the survey's most important variable: volume of water used for irrigation.

A copy of the questionnaire can be seen at the end of this report (pdf version) or in the Integrated Metadatabase (IMDB) survey number 5145.

3.2.1 Volume of water

The irrigation systems used by most farmers are not equipped with water meters. As a result, it is impossible to measure directly the volume of water applied to the fields. On the other hand, some farmers had a fairly precise idea of the number of times they had irrigated and the depth of the water applied in each irrigation event, or how long their irrigation systems had been in operation.

To assist in recalling the information, the questionnaire was constructed to provide respondents with various ways of answering (see Figure 1 and the questionnaire at the end of the report or IMDB survey number 5145). First, the respondent was asked the names of the crops grown on the farm (Question 6). The list of names was then used in the next question, which asked for more information, such as the crop area and the irrigated area, the yield of each crop reported, whether irrigated or not, the quality of the water used on the farm, the volume of water applied and the irrigation systems used. The survey also collected information about non-irrigated crops so that the irrigated and non-irrigated yields of the same crop in the same region could be compared.

In addition to collecting information about crops and the volume of water used, the AWUS attempted to identify the prevalence of the various types of irrigation systems. Since more than one irrigation system can be used on the same crop, the questionnaire asked for the volume of water applied and the irrigated area for each system and each crop irrigated.

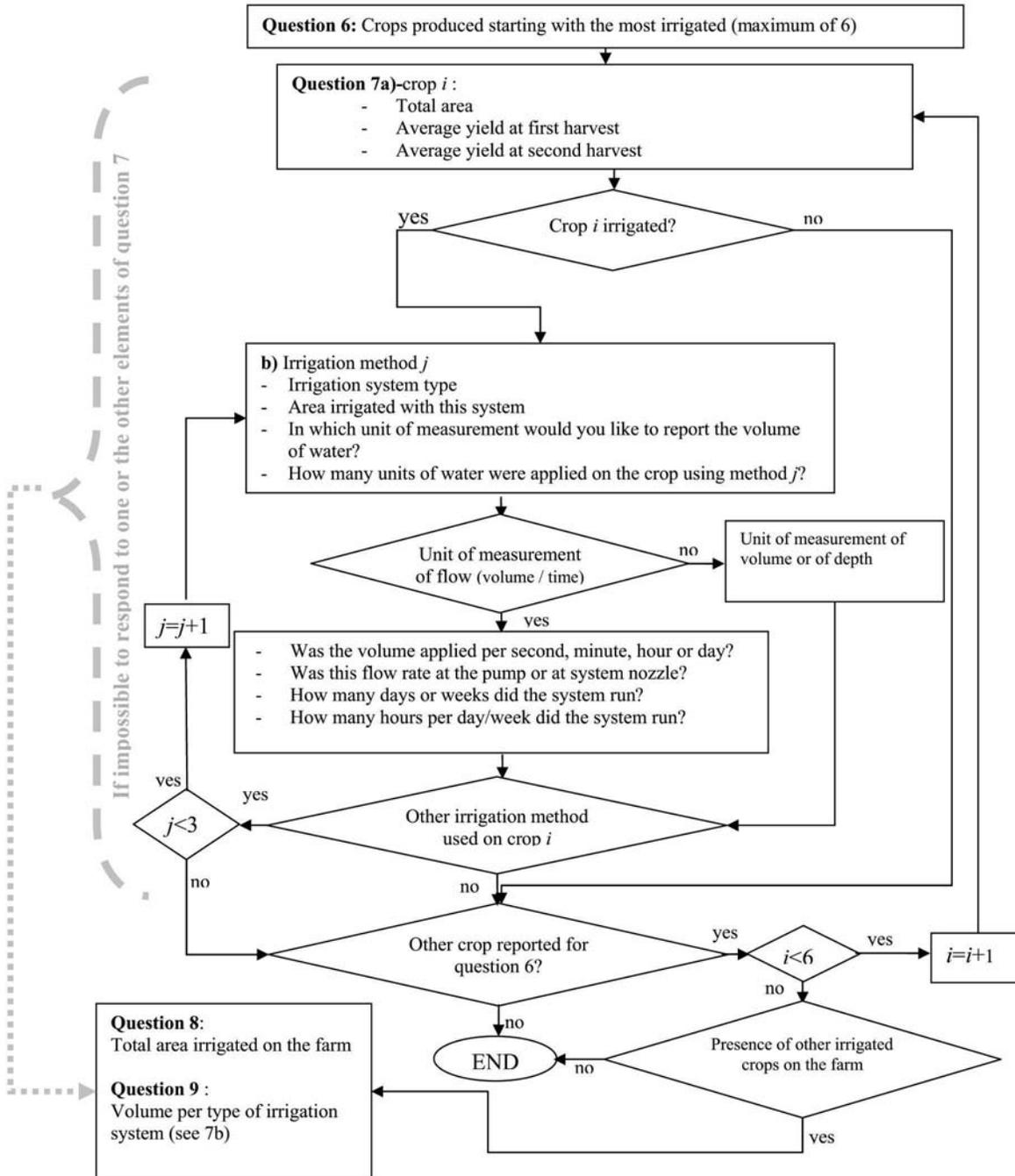
By splitting up the question in order to obtain a volume from the respondent, we collected a great deal of detailed information about irrigation practices. However, this approach made the interviews tedious for agricultural operations with a variety of crops and several irrigation systems.

For some respondents, it was difficult to provide responses for each crop type. This was especially true for market gardeners, who often grow a wide variety of vegetables, some of them interspersed in the same fields. If more than six crops were irrigated on the farm during the reference period, or if the respondent was unable to complete Question 7, which asks for the volume of water used for each crop and each type of irrigation system, the respondents were directed to two more general questions (Figure 1, Questions 8 and 9).

Farming practices vary from place to place. So do the units of measure used. To make the questions easier to answer, respondents were given the choice of several units of measure: water depth per surface area (inches, millimetres per hectare, acre), volume (gallons, litres, cubic metres, etc.), flow rate (gallons/hour, litres/second, etc.). For more than 50% of the sample that responded to the survey, the respondents were able to estimate the volume of water applied in terms of water depth (inches or mm).

Figure 1

Logic model of the questions on volume of irrigation water: Questions 6 to 9 of the Agricultural Water Use Survey



Source(s): Statistics Canada, Environment Accounts and Statistics Division, 2009.

3.2.2 Other data

The questionnaire also had questions on water quality, waste water management, conservation, water sources, water treatment, the presence of a drainage system on the farm, and so on. A number of these questions yielded good results, while others were less productive. For example, the question about treatment of the water used on the farm to improve its quality was well understood, but the question on waste water management proved less effective.

3.3 Recommendations

The aim of the survey was to collect detailed information about irrigation and crops: volumes of water applied, crops irrigated, their yields, the type of irrigation systems used. That information would have provided a clearer picture of the efficiency of farm irrigation systems and irrigation's value added for crop production. However, it is recommended that the complexity of the questionnaire, the timing of the survey and the type of survey vehicle be reviewed in light of the results of the pilot survey.

In designing the survey's next cycle, simplifying the questionnaire should be a priority. Collecting information about irrigation by crop type was too demanding for some respondents. In addition, the current sample size does not yield statistically significant information for that level of detail. It is recommended that the next version of the survey confine itself to estimating irrigation for larger classes, such as fruits, vegetable crops, field crops, hay and improved pasture, and silage. The detailed information collected in the pilot version of the survey will be used to improve the existing irrigation coefficients used as inputs to irrigation models.

Another recommendation has to do with the timing of the survey and the type of survey vehicle. Since most respondents do not have water meters, obtaining information about water volumes is a complex matter. Moreover, asking for that information several months after the events requires additional effort on the respondent's part, which adds another error factor. The survey data suggest that the water volumes and surface areas reported in the AWUS were understated (see section 5). A survey in the form of a diary combined with telephone follow-up might help gather more accurate information. However, it remains to be seen whether such an approach would be accepted by respondents and would be of real value. The topic was discussed in the focus groups on the pilot survey questionnaire. The conclusion was that respondents did not want to answer a survey during their busiest season, but on the other hand, they would like to have reported their irrigation activities as they went along. It is recommended that the feasibility of using a diary to collect irrigation water volumes be studied.

Diaries are already being used in some of Statistics Canada's surveys. For example, Food Expenditure Survey³ respondents have to complete a diary showing their food purchases over a two-week period; respondents of the National Private Vehicle Use Survey⁴ and the Fuel Consumption Survey⁵ also use diaries. The response rates for those surveys range from 56% (for the Fuel Consumption Survey in 1988) to 71% (for the Food Expenditure Survey in 2001, after telephone follow-up). The Canadian Vehicle Survey (CVS) also uses a diary, which respondents have to keep for 28 days. The response rates vary from 50% to 80%, depending on the province and the type of vehicle.⁶ The response rates are lower for those surveys than for the AWUS (81.4% in collection). Some diaries were unusable or were simply not returned.⁷ Moreover, since this type of survey requires an effort throughout the survey period, which in the case of the AWUS is the busiest part of the year, the survey must be designed to minimize response burden.

Another option to consider is to install a water meter specifically for the survey. In theory, this option would provide a more precise measurement. Its feasibility remains to be determined, however.

3. Statistics Canada, 2003, Definitions, data sources and methods: *Food Expenditure Survey (FES)*, survey no. 3503

4. Statistics Canada, 1996, Definitions, data sources and methods: *National Private Vehicle Use Survey (NPVUS)*, survey no. 4407.

5. Statistics Canada, 1988, Definitions, data sources and methods: *Fuel Consumption Survey*, survey no. 3802.

6. Statistics Canada, 2009, Definitions, data sources and methods: *Canadian Vehicle Survey (CVS)*, survey no. 2749, "Canadian Vehicle Survey - Data Accuracy" (http://www.statcan.gc.ca/imdb-bmdi/document/2749_D1_T9_V1-eng.pdf).

7. Statistics Canada, 1988, Definitions, data sources and methods: *Fuel Consumption Survey*, survey no. 3802.

4 Sample design

4.1 Target population and survey frame

The AWUS's sample design was developed by Statistics Canada's Business Survey Methods Division. The target population was made up of all agricultural operations that practise irrigation. The survey population consists of agricultural operations that have at least \$10,000 in gross farm revenues and reported irrigating or having irrigation equipment in the 2006 Census of Agriculture. Excluded from the survey are farms in the territories (Yukon, Northwest Territories and Nunavut), institutional farms (government, university or penitentiary farms), farms on Indian reserves, community pastures, pure hatcheries and farms that produce only Christmas trees.

The survey frame was drawn from the 2006 Census of Agriculture (CEAG) database and contained all agricultural operations that reported having irrigated area or irrigation equipment and meet the criteria outlined above. The survey's sampling unit is the agricultural operation.

In Canada, the proportion of farms that irrigate is relatively low and varies across the provinces by climate and crop type. As shown in Table A, the proportion of irrigators is quite different in British Columbia than in the other provinces, probably because of the type of operations there (mostly orchards and vineyards). The number of greenhouses in British Columbia may also be a factor. Six percent of the agricultural operations in the province reported growing greenhouse products, compared with 2% in Canada as a whole.

Table A
Proportion of irrigated farm operations, 2005

	Farm operation categories		
	Number ¹ of farms in 2006	Number ¹ of operations declaring irrigated areas in 2005	Percentage ² of operations in 2006 that had declared irrigated areas in 2005
	number		percent
Canada	229,373	16,667	7
Newfoundland and Labrador	558	33	6
Prince Edward Island	1,700	55	3
Nova Scotia	3,795	255	7
New Brunswick	2,776	117	4
Quebec	30,675	1,305	4
Ontario	57,211	2,983	5
Manitoba	19,054	241	1
Saskatchewan	44,329	923	2
Alberta	49,431	3,817	8
British Columbia	19,844	6,938	35

1. Statistic Canada, 2006 Census of Agriculture, <http://www.statcan.gc.ca/pub/95-632-x/2007000/4129762-eng.htm> (accessed March 3, 2009).

2. The 2006 Census collects information on active farm operations in 2006, but operators are asked to report the irrigated areas of 2005 because the 2006 growing season is not finished at the time of collection.

Source(s): Statistics Canada, Environment Accounts and Statistics Division, Agricultural Water Use Survey (survey no. 5145).

4.2 Sample size

The sample size, determined essentially by the survey's budget, was set at 2,000 units for the whole of Canada, just under one eighth of the survey's target population. The number of farms in the sample was first distributed among the provinces in proportion to the square root of the number of agricultural operations in each province.⁸ In the case of Newfoundland and Labrador and Prince Edward Island, the initial sample size was so close to the population size that it was decided to survey the whole population for those provinces.

8. Use of the square root diminishes the importance of the largest provinces in the sample allocation while maintaining the proportional relationship among the provinces.

Then the number of farms in each province was allocated across the water use (WU) strata using a multidimensional allocation method. In addition, the sample was coordinated with the samples of other surveys to take into account the overall response burden of units common to various surveys. In other words, in a particular stratum, units whose overall response burden was lower had a greater chance of being selected. Following sample selection, inactive units were replaced with active units to bring the sample size up to 2,000 units for data collection. Inactive units were kept in the samples to represent the survey frame, i.e., to represent unknown inactive units.

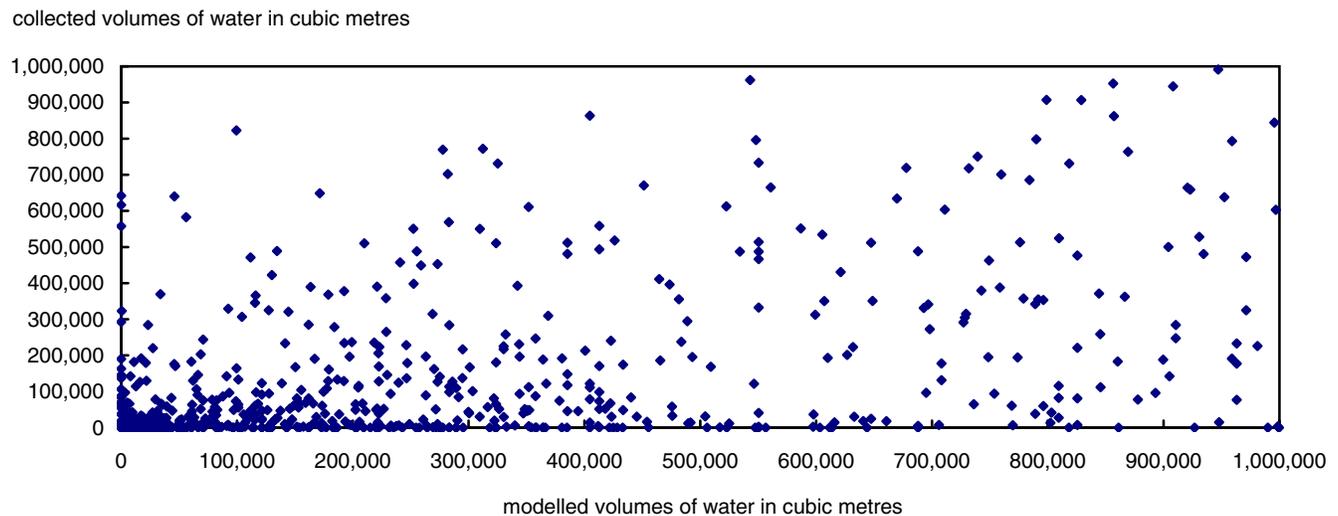
4.3 Stratification

Stratification involves assembling the respondents into homogeneous groups so that a sample can be selected from each group or “stratum”. This reduces the total sample size while minimizing the variance of the estimates produced with the survey data. Stratification also ensures that the various groups of respondents are represented in the overall sample. The survey population was stratified first geographically and then by irrigation water volume, since that is the key variable of interest in the AWUS. The geographic stratification of the population was done on a provincial basis. Originally, AWUS data users preferred a stratification by drainage basin, a geographic unit frequently used in water studies. However, the 2,000 unit sample size in this initial cycle of the survey is insufficient to stratify a national survey by drainage basin.

Since this was the survey’s first iteration, stratification by volume of water used for irrigation was carried out with a modelled variable: “total irrigation water use (WU)”. The WU variable was derived using 2006 CEAG data in an irrigation model developed by Statistics Canada’s Agriculture Division. The model takes account of the province and the area of irrigated crops, adjusted by the ratio of total irrigated area to total area reported. The model uses a logistic regression to determine which crops have the greatest chance of being irrigated, based on the province in which they are located and the presence or absence of specific crops on the farms. Irrigation coefficients were then applied to the crops flagged by the logistical model as being irrigated (Beaulieu, Fric and Soulard, 2007). Irrigation coefficients are available for major irrigated crops.

However, there does not appear to be a direct correlation between the water volumes predicted by the model and those reported by the survey’s respondents (Chart 1). Although there may be many reasons for this discrepancy (e.g., different reference year, imprecision in the irrigation coefficients), improvements will be needed in the model used for stratification. The survey data will help identify a stratification variable that is more strongly correlated to irrigation water volumes.

Chart 1
Modelled volumes of water versus volumes of water reported by respondents



Source(s): Statistics Canada, Environment Accounts and Statistics Division, 2009.

Four water use strata were defined: Nil WU (about 10% of the observations for each province), very high WU (take-all stratum) and two intermediate WU strata. The four strata were observed in every province except Prince Edward Island and Newfoundland and Labrador. Because of the small number of units in those two provinces, only three strata were used; the two intermediate strata were combined.

4.4 Recommendations

In view of the survey results, and in particular the lack of correlation between the modelled values and the survey values, it is recommended that improvements be made in the stratification variable, for example, by improving the water use model or taking another approach.

To satisfy the demand for data by drainage basin, the only option is to increase the sample size, which means increasing the survey's budget. Even so, it will probably remain difficult to produce estimates for some provinces because of confidentiality or data reliability concerns. In some regions, such as the Maritimes, take-all sampling (i.e., all units in the stratum are selected) may be used. That would ensure the reliability of the data.

5 Data collection

A computer-assisted telephone interview (CATI) program was developed to collect the data. It was written and tested by Operations Research and Development Division (now Collection Systems and Infrastructure Division), based on specifications prepared by Agriculture Division and Business Survey Methods Division. It includes automatic data checking functions. For example, an initial verification of the consistency of area data is performed automatically during the interview; the irrigated area for a crop and an irrigation method cannot be larger than the farm's total area or the area reported for that crop. Consistency checks on units of time are also carried out during data capture.

To train interviewers for the survey, a manual containing information about the CATI application, the survey's subject-matter and objectives, and the definitions and concepts used was developed. Each interviewer was given a copy of the manual, which was used in the training period preceding data collection.

The survey was conducted by four separate teams of interviewers:

1. large agricultural operations (12 units) were interviewed by the members of Agriculture Division's Large Agricultural Operation Statistics (LAOS) Unit;
2. agricultural operations in Atlantic Canada were interviewed by the team at the Halifax Regional Office;
3. agricultural operations in the Quebec and Ontario region were interviewed by the team at the Sherbrooke Regional Office; and
4. agricultural operations in the western provinces were interviewed by the team at the Winnipeg Regional Office.

A few days before those teams started the collection process, a letter explaining the survey's purpose and objectives was mailed to all respondents. The letter also contained a description of the type of information being sought (Statistics Canada, 2007, *2007 Agricultural Water Use Survey Interviewer's Manual*). Because the questionnaire was long, complex and designed for a telephone interview, it was not sent to respondents.

The data collection period was from February 2 to March 4, 2008, but most of the interviews had been completed two weeks after the start of collection. The data were collected under the *Statistics Act*, and participation in the survey was voluntary. The survey's net sample was 1,932 units (Table B), and the response rate was 81.4% (i.e., 81.4% of the questionnaires were considered "complete"⁹).

9. A questionnaire was considered complete in three cases: (1) the operation had no cultivated land; (2) the respondent reported not using water for irrigation; or (3) valid responses were entered for all water volume questions.

The survey was well received by respondents, despite the technical nature of the questions.¹⁰ The water volume questions were tedious for respondents (Question 7 in particular; see the questionnaire at the end of the report or IMDB survey number 5145). The interviewers had to probe a great deal to help respondents provide an answer. A number of responses seemed to be very rough approximations, and some respondents chose not to answer those questions. Some respondents also had difficulty answering the questions on the water sources used by the operation (Questions 15-17) and the question on waste water management (Question 20); they did not seem to know what waste water the question was referring to. The variables from that question are not considered sufficiently reliable for analysis.

Table B
Number of questionnaires completed upon collection

	Number of questionnaires
	number
Net sample	1,932
Completed questionnaires	1,563
Partially completed questionnaires	10
Refusal	160
No contact	199

Source(s): Statistics Canada, Environment Accounts and Statistics Division, Agricultural Water Use Survey (survey no. 5145).

5.1 Recommendations

As mentioned previously, the question for which it was hardest to obtain accurate data was Question 7. When asked about the precision of the responses, collection managers at the regional offices pointed out that it had been necessary to probe to obtain an estimate of total water use. The general impression was that the larger operations had a clearer idea of the volumes of water used. In addition, the relevance of collecting information about non-irrigated crops was questioned a number of times, as a result of respondents' comments. It is recommended that the approach used to obtain irrigation water volumes be reviewed. The current method's limitations could be overcome by using other forms of collection (i.e., a diary survey, or installation of water meters with telephone follow-up). These methods will have to be explored in a feasibility study.

It is also recommended that the level of completeness required for a questionnaire to be considered "complete" be revised upward. Since only the water volume questions had to be answered, additional imputation work was needed to compile the survey's database (see the next section on preparation of the database). To minimize the impact that requiring a higher completion rate would have on the response rate, it is recommended that respondents be provided with more information about the survey's objectives in the introductory letter. If respondents have a better understanding of the survey's objectives, the questionnaire completion rate will probably be higher. For example, a summary of Question 7 or an abbreviated version of the questionnaire could be included so that respondents would know the content of the questions in advance and have a better grasp of the interview's structure.

6 Database and preparation of the main estimates

The database associated with the questionnaire is complex, especially as regards the water volume and irrigated area variables. The questions were structured in such a way as to make it as easy as possible to answer them. For example, respondents could select the units of measure (common practice in surveys), and they could answer the

¹⁰ One reason for reticence that was noted by the interviewers has to do with the survey's ultimate goal. Some respondents were reluctant to participate in the survey because they believed it dealt with water conservation, with the ultimate aim of developing regulations governing water use in agriculture. Greater effort should be made to help respondents understand the survey's objectives.

water volume and irrigated area questions in two different ways. All volumes were converted to cubic metres, and all areas to hectares. Units of time for flow rates were all converted to unit of volume selected / second, and times of irrigation system use were all converted to days.

The questionnaire was worded to obtain maximum detail concerning water used for irrigation. For Question 7, that represents 20 variables for each crop and for each irrigation method. Since the questionnaire could accommodate six different crops and three irrigation methods per crop, the database contains 360 different variables for Question 7 alone (see the questionnaire at the end of the report or IMDB survey number 5145). The volume information for each irrigation system used could also be provided in Question 9. As a result, there are 36 variables for Question 9. Irrigation water volumes and irrigated area were derived from those 396 variables.

Total water volume used by each responding unit was computed first with the answers to Question 7 and subsequently with the answers to Question 9. The larger of the two volumes was deemed to be the total volume of water used by the farm to irrigate crops, since preliminary analyses of the survey results indicated a tendency to understate the volumes of water used for irrigation.

Derivation of the irrigated areas was also challenging. The collection of such detailed information about the irrigated areas for each crop type and each irrigation system resulted in a double counting problem, since more than one system can be used to irrigate a field and more than one crop can be interspersed in a field. In fact, Question 8 was intended as a validation tool to check for double counting of irrigated areas, but it was only partly effective because only a fraction of respondents were able to answer it (those who did not answer Question 7 or had more than six crops). To ensure consistency in the data, the sum of the areas irrigated by each irrigation method for a particular crop could not be greater than that crop's total area. If it was, the irrigated area for that crop was imputed with its total area. Total irrigated area for each responding farm was then calculated first with the results of Question 7 and subsequently with the results of Question 9, as was done for water volumes. To maximize data consistency, the figure used for the total irrigated area was based on the same question (Question 7 or 9) as was used for the water volume. Irrigated area by crop type was computed with Question 7 data only, since that question was the only one that provided data on crop types.

Cases where respondents refused permission to share the data with other departments (as specified in the questionnaire) were removed from the database to ensure greater consistency between estimates from the various departments using the survey data.

6.1 Estimates and validation of results

The estimates and the variance were calculated using the appropriate sampling weights, depending on whether they were for water volume variables or not. Because of the complexity of the sample design, the jackknife method was used to compute the variance. All estimates with a coefficient of variation (CV) of 35% or more were considered too unreliable for publication. Estimates with a CV between 25% and 34.99% should be used with caution and are flagged in the results tables. The CVs of the key variables are presented in Table C. In addition, to ensure that respondents cannot be identified from published data, the frequency estimates were subjected to random rounding.

Table C
Coefficients of variation for Agricultural Water Use Survey key variables, 2007

	Number of irrigators	Irrigated area	Volumes of water used
	percent		
Canada	2.76	7.01	6.22
Atlantic region	11.29	12.74	9.67
Quebec	9.24	68.91	19.49
Ontario	7.95	13.25	20.65
Manitoba	11.41	11.26	14.18
Saskatchewan	10.88	25.82	24.04
Alberta	4.74	7.01	7.70
British Columbia	4.50	16.79	11.82

Source(s): Statistics Canada, Environment Accounts and Statistics Division, Agricultural Water Use Survey (survey no. 5145).

The estimates for the survey's key variables (water volumes and irrigated areas) were compared with data from other sources. There is little reliable data on agricultural water use in Canada, but some provinces track the amounts of water used for irrigation. Irrigation experts in British Columbia, Alberta and Saskatchewan were also consulted to validate the AWUS's key data. Some key data were also compared with Census of Agriculture data.

6.2 Data comparisons

6.2.1 Farms that irrigate

The number of agricultural operations is fundamental to the survey's estimates. If the number of irrigators is biased, all of the survey results will also be biased. Consequently, the first comparison performed was between AWUS data and Census of Agriculture (CEAG) data.

The CEAG does not have the same universe of respondents as the AWUS. In fact, the AWUS sample was selected from a subpopulation of the CEAG. Operations with gross revenues of less than \$10,000, operations on Indian reserves or in the territories, greenhouse farms and Christmas tree farms were excluded. In addition, the reference year is 2005 for the CEAG¹¹ and 2007 for the survey. Nevertheless, the order of magnitude of the values for number of irrigators and irrigated area should be comparable. The CEAG data were therefore used to validate the number of irrigators and the irrigated areas.

At the national level, there is a difference of about 37% between the CEAG data and the AWUS data in the number of operations that reported irrigating their crops (Table D). As mentioned previously, however, the survey covers only a subpopulation of irrigators; for example, only farms with gross revenues above \$10,000 are included in the survey. Now, 35.8% of farms in Canada have gross revenues of less than \$10,000 (Statistics Canada, 2009). Since farm revenues have to be high enough to invest in an irrigation system, the proportion of irrigators is expected to be smaller in the population of agricultural operations with revenues of less than \$10,000 than in the total population of agricultural operations. It is also important to note that there are other differences between the survey and the CEAG, such as reference year, and that those differences also affect data comparability.

11. The Census of Agriculture was conducted in 2006, but the reference period for the question on irrigated area is 2005.

Table D
Number of farms that irrigated their crops in Canada, 2005 and 2007

	Number of operations with irrigated crops, or with pre-seeding or post-harvest irrigation in 2007	Number ¹ of operations declaring irrigated areas in 2005
	number	
Canada	10,470	16,667
Atlantic region	280	460
Quebec	955	1,305
Ontario	1,990	2,983
Manitoba	155	241
Saskatchewan	695	923
Alberta	2,920	3,817
British Columbia	3,470	6,938

1. Statistic Canada, 2006 Census of Agriculture, <http://www.statcan.gc.ca/pub/95-632-x/2007000/4129762-eng.htm> (accessed March 3, 2009).

Source(s): Statistics Canada, Environment Accounts and Statistics Division, Agricultural Water Use Survey (survey no. 5145).

6.2.2 Irrigated area in Alberta

In the last CEAG, agricultural operations reported irrigating 536,584 hectares in 2005, over 100,000 hectares more than the AWUS estimate for 2007. As in the case of the number of farms that irrigate, the CEAG data cover a different period and a different universe from the AWUS. Irrigated area remains fairly steady from one CEAG to the next, except in Alberta, where the area is growing (Chart 2). However, that slight increase does not account for the 100,000 hectare difference between the two data sources.

In Alberta, the estimate of irrigated area is based on irrigation permit applications by agricultural operations. Since there is a fee for each acre irrigated, the area is not likely to be overstated.

The CEAG and the Alberta permits data provide different estimates of the province's irrigated area (see Table E). The AWUS figure is 20% to 30% lower than the provincial figure and the CEAG figure. Hence, the discrepancies between the three data sources are substantial. This illustrates the difficulty of assessing the reliability of agricultural water use data.

Table E
Comparison of key data from the Agricultural Water Use Survey, from various sources, in Alberta¹, 2007

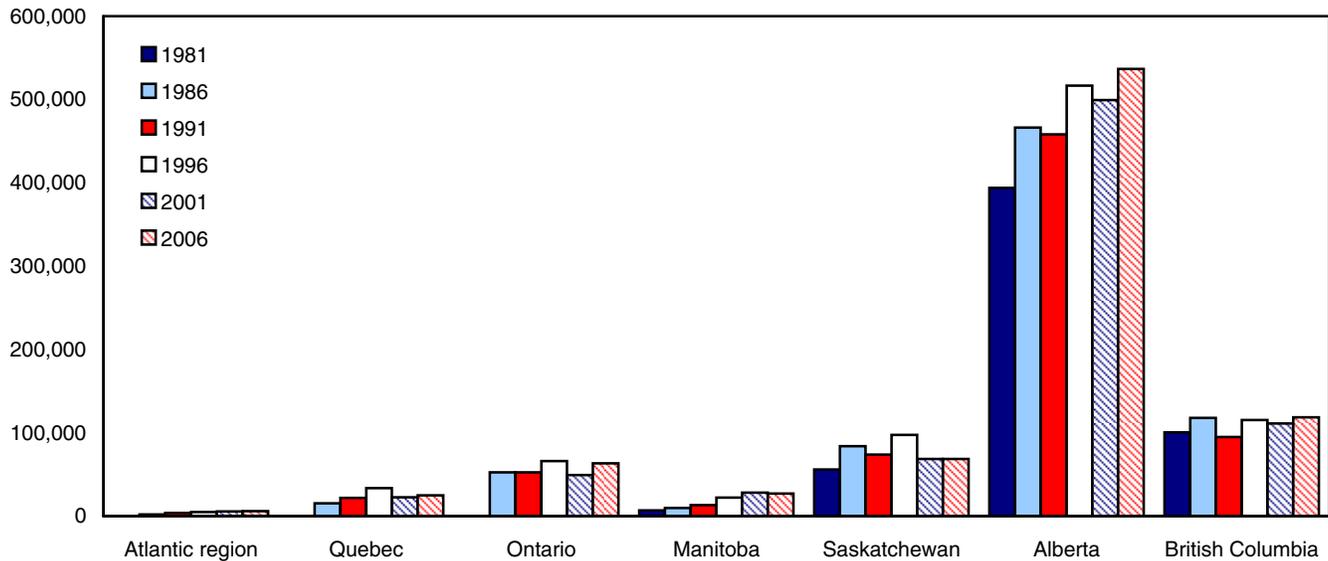
	AWUS, 2007	Provincial ² experts, 2007	CEAG, 2006	Difference between AWUS data and provincial data	Difference between AWUS data and CEAG data
					percentage difference
Number of irrigators	2,920	.	3,817	.	24
Irrigated area (hectares)	430 969	614 643	536 584	30	20
Volumes of water for irrigation (cubic meters)	1,098,000,000	1,567,500,000	.	30	.

1. Data from different sources are not directly comparable. The AWUS universe only has one irrigator sub-population (see section 3); the numbers from provincial experts tend to represent the entire irrigator universe for the province, as is the case for the Census of Agriculture (CEAG); and, CEAG provides the accounts for the 2006 year, the areas irrigated in 2005, while the two other sources refer to 2007. These data are compared to check the survey data against other existing sources for validation purposes only.
2. Alberta data from provincial experts were divided by 80% because they were provided by irrigation district only, and represent 80% of all irrigation in Alberta. (Irrigation Water Management Study Committee, 2002).

Source(s): Statistics Canada, Environment Accounts and Statistics Division, Agricultural Water Use Survey (survey no. 5145).

Chart 2
Irrigated area, 1981 to 2006, Census of Agriculture

irrigated area in hectares



Source(s): Statistics Canada, Census of Agriculture.

6.2.3 Irrigation water volumes

With regard to the volume of water used for irrigation, the differences between the survey’s estimates and the ones from provincial sources are quite substantial (see Table E). The water volumes provided by Alberta are based on flow rates measured at headworks. According to Alberta Agriculture and Rural Development (2008), 1,900 million cubic metres of water were measured at headworks in 2007. To be comparable to AWUS data, that measurement must be adjusted for uses other than irrigation and for transport losses. According to Alberta’s Ministry of Agriculture, only 66% of the water diverted into irrigation canals goes to farms (Irrigation Water Management Study Committee, 2002). That translates to a water volume of 1,254 million cubic metres for irrigation districts only. Those

districts account for 80% of all irrigation in Alberta (Irrigation Water Management Study Committee, 2002); hence the volume must be increased by 20% to reflect other irrigation sources. The result is a difference of about 30% between the two estimates.

In general, for water volume and irrigated area, estimates based on the responses of agricultural operators are lower than provincial estimates (for example, Table D for Alberta). On one hand, the AWUS relies on respondents' recall for the data used to estimate irrigation water volumes. However, the data were collected several months after the period in which the irrigation activities took place. In addition, since water consumption can be a sensitive issue (especially in regions where there is competition between various users), respondents may have tended to understate water volumes. On the other hand, the few provincial estimates that exist are based on estimation methods of varying quality. Under these circumstances, it is difficult to validate either approach.

6.3 High variance for the key variables in Saskatchewan

The water volume and irrigated area estimates for Saskatchewan have a high CV (24.04% for volume and 25.82% for area; see Table C), which indicates considerable variability in the data. Kulshreshtha and Grant (2007) reported that in Saskatchewan, there were significant regional differences in irrigation practices. There are small irrigated zones in the southwestern part of the province, while large-scale irrigation is practised in the Lake Diefenbaker area. This may partly explain the high CV for irrigated area in Saskatchewan. Stratifying the sample to reflect this geographic division might lessen the impact that the interregional variations have on the variances of the results.

7 Conclusion

Producing verifiable information about agricultural water use is complicated, regardless of whether the information is based on modelled data or survey data. On one hand, models that use irrigation coefficients are usually based on average weather conditions and are therefore somewhat theoretical. On the other hand, a survey collects information directly from farmers, and the results, though less theoretical than the modelled figures, are more subjective and variable.

This suggests that changes are needed for the survey's next iteration, in order to make things easier for respondents and improve the quality of the results. First, the type of survey vehicle will have to be reconsidered. For example, a diary survey would simplify the reporting of irrigation events. The impact that the alternatives would have on the response burden and by extension on the response rate would have to be studied.

Improvements are also needed to boost data quality. First, the information collected by the survey will have to be simplified: The high level of detail in the pilot version of the AWUS, though appropriate for a pilot survey, will be curtailed. For example, the detail regarding crop types irrigated will be cut back to broader categories such as fruits, field crops and vegetable crops. This will reduce the response burden and the risk of double counting. In addition, since the survey focuses on irrigation, it might be wise to drop the questions on non-irrigated crops, which were included to measure irrigation's impact on crop yields.

With regard to the geographic breakdown of the results, the sample size would have to be increased if statistics on water use by drainage basin are desired. A take-all sample will have to be considered for regions where farming is less prevalent. The stratification variable for irrigation water volume will have to be changed as well.

These improvements will be made in the survey's next cycle. Nevertheless, the pilot version of the survey produced a valid benchmark of agricultural water use estimates at the national, regional and provincial levels. The data are presented in section "Data tables".

Data tables

Table 1
Number of farms with irrigated crops in Canada, 2007

	Farm operation categories
	Number of operations with irrigated crops, or with pre-seeding or post-harvest irrigation in 2007
	number
Canada	10,470
Atlantic region	280
Quebec	955
Ontario	1,990
Manitoba	155
Saskatchewan	695
Alberta	2,920
British Columbia	3,470

Source(s): Statistics Canada, Environment Accounts and Statistics Division, Agricultural Water Use Survey (survey no. 5145).

Table 2
Volume of water used for irrigation, 2007

	Volume
	cubic metres
Canada	1,502,663,967
Atlantic region	3,322,572
Quebec	7,988,151
Ontario	61,869,241
Manitoba	29,572,432
Saskatchewan	128,446,725 ^E
Alberta	1,098,981,530
British Columbia	172,483,316

Source(s): Statistics Canada, Environment Accounts and Statistics Division, Agricultural Water Use Survey, (survey no. 5145).

Table 3
Proportion of irrigated farmland among irrigators, 2007

	Total farmland area of operations that irrigated in 2007	Total irrigated land area in 2007	Proportion of cropland irrigated by irrigators in 2007
	hectares		percent
Canada	2,443,256	721,896	29.5
Atlantic region	23,504 ^E	3,544	15.1 ^E
Quebec	F	F	F
Ontario	156,623	42,636	27.2
Manitoba	105,794	21,127	20.0
Saskatchewan	863,130	87,831 ^E	10.2 ^E
Alberta	1,050,172	430,969	41.0
British Columbia	169,976	93,466	55.0

Source(s): Statistics Canada, Environment Accounts and Statistics Division, Agricultural Water Use Survey (survey no. 5145).

Table 4
Average area of irrigated farmland, 2007

	Average area of irrigated farmland, 2007
	hectares
Canada	69
Newfoundland and Labrador	4
Prince Edward Island	26 ^E
Nova Scotia	15
New Brunswick	8
Quebec	F
Ontario	21
Manitoba	134
Saskatchewan	126
Alberta	148
British Columbia	27

Source(s): Statistics Canada, Environment Accounts and Statistics Division, Agricultural Water Use Survey (survey no. 5145).

Table 5
Total irrigated area by crop type, 2007

	Crop type				
	Vegetable crops	Fruits	Field crops	Feed crops	Sod and nursery products
	hectares				
Canada	80,410	F	336,727	208,886	6,907
Atlantic region	2,655	498	F	0	174 ^E
Quebec	7,293	F	0	0	1,023 ^E
Ontario	21,717	4,487 ^E	12,086 ^E	F	4,116
Manitoba	19,475	F	F	0	F
Saskatchewan	F	F	F	21,132	F
Alberta	22,230 ^E	F	264,278	134,420	F
British Columbia	F	F	2,487 ^E	53,191	F

Source(s): Statistics Canada, Environment Accounts and Statistics Division, Agricultural Water Use Survey (survey no. 5145).

Table 6
Average land area irrigated by crop type, 2007

	Crop type				
	Vegetable crops	Fruits	Field crops	Feed crops	Sod and nursery products
	hectares				
Canada	39.2	F	117.6	9.1	56.7
Atlantic region	26.3	3.7	8.0	7.2 ^E	0.0
Quebec and Ontario	23.8	F	25.4	8.9	6.8
Prairies	114.0	F	142.0	F	65.4
British Columbia	F	F	F	F	41.3

Source(s): Statistics Canada, Environment Accounts and Statistics Division, Agricultural Water Use Survey (survey no. 5145).

Table 7
Water volume used per hectare by crop type, 2007

	Crop type				
	Vegetable crops	Fruits	Field crops	Feed crops	Sod and nursery products
	cubic metres per hectare				
Canada	1,916	F	2,040	2,650	2,294^E
Atlantic region	1 664 ^E	1,404	508	0	2,181 ^E
Quebec	630	F	0	0	788
Ontario	1,216	1,540	1,159	403	F
Manitoba	X	F	699 ^E	0	1,730
Saskatchewan	1,745	F	1 237 ^E	1,896	F
Alberta	3,568	362	2,265	2,920	544
British Columbia	F	F	F	2,268	F

Source(s): Statistics Canada, Environment Accounts and Statistics Division, Agricultural Water Use Survey (survey no. 5145).

Table 8
Irrigation system type by crop type, 2007

	System type		
	Sprinklers	Micro	Surface
	number		
Vegetable crops	1,601	761	F
Fruits	2,173	2,097	F
Field crops	2,743	F	323 ^E
Feed crops	3,353	F	572
Sod and nursery products	547	330 ^E	0

Source(s): Statistics Canada, Environment Accounts and Statistics Division, Agricultural Water Use Survey (survey no. 5145).

Table 9
Water uses for agricultural activities, other than irrigation in surveyed operations, 2007

	Agricultural activity								
	Spraying fungicide, herbicide, insecticide or fertilizer	Cleaning farm buildings or equipment	Reducing salinity	Cooling of produce	Frost protection	Harvesting	Processing and packaging	Watering livestock	Other
	number								
Canada	7,570	8,410	555	675	1,120	810	1,765	5,730	1,620
Atlantic region	330	365	F	F	105	F	140	195	70 ^E
Quebec and Ontario	2,675	2,730	115 ^E	290	640	345	1,045	510	345
Prairies	2,330	2,620	295 ^E	155 ^E	115 ^E	185 ^E	215 ^E	3,330	725
British Columbia	2,230	2,700	140 ^E	190 ^E	265 ^E	240 ^E	360 ^E	1,695	480

Source(s): Statistics Canada, Environment Accounts and Statistics Division, Agricultural Water Use Survey (survey no. 5145).

Table 10
Water and energy conservation practices, 2007

	Water and energy conservation practice							No practices done
	Wind breaks	Leaving stubble in the fields	Watering at night or in the morning	Pressure reduction	Water or energy saving nozzles	Other energy saving methods or devices		
	number							
Canada	2,640	4,200	5,080	3,755	4,375	1,835	960	
Atlantic region	160	130	200	75	45	60 ^E	F	
Quebec and Ontario	1,705	1,085	2,385	805	1,185	500	F	
Prairies	440	2,355	980	1,665	1,885	450	325	
British Columbia	335	620	1,520	1,215	1,265	820	470	

Source(s): Statistics Canada, Environment Accounts and Statistics Division, Agricultural Water Use Survey (survey no. 5145).

Table 11
Reasons for not irrigating in 2007 or for stopping irrigation during the 2007 growing season

	Surveyed operations who did not irrigate or had to stop irrigation	Reason for not irrigating or for stopping irrigation										
		Shortage of surface water	Shortage of underground water	Equipment failure	Poor water quality	Cost of water	Weather	Water ban	Crop did not require irrigation	Labour shortage	Fuel or energy cost	Other reason
		number										
Canada	4,850	590	F	2,075	F	F	2,575	F	1,315	F	320^E	455^E
Atlantic region	80	15 ^E	F	20 ^E	0	0	50 ^E	0	F	F	F	F
Quebec and Ontario	1,090	300	F	385	F	F	495	F	F	F	F	F
Prairies	1,970	F	F	1,175	F	F	885	F	595	F	185 ^E	F
British Columbia	1,705	115 ^E	F	495	F	F	1,140	F	700	F	F	125 ^E

Source(s): Statistics Canada, Environment Accounts and Statistics Division, Agricultural Water Use Survey (survey no. 5145).

Table 12
Sources of water used for agricultural purposes, 2007

	Water source					Other source of water
	Underground water or well water	On-farm surface water	Water from a rain collection system	Off-farm water		
	number					
Canada	2,930	5,255	870	4,895	295	
Atlantic region	165	240	15	F	F	
Quebec and Ontario	1,080	2,295	540	360 ^E	F	
Prairies	540	1,805	210	2,695	F	
British Columbia	1,140	915	F	1,835	F	

Source(s): Statistics Canada, Environment Accounts and Statistics Division, Agricultural Water Use Survey (survey no. 5145).

Table 13
Off-farm sources of water used for agricultural purposes, 2007

	Water source				
	Tap water	Treated wastewater	Provincial water sources	Private sources	Other sources
	number				
Canada	1,310	F	3,315	375^E	185^E
Atlantic region	F	0	0	0	F
Quebec and Ontario	F	F	F	F	F
Prairies	355	F	2,330	180	F
British Columbia	695	F	955	F	F

Source(s): Statistics Canada, Environment Accounts and Statistics Division, Agricultural Water Use Survey (survey no. 5145).

Table 14
Reasons for using off-farm water sources, 2007

	Reason			
	No water or not enough water available on the farm	Poor quality of on-farm water	Other reason	
	number			
Canada	4,115	395	530	
Atlantic region	F	F	F	
Quebec and Ontario	280 ^E	F	F	
Prairies	2,305	315	185 ^E	
British Columbia	1,525	F	285 ^E	

Source(s): Statistics Canada, Environment Accounts and Statistics Division, Agricultural Water Use Survey (survey no. 5145).

Table 15
Water treatment practices applied prior to farm use, 2007

	Irrigators that had to treat their water	Type of treatment							
		Kill bacteria or other foreign bodies	Equalize pH levels	Remove solids (filtration)	Prevent or clear mineral fouling	Treatment to prevent corrosion	Reduce water hardness	Reduce salinity	Other
	number								
Canada	980	360	385^E	555	F	F	210^E	F	120^E
Atlantic region	F	F	F	0	0	0	F	0	F
Quebec and Ontario	455	105 ^E	275 ^E	280 ^E	F	F	F	F	F
Prairies	265 ^E	F	F	120 ^E	F	F	F	F	F
British Columbia	225 ^E	F	F	150 ^E	F	0	F	F	F

Source(s): Statistics Canada, Environment Accounts and Statistics Division, Agricultural Water Use Survey (survey no. 5145).

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2007 Agricultural Water Use Survey



CONFIDENTIAL when completed
Collected under the authority of the
Statistics Act, Revised Statutes of
Canada, 1985, Chapter S19.

For interviewer use only

Fully completed	005	1	
Partial	005	4	
Refusal	005	2	
No contact	005	3	
In operation	004	00	
Change of operator	004	12	
Out of business	004	13	
Out of scope	004	99	

This is a voluntary survey conducted under Section 8 of the Statistics Act. Your cooperation is important to ensure that the information collected in this survey is as accurate as possible.

All information will be kept confidential under the Statistics Act.

Please refer to the calendar year 2007 when answering the questions.

La version française de ce questionnaire est disponible.

Review the information on the label. If any information is incorrect or missing, please make the necessary corrections in the boxes below.

FRM				
	Farm Name (if applicable)	Area Code		
NA 1				
	Surname or Family Name	Telephone		
	Usual First Name and Initial			
ADR				
	R.R.	Box No.	Number and Street Name	
	Postal Code	Post Office (name of city, town or village where mail is received)		
EML				
	E-mail Address (if applicable)			
	Area Code			
NA 3				
	Partner's Name (if applicable)	Telephone		
NA 4				
	Partner's Name (if applicable)			
	Area Code			
COR				
	Corporation Name (if applicable)	Telephone		

Section A. Type of Operation and Land Area

Please refer to the **2007 GROWING SEASON** when answering the following questions.

1. In 2007, did this operation produce or grow field crops, hay, improved pasture, vegetables, fruits, nursery products or sod? (C101)

EXCLUDE: greenhouses, mushroom barns and Christmas trees.

Yes 01
↓

No 03 Go to Q21, last page.

2. a) In the 2007 growing season, did this operation use or apply water for irrigation or watering crops? (C201)

Yes 01

No 03

2. b) In the 2007 growing season, did this operation use or apply water for increasing soil moisture content e.g., pre-planting or post harvest? (C202)

Yes 01

No 03

2. c) In the 2007 growing season, did this operation use or apply water for any of the following activities?

(Mark all that apply)

(C203) Spraying fungicide, herbicide, insecticide or fertilizer

(C204) Cleaning farm buildings or equipment

(C205) Reducing salinity of the soil (leaching)

(C206) Cooling of produce (e.g. broccoli)

(C207) Frost protection

(C208) Harvesting (e.g. cranberries)

(C209) Processing and packaging (e.g., washing vegetables)

(C210) Watering livestock

(C211) Other (specify) (C212) _____

If answers to Q2a and 2b are both No, then go to Q12, page 29.

Section B. Cropland and Irrigation in 2007

The next questions are about land area operated in the **2007 GROWING SEASON**.

3. Will you be reporting land area in acres or hectares (or arpents)? (C301)

Acres

Hectares

Arpents (Quebec only)

4. In the 2007 growing season, what was the total area of cropland and improved pasture of this operation?

Include:

- all land, producing and non-producing, used for fruits, vegetables, field crops, nursery products, sod, hay and improved pasture land rented or leased **FROM OTHERS**
- irrigated and non-irrigated land

Exclude:

- land owned and rented or leased **TO OTHERS**
- summerfallow

(C401) total area of cropland and pasture (producing and non-producing)

5. Which of the following crop types did you produce or grow on this operation (in the 2007 growing season)?

(Mark all that apply)

(C501) Field crops

(C502) Fruits

(C503) Vegetables

(C504) Nursery products

(C505) Sod

(C506) Hay

(C507) Improved pasture

The following questions are about the crop area, yield and irrigation methods used on this operation in the 2007 growing season.
Include irrigated and non-irrigated land for total area of crops and yield reported.

Enter up to six crops in the table below. First enter those crops that are irrigated (order them from those that require the most water to those that require the least) followed by the crops with the largest land area.

	Crop 1	Crop 2	Crop 3
Crop Name			
6. What crops did you produce or grow on this operation (in the 2007 growing season)? Include producing and non-producing crops.	(C601)	(C602)	(C603)
7.a What was the total area of the crop? acres/hectares (or arpents Quebec)	(C701)	(C745)	(C789)
7.b How will you report average yield of the crop? Yield 1 Mark only one (per crop). Exclude improved pasture.	<p>acre / hectare / arpent (C702)</p> <p>01 <input type="radio"/> Bushels</p> <p>02 <input type="radio"/> Kilograms</p> <p>03 <input type="radio"/> Metric Tonnes</p> <p>04 <input type="radio"/> Imperial Tons</p> <p>05 <input type="radio"/> Pounds</p> <p>06 <input type="radio"/> Hundred Weight</p> <p>07 <input type="radio"/> Pints</p> <p>08 <input type="radio"/> Quarts</p> <p>09 <input type="radio"/> Masters or baskets (about 20 lbs)</p> <p>10 <input type="radio"/> Square feet</p> <p>11 <input type="radio"/> Square metres</p> <p>12 <input type="radio"/> Other (specify) (C703) _____</p> <p>13 <input type="radio"/> Not applicable (no yield) If Not applicable, go to Q7d for the crop</p>	<p>acre / hectare / arpent (C746)</p> <p>01 <input type="radio"/> Bushels</p> <p>02 <input type="radio"/> Kilograms</p> <p>03 <input type="radio"/> Metric Tonnes</p> <p>04 <input type="radio"/> Imperial Tons</p> <p>05 <input type="radio"/> Pounds</p> <p>06 <input type="radio"/> Hundred Weight</p> <p>07 <input type="radio"/> Pints</p> <p>08 <input type="radio"/> Quarts</p> <p>09 <input type="radio"/> Masters or baskets (about 20 lbs)</p> <p>10 <input type="radio"/> Square feet</p> <p>11 <input type="radio"/> Square metres</p> <p>12 <input type="radio"/> Other (specify) (C747) _____</p> <p>13 <input type="radio"/> Not applicable (no yield) If Not applicable, go to Q7d for the crop</p>	<p>acre / hectare / arpent (C790)</p> <p>01 <input type="radio"/> Bushels</p> <p>02 <input type="radio"/> Kilograms</p> <p>03 <input type="radio"/> Metric Tonnes</p> <p>04 <input type="radio"/> Imperial Tons</p> <p>05 <input type="radio"/> Pounds</p> <p>06 <input type="radio"/> Hundred Weight</p> <p>07 <input type="radio"/> Pints</p> <p>08 <input type="radio"/> Quarts</p> <p>09 <input type="radio"/> Masters or baskets (about 20 lbs)</p> <p>10 <input type="radio"/> Square feet</p> <p>11 <input type="radio"/> Square metres</p> <p>12 <input type="radio"/> Other (specify) (C791) _____</p> <p>13 <input type="radio"/> Not applicable (no yield) If Not applicable, go to Q7d for the crop</p>
7.c What was the average yield? Average Yield 1	(C704)	(C748)	(C792)
If you have a second yield how will you report average yield of the crop? Yield 2	<p>acre / hectare / arpent (C705)</p> <p>01 <input type="radio"/> Bushels</p> <p>02 <input type="radio"/> Kilograms</p> <p>03 <input type="radio"/> Metric Tonnes</p> <p>04 <input type="radio"/> Imperial Tons</p> <p>05 <input type="radio"/> Pounds</p> <p>06 <input type="radio"/> Hundred Weight</p> <p>07 <input type="radio"/> Pints</p> <p>08 <input type="radio"/> Quarts</p> <p>09 <input type="radio"/> Masters or baskets (about 20 lbs)</p> <p>10 <input type="radio"/> Square feet</p> <p>11 <input type="radio"/> Square metres</p> <p>12 <input type="radio"/> Other (specify) (C706) _____</p> <p>13 <input type="radio"/> Not applicable (no 2nd yield) If no second yield continue to Q7d.</p>	<p>acre / hectare / arpent (C749)</p> <p>01 <input type="radio"/> Bushels</p> <p>02 <input type="radio"/> Kilograms</p> <p>03 <input type="radio"/> Metric Tonnes</p> <p>04 <input type="radio"/> Imperial Tons</p> <p>05 <input type="radio"/> Pounds</p> <p>06 <input type="radio"/> Hundred Weight</p> <p>07 <input type="radio"/> Pints</p> <p>08 <input type="radio"/> Quarts</p> <p>09 <input type="radio"/> Masters or baskets (about 20 lbs)</p> <p>10 <input type="radio"/> Square feet</p> <p>11 <input type="radio"/> Square metres</p> <p>12 <input type="radio"/> Other (specify) (C750) _____</p> <p>13 <input type="radio"/> Not applicable (no 2nd yield) If no second yield continue to Q7d.</p>	<p>acre / hectare / arpent (C793)</p> <p>01 <input type="radio"/> Bushels</p> <p>02 <input type="radio"/> Kilograms</p> <p>03 <input type="radio"/> Metric Tonnes</p> <p>04 <input type="radio"/> Imperial Tons</p> <p>05 <input type="radio"/> Pounds</p> <p>06 <input type="radio"/> Hundred Weight</p> <p>07 <input type="radio"/> Pints</p> <p>08 <input type="radio"/> Quarts</p> <p>09 <input type="radio"/> Masters or baskets (about 20 lbs)</p> <p>10 <input type="radio"/> Square feet</p> <p>11 <input type="radio"/> Square metres</p> <p>12 <input type="radio"/> Other (specify) (C794) _____</p> <p>13 <input type="radio"/> Not applicable (no 2nd yield) If no second yield continue to Q7d.</p>
What was the average yield? Average Yield 2	(C707)	(C751)	(C795)

The following questions are about the crop area, yield and irrigation methods used on this operation in the 2007 growing season.
Include irrigated and non-irrigated land for total area of crops and yield reported.

Enter up to six crops in the table below. First enter those crops that are irrigated (order them from those that require the most water to those that require the least) followed by the crops with the largest land area.

	Crop 4	Crop 5	Crop 6
Crop Name			
6. What crops did you produce or grow on this operation (in the 2007 growing season)? Include producing and non-producing crops.	(C604)	(C605)	(C606)
7.a What was the total area of the crop? acres/hectares (or arpents Quebec)	(C7133)	(C7177)	(C7221)
7.b How will you report average yield of the crop? Yield 1 Mark only one (per crop). Exclude improved pasture.	<p>acre / hectare / arpent (C7134)</p> <p>01 <input type="radio"/> Bushels</p> <p>02 <input type="radio"/> Kilograms</p> <p>03 <input type="radio"/> Metric Tonnes</p> <p>04 <input type="radio"/> Imperial Tons</p> <p>05 <input type="radio"/> Pounds</p> <p>06 <input type="radio"/> Hundred Weight</p> <p>07 <input type="radio"/> Pints</p> <p>08 <input type="radio"/> Quarts</p> <p>09 <input type="radio"/> Masters or baskets (about 20 lbs)</p> <p>10 <input type="radio"/> Square feet</p> <p>11 <input type="radio"/> Square metres</p> <p>12 <input type="radio"/> Other (specify) (C7135) _____</p> <p>13 <input type="radio"/> Not applicable (no yield) If Not applicable, go to Q7d for the crop</p>	<p>acre / hectare / arpent (C7178)</p> <p>01 <input type="radio"/> Bushels</p> <p>02 <input type="radio"/> Kilograms</p> <p>03 <input type="radio"/> Metric Tonnes</p> <p>04 <input type="radio"/> Imperial Tons</p> <p>05 <input type="radio"/> Pounds</p> <p>06 <input type="radio"/> Hundred Weight</p> <p>07 <input type="radio"/> Pints</p> <p>08 <input type="radio"/> Quarts</p> <p>09 <input type="radio"/> Masters or baskets (about 20 lbs)</p> <p>10 <input type="radio"/> Square feet</p> <p>11 <input type="radio"/> Square metres</p> <p>12 <input type="radio"/> Other (specify) (C7179) _____</p> <p>13 <input type="radio"/> Not applicable (no yield) If Not applicable, go to Q7d for the crop</p>	<p>acre / hectare / arpent (C7222)</p> <p>01 <input type="radio"/> Bushels</p> <p>02 <input type="radio"/> Kilograms</p> <p>03 <input type="radio"/> Metric Tonnes</p> <p>04 <input type="radio"/> Imperial Tons</p> <p>05 <input type="radio"/> Pounds</p> <p>06 <input type="radio"/> Hundred Weight</p> <p>07 <input type="radio"/> Pints</p> <p>08 <input type="radio"/> Quarts</p> <p>09 <input type="radio"/> Masters or baskets (about 20 lbs)</p> <p>10 <input type="radio"/> Square feet</p> <p>11 <input type="radio"/> Square metres</p> <p>12 <input type="radio"/> Other (specify) (C7223) _____</p> <p>13 <input type="radio"/> Not applicable (no yield) If Not applicable, go to Q7d for the crop</p>
7.c What was the average yield? Average Yield 1	(C7136)	(C7180)	(C7224)
If you have a second yield how will you report average yield of the crop? Yield 2	<p>acre / hectare / arpent (C7137)</p> <p>01 <input type="radio"/> Bushels</p> <p>02 <input type="radio"/> Kilograms</p> <p>03 <input type="radio"/> Metric Tonnes</p> <p>04 <input type="radio"/> Imperial Tons</p> <p>05 <input type="radio"/> Pounds</p> <p>06 <input type="radio"/> Hundred Weight</p> <p>07 <input type="radio"/> Pints</p> <p>08 <input type="radio"/> Quarts</p> <p>09 <input type="radio"/> Masters or baskets (about 20 lbs)</p> <p>10 <input type="radio"/> Square feet</p> <p>11 <input type="radio"/> Square metres</p> <p>12 <input type="radio"/> Other (specify) (C7138) _____</p> <p>13 <input type="radio"/> Not applicable (no 2nd yield) If no second yield continue to Q7d.</p>	<p>acre / hectare / arpent (C7181)</p> <p>01 <input type="radio"/> Bushels</p> <p>02 <input type="radio"/> Kilograms</p> <p>03 <input type="radio"/> Metric Tonnes</p> <p>04 <input type="radio"/> Imperial Tons</p> <p>05 <input type="radio"/> Pounds</p> <p>06 <input type="radio"/> Hundred Weight</p> <p>07 <input type="radio"/> Pints</p> <p>08 <input type="radio"/> Quarts</p> <p>09 <input type="radio"/> Masters or baskets (about 20 lbs)</p> <p>10 <input type="radio"/> Square feet</p> <p>11 <input type="radio"/> Square metres</p> <p>12 <input type="radio"/> Other (specify) (C7182) _____</p> <p>13 <input type="radio"/> Not applicable (no 2nd yield) If no second yield continue to Q7d.</p>	<p>acre / hectare / arpent (C7225)</p> <p>01 <input type="radio"/> Bushels</p> <p>02 <input type="radio"/> Kilograms</p> <p>03 <input type="radio"/> Metric Tonnes</p> <p>04 <input type="radio"/> Imperial Tons</p> <p>05 <input type="radio"/> Pounds</p> <p>06 <input type="radio"/> Hundred Weight</p> <p>07 <input type="radio"/> Pints</p> <p>08 <input type="radio"/> Quarts</p> <p>09 <input type="radio"/> Masters or baskets (about 20 lbs)</p> <p>10 <input type="radio"/> Square feet</p> <p>11 <input type="radio"/> Square metres</p> <p>12 <input type="radio"/> Other (specify) (C7226) _____</p> <p>13 <input type="radio"/> Not applicable (no 2nd yield) If no second yield continue to Q7d.</p>
What was the average yield? Average Yield 2	(C7139)	(C7183)	(C7227)

Enter crops from pages 4 and 5 (crop 1 to crop 6). Include water used to increase soil moisture content e.g., pre-planting or post harvest.

	Crop 1	Crop 2	Crop 3
Crop Name			
7.d Was/were the crop(s) irrigated in 2007?	01 <input type="radio"/> Yes (C708) 03 <input type="radio"/> No	01 <input type="radio"/> Yes (C752) 03 <input type="radio"/> No	01 <input type="radio"/> Yes (C796) 03 <input type="radio"/> No

If the crop was not irrigated, go to next crop. If no more crops irrigated, go to page 24.

The following questions (7e to 7m) are asked for up to three irrigation methods per crop. The questions are asked for the first method, then repeated for the second then third methods.

7.e What was the first method of irrigation used for the crop? Method 1 Mark only one (per crop).	(C709) Sprinkler 01 <input type="radio"/> Hand Move 02 <input type="radio"/> Solid or Permanent Set 03 <input type="radio"/> Side Roll, Wheel Line, Wheel Move or Wheel Roll 04 <input type="radio"/> Traveler, Volume Gun, Travelling Gun, Walker, Overhead or Circler 05 <input type="radio"/> Linear move < 25 psi 06 <input type="radio"/> Linear move 25 - 50 psi 07 <input type="radio"/> Linear move >50 psi 08 <input type="radio"/> Centre pivot < 25 psi 09 <input type="radio"/> Centre Pivot 25 - 50 psi 10 <input type="radio"/> Centre Pivot >50 psi Micro 20 <input type="radio"/> Surface drip 21 <input type="radio"/> Sub-surface Drip 22 <input type="radio"/> Micro-sprinkler 23 <input type="radio"/> Bubblers 24 <input type="radio"/> Microjet 25 <input type="radio"/> Hand watering Surface 30 <input type="radio"/> Down rows 31 <input type="radio"/> Furrows 32 <input type="radio"/> Corrugations 33 <input type="radio"/> Border dyke 34 <input type="radio"/> Level basins 35 <input type="radio"/> Uncontrolled flooding (wild flooding) 36 <input type="radio"/> Back flooding 40 <input type="radio"/> Other method (specify) (C710) _____ _____	(C753) Sprinkler 01 <input type="radio"/> Hand Move 02 <input type="radio"/> Solid or Permanent Set 03 <input type="radio"/> Side Roll, Wheel Line, Wheel Move or Wheel Roll 04 <input type="radio"/> Traveler, Volume Gun, Travelling Gun, Walker, Overhead or Circler 05 <input type="radio"/> Linear move < 25 psi 06 <input type="radio"/> Linear move 25 - 50 psi 07 <input type="radio"/> Linear move >50 psi 08 <input type="radio"/> Centre pivot < 25 psi 09 <input type="radio"/> Centre Pivot 25 - 50 psi 10 <input type="radio"/> Centre Pivot >50 psi Micro 20 <input type="radio"/> Surface drip 21 <input type="radio"/> Sub-surface Drip 22 <input type="radio"/> Micro-sprinkler 23 <input type="radio"/> Bubblers 24 <input type="radio"/> Microjet 25 <input type="radio"/> Hand watering Surface 30 <input type="radio"/> Down rows 31 <input type="radio"/> Furrows 32 <input type="radio"/> Corrugations 33 <input type="radio"/> Border dyke 34 <input type="radio"/> Level basins 35 <input type="radio"/> Uncontrolled flooding (wild flooding) 36 <input type="radio"/> Back flooding 40 <input type="radio"/> Other method (specify) (C754) _____ _____	(C797) Sprinkler 01 <input type="radio"/> Hand Move 02 <input type="radio"/> Solid or Permanent Set 03 <input type="radio"/> Side Roll, Wheel Line, Wheel Move or Wheel Roll 04 <input type="radio"/> Traveler, Volume Gun, Travelling Gun, Walker, Overhead or Circler 05 <input type="radio"/> Linear move < 25 psi 06 <input type="radio"/> Linear move 25 - 50 psi 07 <input type="radio"/> Linear move >50 psi 08 <input type="radio"/> Centre pivot < 25 psi 09 <input type="radio"/> Centre Pivot 25 - 50 psi 10 <input type="radio"/> Centre Pivot >50 psi Micro 20 <input type="radio"/> Surface drip 21 <input type="radio"/> Sub-surface Drip 22 <input type="radio"/> Micro-sprinkler 23 <input type="radio"/> Bubblers 24 <input type="radio"/> Microjet 25 <input type="radio"/> Hand watering Surface 30 <input type="radio"/> Down rows 31 <input type="radio"/> Furrows 32 <input type="radio"/> Corrugations 33 <input type="radio"/> Border dyke 34 <input type="radio"/> Level basins 35 <input type="radio"/> Uncontrolled flooding (wild flooding) 36 <input type="radio"/> Back flooding 40 <input type="radio"/> Other method (specify) (C798) _____ _____
	7.f What was the total area of the crop irrigated with the first irrigation method?	(C711)	(C755)

Enter crops from pages 4 and 5 (crop 1 to crop 6). Include water used to increase soil moisture content e.g., pre-planting or post harvest.

	Crop 4	Crop 5	Crop 6
Crop Name			
7.d Was/were the crop(s) irrigated in 2007?	01 <input type="radio"/> Yes (C7140) 03 <input type="radio"/> No	01 <input type="radio"/> Yes (C7184) 03 <input type="radio"/> No	01 <input type="radio"/> Yes (C7228) 03 <input type="radio"/> No

If the crop was not irrigated, go to next crop. If no more crops irrigated, go to page 24.

The following questions (7e to 7m) are asked for up to three irrigation methods per crop. The questions are asked for the first method, then repeated for the second then third methods.

7.e What was the first method of irrigation used for the crop? Method 1 Mark only one (per crop).	(C7141) Sprinkler 01 <input type="radio"/> Hand Move 02 <input type="radio"/> Solid or Permanent Set 03 <input type="radio"/> Side Roll, Wheel Line, Wheel Move or Wheel Roll 04 <input type="radio"/> Traveler, Volume Gun, Travelling Gun, Walker, Overhead or Circler 05 <input type="radio"/> Linear move < 25 psi 06 <input type="radio"/> Linear move 25 - 50 psi 07 <input type="radio"/> Linear move >50 psi 08 <input type="radio"/> Centre pivot < 25 psi 09 <input type="radio"/> Centre Pivot 25 - 50 psi 10 <input type="radio"/> Centre Pivot >50 psi Micro 20 <input type="radio"/> Surface drip 21 <input type="radio"/> Sub-surface Drip 22 <input type="radio"/> Micro-sprinkler 23 <input type="radio"/> Bubblers 24 <input type="radio"/> Microjet 25 <input type="radio"/> Hand watering Surface 30 <input type="radio"/> Down rows 31 <input type="radio"/> Furrows 32 <input type="radio"/> Corrugations 33 <input type="radio"/> Border dyke 34 <input type="radio"/> Level basins 35 <input type="radio"/> Uncontrolled flooding (wild flooding) 36 <input type="radio"/> Back flooding 40 <input type="radio"/> Other method (specify) (C7142) _____ _____	(C7185) Sprinkler 01 <input type="radio"/> Hand Move 02 <input type="radio"/> Solid or Permanent Set 03 <input type="radio"/> Side Roll, Wheel Line, Wheel Move or Wheel Roll 04 <input type="radio"/> Traveler, Volume Gun, Travelling Gun, Walker, Overhead or Circler 05 <input type="radio"/> Linear move < 25 psi 06 <input type="radio"/> Linear move 25 - 50 psi 07 <input type="radio"/> Linear move >50 psi 08 <input type="radio"/> Centre pivot < 25 psi 09 <input type="radio"/> Centre Pivot 25 - 50 psi 10 <input type="radio"/> Centre Pivot >50 psi Micro 20 <input type="radio"/> Surface drip 21 <input type="radio"/> Sub-surface Drip 22 <input type="radio"/> Micro-sprinkler 23 <input type="radio"/> Bubblers 24 <input type="radio"/> Microjet 25 <input type="radio"/> Hand watering Surface 30 <input type="radio"/> Down rows 31 <input type="radio"/> Furrows 32 <input type="radio"/> Corrugations 33 <input type="radio"/> Border dyke 34 <input type="radio"/> Level basins 35 <input type="radio"/> Uncontrolled flooding (wild flooding) 36 <input type="radio"/> Back flooding 40 <input type="radio"/> Other method (specify) (C7186) _____ _____	(C7229) Sprinkler 01 <input type="radio"/> Hand Move 02 <input type="radio"/> Solid or Permanent Set 03 <input type="radio"/> Side Roll, Wheel Line, Wheel Move or Wheel Roll 04 <input type="radio"/> Traveler, Volume Gun, Travelling Gun, Walker, Overhead or Circler 05 <input type="radio"/> Linear move < 25 psi 06 <input type="radio"/> Linear move 25 - 50 psi 07 <input type="radio"/> Linear move >50 psi 08 <input type="radio"/> Centre pivot < 25 psi 09 <input type="radio"/> Centre Pivot 25 - 50 psi 10 <input type="radio"/> Centre Pivot >50 psi Micro 20 <input type="radio"/> Surface drip 21 <input type="radio"/> Sub-surface Drip 22 <input type="radio"/> Micro-sprinkler 23 <input type="radio"/> Bubblers 24 <input type="radio"/> Microjet 25 <input type="radio"/> Hand watering Surface 30 <input type="radio"/> Down rows 31 <input type="radio"/> Furrows 32 <input type="radio"/> Corrugations 33 <input type="radio"/> Border dyke 34 <input type="radio"/> Level basins 35 <input type="radio"/> Uncontrolled flooding (wild flooding) 36 <input type="radio"/> Back flooding 40 <input type="radio"/> Other method (specify) (C7230) _____ _____
	7.f What was the total area of the crop irrigated with the first irrigation method?	(C7143)	(C7187)

Enter crops from pages 4 and 5 (crop 1 to crop 6).

	Crop 1	Crop 2	Crop 3
Crop Name			
<p>7.g The next questions ask about volume (or flow rate) of water used (in the 2007 growing season).</p> <p>How will you report volume of water used: e.g., inches, gallons, litres for the crop?</p> <p>Method 1</p> <p>If the response is by Flow rate, Q7i will ask to specify per second, minute, hour or day.</p>	<p>(C712)</p> <p>Unit of water</p> <p>Water depth per surface area</p> <p>01 <input type="radio"/> Inches per acre</p> <p>02 <input type="radio"/> Millimetres per hectare</p> <p>OR</p> <p>Total volume</p> <p>03 <input type="radio"/> Total acre-feet</p> <p>04 <input type="radio"/> Total gallons</p> <p>05 <input type="radio"/> Total litres</p> <p>06 <input type="radio"/> Total cubic feet</p> <p>07 <input type="radio"/> Total cubic metres</p> <p>OR</p> <p>Volume per surface area</p> <p>08 <input type="radio"/> Acre-feet per acre</p> <p>09 <input type="radio"/> Gallons per acre</p> <p>10 <input type="radio"/> Litres per hectare</p> <p>11 <input type="radio"/> Cubic feet per acre</p> <p>12 <input type="radio"/> Cubic metres per hectare</p> <p>14 <input type="radio"/> Other Volume, specify (C713)</p> <p>_____</p> <p>OR</p> <p>Flow rate</p> <p>20 <input type="radio"/> Gallons (per unit of time)</p> <p>21 <input type="radio"/> Litres (per unit of time)</p> <p>22 <input type="radio"/> Cubic feet (per unit of time)</p> <p>23 <input type="radio"/> Cubic metres (per unit of time)</p> <p>24 <input type="radio"/> Pounds (per unit of time)</p> <p>26 <input type="radio"/> Other Flow Rate (per unit of time), specify (C714)</p> <p>_____</p>	<p>(C756)</p> <p>Unit of water</p> <p>Water depth per surface area</p> <p>01 <input type="radio"/> Inches per acre</p> <p>02 <input type="radio"/> Millimetres per hectare</p> <p>OR</p> <p>Total volume</p> <p>03 <input type="radio"/> Total acre-feet</p> <p>04 <input type="radio"/> Total gallons</p> <p>05 <input type="radio"/> Total litres</p> <p>06 <input type="radio"/> Total cubic feet</p> <p>07 <input type="radio"/> Total cubic metres</p> <p>OR</p> <p>Volume per surface area</p> <p>08 <input type="radio"/> Acre-feet per acre</p> <p>09 <input type="radio"/> Gallons per acre</p> <p>10 <input type="radio"/> Litres per hectare</p> <p>11 <input type="radio"/> Cubic feet per acre</p> <p>12 <input type="radio"/> Cubic metres per hectare</p> <p>14 <input type="radio"/> Other Volume, specify (C757)</p> <p>_____</p> <p>OR</p> <p>Flow rate</p> <p>20 <input type="radio"/> Gallons (per unit of time)</p> <p>21 <input type="radio"/> Litres (per unit of time)</p> <p>22 <input type="radio"/> Cubic feet (per unit of time)</p> <p>23 <input type="radio"/> Cubic metres (per unit of time)</p> <p>24 <input type="radio"/> Pounds (per unit of time)</p> <p>26 <input type="radio"/> Other Flow Rate (per unit of time), specify (C758)</p> <p>_____</p>	<p>(C7100)</p> <p>Unit of water</p> <p>Water depth per surface area</p> <p>01 <input type="radio"/> Inches per acre</p> <p>02 <input type="radio"/> Millimetres per hectare</p> <p>OR</p> <p>Total volume</p> <p>03 <input type="radio"/> Total acre-feet</p> <p>04 <input type="radio"/> Total gallons</p> <p>05 <input type="radio"/> Total litres</p> <p>06 <input type="radio"/> Total cubic feet</p> <p>07 <input type="radio"/> Total cubic metres</p> <p>OR</p> <p>Volume per surface area</p> <p>08 <input type="radio"/> Acre-feet per acre</p> <p>09 <input type="radio"/> Gallons per acre</p> <p>10 <input type="radio"/> Litres per hectare</p> <p>11 <input type="radio"/> Cubic feet per acre</p> <p>12 <input type="radio"/> Cubic metres per hectare</p> <p>14 <input type="radio"/> Other Volume, specify (C7101)</p> <p>_____</p> <p>OR</p> <p>Flow rate</p> <p>20 <input type="radio"/> Gallons (per unit of time)</p> <p>21 <input type="radio"/> Litres (per unit of time)</p> <p>22 <input type="radio"/> Cubic feet (per unit of time)</p> <p>23 <input type="radio"/> Cubic metres (per unit of time)</p> <p>24 <input type="radio"/> Pounds (per unit of time)</p> <p>26 <input type="radio"/> Other Flow Rate (per unit of time), specify (C7102)</p> <p>_____</p>
<p>7.h How many units (i.e., reported in Q7g) of water were applied on the crop using the first irrigation method?</p>	(C715)	(C759)	(C7103)

If possible please report flow rate at system nozzle. If not available, give rate at pump.

If any in 7g is answered by flow rate (20 to 26) then continue to 7i for that crop. If another irrigation method was used for a crop, continue to method 2 for that crop. If no more crop irrigation to report, go to Q8 (page 24).

Enter crops from pages 4 and 5 (crop 1 to crop 6).

	Crop 4	Crop 5	Crop 6
Crop Name			
<p>7.g The next questions ask about volume (or flow rate) of water used (in the 2007 growing season).</p> <p>How will you report volume of water used: e.g., inches, gallons, litres for the crop?</p> <p>Method 1</p> <p>If the response is by Flow rate, Q7i will ask to specify per second, minute, hour or day.</p>	<p>(C7144)</p> <p>Unit of water</p> <p>Water depth per surface area</p> <p>01 <input type="radio"/> Inches per acre</p> <p>02 <input type="radio"/> Millimetres per hectare</p> <p>OR</p> <p>Total volume</p> <p>03 <input type="radio"/> Total acre-feet</p> <p>04 <input type="radio"/> Total gallons</p> <p>05 <input type="radio"/> Total litres</p> <p>06 <input type="radio"/> Total cubic feet</p> <p>07 <input type="radio"/> Total cubic metres</p> <p>OR</p> <p>Volume per surface area</p> <p>08 <input type="radio"/> Acre-feet per acre</p> <p>09 <input type="radio"/> Gallons per acre</p> <p>10 <input type="radio"/> Litres per hectare</p> <p>11 <input type="radio"/> Cubic feet per acre</p> <p>12 <input type="radio"/> Cubic metres per hectare</p> <p>14 <input type="radio"/> Other Volume, specify (C7145)</p> <p>_____</p> <p>OR</p> <p>Flow rate</p> <p>20 <input type="radio"/> Gallons (per unit of time)</p> <p>21 <input type="radio"/> Litres (per unit of time)</p> <p>22 <input type="radio"/> Cubic feet (per unit of time)</p> <p>23 <input type="radio"/> Cubic metres (per unit of time)</p> <p>24 <input type="radio"/> Pounds (per unit of time)</p> <p>26 <input type="radio"/> Other Flow Rate (per unit of time), specify (C7146)</p> <p>_____</p>	<p>(C7188)</p> <p>Unit of water</p> <p>Water depth per surface area</p> <p>01 <input type="radio"/> Inches per acre</p> <p>02 <input type="radio"/> Millimetres per hectare</p> <p>OR</p> <p>Total volume</p> <p>03 <input type="radio"/> Total acre-feet</p> <p>04 <input type="radio"/> Total gallons</p> <p>05 <input type="radio"/> Total litres</p> <p>06 <input type="radio"/> Total cubic feet</p> <p>07 <input type="radio"/> Total cubic metres</p> <p>OR</p> <p>Volume per surface area</p> <p>08 <input type="radio"/> Acre-feet per acre</p> <p>09 <input type="radio"/> Gallons per acre</p> <p>10 <input type="radio"/> Litres per hectare</p> <p>11 <input type="radio"/> Cubic feet per acre</p> <p>12 <input type="radio"/> Cubic metres per hectare</p> <p>14 <input type="radio"/> Other Volume, specify (C7189)</p> <p>_____</p> <p>OR</p> <p>Flow rate</p> <p>20 <input type="radio"/> Gallons (per unit of time)</p> <p>21 <input type="radio"/> Litres (per unit of time)</p> <p>22 <input type="radio"/> Cubic feet (per unit of time)</p> <p>23 <input type="radio"/> Cubic metres (per unit of time)</p> <p>24 <input type="radio"/> Pounds (per unit of time)</p> <p>26 <input type="radio"/> Other Flow Rate (per unit of time, specify (C7190)</p> <p>_____</p>	<p>(C7232)</p> <p>Unit of water</p> <p>Water depth per surface area</p> <p>01 <input type="radio"/> Inches per acre</p> <p>02 <input type="radio"/> Millimetres per hectare</p> <p>OR</p> <p>Total volume</p> <p>03 <input type="radio"/> Total acre-feet</p> <p>04 <input type="radio"/> Total gallons</p> <p>05 <input type="radio"/> Total litres</p> <p>06 <input type="radio"/> Total cubic feet</p> <p>07 <input type="radio"/> Total cubic metres</p> <p>OR</p> <p>Volume per surface area</p> <p>08 <input type="radio"/> Acre-feet per acre</p> <p>09 <input type="radio"/> Gallons per acre</p> <p>10 <input type="radio"/> Litres per hectare</p> <p>11 <input type="radio"/> Cubic feet per acre</p> <p>12 <input type="radio"/> Cubic metres per hectare</p> <p>14 <input type="radio"/> Other Volume, specify (C7233)</p> <p>_____</p> <p>OR</p> <p>Flow rate</p> <p>20 <input type="radio"/> Gallons (per unit of time)</p> <p>21 <input type="radio"/> Litres (per unit of time)</p> <p>22 <input type="radio"/> Cubic feet (per unit of time)</p> <p>23 <input type="radio"/> Cubic metres (per unit of time)</p> <p>24 <input type="radio"/> Pounds (per unit of time)</p> <p>26 <input type="radio"/> Other Flow Rate (per unit of time, specify (C7234)</p> <p>_____</p>
<p>7.h How many units (i.e., reported in Q7g) of water were applied on the crop using the first irrigation method?</p>	<p>(C7147)</p>	<p>(C7191)</p>	<p>(C7235)</p>

If possible please report flow rate at system nozzle. If not available, give rate at pump.

If any in 7g is answered by flow rate (20 to 26) then continue to 7i for that crop. If another irrigation method was used for a crop, continue to method 2 for that crop. If no more crop irrigation to report, go to Q8 (page 24).

Enter crops from pages 4 and 5 (crop 1 to crop 6).

	Crop 1	Crop 2	Crop 3
Crop Name			
7.i Were the units applied per second, minute, hour or day? Method 1	(C716) 01 <input type="radio"/> Per second 02 <input type="radio"/> Per minute 03 <input type="radio"/> Per hour 04 <input type="radio"/> Per day	(C760) 01 <input type="radio"/> Per second 02 <input type="radio"/> Per minute 03 <input type="radio"/> Per hour 04 <input type="radio"/> Per day	(C7104) 01 <input type="radio"/> Per second 02 <input type="radio"/> Per minute 03 <input type="radio"/> Per hour 04 <input type="radio"/> Per day
7.j Was this at the system nozzle or pump? Method 1	(C717) 01 <input type="radio"/> System nozzle 03 <input type="radio"/> Pump	(C761) 01 <input type="radio"/> System nozzle 03 <input type="radio"/> Pump	(C7105) 01 <input type="radio"/> System nozzle 03 <input type="radio"/> Pump
7.k What was the total number of days or weeks that this system ran? Method 1	(C718) <div style="border: 1px solid black; width: 100px; height: 15px; margin: 5px auto;"></div> days or weeks	(C762) <div style="border: 1px solid black; width: 100px; height: 15px; margin: 5px auto;"></div> days or weeks	(C7106) <div style="border: 1px solid black; width: 100px; height: 15px; margin: 5px auto;"></div> days or weeks
7.l Was it days or weeks? Method 1	(C719) 01 <input type="radio"/> Days 03 <input type="radio"/> Weeks	(C763) 01 <input type="radio"/> Days 03 <input type="radio"/> Weeks	(C7107) 01 <input type="radio"/> Days 03 <input type="radio"/> Weeks
7.m What was the total number of hours (per day/week) that this system ran? Method 1	(C720) <div style="border: 1px solid black; width: 100px; height: 15px; margin: 5px auto;"></div> hours	(C764) <div style="border: 1px solid black; width: 100px; height: 15px; margin: 5px auto;"></div> hours	(C7108) <div style="border: 1px solid black; width: 100px; height: 15px; margin: 5px auto;"></div> hours

If another irrigation method was used for a crop, continue to method 2 for that crop. If no more crop irrigation to report, go to Q8 (page 24).

Enter crops from pages 4 and 5 (crop 1 to crop 6).

	Crop 4	Crop 5	Crop 6
Crop Name			
7.i Were the units applied per second, minute, hour or day? Method 1	(C7148) 01 <input type="radio"/> Per second 02 <input type="radio"/> Per minute 03 <input type="radio"/> Per hour 04 <input type="radio"/> Per day	(C7192) 01 <input type="radio"/> Per second 02 <input type="radio"/> Per minute 03 <input type="radio"/> Per hour 04 <input type="radio"/> Per day	(C7236) 01 <input type="radio"/> Per second 02 <input type="radio"/> Per minute 03 <input type="radio"/> Per hour 04 <input type="radio"/> Per day
7.j Was this at the system nozzle or pump? Method 1	(C7149) 01 <input type="radio"/> System nozzle 03 <input type="radio"/> Pump	(C7193) 01 <input type="radio"/> System nozzle 03 <input type="radio"/> Pump	(C7237) 01 <input type="radio"/> System nozzle 03 <input type="radio"/> Pump
7.k What was the total number of days or weeks that this system ran? Method 1	(C7150) <div style="border: 1px solid black; width: 100px; height: 15px; margin: 5px auto;"></div> days or weeks	(C7194) <div style="border: 1px solid black; width: 100px; height: 15px; margin: 5px auto;"></div> days or weeks	(C7238) <div style="border: 1px solid black; width: 100px; height: 15px; margin: 5px auto;"></div> days or weeks
7.l Was it days or weeks? Method 1	(C7151) 01 <input type="radio"/> Days 03 <input type="radio"/> Weeks	(C7195) 01 <input type="radio"/> Days 03 <input type="radio"/> Weeks	(C7239) 01 <input type="radio"/> Days 03 <input type="radio"/> Weeks
7.m What was the total number of hours (per day/week) that this system ran? Method 1	(C7152) <div style="border: 1px solid black; width: 100px; height: 15px; margin: 5px auto;"></div> hours	(C7196) <div style="border: 1px solid black; width: 100px; height: 15px; margin: 5px auto;"></div> hours	(C7240) <div style="border: 1px solid black; width: 100px; height: 15px; margin: 5px auto;"></div> hours

If another irrigation method was used for a crop, continue to method 2 for that crop. If no more crop irrigation to report, go to Q8 (page 24).

Enter crops from pages 4 and 5 (crop 1 to crop 6). Include water used to increase soil moisture content e.g., pre-planting or post harvest.

	Crop 1	Crop 2	Crop 3
<p>7.e What was the second method of irrigation used for the crop?</p> <p>Method 2</p> <p>Mark only one (per crop).</p>	<p>(C721)</p> <p>Sprinkler</p> <p>01 <input type="radio"/> Hand Move</p> <p>02 <input type="radio"/> Solid or Permanent Set</p> <p>03 <input type="radio"/> Side Roll, Wheel Line, Wheel Move or Wheel Roll</p> <p>04 <input type="radio"/> Traveler, Volume Gun, Travelling Gun, Walker, Overhead or Circler</p> <p>05 <input type="radio"/> Linear move < 25 psi</p> <p>06 <input type="radio"/> Linear move 25 - 50 psi</p> <p>07 <input type="radio"/> Linear move >50 psi</p> <p>08 <input type="radio"/> Centre pivot < 25 psi</p> <p>09 <input type="radio"/> Centre Pivot 25 - 50 psi</p> <p>10 <input type="radio"/> Centre Pivot >50 psi</p> <p>Micro</p> <p>20 <input type="radio"/> Surface drip</p> <p>21 <input type="radio"/> Sub-surface Drip</p> <p>22 <input type="radio"/> Micro-sprinkler</p> <p>23 <input type="radio"/> Bubblers</p> <p>24 <input type="radio"/> Microjet</p> <p>25 <input type="radio"/> Hand watering</p> <p>Surface</p> <p>30 <input type="radio"/> Down rows</p> <p>31 <input type="radio"/> Furrows</p> <p>32 <input type="radio"/> Corrugations</p> <p>33 <input type="radio"/> Border dyke</p> <p>34 <input type="radio"/> Level basins</p> <p>35 <input type="radio"/> Uncontrolled flooding (wild flooding)</p> <p>36 <input type="radio"/> Back flooding</p> <p>40 <input type="radio"/> Other method (specify) <u>(C722)</u> _____</p>	<p>(C765)</p> <p>Sprinkler</p> <p>01 <input type="radio"/> Hand Move</p> <p>02 <input type="radio"/> Solid or Permanent Set</p> <p>03 <input type="radio"/> Side Roll, Wheel Line, Wheel Move or Wheel Roll</p> <p>04 <input type="radio"/> Traveler, Volume Gun, Travelling Gun, Walker, Overhead or Circler</p> <p>05 <input type="radio"/> Linear move < 25 psi</p> <p>06 <input type="radio"/> Linear move 25 - 50 psi</p> <p>07 <input type="radio"/> Linear move >50 psi</p> <p>08 <input type="radio"/> Centre pivot < 25 psi</p> <p>09 <input type="radio"/> Centre Pivot 25 - 50 psi</p> <p>10 <input type="radio"/> Centre Pivot >50 psi</p> <p>Micro</p> <p>20 <input type="radio"/> Surface drip</p> <p>21 <input type="radio"/> Sub-surface Drip</p> <p>22 <input type="radio"/> Micro-sprinkler</p> <p>23 <input type="radio"/> Bubblers</p> <p>24 <input type="radio"/> Microjet</p> <p>25 <input type="radio"/> Hand watering</p> <p>Surface</p> <p>30 <input type="radio"/> Down rows</p> <p>31 <input type="radio"/> Furrows</p> <p>32 <input type="radio"/> Corrugations</p> <p>33 <input type="radio"/> Border dyke</p> <p>34 <input type="radio"/> Level basins</p> <p>35 <input type="radio"/> Uncontrolled flooding (wild flooding)</p> <p>36 <input type="radio"/> Back flooding</p> <p>40 <input type="radio"/> Other method (specify) <u>(C766)</u> _____</p>	<p>(C7109)</p> <p>Sprinkler</p> <p>01 <input type="radio"/> Hand Move</p> <p>02 <input type="radio"/> Solid or Permanent Set</p> <p>03 <input type="radio"/> Side Roll, Wheel Line, Wheel Move or Wheel Roll</p> <p>04 <input type="radio"/> Traveler, Volume Gun, Travelling Gun, Walker, Overhead or Circler</p> <p>05 <input type="radio"/> Linear move < 25 psi</p> <p>06 <input type="radio"/> Linear move 25 - 50 psi</p> <p>07 <input type="radio"/> Linear move >50 psi</p> <p>08 <input type="radio"/> Centre pivot < 25 psi</p> <p>09 <input type="radio"/> Centre Pivot 25 - 50 psi</p> <p>10 <input type="radio"/> Centre Pivot >50 psi</p> <p>Micro</p> <p>20 <input type="radio"/> Surface drip</p> <p>21 <input type="radio"/> Sub-surface Drip</p> <p>22 <input type="radio"/> Micro-sprinkler</p> <p>23 <input type="radio"/> Bubblers</p> <p>24 <input type="radio"/> Microjet</p> <p>25 <input type="radio"/> Hand watering</p> <p>Surface</p> <p>30 <input type="radio"/> Down rows</p> <p>31 <input type="radio"/> Furrows</p> <p>32 <input type="radio"/> Corrugations</p> <p>33 <input type="radio"/> Border dyke</p> <p>34 <input type="radio"/> Level basins</p> <p>35 <input type="radio"/> Uncontrolled flooding (wild flooding)</p> <p>36 <input type="radio"/> Back flooding</p> <p>40 <input type="radio"/> Other method (specify) <u>(C7110)</u> _____</p>
<p>7.f What was the total area of the crop irrigated with the second irrigation method?</p>	<p>(C723)</p>	<p>(C767)</p>	<p>(C7111)</p>

Enter crops from pages 4 and 5 (crop 1 to crop 6). Include water used to increase soil moisture content e.g., pre-planting or post harvest.

	Crop 4	Crop 5	Crop 6
<p>7.e What was the second method of irrigation used for the crop?</p> <p>Method 2</p> <p>Mark only one (per crop).</p>	<p>(C7153)</p> <p>Sprinkler</p> <p>01 <input type="radio"/> Hand Move</p> <p>02 <input type="radio"/> Solid or Permanent Set</p> <p>03 <input type="radio"/> Side Roll, Wheel Line, Wheel Move or Wheel Roll</p> <p>04 <input type="radio"/> Traveler, Volume Gun, Travelling Gun, Walker, Overhead or Circler</p> <p>05 <input type="radio"/> Linear move < 25 psi</p> <p>06 <input type="radio"/> Linear move 25 - 50 psi</p> <p>07 <input type="radio"/> Linear move >50 psi</p> <p>08 <input type="radio"/> Centre pivot < 25 psi</p> <p>09 <input type="radio"/> Centre Pivot 25 - 50 psi</p> <p>10 <input type="radio"/> Centre Pivot >50 psi</p> <p>Micro</p> <p>20 <input type="radio"/> Surface drip</p> <p>21 <input type="radio"/> Sub-surface Drip</p> <p>22 <input type="radio"/> Micro-sprinkler</p> <p>23 <input type="radio"/> Bubblers</p> <p>24 <input type="radio"/> Microjet</p> <p>25 <input type="radio"/> Hand watering</p> <p>Surface</p> <p>30 <input type="radio"/> Down rows</p> <p>31 <input type="radio"/> Furrows</p> <p>32 <input type="radio"/> Corrugations</p> <p>33 <input type="radio"/> Border dyke</p> <p>34 <input type="radio"/> Level basins</p> <p>35 <input type="radio"/> Uncontrolled flooding (wild flooding)</p> <p>36 <input type="radio"/> Back flooding</p> <p>40 <input type="radio"/> Other method (specify) <u>(C7154)</u> _____</p>	<p>(C7197)</p> <p>Sprinkler</p> <p>01 <input type="radio"/> Hand Move</p> <p>02 <input type="radio"/> Solid or Permanent Set</p> <p>03 <input type="radio"/> Side Roll, Wheel Line, Wheel Move or Wheel Roll</p> <p>04 <input type="radio"/> Traveler, Volume Gun, Travelling Gun, Walker, Overhead or Circler</p> <p>05 <input type="radio"/> Linear move < 25 psi</p> <p>06 <input type="radio"/> Linear move 25 - 50 psi</p> <p>07 <input type="radio"/> Linear move >50 psi</p> <p>08 <input type="radio"/> Centre pivot < 25 psi</p> <p>09 <input type="radio"/> Centre Pivot 25 - 50 psi</p> <p>10 <input type="radio"/> Centre Pivot >50 psi</p> <p>Micro</p> <p>20 <input type="radio"/> Surface drip</p> <p>21 <input type="radio"/> Sub-surface Drip</p> <p>22 <input type="radio"/> Micro-sprinkler</p> <p>23 <input type="radio"/> Bubblers</p> <p>24 <input type="radio"/> Microjet</p> <p>25 <input type="radio"/> Hand watering</p> <p>Surface</p> <p>30 <input type="radio"/> Down rows</p> <p>31 <input type="radio"/> Furrows</p> <p>32 <input type="radio"/> Corrugations</p> <p>33 <input type="radio"/> Border dyke</p> <p>34 <input type="radio"/> Level basins</p> <p>35 <input type="radio"/> Uncontrolled flooding (wild flooding)</p> <p>36 <input type="radio"/> Back flooding</p> <p>40 <input type="radio"/> Other method (specify) <u>(C7198)</u> _____</p>	<p>(C7241)</p> <p>Sprinkler</p> <p>01 <input type="radio"/> Hand Move</p> <p>02 <input type="radio"/> Solid or Permanent Set</p> <p>03 <input type="radio"/> Side Roll, Wheel Line, Wheel Move or Wheel Roll</p> <p>04 <input type="radio"/> Traveler, Volume Gun, Travelling Gun, Walker, Overhead or Circler</p> <p>05 <input type="radio"/> Linear move < 25 psi</p> <p>06 <input type="radio"/> Linear move 25 - 50 psi</p> <p>07 <input type="radio"/> Linear move >50 psi</p> <p>08 <input type="radio"/> Centre pivot < 25 psi</p> <p>09 <input type="radio"/> Centre Pivot 25 - 50 psi</p> <p>10 <input type="radio"/> Centre Pivot >50 psi</p> <p>Micro</p> <p>20 <input type="radio"/> Surface drip</p> <p>21 <input type="radio"/> Sub-surface Drip</p> <p>22 <input type="radio"/> Micro-sprinkler</p> <p>23 <input type="radio"/> Bubblers</p> <p>24 <input type="radio"/> Microjet</p> <p>25 <input type="radio"/> Hand watering</p> <p>Surface</p> <p>30 <input type="radio"/> Down rows</p> <p>31 <input type="radio"/> Furrows</p> <p>32 <input type="radio"/> Corrugations</p> <p>33 <input type="radio"/> Border dyke</p> <p>34 <input type="radio"/> Level basins</p> <p>35 <input type="radio"/> Uncontrolled flooding (wild flooding)</p> <p>36 <input type="radio"/> Back flooding</p> <p>40 <input type="radio"/> Other method (specify) <u>(C7242)</u> _____</p>
<p>7.f What was the total area of the crop irrigated with the second irrigation method?</p>	<p>(C7155)</p>	<p>(C7199)</p>	<p>(C7243)</p>

Enter crops from pages 4 and 5 (crop 1 to crop 6).

	Crop 1	Crop 2	Crop 3
Crop Name			
<p>7.g The next questions ask about volume (or flow rate) of water used (in the 2007 growing season).</p> <p>How will you report volume of water used: e.g., inches, gallons, litres for the crop?</p> <p>Method 2</p> <p>Mark only one (per crop).</p> <p>If the response is by Flow rate, Q7i will ask to specify per second, minute, hour or day.</p>	<p>(C724)</p> <p>Unit of water</p> <p>Water depth per surface area</p> <p>01 <input type="radio"/> Inches per acre</p> <p>02 <input type="radio"/> Millimetres per hectare</p> <p>OR</p> <p>Total volume</p> <p>03 <input type="radio"/> Total acre-feet</p> <p>04 <input type="radio"/> Total gallons</p> <p>05 <input type="radio"/> Total litres</p> <p>06 <input type="radio"/> Total cubic feet</p> <p>07 <input type="radio"/> Total cubic metres</p> <p>OR</p> <p>Volume per surface area</p> <p>08 <input type="radio"/> Acre-feet per acre</p> <p>09 <input type="radio"/> Gallons per acre</p> <p>10 <input type="radio"/> Litres per hectare</p> <p>11 <input type="radio"/> Cubic feet per acre</p> <p>12 <input type="radio"/> Cubic metres per hectare</p> <p>14 <input type="radio"/> Other Volume, specify (C725)</p> <p>_____</p> <p>OR</p> <p>Flow rate</p> <p>20 <input type="radio"/> Gallons (per unit of time)</p> <p>21 <input type="radio"/> Litres (per unit of time)</p> <p>22 <input type="radio"/> Cubic feet (per unit of time)</p> <p>23 <input type="radio"/> Cubic metres (per unit of time)</p> <p>24 <input type="radio"/> Pounds (per unit of time)</p> <p>26 <input type="radio"/> Other Flow Rate (per unit of time), specify (C726)</p> <p>_____</p>	<p>(C768)</p> <p>Unit of water</p> <p>Water depth per surface area</p> <p>01 <input type="radio"/> Inches per acre</p> <p>02 <input type="radio"/> Millimetres per hectare</p> <p>OR</p> <p>Total volume</p> <p>03 <input type="radio"/> Total acre-feet</p> <p>04 <input type="radio"/> Total gallons</p> <p>05 <input type="radio"/> Total litres</p> <p>06 <input type="radio"/> Total cubic feet</p> <p>07 <input type="radio"/> Total cubic metres</p> <p>OR</p> <p>Volume per surface area</p> <p>08 <input type="radio"/> Acre-feet per acre</p> <p>09 <input type="radio"/> Gallons per acre</p> <p>10 <input type="radio"/> Litres per hectare</p> <p>11 <input type="radio"/> Cubic feet per acre</p> <p>12 <input type="radio"/> Cubic metres per hectare</p> <p>14 <input type="radio"/> Other Volume, specify (C769)</p> <p>_____</p> <p>OR</p> <p>Flow rate</p> <p>20 <input type="radio"/> Gallons (per unit of time)</p> <p>21 <input type="radio"/> Litres (per unit of time)</p> <p>22 <input type="radio"/> Cubic feet (per unit of time)</p> <p>23 <input type="radio"/> Cubic metres (per unit of time)</p> <p>24 <input type="radio"/> Pounds (per unit of time)</p> <p>26 <input type="radio"/> Other Flow Rate (per unit of time), specify (C770)</p> <p>_____</p>	<p>(C7112)</p> <p>Unit of water</p> <p>Water depth per surface area</p> <p>01 <input type="radio"/> Inches per acre</p> <p>02 <input type="radio"/> Millimetres per hectare</p> <p>OR</p> <p>Total volume</p> <p>03 <input type="radio"/> Total acre-feet</p> <p>04 <input type="radio"/> Total gallons</p> <p>05 <input type="radio"/> Total litres</p> <p>06 <input type="radio"/> Total cubic feet</p> <p>07 <input type="radio"/> Total cubic metres</p> <p>OR</p> <p>Volume per surface area</p> <p>08 <input type="radio"/> Acre-feet per acre</p> <p>09 <input type="radio"/> Gallons per acre</p> <p>10 <input type="radio"/> Litres per hectare</p> <p>11 <input type="radio"/> Cubic feet per acre</p> <p>12 <input type="radio"/> Cubic metres per hectare</p> <p>14 <input type="radio"/> Other Volume, specify (C7113)</p> <p>_____</p> <p>OR</p> <p>Flow rate</p> <p>20 <input type="radio"/> Gallons (per unit of time)</p> <p>21 <input type="radio"/> Litres (per unit of time)</p> <p>22 <input type="radio"/> Cubic feet (per unit of time)</p> <p>23 <input type="radio"/> Cubic metres (per unit of time)</p> <p>24 <input type="radio"/> Pounds (per unit of time)</p> <p>26 <input type="radio"/> Other Flow Rate (per unit of time), specify (C7114)</p> <p>_____</p>
<p>7.h How many units (i.e., reported in Q7g) of water were applied on the crop using the second irrigation method?</p>	<p>(C727)</p>	<p>(C771)</p>	<p>(C7115)</p>

If possible please report flow rate at system nozzle. If not available, give rate at pump.

If any in 7g is answered by flow rate (20 to 26) then continue to 7i for that crop. If another irrigation method was used for a crop, continue to method 3 for that crop. If no more crop irrigation to report, go to Q8 (page 24).

Enter crops from pages 4 and 5 (crop 1 to crop 6).

	Crop 4	Crop 5	Crop 6
Crop Name			
<p>7.g The next questions ask about volume (or flow rate) of water used (in the 2007 growing season).</p> <p>How will you report volume of water used: e.g., inches, gallons, litres for the crop?</p> <p>Method 2</p> <p>Mark only one (per crop).</p> <p>If the response is by Flow rate, Q7i will ask to specify per second, minute, hour or day.</p>	<p>(C7156)</p> <p>Unit of water</p> <p>Water depth per surface area</p> <p>01 <input type="radio"/> Inches per acre</p> <p>02 <input type="radio"/> Millimetres per hectare</p> <p>OR</p> <p>Total volume</p> <p>03 <input type="radio"/> Total acre-feet</p> <p>04 <input type="radio"/> Total gallons</p> <p>05 <input type="radio"/> Total litres</p> <p>06 <input type="radio"/> Total cubic feet</p> <p>07 <input type="radio"/> Total cubic metres</p> <p>OR</p> <p>Volume per surface area</p> <p>08 <input type="radio"/> Acre-feet per acre</p> <p>09 <input type="radio"/> Gallons per acre</p> <p>10 <input type="radio"/> Litres per hectare</p> <p>11 <input type="radio"/> Cubic feet per acre</p> <p>12 <input type="radio"/> Cubic metres per hectare</p> <p>14 <input type="radio"/> Other Volume, specify (C7157)</p> <p>_____</p> <p>OR</p> <p>Flow rate</p> <p>20 <input type="radio"/> Gallons (per unit of time)</p> <p>21 <input type="radio"/> Litres (per unit of time)</p> <p>22 <input type="radio"/> Cubic feet (per unit of time)</p> <p>23 <input type="radio"/> Cubic metres (per unit of time)</p> <p>24 <input type="radio"/> Pounds (per unit of time)</p> <p>26 <input type="radio"/> Other Flow Rate (per unit of time), specify (C7158)</p> <p>_____</p>	<p>(C7200)</p> <p>Unit of water</p> <p>Water depth per surface area</p> <p>01 <input type="radio"/> Inches per acre</p> <p>02 <input type="radio"/> Millimetres per hectare</p> <p>OR</p> <p>Total volume</p> <p>03 <input type="radio"/> Total acre-feet</p> <p>04 <input type="radio"/> Total gallons</p> <p>05 <input type="radio"/> Total litres</p> <p>06 <input type="radio"/> Total cubic feet</p> <p>07 <input type="radio"/> Total cubic metres</p> <p>OR</p> <p>Volume per surface area</p> <p>08 <input type="radio"/> Acre-feet per acre</p> <p>09 <input type="radio"/> Gallons per acre</p> <p>10 <input type="radio"/> Litres per hectare</p> <p>11 <input type="radio"/> Cubic feet per acre</p> <p>12 <input type="radio"/> Cubic metres per hectare</p> <p>14 <input type="radio"/> Other Volume, specify (C7201)</p> <p>_____</p> <p>OR</p> <p>Flow rate</p> <p>20 <input type="radio"/> Gallons (per unit of time)</p> <p>21 <input type="radio"/> Litres (per unit of time)</p> <p>22 <input type="radio"/> Cubic feet (per unit of time)</p> <p>23 <input type="radio"/> Cubic metres (per unit of time)</p> <p>24 <input type="radio"/> Pounds (per unit of time)</p> <p>26 <input type="radio"/> Other Flow Rate (per unit of time), specify (C7202)</p> <p>_____</p>	<p>(C7244)</p> <p>Unit of water</p> <p>Water depth per surface area</p> <p>01 <input type="radio"/> Inches per acre</p> <p>02 <input type="radio"/> Millimetres per hectare</p> <p>OR</p> <p>Total volume</p> <p>03 <input type="radio"/> Total acre-feet</p> <p>04 <input type="radio"/> Total gallons</p> <p>05 <input type="radio"/> Total litres</p> <p>06 <input type="radio"/> Total cubic feet</p> <p>07 <input type="radio"/> Total cubic metres</p> <p>OR</p> <p>Volume per surface area</p> <p>08 <input type="radio"/> Acre-feet per acre</p> <p>09 <input type="radio"/> Gallons per acre</p> <p>10 <input type="radio"/> Litres per hectare</p> <p>11 <input type="radio"/> Cubic feet per acre</p> <p>12 <input type="radio"/> Cubic metres per hectare</p> <p>14 <input type="radio"/> Other Volume, specify (C7245)</p> <p>_____</p> <p>OR</p> <p>Flow rate</p> <p>20 <input type="radio"/> Gallons (per unit of time)</p> <p>21 <input type="radio"/> Litres (per unit of time)</p> <p>22 <input type="radio"/> Cubic feet (per unit of time)</p> <p>23 <input type="radio"/> Cubic metres (per unit of time)</p> <p>24 <input type="radio"/> Pounds (per unit of time)</p> <p>26 <input type="radio"/> Other Flow Rate (per unit of time), specify (C7246)</p> <p>_____</p>
<p>7.h How many units (i.e., reported in Q7g) of water were applied on the crop using the second irrigation method?</p>	(C7159)	(C7203)	(C7247)

If possible please report flow rate at system nozzle. If not available, give rate at pump.

If any in 7g is answered by flow rate (20 to 26) then continue to 7i for that crop. If another irrigation method was used for a crop, continue to method 3 for that crop. If no more crop irrigation to report, go to Q8 (page 24).

Enter crops from pages 4 and 5 (crop 1 to crop 6).

	Crop 1	Crop 2	Crop 3
Crop Name			
7.i Were the units applied per second, minute, hour or day? Method 2	(C728) 01 <input type="radio"/> Per second 02 <input type="radio"/> Per minute 03 <input type="radio"/> Per hour 04 <input type="radio"/> Per day	(C772) 01 <input type="radio"/> Per second 02 <input type="radio"/> Per minute 03 <input type="radio"/> Per hour 04 <input type="radio"/> Per day	(C7116) 01 <input type="radio"/> Per second 02 <input type="radio"/> Per minute 03 <input type="radio"/> Per hour 04 <input type="radio"/> Per day
7.j Was this at the system nozzle or pump? Method 2	(C729) 01 <input type="radio"/> System nozzle 03 <input type="radio"/> Pump	(C773) 01 <input type="radio"/> System nozzle 03 <input type="radio"/> Pump	(C7117) 01 <input type="radio"/> System nozzle 03 <input type="radio"/> Pump
7.k What was the total number of days or weeks that this system ran? Method 2	(C730) <div style="border: 1px solid black; width: 100px; height: 15px; margin: 5px auto;"></div> days or weeks	(C774) <div style="border: 1px solid black; width: 100px; height: 15px; margin: 5px auto;"></div> days or weeks	(C7118) <div style="border: 1px solid black; width: 100px; height: 15px; margin: 5px auto;"></div> days or weeks
7.l Was it days or weeks? Method 2	(C731) 01 <input type="radio"/> Days 03 <input type="radio"/> Weeks	(C775) 01 <input type="radio"/> Days 03 <input type="radio"/> Weeks	(C7119) 01 <input type="radio"/> Days 03 <input type="radio"/> Weeks
7.m What was the total number of hours (per day/week) that this system ran? Method 2	(C732) <div style="border: 1px solid black; width: 100px; height: 15px; margin: 5px auto;"></div> hours	(C776) <div style="border: 1px solid black; width: 100px; height: 15px; margin: 5px auto;"></div> hours	(C7120) <div style="border: 1px solid black; width: 100px; height: 15px; margin: 5px auto;"></div> hours

If another irrigation method was used for a crop, continue to method 3 for that crop. If no more crop irrigation to report, go to Q8 (page 24).

Enter crops from pages 4 and 5 (crop 1 to crop 6).

Crop Name	Crop 4	Crop 5	Crop 6
<p>7.i Were the units applied per second, minute, hour or day?</p> <p>Method 2</p>	<p>(C7160)</p> <p>01 <input type="radio"/> Per second</p> <p>02 <input type="radio"/> Per minute</p> <p>03 <input type="radio"/> Per hour</p> <p>04 <input type="radio"/> Per day</p>	<p>(C7204)</p> <p>01 <input type="radio"/> Per second</p> <p>02 <input type="radio"/> Per minute</p> <p>03 <input type="radio"/> Per hour</p> <p>04 <input type="radio"/> Per day</p>	<p>(C7248)</p> <p>01 <input type="radio"/> Per second</p> <p>02 <input type="radio"/> Per minute</p> <p>03 <input type="radio"/> Per hour</p> <p>04 <input type="radio"/> Per day</p>
<p>7.j Was this at the system nozzle or pump?</p> <p>Method 2</p>	<p>(C7161)</p> <p>01 <input type="radio"/> System nozzle</p> <p>03 <input type="radio"/> Pump</p>	<p>(C7205)</p> <p>01 <input type="radio"/> System nozzle</p> <p>03 <input type="radio"/> Pump</p>	<p>(C7249)</p> <p>01 <input type="radio"/> System nozzle</p> <p>03 <input type="radio"/> Pump</p>
<p>7.k What was the total number of days or weeks that this system ran?</p> <p>Method 2</p>	<p>(C7162)</p> <p>_____</p> <p>days or weeks</p>	<p>(C7206)</p> <p>_____</p> <p>days or weeks</p>	<p>(C7250)</p> <p>_____</p> <p>days or weeks</p>
<p>7.l Was it days or weeks?</p> <p>Method 2</p>	<p>(C7163)</p> <p>01 <input type="radio"/> Days</p> <p>03 <input type="radio"/> Weeks</p>	<p>(C7207)</p> <p>01 <input type="radio"/> Days</p> <p>03 <input type="radio"/> Weeks</p>	<p>(C7251)</p> <p>01 <input type="radio"/> Days</p> <p>03 <input type="radio"/> Weeks</p>
<p>7.m What was the total number of hours (per day/week) that this system ran?</p> <p>Method 2</p>	<p>(C7164)</p> <p>_____</p> <p>hours</p>	<p>(C7208)</p> <p>_____</p> <p>hours</p>	<p>(C7252)</p> <p>_____</p> <p>hours</p>

If another irrigation method was used for a crop, continue to method 3 for that crop. If no more crop irrigation to report, go to Q8 (page 24).

Enter crops from pages 4 and 5 (crop 1 to crop 6). Include water used to increase soil moisture content e.g., pre-planting or post harvest.

	Crop 1	Crop 2	Crop 3
<p>7.e What was the third method of irrigation used for the crop?</p> <p>Method 3</p> <p>Mark only one (per crop).</p>	<p>(C733)</p> <p>Sprinkler</p> <p>01 <input type="radio"/> Hand Move</p> <p>02 <input type="radio"/> Solid or Permanent Set</p> <p>03 <input type="radio"/> Side Roll, Wheel Line, Wheel Move or Wheel Roll</p> <p>04 <input type="radio"/> Traveler, Volume Gun, Travelling Gun, Walker, Overhead or Circler</p> <p>05 <input type="radio"/> Linear move < 25 psi</p> <p>06 <input type="radio"/> Linear move 25 - 50 psi</p> <p>07 <input type="radio"/> Linear move >50 psi</p> <p>08 <input type="radio"/> Centre pivot < 25 psi</p> <p>09 <input type="radio"/> Centre Pivot 25 - 50 psi</p> <p>10 <input type="radio"/> Centre Pivot >50 psi</p> <p>Micro</p> <p>20 <input type="radio"/> Surface drip</p> <p>21 <input type="radio"/> Sub-surface Drip</p> <p>22 <input type="radio"/> Micro-sprinkler</p> <p>23 <input type="radio"/> Bubblers</p> <p>24 <input type="radio"/> Microjet</p> <p>25 <input type="radio"/> Hand watering</p> <p>Surface</p> <p>30 <input type="radio"/> Down rows</p> <p>31 <input type="radio"/> Furrows</p> <p>32 <input type="radio"/> Corrugations</p> <p>33 <input type="radio"/> Border dyke</p> <p>34 <input type="radio"/> Level basins</p> <p>35 <input type="radio"/> Uncontrolled flooding (wild flooding)</p> <p>36 <input type="radio"/> Back flooding</p> <p>40 <input type="radio"/> Other method (specify) <u>(C734)</u> _____</p> <p>_____</p>	<p>(C777)</p> <p>Sprinkler</p> <p>01 <input type="radio"/> Hand Move</p> <p>02 <input type="radio"/> Solid or Permanent Set</p> <p>03 <input type="radio"/> Side Roll, Wheel Line, Wheel Move or Wheel Roll</p> <p>04 <input type="radio"/> Traveler, Volume Gun, Travelling Gun, Walker, Overhead or Circler</p> <p>05 <input type="radio"/> Linear move < 25 psi</p> <p>06 <input type="radio"/> Linear move 25 - 50 psi</p> <p>07 <input type="radio"/> Linear move >50 psi</p> <p>08 <input type="radio"/> Centre pivot < 25 psi</p> <p>09 <input type="radio"/> Centre Pivot 25 - 50 psi</p> <p>10 <input type="radio"/> Centre Pivot >50 psi</p> <p>Micro</p> <p>20 <input type="radio"/> Surface drip</p> <p>21 <input type="radio"/> Sub-surface Drip</p> <p>22 <input type="radio"/> Micro-sprinkler</p> <p>23 <input type="radio"/> Bubblers</p> <p>24 <input type="radio"/> Microjet</p> <p>25 <input type="radio"/> Hand watering</p> <p>Surface</p> <p>30 <input type="radio"/> Down rows</p> <p>31 <input type="radio"/> Furrows</p> <p>32 <input type="radio"/> Corrugations</p> <p>33 <input type="radio"/> Border dyke</p> <p>34 <input type="radio"/> Level basins</p> <p>35 <input type="radio"/> Uncontrolled flooding (wild flooding)</p> <p>36 <input type="radio"/> Back flooding</p> <p>40 <input type="radio"/> Other method (specify) <u>(C778)</u> _____</p> <p>_____</p>	<p>(C7121)</p> <p>Sprinkler</p> <p>01 <input type="radio"/> Hand Move</p> <p>02 <input type="radio"/> Solid or Permanent Set</p> <p>03 <input type="radio"/> Side Roll, Wheel Line, Wheel Move or Wheel Roll</p> <p>04 <input type="radio"/> Traveler, Volume Gun, Travelling Gun, Walker, Overhead or Circler</p> <p>05 <input type="radio"/> Linear move < 25 psi</p> <p>06 <input type="radio"/> Linear move 25 - 50 psi</p> <p>07 <input type="radio"/> Linear move >50 psi</p> <p>08 <input type="radio"/> Centre pivot < 25 psi</p> <p>09 <input type="radio"/> Centre Pivot 25 - 50 psi</p> <p>10 <input type="radio"/> Centre Pivot >50 psi</p> <p>Micro</p> <p>20 <input type="radio"/> Surface drip</p> <p>21 <input type="radio"/> Sub-surface Drip</p> <p>22 <input type="radio"/> Micro-sprinkler</p> <p>23 <input type="radio"/> Bubblers</p> <p>24 <input type="radio"/> Microjet</p> <p>25 <input type="radio"/> Hand watering</p> <p>Surface</p> <p>30 <input type="radio"/> Down rows</p> <p>31 <input type="radio"/> Furrows</p> <p>32 <input type="radio"/> Corrugations</p> <p>33 <input type="radio"/> Border dyke</p> <p>34 <input type="radio"/> Level basins</p> <p>35 <input type="radio"/> Uncontrolled flooding (wild flooding)</p> <p>36 <input type="radio"/> Back flooding</p> <p>40 <input type="radio"/> Other method (specify) <u>(C7122)</u> _____</p> <p>_____</p>
<p>7.f What was the total area of the crop irrigated with the third irrigation method?</p>	<p>(C735)</p>	<p>(C779)</p>	<p>(C7123)</p>

Enter crops from pages 4 and 5 (crop 1 to crop 6). Include water used to increase soil moisture content e.g., pre-planting or post harvest.

	Crop 4	Crop 5	Crop 6
<p>7.e What was the third method of irrigation used for the crop?</p> <p>Method 3</p> <p>Mark only one (per crop).</p>	<p>(C7165)</p> <p>Sprinkler</p> <p>01 <input type="radio"/> Hand Move</p> <p>02 <input type="radio"/> Solid or Permanent Set</p> <p>03 <input type="radio"/> Side Roll, Wheel Line, Wheel Move or Wheel Roll</p> <p>04 <input type="radio"/> Traveler, Volume Gun, Travelling Gun, Walker, Overhead or Circler</p> <p>05 <input type="radio"/> Linear move < 25 psi</p> <p>06 <input type="radio"/> Linear move 25 - 50 psi</p> <p>07 <input type="radio"/> Linear move >50 psi</p> <p>08 <input type="radio"/> Centre pivot < 25 psi</p> <p>09 <input type="radio"/> Centre Pivot 25 - 50 psi</p> <p>10 <input type="radio"/> Centre Pivot >50 psi</p> <p>Micro</p> <p>20 <input type="radio"/> Surface drip</p> <p>21 <input type="radio"/> Sub-surface Drip</p> <p>22 <input type="radio"/> Micro-sprinkler</p> <p>23 <input type="radio"/> Bubblers</p> <p>24 <input type="radio"/> Microjet</p> <p>25 <input type="radio"/> Hand watering</p> <p>Surface</p> <p>30 <input type="radio"/> Down rows</p> <p>31 <input type="radio"/> Furrows</p> <p>32 <input type="radio"/> Corrugations</p> <p>33 <input type="radio"/> Border dyke</p> <p>34 <input type="radio"/> Level basins</p> <p>35 <input type="radio"/> Uncontrolled flooding (wild flooding)</p> <p>36 <input type="radio"/> Back flooding</p> <p>40 <input type="radio"/> Other method (specify) <u>(C7166)</u> _____</p>	<p>(C7209)</p> <p>Sprinkler</p> <p>01 <input type="radio"/> Hand Move</p> <p>02 <input type="radio"/> Solid or Permanent Set</p> <p>03 <input type="radio"/> Side Roll, Wheel Line, Wheel Move or Wheel Roll</p> <p>04 <input type="radio"/> Traveler, Volume Gun, Travelling Gun, Walker, Overhead or Circler</p> <p>05 <input type="radio"/> Linear move < 25 psi</p> <p>06 <input type="radio"/> Linear move 25 - 50 psi</p> <p>07 <input type="radio"/> Linear move >50 psi</p> <p>08 <input type="radio"/> Centre pivot < 25 psi</p> <p>09 <input type="radio"/> Centre Pivot 25 - 50 psi</p> <p>10 <input type="radio"/> Centre Pivot >50 psi</p> <p>Micro</p> <p>20 <input type="radio"/> Surface drip</p> <p>21 <input type="radio"/> Sub-surface Drip</p> <p>22 <input type="radio"/> Micro-sprinkler</p> <p>23 <input type="radio"/> Bubblers</p> <p>24 <input type="radio"/> Microjet</p> <p>25 <input type="radio"/> Hand watering</p> <p>Surface</p> <p>30 <input type="radio"/> Down rows</p> <p>31 <input type="radio"/> Furrows</p> <p>32 <input type="radio"/> Corrugations</p> <p>33 <input type="radio"/> Border dyke</p> <p>34 <input type="radio"/> Level basins</p> <p>35 <input type="radio"/> Uncontrolled flooding (wild flooding)</p> <p>36 <input type="radio"/> Back flooding</p> <p>40 <input type="radio"/> Other method (specify) <u>(C7210)</u> _____</p>	<p>(C7253)</p> <p>Sprinkler</p> <p>01 <input type="radio"/> Hand Move</p> <p>02 <input type="radio"/> Solid or Permanent Set</p> <p>03 <input type="radio"/> Side Roll, Wheel Line, Wheel Move or Wheel Roll</p> <p>04 <input type="radio"/> Traveler, Volume Gun, Travelling Gun, Walker, Overhead or Circler</p> <p>05 <input type="radio"/> Linear move < 25 psi</p> <p>06 <input type="radio"/> Linear move 25 - 50 psi</p> <p>07 <input type="radio"/> Linear move >50 psi</p> <p>08 <input type="radio"/> Centre pivot < 25 psi</p> <p>09 <input type="radio"/> Centre Pivot 25 - 50 psi</p> <p>10 <input type="radio"/> Centre Pivot >50 psi</p> <p>Micro</p> <p>20 <input type="radio"/> Surface drip</p> <p>21 <input type="radio"/> Sub-surface Drip</p> <p>22 <input type="radio"/> Micro-sprinkler</p> <p>23 <input type="radio"/> Bubblers</p> <p>24 <input type="radio"/> Microjet</p> <p>25 <input type="radio"/> Hand watering</p> <p>Surface</p> <p>30 <input type="radio"/> Down rows</p> <p>31 <input type="radio"/> Furrows</p> <p>32 <input type="radio"/> Corrugations</p> <p>33 <input type="radio"/> Border dyke</p> <p>34 <input type="radio"/> Level basins</p> <p>35 <input type="radio"/> Uncontrolled flooding (wild flooding)</p> <p>36 <input type="radio"/> Back flooding</p> <p>40 <input type="radio"/> Other method (specify) <u>(C7254)</u> _____</p>
<p>7.f What was the total area of the crop irrigated with the third irrigation method?</p>	<p>(C7167)</p>	<p>(C7211)</p>	<p>(C7255)</p>

Enter crops from pages 4 and 5 (crop 1 to crop 6).

	Crop 1	Crop 2	Crop 3
Crop Name			
<p>7.g The next questions ask about volume (or flow rate) of water used (in the 2007 growing season).</p> <p>How will you report volume of water used: e.g., inches, gallons, litres for the crop?</p> <p>Method 3</p> <p>Mark only one (per crop).</p> <p>If the response is by Flow rate, Q7i will ask to specify per second, minute, hour or day.</p>	<p>(C736)</p> <p>Unit of water</p> <p>Water depth per surface area</p> <p>01 <input type="radio"/> Inches per acre</p> <p>02 <input type="radio"/> Millimetres per hectare</p> <p>OR</p> <p>Total volume</p> <p>03 <input type="radio"/> Total acre-feet</p> <p>04 <input type="radio"/> Total gallons</p> <p>05 <input type="radio"/> Total litres</p> <p>06 <input type="radio"/> Total cubic feet</p> <p>07 <input type="radio"/> Total cubic metres</p> <p>OR</p> <p>Volume per surface area</p> <p>08 <input type="radio"/> Acre-feet per acre</p> <p>09 <input type="radio"/> Gallons per acre</p> <p>10 <input type="radio"/> Litres per hectare</p> <p>11 <input type="radio"/> Cubic feet per acre</p> <p>12 <input type="radio"/> Cubic metres per hectare</p> <p>14 <input type="radio"/> Other Volume, specify (C737)</p> <p>_____</p> <p>OR</p> <p>Flow rate</p> <p>20 <input type="radio"/> Gallons (per unit of time)</p> <p>21 <input type="radio"/> Litres (per unit of time)</p> <p>22 <input type="radio"/> Cubic feet (per unit of time)</p> <p>23 <input type="radio"/> Cubic metres (per unit of time)</p> <p>24 <input type="radio"/> Pounds (per unit of time)</p> <p>26 <input type="radio"/> Other Flow Rate (per unit of time), specify (C738)</p> <p>_____</p>	<p>(C780)</p> <p>Unit of water</p> <p>Water depth per surface area</p> <p>01 <input type="radio"/> Inches per acre</p> <p>02 <input type="radio"/> Millimetres per hectare</p> <p>OR</p> <p>Total volume</p> <p>03 <input type="radio"/> Total acre-feet</p> <p>04 <input type="radio"/> Total gallons</p> <p>05 <input type="radio"/> Total litres</p> <p>06 <input type="radio"/> Total cubic feet</p> <p>07 <input type="radio"/> Total cubic metres</p> <p>OR</p> <p>Volume per surface area</p> <p>08 <input type="radio"/> Acre-feet per acre</p> <p>09 <input type="radio"/> Gallons per acre</p> <p>10 <input type="radio"/> Litres per hectare</p> <p>11 <input type="radio"/> Cubic feet per acre</p> <p>12 <input type="radio"/> Cubic metres per hectare</p> <p>14 <input type="radio"/> Other Volume, specify (C781)</p> <p>_____</p> <p>OR</p> <p>Flow rate</p> <p>20 <input type="radio"/> Gallons (per unit of time)</p> <p>21 <input type="radio"/> Litres (per unit of time)</p> <p>22 <input type="radio"/> Cubic feet (per unit of time)</p> <p>23 <input type="radio"/> Cubic metres (per unit of time)</p> <p>24 <input type="radio"/> Pounds (per unit of time)</p> <p>26 <input type="radio"/> Other Flow Rate (per unit of time), specify (C782)</p> <p>_____</p>	<p>(C7124)</p> <p>Unit of water</p> <p>Water depth per surface area</p> <p>01 <input type="radio"/> Inches per acre</p> <p>02 <input type="radio"/> Millimetres per hectare</p> <p>OR</p> <p>Total volume</p> <p>03 <input type="radio"/> Total acre-feet</p> <p>04 <input type="radio"/> Total gallons</p> <p>05 <input type="radio"/> Total litres</p> <p>06 <input type="radio"/> Total cubic feet</p> <p>07 <input type="radio"/> Total cubic metres</p> <p>OR</p> <p>Volume per surface area</p> <p>08 <input type="radio"/> Acre-feet per acre</p> <p>09 <input type="radio"/> Gallons per acre</p> <p>10 <input type="radio"/> Litres per hectare</p> <p>11 <input type="radio"/> Cubic feet per acre</p> <p>12 <input type="radio"/> Cubic metres per hectare</p> <p>14 <input type="radio"/> Other Volume, specify (C7125)</p> <p>_____</p> <p>OR</p> <p>Flow rate</p> <p>20 <input type="radio"/> Gallons (per unit of time)</p> <p>21 <input type="radio"/> Litres (per unit of time)</p> <p>22 <input type="radio"/> Cubic feet (per unit of time)</p> <p>23 <input type="radio"/> Cubic metres (per unit of time)</p> <p>24 <input type="radio"/> Pounds (per unit of time)</p> <p>26 <input type="radio"/> Other Flow Rate (per unit of time), specify (C7126)</p> <p>_____</p>
<p>7.h How many units (i.e., reported in Q7g) of water were applied on the crop using the third irrigation method?</p>	<p>(C739)</p>	<p>(C783)</p>	<p>(C7127)</p>

If possible please report flow rate at system nozzle. If not available, give rate at pump.

If any in 7g is answered by flow rate (20 to 26) then continue to 7i for that crop. If no more crop irrigation to report, go to Q8 (page 24).

Enter crops from pages 4 and 5 (crop 1 to crop 6).

	Crop 4	Crop 5	Crop 6
Crop Name			
<p>7.g The next questions ask about volume (or flow rate) of water used (in the 2007 growing season).</p> <p>How will you report volume of water used: e.g., inches, gallons, litres for the crop?</p> <p>Method 3</p> <p>Mark only one (per crop).</p> <p>If the response is by Flow rate, Q7i will ask to specify per second, minute, hour or day.</p>	<p>(C7168)</p> <p>Unit of water</p> <p>Water depth per surface area</p> <p>01 <input type="radio"/> Inches per acre</p> <p>02 <input type="radio"/> Millimetres per hectare</p> <p>OR</p> <p>Total volume</p> <p>03 <input type="radio"/> Total acre-feet</p> <p>04 <input type="radio"/> Total gallons</p> <p>05 <input type="radio"/> Total litres</p> <p>06 <input type="radio"/> Total cubic feet</p> <p>07 <input type="radio"/> Total cubic metres</p> <p>OR</p> <p>Volume per surface area</p> <p>08 <input type="radio"/> Acre-feet per acre</p> <p>09 <input type="radio"/> Gallons per acre</p> <p>10 <input type="radio"/> Litres per hectare</p> <p>11 <input type="radio"/> Cubic feet per acre</p> <p>12 <input type="radio"/> Cubic metres per hectare</p> <p>14 <input type="radio"/> Other Volume, specify (C7169)</p> <p>_____</p> <p>OR</p> <p>Flow rate</p> <p>20 <input type="radio"/> Gallons (per unit of time)</p> <p>21 <input type="radio"/> Litres (per unit of time)</p> <p>22 <input type="radio"/> Cubic feet (per unit of time)</p> <p>23 <input type="radio"/> Cubic metres (per unit of time)</p> <p>24 <input type="radio"/> Pounds (per unit of time)</p> <p>26 <input type="radio"/> Other Flow Rate (per unit of time), specify (C7170)</p> <p>_____</p>	<p>(C7212)</p> <p>Unit of water</p> <p>Water depth per surface area</p> <p>01 <input type="radio"/> Inches per acre</p> <p>02 <input type="radio"/> Millimetres per hectare</p> <p>OR</p> <p>Total volume</p> <p>03 <input type="radio"/> Total acre-feet</p> <p>04 <input type="radio"/> Total gallons</p> <p>05 <input type="radio"/> Total litres</p> <p>06 <input type="radio"/> Total cubic feet</p> <p>07 <input type="radio"/> Total cubic metres</p> <p>OR</p> <p>Volume per surface area</p> <p>08 <input type="radio"/> Acre-feet per acre</p> <p>09 <input type="radio"/> Gallons per acre</p> <p>10 <input type="radio"/> Litres per hectare</p> <p>11 <input type="radio"/> Cubic feet per acre</p> <p>12 <input type="radio"/> Cubic metres per hectare</p> <p>14 <input type="radio"/> Other Volume, specify (C7213)</p> <p>_____</p> <p>OR</p> <p>Flow rate</p> <p>20 <input type="radio"/> Gallons (per unit of time)</p> <p>21 <input type="radio"/> Litres (per unit of time)</p> <p>22 <input type="radio"/> Cubic feet (per unit of time)</p> <p>23 <input type="radio"/> Cubic metres (per unit of time)</p> <p>24 <input type="radio"/> Pounds (per unit of time)</p> <p>26 <input type="radio"/> Other Flow Rate (per unit of time), specify (C7214)</p> <p>_____</p>	<p>(C7256)</p> <p>Unit of water</p> <p>Water depth per surface area</p> <p>01 <input type="radio"/> Inches per acre</p> <p>02 <input type="radio"/> Millimetres per hectare</p> <p>OR</p> <p>Total volume</p> <p>03 <input type="radio"/> Total acre-feet</p> <p>04 <input type="radio"/> Total gallons</p> <p>05 <input type="radio"/> Total litres</p> <p>06 <input type="radio"/> Total cubic feet</p> <p>07 <input type="radio"/> Total cubic metres</p> <p>OR</p> <p>Volume per surface area</p> <p>08 <input type="radio"/> Acre-feet per acre</p> <p>09 <input type="radio"/> Gallons per acre</p> <p>10 <input type="radio"/> Litres per hectare</p> <p>11 <input type="radio"/> Cubic feet per acre</p> <p>12 <input type="radio"/> Cubic metres per hectare</p> <p>14 <input type="radio"/> Other Volume, specify (C7257)</p> <p>_____</p> <p>OR</p> <p>Flow rate</p> <p>20 <input type="radio"/> Gallons (per unit of time)</p> <p>21 <input type="radio"/> Litres (per unit of time)</p> <p>22 <input type="radio"/> Cubic feet (per unit of time)</p> <p>23 <input type="radio"/> Cubic metres (per unit of time)</p> <p>24 <input type="radio"/> Pounds (per unit of time)</p> <p>26 <input type="radio"/> Other Flow Rate (per unit of time), specify (C7258)</p> <p>_____</p>
<p>7.h How many units (i.e., reported in Q7g) of water were applied on the crop using the third irrigation method?</p>	<p>(C7171)</p>	<p>(C7215)</p>	<p>(C7259)</p>

If possible please report flow rate at system nozzle. If not available, give rate at pump.

If any in 7g is answered by flow rate (20 to 26) then continue to 7i for that crop. If no more crop irrigation to report, go to Q8 (page 24).

Enter crops from pages 4 and 5 (crop 1 to crop 6).

	Crop 1	Crop 2	Crop 3
Crop Name			
7.i Were the units applied per second, minute, hour or day? Method 3	(C740) 01 <input type="radio"/> Per second 02 <input type="radio"/> Per minute 03 <input type="radio"/> Per hour 04 <input type="radio"/> Per day	(C784) 01 <input type="radio"/> Per second 02 <input type="radio"/> Per minute 03 <input type="radio"/> Per hour 04 <input type="radio"/> Per day	(C7128) 01 <input type="radio"/> Per second 02 <input type="radio"/> Per minute 03 <input type="radio"/> Per hour 04 <input type="radio"/> Per day
7.j Was this at the system nozzle or pump? Method 3	(C741) 01 <input type="radio"/> System nozzle 03 <input type="radio"/> Pump	(C785) 01 <input type="radio"/> System nozzle 03 <input type="radio"/> Pump	(C7129) 01 <input type="radio"/> System nozzle 03 <input type="radio"/> Pump
7.k What was the total number of days or weeks that this system ran? Method 3	(C742) <div style="border-top: 1px solid black; width: 100px; margin: 5px auto;"></div> days or weeks	(C786) <div style="border-top: 1px solid black; width: 100px; margin: 5px auto;"></div> days or weeks	(C7130) <div style="border-top: 1px solid black; width: 100px; margin: 5px auto;"></div> days or weeks
7.l Was it days or weeks? Method 3	(C743) 01 <input type="radio"/> Days 03 <input type="radio"/> Weeks	(C787) 01 <input type="radio"/> Days 03 <input type="radio"/> Weeks	(C7131) 01 <input type="radio"/> Days 03 <input type="radio"/> Weeks
7.m What was the total number of hours (per day/week) that this system ran? Method 3	(C744) <div style="border-top: 1px solid black; width: 100px; margin: 5px auto;"></div> hours	(C788) <div style="border-top: 1px solid black; width: 100px; margin: 5px auto;"></div> hours	(C7132) <div style="border-top: 1px solid black; width: 100px; margin: 5px auto;"></div> hours

If no more crop irrigation to report, go to Q8 (page 24).

Enter crops from pages 4 and 5 (crop 1 to crop 6).

	Crop 4	Crop 5	Crop 6
Crop Name			
7.i Were the units applied per second, minute, hour or day? Method 3	(C7172) 01 <input type="radio"/> Per second 02 <input type="radio"/> Per minute 03 <input type="radio"/> Per hour 04 <input type="radio"/> Per day	(C7216) 01 <input type="radio"/> Per second 02 <input type="radio"/> Per minute 03 <input type="radio"/> Per hour 04 <input type="radio"/> Per day	(C7260) 01 <input type="radio"/> Per second 02 <input type="radio"/> Per minute 03 <input type="radio"/> Per hour 04 <input type="radio"/> Per day
7.j Was this at the system nozzle or pump? Method 3	(C7173) 01 <input type="radio"/> System nozzle 03 <input type="radio"/> Pump	(C7217) 01 <input type="radio"/> System nozzle 03 <input type="radio"/> Pump	(C7261) 01 <input type="radio"/> System nozzle 03 <input type="radio"/> Pump
7.k What was the total number of days or weeks that this system ran? Method 3	(C7174) <div style="border: 1px solid black; width: 100px; height: 15px; margin: 5px auto;"></div> days or weeks	(C7218) <div style="border: 1px solid black; width: 100px; height: 15px; margin: 5px auto;"></div> days or weeks	(C7262) <div style="border: 1px solid black; width: 100px; height: 15px; margin: 5px auto;"></div> days or weeks
7.l Was it days or weeks? Method 3	(C7175) 01 <input type="radio"/> Days 03 <input type="radio"/> Weeks	(C7219) 01 <input type="radio"/> Days 03 <input type="radio"/> Weeks	(C7263) 01 <input type="radio"/> Days 03 <input type="radio"/> Weeks
7.m What was the total number of hours (per day/week) that this system ran? Method 3	(C7176) <div style="border: 1px solid black; width: 100px; height: 15px; margin: 5px auto;"></div> hours	(C7220) <div style="border: 1px solid black; width: 100px; height: 15px; margin: 5px auto;"></div> hours	(C7264) <div style="border: 1px solid black; width: 100px; height: 15px; margin: 5px auto;"></div> hours

If no more crop irrigation to report, go to Q8 (page 24).

Total Water Use by Irrigation Method

If you have completed the crop level irrigation questions, go to Q10 (page 28).

8. The following questions ask about TOTAL irrigation for this operation for the total cropland area (as reported in question 4), in the 2007 growing season.

Of the total area of cropland, how many (acres/hectares/arpents) were irrigated (in the 2007 growing season)?

Include water applied to increase soil moisture content, e.g., pre-planting or post-harvest.

Include both producing and non-producing cropland.

(C801)

_____ total land irrigated

	Method 1	Method 2	Method 3	
<p>9.a What irrigation method(s) did you use?</p> <p>Enter up to three (3) irrigation methods.</p> <p>Mark one only for each method.</p>	<p>(C901)</p> <p>Sprinkler</p> <p>01 <input type="radio"/> Hand Move</p> <p>02 <input type="radio"/> Solid or Permanent Set</p> <p>03 <input type="radio"/> Side Roll, Wheel Line, Wheel Move or Wheel Roll</p> <p>04 <input type="radio"/> Traveler, Volume Gun, Travelling Gun, Walker, Overhead or Circler</p> <p>05 <input type="radio"/> Linear move < 25 psi</p> <p>06 <input type="radio"/> Linear move 25 - 50 psi</p> <p>07 <input type="radio"/> Linear move >50 psi</p> <p>08 <input type="radio"/> Centre pivot < 25 psi</p> <p>09 <input type="radio"/> Centre Pivot 25 - 50 psi</p> <p>10 <input type="radio"/> Centre Pivot >50 psi</p> <p>Micro</p> <p>20 <input type="radio"/> Surface drip</p> <p>21 <input type="radio"/> Sub-surface Drip</p> <p>22 <input type="radio"/> Micro-sprinkler</p> <p>23 <input type="radio"/> Bubblers</p> <p>24 <input type="radio"/> Microjet</p> <p>25 <input type="radio"/> Hand watering</p> <p>Surface</p> <p>30 <input type="radio"/> Down rows</p> <p>31 <input type="radio"/> Furrows</p> <p>32 <input type="radio"/> Corrugations</p> <p>33 <input type="radio"/> Border dyke</p> <p>34 <input type="radio"/> Level basins</p> <p>35 <input type="radio"/> Uncontrolled flooding (wild flooding)</p> <p>36 <input type="radio"/> Back flooding</p> <p>40 <input type="radio"/> Other method (specify) <u>(C902)</u></p> <p>_____</p> <p>_____</p> <p>Continue to 9.b</p>	<p>(C913)</p> <p>Sprinkler</p> <p>01 <input type="radio"/> Hand Move</p> <p>02 <input type="radio"/> Solid or Permanent Set</p> <p>03 <input type="radio"/> Side Roll, Wheel Line, Wheel Move or Wheel Roll</p> <p>04 <input type="radio"/> Traveler, Volume Gun, Travelling Gun, Walker, Overhead or Circler</p> <p>05 <input type="radio"/> Linear move < 25 psi</p> <p>06 <input type="radio"/> Linear move 25 - 50 psi</p> <p>07 <input type="radio"/> Linear move >50 psi</p> <p>08 <input type="radio"/> Centre pivot < 25 psi</p> <p>09 <input type="radio"/> Centre Pivot 25 - 50 psi</p> <p>10 <input type="radio"/> Centre Pivot >50 psi</p> <p>Micro</p> <p>20 <input type="radio"/> Surface drip</p> <p>21 <input type="radio"/> Sub-surface Drip</p> <p>22 <input type="radio"/> Micro-sprinkler</p> <p>23 <input type="radio"/> Bubblers</p> <p>24 <input type="radio"/> Microjet</p> <p>25 <input type="radio"/> Hand watering</p> <p>Surface</p> <p>30 <input type="radio"/> Down rows</p> <p>31 <input type="radio"/> Furrows</p> <p>32 <input type="radio"/> Corrugations</p> <p>33 <input type="radio"/> Border dyke</p> <p>34 <input type="radio"/> Level basins</p> <p>35 <input type="radio"/> Uncontrolled flooding (wild flooding)</p> <p>36 <input type="radio"/> Back flooding</p> <p>40 <input type="radio"/> Other method (specify) <u>(C914)</u></p> <p>_____</p> <p>_____</p> <p>00 <input type="radio"/> Not aplicable (no 2nd or 3rd method)</p> <p>If not applicable, go to Q10 (page 28).</p>	<p>(C925)</p> <p>Sprinkler</p> <p>01 <input type="radio"/> Hand Move</p> <p>02 <input type="radio"/> Solid or Permanent Set</p> <p>03 <input type="radio"/> Side Roll, Wheel Line, Wheel Move or Wheel Roll</p> <p>04 <input type="radio"/> Traveler, Volume Gun, Traveling Gun, Walker, Overhead or Circler</p> <p>05 <input type="radio"/> Linear move < 25 psi</p> <p>06 <input type="radio"/> Linear move 25 - 50 psi</p> <p>07 <input type="radio"/> Linear move >50 psi</p> <p>08 <input type="radio"/> Centre pivot < 25 psi</p> <p>09 <input type="radio"/> Centre Pivot 25 - 50 psi</p> <p>10 <input type="radio"/> Centre Pivot >50 psi</p> <p>Micro</p> <p>20 <input type="radio"/> Surface drip</p> <p>21 <input type="radio"/> Sub-surface Drip</p> <p>22 <input type="radio"/> Micro-sprinkler</p> <p>23 <input type="radio"/> Bubblers</p> <p>24 <input type="radio"/> Microjet</p> <p>25 <input type="radio"/> Hand watering</p> <p>Surface</p> <p>30 <input type="radio"/> Down rows</p> <p>31 <input type="radio"/> Furrows</p> <p>32 <input type="radio"/> Corrugations</p> <p>33 <input type="radio"/> Border dyke</p> <p>34 <input type="radio"/> Level basins</p> <p>35 <input type="radio"/> Uncontrolled flooding (wild flooding)</p> <p>36 <input type="radio"/> Back flooding</p> <p>40 <input type="radio"/> Other method (specify) <u>(C926)</u></p> <p>_____</p> <p>_____</p> <p>00 <input type="radio"/> Not aplicable (no 2nd or 3rd method)</p> <p>If not applicable, go to Q10 (page 28).</p>	
	<p>9.b What was the total area irrigated with the irrigation method(s)?</p>	<p>(C903)</p>	<p>(C915)</p>	<p>(C927)</p>

	Method 1	Method 2	Method 3
<p>9.c How will you report volume of water used: e.g., inches, gallons, litres?</p> <p>Mark one only for each method.</p> <p>If the response is by Flow rate, Q9e will ask to specify per second, minute, hour or day.</p>	<p>(C904)</p> <p>Unit of water</p> <p>Water depth per surface area</p> <p>01 <input type="radio"/> Inches per acre</p> <p>02 <input type="radio"/> Millimetres per hectare</p> <p>OR</p> <p>Total volume</p> <p>03 <input type="radio"/> Total acre-feet</p> <p>04 <input type="radio"/> Total gallons</p> <p>05 <input type="radio"/> Total litres</p> <p>06 <input type="radio"/> Total cubic feet</p> <p>07 <input type="radio"/> Total cubic metres</p> <p>OR</p> <p>Volume per surface area</p> <p>08 <input type="radio"/> Acre-feet per acre</p> <p>09 <input type="radio"/> Gallons per acre</p> <p>10 <input type="radio"/> Litres per hectare</p> <p>11 <input type="radio"/> Cubic feet per acre</p> <p>12 <input type="radio"/> Cubic metres per hectare</p> <p>14 <input type="radio"/> Other Volume, specify (C905)</p> <hr/> <p>OR</p> <p>Flow rate</p> <p>20 <input type="radio"/> Gallons (per unit of time)</p> <p>21 <input type="radio"/> Litres (per unit of time)</p> <p>22 <input type="radio"/> Cubic feet (per unit of time)</p> <p>23 <input type="radio"/> Cubic metres (per unit of time)</p> <p>24 <input type="radio"/> Pounds (per unit of time)</p> <p>26 <input type="radio"/> Other Flow Rate (per unit of time), specify (C906)</p> <hr/>	<p>(C916)</p> <p>Unit of water</p> <p>Water depth per surface area</p> <p>01 <input type="radio"/> Inches per acre</p> <p>02 <input type="radio"/> Millimetres per hectare</p> <p>OR</p> <p>Total volume</p> <p>03 <input type="radio"/> Total acre-feet</p> <p>04 <input type="radio"/> Total gallons</p> <p>05 <input type="radio"/> Total litres</p> <p>06 <input type="radio"/> Total cubic feet</p> <p>07 <input type="radio"/> Total cubic metres</p> <p>OR</p> <p>Volume per surface area</p> <p>08 <input type="radio"/> Acre-feet per acre</p> <p>09 <input type="radio"/> Gallons per acre</p> <p>10 <input type="radio"/> Litres per hectare</p> <p>11 <input type="radio"/> Cubic feet per acre</p> <p>12 <input type="radio"/> Cubic metres per hectare</p> <p>14 <input type="radio"/> Other Volume, specify (C917)</p> <hr/> <p>OR</p> <p>Flow rate</p> <p>20 <input type="radio"/> Gallons (per unit of time)</p> <p>21 <input type="radio"/> Litres (per unit of time)</p> <p>22 <input type="radio"/> Cubic feet (per unit of time)</p> <p>23 <input type="radio"/> Cubic metres (per unit of time)</p> <p>24 <input type="radio"/> Pounds (per unit of time)</p> <p>26 <input type="radio"/> Other Flow Rate (per unit of time), specify (C918)</p> <hr/>	<p>(C928)</p> <p>Unit of water</p> <p>Water depth per surface area</p> <p>01 <input type="radio"/> Inches per acre</p> <p>02 <input type="radio"/> Millimetres per hectare</p> <p>OR</p> <p>Total volume</p> <p>03 <input type="radio"/> Total acre-feet</p> <p>04 <input type="radio"/> Total gallons</p> <p>05 <input type="radio"/> Total litres</p> <p>06 <input type="radio"/> Total cubic feet</p> <p>07 <input type="radio"/> Total cubic metres</p> <p>OR</p> <p>Volume per surface area</p> <p>08 <input type="radio"/> Acre-feet per acre</p> <p>09 <input type="radio"/> Gallons per acre</p> <p>10 <input type="radio"/> Litres per hectare</p> <p>11 <input type="radio"/> Cubic feet per acre</p> <p>12 <input type="radio"/> Cubic metres per hectare</p> <p>14 <input type="radio"/> Other Volume, specify (C929)</p> <hr/> <p>OR</p> <p>Flow rate</p> <p>20 <input type="radio"/> Gallons (per unit of time)</p> <p>21 <input type="radio"/> Litres (per unit of time)</p> <p>22 <input type="radio"/> Cubic feet (per unit of time)</p> <p>23 <input type="radio"/> Cubic metres (per unit of time)</p> <p>24 <input type="radio"/> Pounds (per unit of time)</p> <p>26 <input type="radio"/> Other Flow Rate (per unit of time), specify (C930)</p> <hr/>
<p>9.d How many units were applied using the irrigation method?</p>	<p>(C907)</p>	<p>(C919)</p>	<p>(C931)</p>

If possible please report flow rate at system nozzle. If not available, give rate at pump.

If any in 9d is answered by flow rate (20 to 26) then continue to 9e. If no more irrigation to report go to Q10 (page 28).

	Method 1	Method 2	Method 3
9.e Were the units applied per second, minute, hour or day?	(C908) 01 <input type="radio"/> Per second 02 <input type="radio"/> Per minute 03 <input type="radio"/> Per hour 04 <input type="radio"/> Per day	(C920) 01 <input type="radio"/> Per second 02 <input type="radio"/> Per minute 03 <input type="radio"/> Per hour 04 <input type="radio"/> Per day	(C932) 01 <input type="radio"/> Per second 02 <input type="radio"/> Per minute 03 <input type="radio"/> Per hour 04 <input type="radio"/> Per day
9.f Was this at the system nozzle or pump?	(C909) 01 <input type="radio"/> System nozzle 03 <input type="radio"/> Pump	(C921) 01 <input type="radio"/> System nozzle 03 <input type="radio"/> Pump	(C933) 01 <input type="radio"/> System nozzle 03 <input type="radio"/> Pump
9.g What was the total number of days or weeks that this system ran?	(C910) <input type="text"/> days or weeks	(C922) <input type="text"/> days or weeks	(C934) <input type="text"/> days or weeks
9.h Was it days or weeks?	(C911) 01 <input type="radio"/> Days 03 <input type="radio"/> Weeks	(C923) 01 <input type="radio"/> Days 03 <input type="radio"/> Weeks	(C935) 01 <input type="radio"/> Days 03 <input type="radio"/> Weeks
9.i What was the total number of hours (per day/week) that this system ran?	(C912) <input type="text"/> hours	(C924) <input type="text"/> hours	(C936) <input type="text"/> hours

Irrigation Practices and Water Sources

The following questions ask about irrigation practices AND water sources for the operation during the 2007 growing season.

10. Which of the following practices were used for the purpose of water or energy conservation?

(Mark all that apply)

- (C1001) Wind breaks
- (C1002) Leaving stubble on fields (e.g., minimum tillage, direct seeding)
- (C1003) Watering at night or in the morning
- (C1004) Pressure reduction
- (C1005) Water or energy saving nozzles
- (C1006) Other energy saving methods or devices (specify) (C1008) _____
- (C1007) No practices done

11. Which of the following factors or tools helped this operation determine when to irrigate?

(Mark all that apply)

- (C1101) Crop condition or crop stage (observation including disease)
- (C1102) Use of soil moisture sensors (e.g., moisture blocks or tensiometers)
- (C1103) Use of plant sensors (e.g. infrared thermometers)
- (C1104) Feel and appearance of the soil
- (C1105) Weather forecasts (meteorological reports)
- (C1106) Water availability
- (C1107) Use of an irrigation scheduling consultant (commercial and/or government)
- (C1108) Planned irrigation schedule
- (C1109) Rain gauge
- (C1110) Other factors or tools (specify) (C1111) _____

12. In 2007, did this operation have to stop irrigating OR not irrigate for any reason, such as equipment failure, weather, or water shortage? (C1201)

Yes 01

No 03

↓
Go to Question 14

13. Why was irrigation stopped or not done?

(Mark all that apply)

(C1301) Shortage of surface water

(C1302) Shortage of underground water (include shallow wells and deep wells)

(C1303) Equipment failure

(C1304) Poor water quality

(C1305) Cost of water

(C1306) Weather (e.g., excess rain, heat, frost, wind, hail, lightning)

(C1307) Water ban

(C1308) Crop did not require irrigation

(C1309) Labour shortage

(C1310) Fuel or energy cost

(C1311) Other reason (specify) (C1312) _____

14. Did this operation use a drainage system (e.g., land tiles or tiling)? (C1401)

Yes 01

No 03

If there was no irrigation (answers to Q2a and Q2b are both No), go to page 32.
Else continue to next page.

The next questions deal with possible sources of water used on this operation.
Exclude water for personal use.

15. Did this operation use any of the following ...?

(Mark all that apply)

- (C1501) Underground water or well water (include shallow wells and deep wells)
- (C1502) ON-FARM lakes, rivers, creeks or streams, ponds or dugouts i.e. direct access (surface water)
- (C1503) Water from a rain collection system (e.g., cistern or rain barrel)
- (C1504) OFF-FARM water transported TO THE FARM e.g., via pipeline, canal system or vehicle
- (C1505) Other (specify) (C1506) _____

If off-farm water is selected, then go to question 16.
Else go to question 18.

16. Which of the following OFF-FARM water sources did this operation use?

(Mark all that apply)

- (C1601) Tap water (drinking water or municipal water)
- (C1602) Treated wastewater
- (C1603) Provincial water sources (irrigation district, group project)
- (C1604) Private sources
- (C1605) Other sources (specify) (C1606) _____

17. Why did this operation need to obtain water from an OFF-FARM source?

(Mark all that apply)

- (C1701) No water or not enough water available ON THE FARM (for irrigation)
- (C1702) Poor quality of ON-FARM water
- (C1703) Other reason (specify) (C1704) _____

18. Water may be treated to improve its overall quality.

Does this operation treat water prior to farm use? (C1801)

Yes 01

No 03

↓
Go to Question 20

19. Which of the following water treatment practices were used by this operation?

(Mark all that apply)

(C1901) Treatment to kill bacteria or other foreign bodies (i.e. disinfection)

(C1902) Treatment to equalize pH levels

(C1903) Treatment to remove solids (i.e. filtration)

(C1904) Treatment to prevent or to clear mineral fouling

(C1905) Treatment to prevent corrosion

(C1906) Treatment to reduce water hardness

(C1907) Treatment to reduce salinity (salt content)

(C1908) Other treatment to purify water (specify) (C1909) _____

20. In 2007, how did this operation deal with its wastewater e.g., water used when cleaning equipment and produce, excess water from fertilizer or pesticide use?

Exclude household wastewater and irrigation runoff.

(Mark all that apply)

(C2001) Returned to soil

(C2002) Drained into body of water or wetland

(C2003) Drained to sewer / septic tank

(C2004) Drained to settling basin / holding bin

(C2005) Collected for reuse

(C2006) Other (specify) (C2007) _____

Data Sharing Agreement

Thank you for taking the time to participate in our survey. To reduce survey duplication and to ensure more uniform statistics, Statistics Canada has entered into an agreements under Section 12 of the Statistics Act, for the sharing of information from this survey with Agriculture and Agri-food Canada and Environment Canada.

Statistics Canada will not share your farm name, address or other identifying information. All agreements require that the information you provide be kept confidential and be used only for statistical or research purposes.

21. Do you agree to share the information on this survey with: (C2101)

Agriculture and Agri-Food Canada

Yes 01

No 03

22. Do you agree to share this information on this survey with: (C2201)

Environment Canada?

Yes 01

No 03

Similarly, Statistics Canada has entered into an agreement, under Section 12 of the Statistics Act, with your province for the sharing of information from the survey respondents in your province.

23. Do you agree to share this information on this survey with: (C2301)

Prince Edward Island Department of Agriculture?

Yes 01

No 03

New Brunswick Department of Agriculture and Aquaculture?

Yes 01

No 03

Manitoba Agriculture, Food and Rural Initiatives?

Yes 01

No 03

Saskatchewan Ministry of Agriculture?

Yes 01

No 03

Alberta Agriculture and Food?

Yes 01

No 03

British Columbia Ministry of Agriculture and Lands?

Yes 01

No 03

Do you agree to share the information on this survey, including your farm name, address and other identifying information, with:

The Institut de la statistique du Québec?

Yes 01

No 03

Thank you for your co-operation.

End of interview