
Farm Structure Survey 2007
National Methodological Report (NMR)

MEMBER STATE: The Netherlands

June 2008

FARM STRUCTURE SURVEY 2007 NATIONAL METHODOLOGICAL REPORT

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SUMMARY

Every year an agricultural census is held in the spring. In 2007 the agricultural census was fine-tuned with the Farm Structure Survey for the statistical year 2007. For efficiency reasons the questionnaire of the agricultural census nowadays also serves as an application form for the single payment scheme, and the enforcement of the manure law.

The agricultural census / Farm Structure Survey 2007 included all farms that were registered in the National Farm Register (NFR). It is laid down by law, that all holdings practicing agricultural activities have to register in this NFR. For 2007, this included about 91 000 holdings. All registered holdings received a questionnaire. About 76 500 of the holdings are above 3 NSU (in Dutch NGE), which is the economical threshold for the agricultural census / Farm Structure Survey, these represent about 99% of total standard gross margin (SGM). About 96% of the questionnaires was returned. The agricultural census / Farm Structure Survey is therefore considered to be exhaustive for all agricultural holdings.

For animal characteristics the reference date is the first of April of the survey year. For crops the reference date is 15th May. For labour force and incidental characteristics the reference period is the preceding year, ending on the first of April of the survey year.

Preparations for the agricultural census are made by Statistics Netherlands (CBS) in cooperation with a working group of experts on agriculture. The maintaining of the farm register, design, printing, sending and collection of the questionnaires, digitising the data, and supplementary interviewing of holders is done by NSIR, the National Service for the Implementation of Regulations; a part of the Ministry of Agriculture, Nature and Food quality. A copy of the data file is sent to Statistics Netherlands, for data processing, analysis and dissemination. Data control and error correction is performed in all phases of the process, both at NSIR and CBS.

The main results on the national and regional level are published in yearly publications. The main national results of the 2007 census were published in the second half of 2007. Results are published in the Statline database which is available on the internet (statline.cbs.nl/statweb). In this database internet-users may select their own indicators and information topics. Incidentally short publications on specific subjects are presented in the form of newspaper communiqués or on the website of the CBS (www.cbs.nl).

1. INTRODUCTION

1.1 History, scope

History

From 1934 onwards there has been an agricultural census in the Netherlands every year. However, it is not purely a statistical project. It serves several purposes: on the one hand production of statistics by Statistics Netherlands and creating a frame for sampling, on the other hand providing data on individual holdings for administrative activities of the Ministry of Agriculture, Nature and Food Quality (the Ministry). As both the Ministry and Statistics Netherlands have their responsibility for the census, it is held as a joint effort.

In 1990, it was the last time special meeting days were organised to assess the data from the farmers. On these meeting days, farmers and correspondents jointly filled in the questionnaire manually. In the period 1991 – 1995, these sessions still took place, but the manual procedure was gradually replaced by filling in the information in a computer file. In 1996, a correspondent could make a choice between coming to a special meeting place or filling in the survey form himself and returning it by post mail. From 1997 on, a complete census was organised by post mail every year. The year 2003 was a pilot year in which respondents had the opportunity of supplying the census information by means of internet.

Since the statistical year 2002 the questionnaire of the agricultural census is combined with the application for animal, crop and arable land subsidies (in 2006 also for the single payment scheme). In 2007 data collection for the enforcement of the manure law is also combined in this questionnaire. This is done for efficiency reasons, both for the farmers as well as for the administration and processing of data.

In 2007 there were about 91 000 registered farm holdings in the Netherlands, which all together have nearly 2 000 000 ha of agricultural land. About 76 500 of these holdings are above 3 NSU (in Dutch NGE), which is the economical threshold for the census. The holdings above 3 NSU represent about 99% of total standard gross margin (SGM). The difference between types of farming, specialisation, economic size and area is considerable. About 1500 holdings, mainly industrial livestock farms, do not have agricultural land at all. Farming is spread all over the country, but several regions have their own characteristic type of agricultural activities. A number of crops is concentrated in parts of the country or in relatively small areas. For instance bulb growing takes place mainly in the coastal sand districts and in the clay districts arable farming is predominant.

Combining the data capture for statistics and administration has advantages and disadvantages. The aim of statistical data collection is different from the aim for administrative data. The aim of statistical data is to objectify data, trends and tendencies for groups of people, holdings or entities, not influenced by the concerns of individuals. They are used among others for policy preparation, or policy evaluation. Administrative data are the opposite. They are clearly related to an individual person

or an individual holding, with the aim to use these data for measures concerning this individual, e.g. with the implementation of all kind of regulations (the European Common Agricultural Policy, disease control and so on). The link between these aims is that statistics are based on data for individual people or individual holdings.

From a statistical point of view it is clear that there is a risk of a bias in the data due to the fact that farmers are well aware of the possibility that these data are to be used as a basis for possible financial arrangements or providing permits and so on. Statistics Netherlands indeed has to keep in mind what kind of biases might occur and intensify checks on these items. On the other hand administrative authorities do not rest before they have a 100% response and have the financial and juridical means to enforce responses of the correspondents. This is not easily available for statistics. And last but not least, it has become government policy that, in order to reduce administrative burden, the same data may only be collected once ('collect once – use often').

Statistics Netherlands has a register of all industrial and non-industrial commercial establishments, but the agricultural holdings are not yet fully covered in this register. For agricultural statistics we rely therefore on the farm register of the Ministry of Agriculture, Nature and Food Quality. Under the Agricultural Act farmers have the obligation to identify themselves in this register. This register is a database of the Ministry (NSIR) containing names, addresses and a few other characteristics of holders or holdings and a unique registration number. At the same time Statistics Netherlands has a database with the census information for a number of years using the same registration numbers of the holders and holdings. Identification numbers, names and addresses are exchanged each year to keep the databases up to date. The combination of data on individual holdings provides a magnificent basis for stratification and efficient sampling. Changes in addresses are entered into the farm register throughout the year, changes in census data of course only once a year. A yearly census may seem expensive (even when only half of the cost is looked upon as expenses for statistics). But the excellent quality of the date sample frame allows for relative small samples in related agricultural statistics and thus reduction of costs.

Scope

In the Netherlands all holdings engaged in agricultural activities are by law obligated to register. The National Farm Register (NFR) is kept by the NSIR. The census is directed to all holders of agricultural holdings with an economic size above a certain threshold. In the Netherlands a margin of 3 NSU (in Dutch NGE: 'Nederlandse Grootte Eenheid') is used as economical size threshold.

An economic size threshold is used to differ between (very) small holdings with largely hobbyist activities like having a small greenhouse, or keeping some goats or a few chickens for pleasure and professional breeding of livestock or growing crops for commercial purposes.

This threshold results in including agricultural activities that contribute for about 99% of total standard gross margin. As in many countries an attempt to capture the last percent would raise the effort to receive reliable information to an unjustifiable level.

The NSU is the Dutch Equivalent of the European Size Unit (ESU). It differs from the ESU because of differences in inflation level in the European member states since the introduction of the ESU in 1973. For the census in 2007 one NSU amounted 1420 Euro. Like the ESU the NSU is based on European Standard Gross Margins (SGM). These SGM's describe the gross production minus the proportionally variable non-factor costs (e.g. seed, fertilizer, feed concentrates, fodder etc.). The SGM is expressed in Euro and for the Dutch situation calculated by the Agricultural Economic Institute (LEI). It is calculated per head of livestock and per hectare of crop and derived from averages of financial data for a sample of holdings, thus constituting a set of coefficients. The standard gross margin of a holding in the census is computed by multiplying the records on the census items with the SGM's per head and per hectare. The proportionate importance of the components of the SGM's may change over time, due to changes in technical-economic production circumstances (e.g. more efficient use of fertilizer, mechanisation or yield improvements). Recalculation of the SGM per head and per hectare is therefore periodically necessary.

1.2 National legislation

The main legal base for the FSS2007 is the Agricultural Act. This law provides the framework for all kind of rules and regulations regarding the agricultural production. Based on this law the minister for Agriculture issues a decision to hold an agricultural census every year.

The Statistics Netherlands Act establishes Statistics Netherlands as executive office for community statistics. It also provides right of access to administrative data. The agricultural census is part of the working program for Statistics Netherlands. The working program is established by the Central Commission for Statistics, an independent body in which many sectors of the society are represented (government, trade unions, employers organisations, etc.). The status of the Central Commission for Statistics is also established in the Statistics Netherlands Act.

Statistics Netherlands executes the census, for over fifty years now, together with NSIR, an agency of the Ministry. NSIR is responsible for the implementation of all kind of regulations (the European Common Agricultural Policy, disease control, providing permits and so on).

As stated above the agricultural census is based on the Agricultural Act. It is therefore compulsory and anyone, to whom an agricultural census questionnaire is issued, is obliged to complete it faithfully and truthfully, to put his signature and to return it.

The Agricultural Act also regulates the scope of agricultural activities, definition of agricultural holdings and the identification and registration of farmers. Every person executing agricultural activities according to the Agricultural Act is obliged to register with the NSIR. All farmers receive an agricultural census questionnaire and are obliged to supply the necessary information for this census.

The census data are protected by the Act on Registration of personal data and the Statistics Netherlands Act. These Acts protect data on individual private or legal persons from illegal use, such as being published, sold, used or exchanged without permission of the persons involved. NSIR as well as Statistics Netherlands and all

personnel having access to the data have to comply with these acts. Furthermore Statistics Netherlands is not allowed to use census data for any other purpose than producing the statistics for which the data is meant and is not allowed to publish data in such a way that individuals or data on individuals may be traced.

Identification, protection and obligations of enumerators

There was no need for enumerators because the questionnaires were sent by mail. Mailings were organised and executed by NSIR. The correspondents filled in the forms and sent it back to NSIR by mail. In case of lack of clarity or incompleteness of the forms the correspondents were contacted by checking personnel during the initial processing of the survey forms.

2. CONTENT

2.1 Characteristics and reference period

Characteristics

The list of characteristics for the annual census is determined by a group of experts on agriculture. The FSS-characteristics are integrated within the annual census. The number of characteristics is quite high. To maintain continuity in the data most of the characteristics are repeated yearly or in a regular scheme. Of course developments in agriculture are reflected in changes in the list. The bigger part of the list contains:

- animal species: cattle, pigs, poultry, horse, rabbits, fur animals (all together approx. 50 items);
- arable crops (approx. 70 items), horticultural crops (over 100 items), grasslands, rough grazings, fallow land, natural territory;
- peculiars about the holder or holders: sex and year of birth, main and subsidiary occupation (other gainful activity), average working hours per week;
- labour: spouses, family and non-family, regular and non-regular working, number of average working hours per week on the holding.

These are the topics that appear every year in the census.

For characteristics that do not change very fast, yearly data are not necessary. For instance the area of land in ownership and rented, the area of irrigated land, the presence of a successor to the present holder is included in a list with a lower frequency. Major additions of this kind occur in the years when the EU Farm Structure Survey is held. Additional FSS characteristics are combined with these non-yearly topics if possible.

In comparison with the FSS list of characteristics the questions on horticulture are more detailed, because of the specific economic importance of this agricultural business in the Netherlands. Furthermore there is more detail in the questions on rural development. Because of the dense population and intense land use, recreation developments and nature protection issues are important topics in the rural area.

When preparing the census, there is an almost constant pressure to introduce new items in the questionnaire. Thus extending it bit by bit and constituting a threat for the project as such. Proposals for introducing new items ought to be accompanied by serious suggestions for deleting certain questions.

Reference period

For animal characteristics in the agricultural census the reference date is the first of April of the survey year. The animals that are already sold but not yet delivered on the reference day, should also be given. For crops the reference date is 15th May. If the area is not cultivated on the reference day, the situation later in the crop year (for example based on crop-planning) should be taken into account. For labour force and incidental characteristics the reference period is the preceding year, ending on the first of April of the survey year.

Differences in content and definitions

The vast majority of characteristics for the FSS in the questionnaire is defined in the way that is prescribed in the FSS definition regulation (Commission Regulation 204/2006). Because of the use of data for national purposes there are some differences in content or in definition.

In most cases there is only a difference in detail of the characteristic, for example when 'flowers under glass' (D16)' is needed for the FSS, while in the questionnaire all sorts of flowers under glass have to be specified.

The Dutch questionnaire only asks for other gainful activities of holder-manager, spouse and family members outside the holding. Other gainful activities on the holding are part of the questions on rural development. For L07, L08 and L09 both are taken into account.

Due to change of the questionnaire the legal personality of the holding (B0102) in 2007 could no longer be derived directly from the collected data. Therefore additional information from the NSIR and the FSS2005 was used.

The FSS2007 shows a considerable increase of the area other land (H03). This is due to the fact that not all parts of the total area belonging to the agricultural holding were recorded in 2005.

Omitted characteristics.

Characteristics for which no information was collected because they do not exist (ne) or are not significant (ns) concerned:

C6a Household of holder consumes more than 50% of final production (ne)

C6b Direct sales to consumers more than 50% of total sales (ns)

D2 Durum wheat (ne)

D7 Rice (ne)

D9f lentils, chick peas and vetches (ns)

D23 Tobacco (ne)

D24 Hops (ne)

D25 Cotton (ne)

D33 Other textile crops (ne)

E Kitchen garden (ns)

G1b Subtropical fruits and berry species (ne)

G2 Citrus plantations (ne)

G3 (G3a/b) Olive plantations (ne)

G4 (G4a/b/c/d) Vineyards (ne)

G6 Other permanent crops (ne)

I1 Successive secondary crops (ne)

I8e Set aside areas under incentive schemes

J16c Geese (ns)

J18 Bees (ns)

M01b Other gainful activity: handicraft (ns)

M01d: Other gainful activity: wood processing (ns)

Note: characteristics D27, D28, D30, G1c and J19 were flagged in Commission Regulation 204/2006 as non-existent or non-significant, but were nevertheless supplied; characteristic I8e was not flagged but proved to be non-existent.

2.2 Questionnaire

The census was performed by sending a paper questionnaire in the spring (March) of 2007. The questionnaire had to be returned May 15 at the latest. The required information was to be sent back as paper copy by mail.

Because of the combined function of the questionnaire (census and administrative purpose) the questionnaire consist of several forms. Together with the main form farmers receive topographical maps of the farm-parcels on which they have to indicate where and what kind of crop they are growing or planning to grow, and a summary form on which the total area per crop has to be indicated. With the questionnaire information for the single payment scheme and several animal, crop and arable land subsidies, as well as for the manure law can be supplied.

In 2007 it was also possible to supply information using an internet application. This makes online validation and intelligent routing possible. This leads to more quicker processing, and less administrative burden. About 20% of the holdings used the internet application.

3. SURVEY METHODOLOGY

3.1 Survey organisation

The Farm Structure Survey is part of the agricultural census which is held every year in spring. As already indicated the census is a joint effort of the Ministry of Agriculture, Nature and Food Quality – and especially its executive service NSIR - and Statistics Netherlands. Agreements on the division of tasks are recorded in the document: "Technisch rapport Landbouwtelling 2007".

The first preparations for the agricultural census are made by a permanent working group on the census characteristics. This working group consists of experts on agriculture and meets every year in April to discuss the characteristics of the census of the next year. A finalized proposal is sent for approval to the directorates of the Ministry of Agriculture, Nature and Food Quality and to Statistics Netherlands. After approval drafts of the questionnaires and a booklet with explanatory notes are validated by the working group.

For efficiency reasons the questionnaire of the agricultural census nowadays also serves as an application form for the single payment scheme and animal, crop and arable land subsidies in the framework of the European Common Agriculture Policy (CAP), as well as for the enforcement of the minerals regulation (manure). The combined questionnaire and application form is extended with geographical information on the location of the crops on the farm. The initial preparation of the census, the data processing and analysing were done by Statistics Netherlands (CBS). The maintaining of a farm register, the set up, printing, sending and collecting of the questionnaires, digitising the data, and supplementary interviewing of holders is done by the Ministry (NSIR). A copy of the digitised data is sent to Statistics Netherlands, where the data are processed and statistical results are produced and disseminated.

In both CBS and NSIR a permanent team of personnel issues the regular work. Temporarily personnel are hired in for data-entry and the first data-controls.

In NSIR a permanent staff of nine persons is working on the agricultural census. About 20 persons were working on a temporary base, mostly for error-control. Main tasks are error-control, registration, coordination and application management. The data-entry is performed by a subcontractor.

In Statistics Netherlands a total of approximately 3.5 fte (full time equivalents) has been working on the agricultural census 2007, all of them on a steady basis. Major tasks are automation, error control, analysis and preparing the publications.

3.2 Calendar (overview of work progress)

As already indicated the census is a joint effort of the Ministry of Agriculture, Nature and Food Quality / the NSIR and Statistics Netherlands.

During the working process several phases can be distinguished. In the following time table the working process phases are distinguished and placed in time:

Table 1. Time table

	Working process phase	Period
1.	Determination of the content and format of the questionnaire.	April 2006 – Nov. 2006
2.	Development phase	Aug. 2006 – Jan. 2007
3.	Training phase	Feb. 2007 – March 2007
4.	Data-collecting phase	April 2007 – May 2007
5.	Data-control phase	April 2007 – Okt. 2007
6.	Processing and analysing phase	May 2007 – Feb. 2008
7.	Dissemination phase	Dec. 2007 – March 2008

1. Determination of the content and format of the questionnaire

A number of organisations active in the agricultural sector in the Netherlands is involved in this process. The data need is inventoried involving a group of experts. This group of experts forms a permanent working group on the census characteristics. The working group meets every year in March or April to discuss the characteristics of the census of the next year. A finalized proposal is sent for approval to the directorates of both the Ministry of Agriculture, Nature and Food Quality and Statistics Netherlands. A large number of questions and characteristics is constant over the years. A small number of questions expires, changes or is newly introduced. There is always some room for extra questions with a temporary character. In 2007 additional questions required for the EU Farm Structure Survey 2007 were added to the list of characteristics.

2. Development phase

Statistics Netherlands and NSIR, in cooperation with the expert group, prepare the questionnaire by formulating the questions concerning the required characteristics and explanatory notes for the instruction manual. NSIR takes care of the final design and printing process of both questionnaire and instruction manual and submits the list of addresses of the National Farm Register (NFR). The instruction manual gives character definitions and explanatory notes for the farmers on how to fill in the form. It is also helpful for the controllers/interviewers while executing the error control. NSIR develops and adjusts the necessary software tools for the data-entry. Therefore external software houses are employed. NSIR is responsible for the checking end testing of the end products.

3. Training phase

The management of the survey process is responsible for the training of the employees. Training is particularly aimed for temporarily personnel for the data-

entry and the controlling process. Partly, this training is on forehand and partly it is “on the job”.

4. Data-collecting phase

Each holder receives a questionnaire, just before the reference date of the first of April. Farmers have to fill in the form on May 15 at the latest. Farmers that do not respond receive several postal reminders and may be fined or may receive less financial aid.

The survey forms are processed (scanned) by a data entry company, resulting in digital files. The data entry program performs a first check on typing and data errors. The files are read in and stored in the NSIR database. The paper forms are archived by NSIR as well.

An increasing number of respondents supply the census information by internet (20% in 2007).

5. Data-control phase

Checking the information in the questionnaires takes place using a special control program. Data is checked for hard and soft errors. Hard errors are non-valid values. Soft errors are unlikely values. If necessary the checking personnel contacts the holder that sent back the questionnaire to correct for errors. After approval of a form the holder receives a print out of its data. Then it still is possible to pass on changes. By the end of September this process ended. At that that time 96% of the forms were received and processed. The final data are sent to Statistics Netherlands for further checking and the processing of a large range of statistics.

6. Processing and analysing phase

In Statistics Netherlands a more advanced check is performed on for instance internal contradictions and differences with the trends and results of previous years. Calculations are made for composed indicators. The data are rearranged, selected and transformed for dissemination purposes. Since the agricultural census is exhaustive the results are used as a sample base for other statistics such as yield assessments, labour and productivity statistics and environmental statistics.

7. Dissemination Phase

The main publication is the Statline database which is available on the internet (www.cbs.nl). In this database internet-users may select their own indicators and information topics. Several times a year short publications on specific subjects are presented in the form of newspaper reports or internet-magazine articles.

3.3 Preparing the survey operations (‘planning the survey’)

3.3.1 Population and frame

Population

The agricultural census / Farm Structure Survey 2007 included all farms that were registered in the National Farm Register (NFR). It is laid down by law that all

holdings practicing agricultural activities have to register in this NFR. For 2007, this included about 91 000 holdings.

Changes in the numbers of holdings are presented in table 2.

The number of farm holdings (above 3 NGE) decreases with approximately 3.5% each year to 76 741 in 2007 in the Netherlands. The next table shows the changes in numbers since 1999.

Table 2. Changes in number of agricultural holdings in the Netherlands.

Year	Target population of holdings in the NFR	Number of holdings >3 NGE	Yearly mutation >3 NGE (%)
1999	116 307	101 545	.
2000	110 225	97 483	-4.0
2001	109 045	92 783	-4.8
2002	104 132	89 580	-3.6
2003	97 482	85 501	-4.6
2004	90 550	83 885	-1.9
2005	93 803	81 830	-2.4
2006	91 913	79 435	-2.9
2007	90 999	76 741	-3.4

Frame

The frame of the holdings in the agricultural census and FSS is the National Farm Register. For the agricultural census all holdings above 3 NSU (in Dutch: NGE) are selected from the National Farm Register (see also 'Scope' in chapter 1).

The holdings above 3 NSU account for about 99% of standard gross margin (SGM). For the census this selection is considered to be exhaustive.

Note: According to Dutch law, all holdings that fall under any agricultural regulation, such as the single payment scheme or manure law, have to register with the NSIR. Therefore the NFR will reflect the change in definition of agricultural holding described in Commission Regulation 204/2006.

Frame errors

Farmers are obligated to register in the NFR and to fill out and send in the agricultural census questionnaire. A condition for obtaining financial support is the registration of a holder in the NFR and returning the yearly questionnaire in time. In the case of new holders, they are requested to fill in registration forms whenever required. Only after a proper registration an application for support can be taken into consideration. New holders who register after the first of April will not be surveyed over that year.

Every year there are many mutations in the data of the National Farm Register. These are continuously processed in the NFR. There can be take-overs of holdings or changes in address, telephone number, size of the holding etc. From time to time the NFR is checked for under coverage by checking with the registers of Commodity Boards for meat, eggs, grain and other agricultural products. Under coverage is supposed to be small, because of the negative financial consequences for the farmers. Over coverage is prevented by the use of a unique registration code for each holding and regular checks on for instance duplication in names, addresses and postal codes. Over coverage cannot be excluded, but the effects of over coverage are supposed to be small, because the most common reason for duplication in the register are partnerships such as between father and son where both partners are registered and both partners

receive a census questionnaire. In these cases usually one of the questionnaires is not returned or is returned with a note that the doubling should be corrected.

Under- and over coverage is also checked in a Geographical Information System for those holdings that fill in the maps in the combined form for the census information and application for crop subsidies. Clearing up the National Farm Register is usually time-consuming.

On the agricultural census questionnaire one can indicate whether there are mutations or not. These mutations will be processed first to ensure a proper connection of the census data and the relation number (the code for a holder).

In the period between the first of April and the end of August, the survey data of that specific year will be entered into a data base. In the same period mutations will still be processed in the system. After the closure of the survey, end of August, new mutations are collected in a paper archive.

3.3.2 Survey design

Each year, the agricultural census is carried out by an exhaustive enumeration of all the agricultural holdings above the limit of 3 NSU. Sampling designs and sampling methods are therefore not in use.

The information of the exhaustive agricultural census provides the basis for sample enumeration of more specific agricultural research, like crop yield predictions. Methods and designs used for those statistics are not discussed in this paper.

Questionnaires for crop yield predictions and other census activities are tuned to the agricultural census in order to prevent asking the same question to farmers twice. For the same reason the census questionnaire is combined with the application for the single payment scheme in the context of the CAP.

3.3.3 Pilot Survey

After preparing the questions in the working group for the annual census the questionnaire is designed and printed by NSIR and tested by a testing group. The testing group consists of personnel from NSIR and students of an agricultural college. These tests concern the whole process of filling in the questionnaire, data-entry and error-control. For error-control (both at NSIR and at Statistics Netherlands) a special program is developed. Each year this program is adapted to the data in the questionnaire and tested with sample test data with deliberately introduced faults.

3.3.4 Informing and training the staff and respondents

The agricultural census is a well-known phenomenon in the Netherlands and is organised every year. Proceeding to the mailing of all the forms, a special Regulation signed by the Minister of agriculture will be published in the Official Journal of the Netherlands, the 'Staatscourant'. Together with the questionnaire and an instruction manual, the holders will receive a special letter, informing them on the frame of the survey. The instruction manual is prepared by the NSIR, assisted by the expert group. During the census NSIR keeps up a helpdesk for support to the farmers while filling in the forms.

In 2007 a specialised organisation (Banctec) took care of the data-entry-process, under supervision of the NSIR. For the duration of the census temporarily personnel is employed by NSIR for error-control. In order to perform this task they receive a one-day instruction course. During the processing and control of the data they receive support and further instructions from the staff. After entering the data the paper forms are being archived by NSIR. After the first control and – if necessary – correction the resulting digital data is saved and sent to several users of the data; for instance the parcel registration office. A copy of the data is further recoded and checked and finally sent to Statistics Netherlands.

3.4 Sampling, data collection and data entry

3.4.1 Drawing the sample

Since the Farm Structure Survey is performed as an exhaustive census, no samples are drawn.

3.4.2 Data collection and entry

Data collection

In 2007 the agricultural census / Farm Structure Survey was organised by mail. The forms were sent by the end of March, just before the reference date of the national census, namely 1 April. After filling in the questionnaire the holders sent back their forms to NSIR using pre-stamped return envelopes. During the error-control farmers may have been interviewed by telephone in order to receive missing data or corrections on faults.

In 2007 about 20% of the respondents filled in the census via internet. The internet application provides a number of online controls and validations, diminishing the need for additional telephone interviewing. Also the respondent only receives relevant questions (for example only questions about livestock if there are any animals on the holding), thus reducing the administrative burden.

Data entry mode

The data-entry method was a specially developed computer program with error control and handling facilities. This means a “heads up” method was used. Data-entry was performed by a specialised private company using electronic scanning methods and manual correction, supplementation and control.

Data transmission to Statistics Netherlands (CBS)

During the enumeration period the data of the completed enumerations is periodically delivered to the CBS, by CD-rom or e-mail. The final response for the 2007 census was 96%.

3.4.3 Utilisation of administrative data sources

The administrative sources used are the National Farm Register (NFR), the Integrated Administration and Control System (IACS), and the Organic Farming Register. They are obtained from NSIR and from SKAL, the inspection and certification authority for organic production, according to Commission Regulation 2092/91.

The National Farm Register is kept by NSIR and based on a regulation that stipulates that anyone starting an agricultural holding of a particular size, has the obligation to inform the organization responsible for the Register within 4 weeks in writing. Additionally, the same persons have the obligation to provide data to the Register if requested. On a regular basis the farmers are confronted with the information that is kept in the National Farm Register in order to enable them to update obsolete information.

In the National Farm Register every holding has a unique number, which can be used to link data from different sources.

For some of the characteristics a Geographical Information System has been used.

Complementary data from the administrative and other sources are assigned to each holding using the registration number in the NFR.

An overview of the characteristics involved and the sources used is given in the table below:

Table 3. Administrative and other sources

Code	Characteristic	Organisation	Source description
A03	Environmental restrictions area	NSIR / Ministry of Agriculture	Overlay of GIS-map of holdings parcel locations and GIS-map of Natura 2000 (habitat and bird directive) areas
CC05	Organic farming	SKAL	Organic Farm Register
I08	Set-aside areas	NSIR	Integrated Administration and Control System (IACS).

3.4.4 Control of the data

Quality control of the input by the data entry firm

At first, the forms are checked for a holder's signature and possible mutations. The service enters the data twice by different persons to increase the reliability of the input. The input of the data entry service is tested with random checks. The paper forms and the input by the data entry service are then compared. Also the submission of forms and files by the data entry service is monitored with lists from the National Farm Register.

Error- control

Both at NSIR and CBS several actions are performed to check for errors or improbabilities in the survey data. In the questionnaire, it is explicitly described how to fill in the data for e.g. land or crops in case of lease contracts. However, it is very difficult to check whether this land or crop is double counted for in the case that both leaseholder and the lessor have filled in the same information. In case of a combined questionnaire and application form for financial aid a check is performed in a Geographical Information System on the basis of the maps drawn by the farmers.

After the survey forms have been processed by the data entry department - resulting in digital files - these files are read in and stored in the NSIR data base. Next the files are checked for hard and soft errors in the data, using special programs checking on constraints. Next the data is sent to several departments of NSIR for use in

registrations. If necessary the holders that sent back the questionnaire are contacted by NSIR to restore the errors found. This procedure is repeated several times until no further errors are found. Errors may be restored by error-checking personnel of NSIR and CBS. Contacts with the holdings in order to achieve complementary information or to restore errors are restricted to the personnel of NSIR. Once the data are sent to CBS there are usually no more contacts with the respondents. If new errors are discovered these will be corrected according to best present knowledge and probability.

The checks concern empty values, valid values, unlikely values, range checks, checks of correlation in the data, checking of totals and so forth. Some examples might illustrate this procedure:

- Filling in over 25 milk cows, without any young animals – would this be correct?
- The total area of a holding differs from the sum of the sub-areas.
- Filling in over 5 000 pigs – would this be correct?

Printing of the results

After the control phase, the holders receive print outs of their data. If necessary, they will still be in the position to pass on changes to these data. The form then goes through the full procedure once again.

3.4.5 Non-response

Farmers that do not respond to the first request to fill in and send in the form receive two postal reminders. If they still do not react another official census questionnaire is sent to them by registered mail, and they are obliged to complete, sign and return it within 5 days. Persistent refusers may be visited by the Agricultural Inspection Service, which is the investigation service of the Ministry. They can also receive a penalty. Partly completed forms are completed by call-backs from the error-checking personnel.

If the census would serve statistical purposes only the legal enforcement would probably not be so strict. Only because of the administrative purposes and the financial advantages of the combined form for the census and the application for animal, crop and area subsidies, and for the enforcement of the minerals regulation the census has a near to 100% (approximately 96% in 2007) response. In 2007 there is only the combined form, however a group of 6000 (greenhouse farmers) received only part of the form (no maps and no overview of parcels for crops).

3.5 Data processing, analysis and estimation

3.5.1 Methods for handling missing or incorrect data items

The NSIR performs computer controls on the data and when necessary additional information is collected from the farmers by phone. The errors can be divided into two types: *hard errors* and *soft errors*. Hard errors are data that can never occur in reality. For instance the total area of holding does not equal the total of the various crop areas and other areas of the holding; there are sows with piglets, but there are no piglets; the

age of the holder is over a certain limit. Soft errors are data that are unlikely but not impossible e.g. the recording of a certain crop that is very uncommon in the region; a number of animals that is extremely high; the amount of labour is not in line with the size of the holding.

The data that are finally accepted by NSIR are forwarded to Statistics Netherlands.

Data processing by Statistics Netherlands involves further checks for hard and soft errors, and enrichment with additional information, such as total sgm and typology. Also regression analyses are performed as part of the control cycle.

Item non-response is often detected by the control programs and controlling personnel, and is corrected for. Imputation for the small percentage of non-response is discussed in paragraph 3.5.2 'Estimation and sampling errors'.

First results are published in July. There is a special need for having (provisional) data on areas of crops available at that time, because crop areas serve as a basis for the first yield estimates, which are carried out in August. Final results are published from September onwards.

Every holder has a unique registration number and if a holder has more than one holding all data are related to this same registration number. So the register of holdings is actually a register of holders. To each holder a municipality is assigned. This is usually the place where the most important buildings of the holding are located. In the tabulation of results all the data of a holding are calculated to belong to this municipality. In some extreme cases it therefore happens that the figure for the total agricultural area in a municipality is higher than the total area of the municipality within its boundaries.

Sources of data, data-manipulation and analysis and calculation methods are documented for internal use at Statistics Netherlands.

3.5.2 Estimation and sampling errors

Since the Farm Structure Survey is performed as an exhaustive census, no samples are drawn. All agricultural holdings receive a questionnaire and 96% of all questionnaires is returned. Estimation for the small percentage non-response is based on next-neighbour imputation. Size and farm type from previous year's response were used as stratification criterion. Analysis on the impact of the imputation is part of the validation process. Weighting or re-weighting does not take place.

3.5.3 Non sampling errors

Coverage errors (under coverage, over coverage, misclassification and multiple listing errors and so on) are discussed in paragraph 3.3.1 'Population and frame'. Correction for these errors is mainly affecting the National Farm Register. Corrections are carried out by NSIR.

Measurements errors are partly detected by control programs (see paragraph 3.4.4 'Control of the data'). If detected by these programs or otherwise in an early stage of

the process, the farm holders are contacted to correct these errors. If these kinds of errors are detected later on, for each type of error the consequences are being evaluated in order to decide whether the error should or should not be corrected. The way in which correction takes place is dependent on the type and seriousness of the error and the consequences for the analysis of data.

Processing errors are discussed in paragraph 3.5 'Data processing, analysis and estimation'. Because the census is exhaustive and a heavy control procedure is followed for administrative purposes the number of errors is probably low. The number of corrected errors is not registered.

Non-sampling errors are usually detected in one of the earlier processing stages; a final check comes from the evaluation of the results (see paragraph 3.5.4.)

3.5.4 Evaluation of results

Evaluation of the results takes place by comparing the results with previous results and trends and by comparing with agricultural data from other sources.

Comparisons are made at several levels of aggregation: national, provincial and regional. Comparing individual data on holdings usually only takes place as a result of the detection of errors in the data.

Agricultural data from other sources with which the census information can be compared result from other statistics (i.e. manure and nutrients statistics, land use statistics and agricultural income statistics) and from administrative data of commodity boards and CAP regulations executive offices.

The results of the evaluation prove that the agricultural census information is generally highly reliable.

4. PUBLICATION AND DISSEMINATION

The results of the census are published on the CBS internet database 'Statline'. In this database internet-users may select their own indicators and information topics. Results are presented on several levels of aggregation (national, provincial, regional and municipal). To prevent disclosure of individual data of holdings, certain characteristics may be hidden.

Incidental information on specific subjects is released in articles in the 'Webmagazine' on the CBS internet site (www.cbs.nl). Through RSS-feeds users can be informed of new content on the website. Information on the internet is free of charge. Metadata is included in all publications.

Statistics Netherlands has a central press department to maintain contact with the general press. Apart from that there is an information section, which takes care of the dissemination of the results towards the more agriculturally specialised press and other parties.

Apart from the regular publication on internet CBS has an information service desk available. Relatively simple information requests are handled by this desk. Complex requests are answered by specialised personnel for whom cost prices are charged.

The results of the 2007 census are published from the second half of 2007 until the second quarter of 2008, in regular updates.

Statistical confidentiality

To maintain statistical confidentiality, no individual holding data may be disclosed by the published results. This is especially important in the lower regional tables and for 'sensitive' characteristics (labour force, economic value); e.g. a table shows that there is one holding with an economic size of 100 NSU in a certain region, and another table shows that the total economic size of the holdings in that region is 100 NSU, you would know that the one holding must be 100 NSU.

A solution could be to apply the rule of dominance that is to hide the contents of table cells where the data are from few holdings. This is a very complicated operation. Very often a hidden cell value can be recalculated by difference from data in other tables so once you start to adapt tables by making changes in some cells, you have to continue this in other tables and the hiding operation spreads throughout the table set like an oil spill.

Therefore we have chosen for an easier pragmatic approach: tables with a danger of disclosing individual data are published only at country or province level, or the level of detail is lowered at regional level. Usually tables with sensitive characteristics, e.g. economic size, labour force, sometimes in combination with a second dimension e.g. farm type, are not published at the lower regional levels. We do have these tables at our office for special studies, but they are not published. In case of ad hoc requests confidentiality rules are specially applied.

REFERENCES

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- Working group "Structure and Typology of Agricultural Holdings": Eurofarm Manual for Data Suppliers, survey 2007. Doc. CPSA/SB/641, rev.2
- LEI & CBS (2007). Land- en tuinbouwcijfers 2007. LEI Wageningen UR & CBS Voorburg.
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ANNEX 1. QUESTIONNAIRE FSS 2007

This annex contains the main questionnaire for the agricultural census 2007 (1a: 'Gecombineerde opgave 2007'), and the summary form for the total area per crop (1b: 'Overzicht gewaspercelen 2007'). The application forms for animal, crop and arable land subsidies are not included.