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Éditeur responsable : R. MASSANT
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B-1000 Bruxelles – 44 rue de Louvain

Statistics Belgium
Working Paper n° 10

Final report

PILOT STUDY ON STATISTICS ON WASTE IN AGRICULTURE, FISHING AND FORESTRY

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The action has received European Commission funding coming from DG Environment

Grant agreement 200371200002

Acknowledgments

Acknowledgments

We acknowledge agriculture experts for valuable help and comments: Paul Wadin (Walloon region, DGA-D14 agricultural accounts survey), Yvan Bergmans (INS, statistician, agricultural expert), Elisabeth Draelants (INS, agricultural statistician), Koen Desimpelaere (VLM – Mestbank, bank of manure, Flemish Region), and Philippe Decornet (animal waste expert).

Tom De Roey designed the questionnaire and the merge system, together with Walter Verboven.

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Introduction

Introduction

In Belgium, the only data available on waste production are regional administrative data. The waste management being a regional competence, the situation differs between the regions. In Flanders, OVAM (Flemish waste institute) has been collecting waste production data for 20 years, by the way of a legal obligation to companies to declare any waste production. In Walloon, an integrate survey covering about 200 IPPC companies, runs from 1997[1].

The agricultural sector is not well covered by administrative waste databanks: only about 2 (big) industrial "farmers" are some times covered by the Walloon survey, and in Flanders, only companies with employees are covered, plus a few self declaring companies without employees. If we consider that 90% of the farmers have no employee, the coverage in Flanders is certainly not complete.

The definitions used in regions are different. For example, animal manure is not legally considered waste in Flanders, but well in Walloon.

The goal of this pilot study is:
-to identify feasible definition for waste in agriculture, forestry and fisheries;
-to set the bases for a regular production of waste statistics in this sectors, at the level of Belgium, and comparable with other countries (following the standard defined within the framework of the regulation 2150/2002);
-to assess the feasibility of using administrative data;
-to identify emission factors to be applied to agricultural production statistics, in order to estimate waste production using models;
-to identify the relative share of different types of farms in agricultural waste production, in order to optimise future possible surveys.

[1] Brussels region is almost not concerned by agriculture, well by forestry.

National policy needs

National policy needs

Problems arising

Agriculture has always been the receptacle of waste[2], mainly for 2 purposes:
-Animal feeding;
-Soil improvement

The direct animal feeding with waste from restaurant or households diminished with the evolution of the structure of the farms and the urbanisation of the human population. On the other side, new types of waste coming from the cities (urban compost, water treatment residues) or from the industry (mainly food industry) are produced and delivered to farms in the form of fertilizers and soil improving matters or animal foods.

However, both of these practices are evolving because more restrictive legislation in order to protect:
-the food chain (after the Belgian dioxin crisis of 1999, then the BSE crisis);
-the environment (water, soil and air), mainly concerned with excesses of manures.

As a result, what was considered before as by products becomes more and more "waste" in practice and in the legislations, because the farmers, the industry or the water treatment companies "have to discard them".

The policy needs for statistics

Policy needs for statistics are potentially unlimited. In order to get an idea on the priority policy needs for environment in Belgium, it is useful to get a look on the existing legislation on one side, and environmental reports on the other side.

Generally speaking, the policy needs seem more focused to the notion of "excess". Waste policy can be concerned with 2 major problems:
-Pollution produced by waste storage, reuse or treatment
-Management of waste that cannot be "recycled" internally in a given farm

The notion of "environmental problem" evolves with the time, and is addressed by more restrictive legislations, which are constrains to the material flows of the agricultural system, changing the status of waste for several materials. For example, manure is not a waste unless it considered "in excess" following the legislation.

Following this analysis, one could concentrate statistics on:
-Internal "on site" waste management resulting in an environmental problem[3]

[2] In France 1994, 60% of the waste would be treated by agriculture (Petitjean, 2003).
[3] Since our annexe II excludes the internal treatment, this should here be limited to the waste treated coming from outside …

-all waste and “secondary material” exported out of the site[4] of production, or more precisely, *which changes of hands*[5].

The excess of manures is a problem for environment in Belgium since the 60’s, mainly in Flanders where more intensive animal farms appeared. The problem for environment, in case of excess, is the emissions of various pollutants (NH3, $NO3^-$, P2O5, K and heavy metals) to air, soil and/or waters.

[4] The site being here a farm with all its lands
[5] This definition is certainly applicable to small companies, certainly not to multinationals!

General methodology

General methodology

The implementation of the waste statistics regulation is conceived as a bi-dimensional thinking process combining:

-A generic approach
-A thematic approach

The generic approach

The generic approach is the point of view of the regulation, giving a standard (waste definition etc) applicable to all economic sectors and situations.

We are building the system able to launch the full survey necessary for implementing the Regulation, not only for agriculture, but also for all sectors. This involves internal and external actors:

-Business registers team (to assess the universe)
-ITC teams (building tools for merge and recording)
-Methodological team (for sample design, then extrapolation, analysis of variance etc)
-Printery team (for editing the questionnaires and merged letters)
-Sending team
-WWW team (for WWW helpdesk)
-Call centre and accompanying team (to collect the results, play the role of helpdesk, check the data, recall or phone to "doubtful" respondents)
-Juridical team, for elaborating cooperation contract for access to administrative microdata
-The external actors are mainly the regional administrations of waste, which provide their expertise, their specific needs, and hopefully their administrative registers and data[6].

The thematic approach

The thematic approach or point of view consists of thinking in terms of the respondents and their particular situation. They are divided in economic sectors and size of companies, with a particular situation in terms of waste production and cultural waste concepts. For example, waste in agricultural sector would be not the same as waste in chemistry. Moreover, the way to consider the limit between a waste and a by-product could differ between actors. A first analysis has identified at least 9 modules or categories of respondents in terms of waste statistics:

-Agriculture and forestry
-Fisheries
-Industry covered by the Prodcom statistics

[6] Walloon and Brussels regions are ready to provide their data

-Industry not covered by the Prodcom statistics
-NACE 37, 90 and 51.57 (as producer of secondary waste, and for annexe II)
-Construction and demolition
-Services (big companies)
-Services (SMEs with waste collected by municipalities)
-Regional waste administrations (for annexe II, households, parts of annexe I)

The thematic approach consist of consulting internal and external experts and seeking possible collaborations:
-Internal statistical divisions (e.g., agricultural statistics)
-External statistical and administrative divisions (agricultural economic divisions, manure banks, waste administrations)
-Professional federations (not consulted yet for agriculture)
-Individual collaborative farmers for checking of the questionnaire

The thematic approach is very important to adapt the language and questionnaire, and to identify specific situations concerning waste.

The learn and thinking process

The 2 points of view described above are alternatively used, one feeding the other.

A pilot study was conduced in 2 strategic sectors in a first stage:
-Construction and demolition sector
-Food sector

The first sector is interesting because of its structure (majority of SMEs and companies without employees, big amounts of waste with internal reuse, difficulty to define local units).

The second sector is more representative of industries, and is at the border of agriculture, with same kind of waste.

The pilot survey, with 2 specific questionnaires (only the list of waste presented varied) was sent in September to a stratified sample of about 2237 companies in the construction sector and 1178 companies in the food sector, all of them active in local units situated in Walloon and Brussels regions.

We do not describe here in detail all the processes and developments involved, but it has to be mentioned that this pilot surveys feed the “generic approach” by ameliorating tools, systems and collaborations necessary for the pilot study on agricultural waste. Moreover, it was a test of the type of questionnaire used, which seemed to be well accepted by the respondents, even the smallest ones[7]. The great lines of the Blaise tool for recording the answers in a database was also developed during this NSI first phase of pilot surveys.

[7] the only difficulty encountered is linked to the geolocalisation of waste production in the construction sector, our survey being limited to Walloon and Brussels regions, because we still hope to be able to use administrative micro data for Flanders

With this experience, we started a second round of ‘thematic” pilot survey: on agriculture, which is the subject of this report.

Agriculture

Agriculture

Introduction

A meeting and contacts with various agricultural statisticians have been taken (see acknowledgments) in order to get experience with farmers and to explore the possible link with existing surveys.

Some administrative data would be used for several fluxes, like the nutriment databanks or some administrative declarations.

For other fluxes, a survey on waste generation will help to determine waste emission factors to be applied on waste production data (from the agricultural annual census).

Structure of the economic sectors

The structure of the universe of companies owning a VAT number (table 1) shows that the vast majority of the agricultural companies (99.6%), service to companies (98.7%), forestry (99.7%) and fisheries (95.5%) have less than 10 workers. It is evident that they should not be excluded from waste surveys.

The table shows also that the vast majority of farmers are individuals without employees (respectively 90%, 78%, 92% and 55%).

Table 1: Number of companies in each economic sector in Belgium (2002) (only companies with a VAT number[8])

	Number of employees							
NACE	**0**	**1-4**	**5-9**	**10-19**	**20+**		**0**	**<10**
0111	2979	155	8	1	1	3144	94,8%	99,9%
0112	3734	2141	294	129	49	6347	58,8%	97,2%
0113	1289	1656	28	9	2	2984	43,2%	99,6%
0121	1918	123	10	4	2	2057	93,2%	99,7%
0122	1185	95	7	0	1	1288	92,0%	99,9%
0123	1860	115	2	3	0	1980	93,9%	99,8%
0124	849	73	10	6	4	942	90,1%	98,9%
0125	634	26	3	2	0	665	95,3%	99,7%
0130	37247	511	9	5	0	37772	98,6%	100,0%
0141	7691	1969	239	102	39	10040	76,6%	98,6%
0142	1090	121	5	2	4	1222	89,2%	99,5%
0150	15	0	0	0	0	15	100,0%	100,0%
0201	2102	174	22	5	4	2307	91,1%	99,6%
0202	372	5	0	0	0	377	98,7%	100,0%
0501	67	53	58	8	2	188	35,6%	94,7%
0502	103	13	0	3	1	120	85,8%	96,7%
011-013	**51695**	**4895**	**371**	**159**	**59**	**57179***	**90,4%**	**99,6%**
014-015	8796	2090	244	104	43	11277	78,0%	98,7%
02	**2474**	**179**	**22**	**5**	**4**	**2684**	**92,2%**	**99,7%**
05	**170**	**66**	**58**	**11**	**3**	**308**	**55,2%**	**95,5%**

Source: NIS, DBRIS 2004

011x= grains and horticulture, 012x=breeding; 013x= mixed; 014x= service to agriculture; 015x= hunting; 020x= forestry; 050x= fisheries and aquaculture

In 2004, there were 53221 exploitations in the agricultural census that covers sector NACE011-013, non-VAT owners and owners with a limited commercial production like agricultural schools. They have a total of 71908 YLU (year-equivalent labour units[9]) at work (source NIS, 2004). Out of this total, 10930 YLU concern employees[10], and 2355 YLU irregular, seasonal or irregular workers[11]. The 58623 remaining YLU are attributed to the owner and his/her family members without employee's status.

[8] Some small farmers have no VAT number (nor employees): the percentages of small farmers showed in table 1 are thus a minimum. On the other side, there are companies with VAT number and a NACE classification in agricultural sector, but which are not or not anymore basic farm producers, and there are agricultural producers which are classified in non-agricultural NACE sectors by VAT administration. As a comparison, the number of farmers subject to the agricultural census was 56912 (against 57179 in the table).

[9] 1 YLU = 1 equivalent full time, equivalent to one person (>=16 year old) working at least 38 hours a week and 225 days a year.

[10] Thus corresponding to a greater number of persons officially recorded in the Social Security Databank

[11] Including students and workers employed by service to agriculture sectors, thus not considered as employees of the farmer himself by the Social Security Offices.

The distribution of full time equivalent labour (YLU) in agricultural census is given bellow:

Size classes:	0 YLU	]0 – 1] YLU	]1-4] YLU	]4-10] YLU	>10 YLU	Total
Total labour (YLU)	54525	6480	4731	3050	3121	71908
Employees (YLU)	0	2524	3079	2450	2877	10930
Number of farms	47862	3507	1329	390	133	53221
% farms	**89.9%**	**6.6%**	**2.5%**	**0.7%**	**0.2%**	**100%**

Source: NIS, 2004

The comparison with previous table above suggests that most of the external employees in farmers are part time employees, even in farm with more than 10 employees. The extrapolation using the number of employees could thus introduce a bias.

Structure of the waste generation

In Belgian situation, one could expect various types of farms with specific waste production patterns. Waste production is a function of:
-The production type;
-The intensity of production (mainly for breeders)
-The size of exploitation (1 UDE = dimension unit = 1000 EUR of gross margin[12])

Table 2 summarize the logical strata for waste production in agricultural sector.

Table 2: Logical stratum identification

Orientation	Sub-orientation	Remark	Waste
Big cultures		Extensive	Few (packaging, plastic films, used oil)
Milk		More intensive	Many
Bovine meat		Mainly extensive	Few
Mix			Variable
Granivore	pig		Many (manure, partly recycled)
	poultry	Heterogeneous: big, small exploitations, partial time, contract of employee of food firms. High integration rate.	Many (droppings)
Horticulture	Permanent		
	Vegetable		Packaging

The results from declaration by biggest farms to Flanders administration gives an average percentage of 31% mixed and undifferentiated materials, 23% animal waste (as manure is there not considered as waste, this includes only dead animals and residues of slaughtering), 20% diverse mineral waste, 14% construction and demolition waste (e.g. from ways construction), 4% vegetal waste, 2% food waste, 2% paper and carton, and 3% others (OVAM, 2003).

[12] A parameter close to the value added

Existing registers and auxiliary data

The agricultural annual census

The agricultural annual census of May (INS) can serve as basis for any technical extrapolation (on the base of production, livestock etc) based on its 1233 available parameters.

The legal basis of the agricultural census is laid down in the royal decree of April 2, 2001 relating to the organisation of an annual agricultural census in May.
The royal decree prescribes that the census is to be held in all farms with an operating base located in Belgium. A farm is defined as an enterprise producing agricultural products in order to sell them. Participation in the agricultural census is compulsory. Statistics Belgium is project manager of the survey. The municipal authorities carry out the data collection.

The agricultural census consists of a registration of a certain amount of information on the farms: legal personality of the holding and type of farming, characteristics of the farm labour force, area farmed by culture, livestock numbers, machinery, information on buildings and agricultural installations. These characteristics are more numerous and more detailed than those of the structure survey, in order to satisfy the requests of national users.
Generally, definitions of characteristics are in conformity with the definitions determined by Community legislation concerning the structure survey.
Reference date is May 1 for the area farmed in open air and livestock. For farm labour force and cultures in glasshouses, the reference period corresponds to the 12 months preceding May 1.
The municipal authorities can choose between a paper form and an electronic form developed with Blaise software. In 2003, 259 municipalities used the electronic form, thus allowing 38% of the declarations to be collected by this means. Declarations are to be collected by municipal authorities between May 1 and May 31.

A central service in Brussels manages the organisation of the survey (elaboration of documents, mailing to communes, data processing, publication of results). Data entry is performed in regional offices.

The municipal authorities collect the declarations of the holders on the basis of a list of addresses provided by the central service.

The municipal census takers receive a census handbook with all explanations required for the comprehension of the forms as well as instructions for taking the census. Census takers can also take part in training sessions organised by the General Direction of Statistics and Economic Information.

Controls are performed immediately during data entry in order to check if data acquisition is in conformity and if the form is correctly completed. Plausibility

controls are performed for areas farmed and livestock by comparing new data with those of the previous year. These plausibility controls are performed immediately during data acquisition and once more during data analysis.

Supposed declaration errors are pointed out to the regional offices in order to correct them after contact with the holder.

The definitive data set is available towards the end of December, when definitive summary and detailed results are released. In December 2003, a test sampling could be done for the purpose of the waste statistics survey. It is thus feasible to get a sampling frame, related to 2004 production, in end November 2004, asking for waste 2004. The goal of the waste survey would then be to estimate the relation between agricultural production and waste production of the same year (emission factors).

The (regional) agricultural accounting surveys

The (regional) agricultural accounting surveys know the orientation, the intensity (units of N/ha) and the size of exploitations. A representative (unless for poultry) consists of more than 500 exploitations in Walloon (545 in 2002), more than 600 in Flanders.

What is known: the export of N, P, K (=> it is possible to know animal waste). The other waste parameters should be asked to farmers, in addition to the accounting survey.

The accountants (surveyors) have a trust relation with the farmers, which they visit 3 times a year (one obligatory, for balance in December-January). This could be an opportunity for surveyors to help the farmers to answer a simple waste survey.

The related Walloon administration is ready to collaborate with a survey, the accountants helping the farmers to answer a simple survey on waste quantities, or if necessary, a "journal of waste". Flanders equivalent did not formally react yet. In such a case, a formal cooperation accord would be signed between the administrations and NIS.

For this pilot study, we were too late to start such a pilot collaboration using a "Journal of waste" during the year 2003. In place, an ex-post survey will be conduced, where we will ask what the respondents would think of a continuous ("journal") survey.

Waste regional administration (Flanders – OVAM)

The Flemish waste products decree contains a clause that requires enterprises to annually report their waste production quantity, starting from any production above 1 Kg. The legislator meant via this regulation to gather all data from all enterprises; in other words, to gather an exhaustive picture of the total waste production. This work is carried out by OVAM, the Flemish waste administration. The 2002 survey elicited

responses from 32.090 enterprises, out of the 150000 companies expected to be concerned by this legislation. Of these, 8.315 enterprises or 58.591 reporting forms were studied in detail, which rendered a representative sampling of waste production in Flanders (OVAM, 2004). The collected data was extrapolated vis-à-vis the number of companies known in the reference databanks, principally the NOSS (National Office of Social Security) databank, divided in strata of about 60 sectors x 9 size classes (number of employees).

Agriculture is not well represented in this administrative statistics, mainly because few farmers have employees and are registered in NOSS. Moreover, the quality of the declarations is not guarantied. The administrative form is the same for all economic sectors: the waste is identified by a code to be picked up in a regional extended list of waste (compatible with Eural), available on request and on the WWW (http://www.ovam.be).

Flanders owns 6225 farmers with employees, out of which 797 are known by the waste administration because they made at least one waste declaration (Probabilitas, 2004).

Experimental results for agricultural sector were published for the first time in 2003. They are interesting to identify most probable types of waste produced by diverse types of the biggest exploitations, also by size classes of farms having employees.

The mean quantity of waste (regional definition[13]) declared by farms with employees in Flanders varies between 9 and 100 kg per small farm and per year, and can reach up to 4182 kgs for big farms (table 3).

Table 3: Mean quantity of waste declared by each farmer with employees in Flanders (Kg per year)

	Number of employees							
Production year	0	1-4	5-9	10-19	20-49	50-99	100-199	200-499	500+
2000		100	71	594	403	77	102	390	
2001		9	49	351	298	19	4182	296	
2002		15	51	180	155	53	250	300	

Source: Probabilitas, 2004.

From 2004 onwards, OVAM adopted a sample survey in place of an exhaustive declaration obligation. The sample would consist of 340 farmers with employees[14] for data 2005 (Probabilitas, 2004).

A NIS survey in Flanders could be simplified in the future if we get the individual declarations of this 340 declaring farmers. A crossing of administrative microdata and the agricultural census survey could give much information on correlations between production and waste, and emission factors. The form used in Flanders being more comprehensive than requested by the waste statistics regulation, the administrative microdata could either serve as direct input for our needs, either serve as verification (quality check).

[13] excesses of animal manures are not included
[14] out of about 797 known in the administrative databank

A cooperation agreement between OVAM and Statistics Belgium is on the pipe to get the available individual data (at the level of all economic sectors). However, as on one side, no agreement was signed yet at the time of this pilot survey[15], and as on the other side, the administrative file does probably not cover well the majority of farmers (being farmers without employees, as seen in table 1), we conduced the pilot survey also to Flemish farmers.

The manure banks

Manure banks are present in Flanders and in Walloon. The Flanders part is much more developed, because of the specific typology of (more intensive) farmers, producing more manures excesses, but the same kind of data is available in Flanders and in Walloon.

The Mestbank is managed by the Flemish Land Administration (VLM) and knows in detail not only the "average yearly livestock" but also the production of manure from all breeding companies in Flanders. All flows of manures between exploitations are inventoried (kind, quantity, kg P2O5, kg N, …). Total data on import, export and treatment of animal manures, original or transformed, is known, conform to the EC Directive EVOA and additional Flemish legislation. This administration is ready to give us all available data for statistical purposes. Imports, exports and data up to the level of municipalities are available on the site:
http://www.vlm.be/Mestbank/startpagina.htm

Other sources

A "concurrent" register is the Statistical register of companies (DBRIS), with about 700000 Belgian companies, including 57000 agricultural companies (see table 1). The register depends on the sector mentioned on the VAT declaration of the companies. It is a merge of various administrative registers including the National security registers, the VAT register etc. The accompanying auxiliary data is limited (value added, NACE sector, classes of employment, number of companies, number and situation of local units etc) which limits the possibility of extrapolations. This register will be linked to the new register of companies being created for administrative simplification purpose (unique administrative register for all companies in Belgium). It is the default register for waste statistics and for generic verification of double counts (one company can only be classified once in the overall survey).

Phytophar-recover (http:www.phytofar.be) collects pesticide and nutriments packaging (this is a legal obligation for farmers). This is a possible source for statistics on dangerous packaging waste. Phytofar claims to have recovered, in 2003, 483360 Kg of phytopackaging, which would represent 92.38% of the packaging put on the market (phytofar, 2004).

[15] the delivery of regional administrative data for statistical purposes is foreseen in article 24bis of the national statistical law of 1962, but there is no mean to force it: a cooperation agreement is thus a good practical solution to limit the burden to the companies.

Several municipalities collect specific agricultural waste, such as plastic films. Municipal waste statistics are thus a possible source for verifying specific waste production data.

The case of animal and vegetal waste

The somewhat subjective definition of waste ("…which the holder discards or intends or is required to discard") opens the door to infinite discussions on what is *objectively* a waste or not. This is particularly true for the agricultural sector.

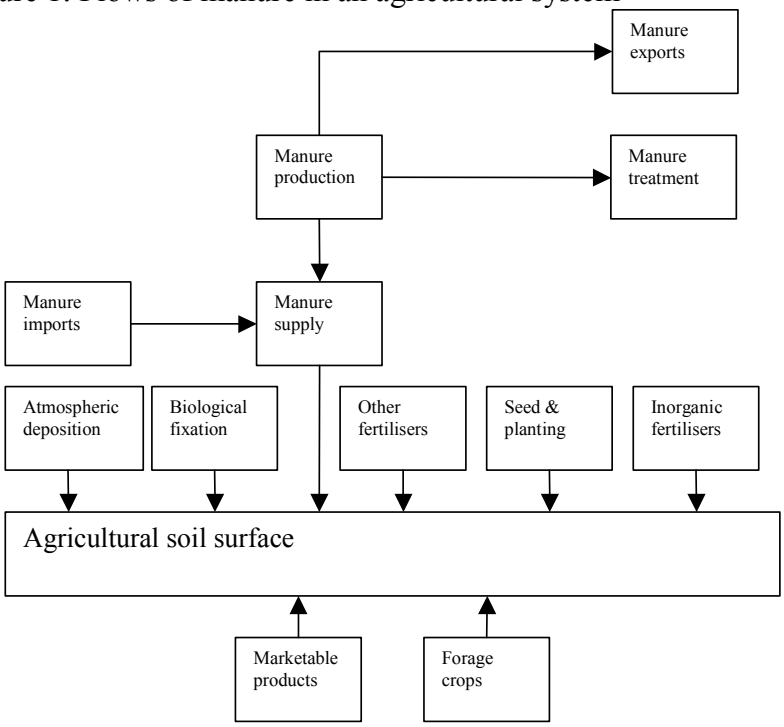
The different possible point of view on animal slurries and manures are summarized below:

-Agricultural system: no waste, everything is recycled (but there is water and air pollution resulting from use of organic manure)
-Individual farmer in a network: only excess of manure that cannot be exported is a waste (waste is limited to manure treated)
-Individual farmer in a market: only excess of manure that cannot be sold is a waste (waste is limited to manure treated and exported with positive market value)
-Individual farmer from an environmental point of view: all manure is waste production, which is then most of the time recycled. The total waste is equal to the manure primary production.

The point of view of the Belgian farmers is the same as the point of view of the "agricultural system": there is no animal or vegetal waste (unless waste resulting from a waste collection obligation, like dead animals). For slurries and manures, this point of view is supported by the Flemish legislation (which does not consider them waste) but not by the Walloon legislation (which consider them waste).

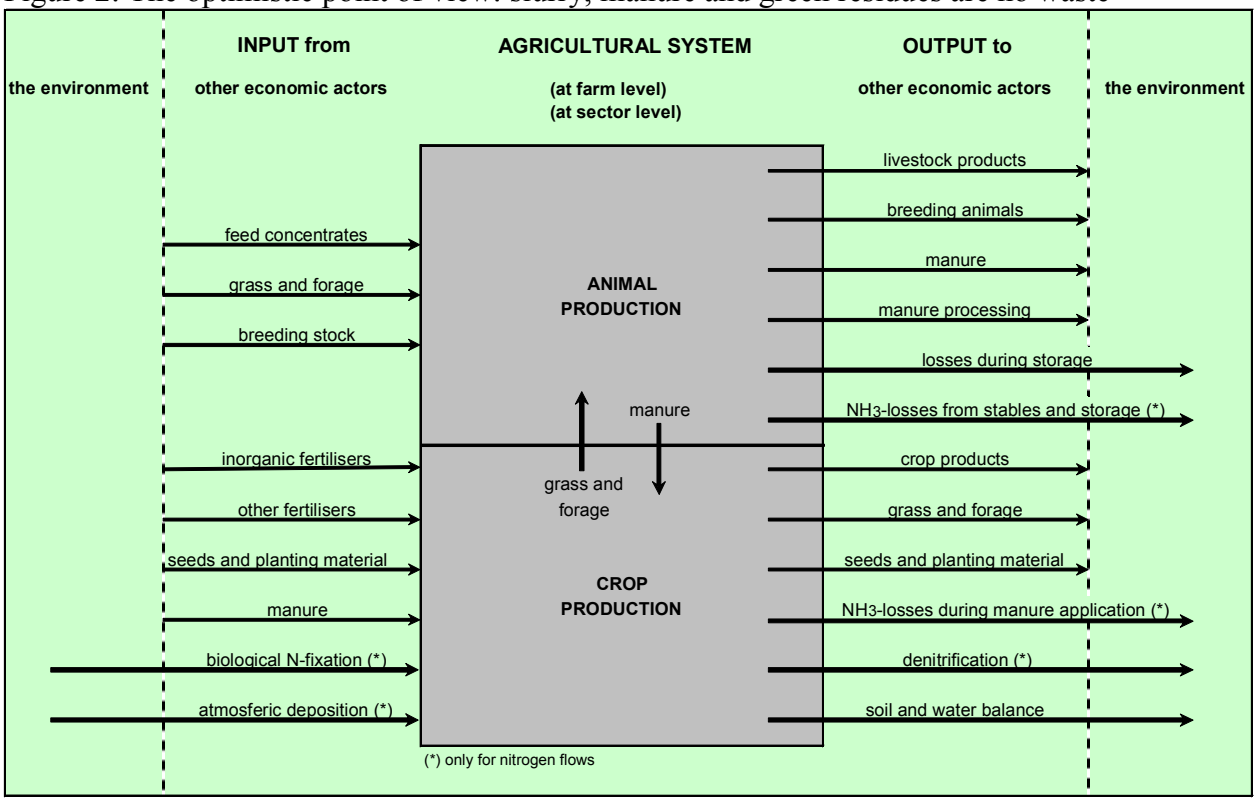
Figure 1 summarizes the flows of manure in an agricultural system. It shows that animal manure is a normal input in the system, thus, in the worst situation, a secondary product, not a waste. Lauwers et al (2004, p. 59) consider animal manure as a marketable product (*but with negative prices*) that can be substituted for inorganic fertilizers.

Figure 1: Flows of manure in an agricultural system



Source: adapted from Lauwers et al (2004)

Figure 2: The optimistic point of view: slurry, manure and green residues are no waste



Source: Lauwers et al (2004).

Actually, manure becomes an environmental problem in case of excess, resulting in water and air pollution, or soil accumulation. This is mainly a problem for some intensive industrial breeding farms (poultry or pigs), if they cannot valorise this by-product as marketable manure. At the most "optimistic" point of view, one can consider that manure excesses are the cause of environmental problems limited to water and air pollution, as showed in figure 2. Following this point of view, there is no waste, since all animal manure is a normal part of the internal flows of the agricultural system. The same reasoning can be applied to vegetal waste.

From a more pessimistic (realistic?) point of view, one could consider the manure "treated" or "exported" as resulting from a "waste" consideration (otherwise, why should we treat it, or export it at negative market price). As in the Walloon legislation, animal slurries are considered waste, and importation of animal slurries is prohibited, the market for manure export[16] is reduced, and treatment becomes a solution of an emerging problem (excess means then "waste"). Manure treatment could be considered, as a first approximation, as equal to manure "waste". This assumption has to be discussed: should he exportation be included as waste?

This situation being particular to Flanders (industrial breeding is much more limited in Walloon agriculture, as seen on figure 2), the total manure treated (and/or exported) at the level of Flanders would represent an estimate of the total for Belgium. The table 3 bellow has to be translated in tons of fresh manure, which is not evident because of the variety of water contents of excrements (nutrient excretion is calculated directly from species and age to Kg of N and P2O5).

[16] There are even exportations on ships up to Russia

Table 3: Manure import, export and treatment in Flanders (ton)

Year	Manure import		Manure export		Manure treatment	
	N	P	N	P	N	P
1995	952	300	2.635	1.212	0	0
1996	1.130	327	1.988	917	77	32
1997	1.929	619	3.462	1.543	205	86
1998	2.269	722	2.795	1.080	698	278
1999	2.123	632	2.930	1.023	1.158	488
2000	2.235	708	1.826	749	2.910	964
2001	2.480	760	6.290	2.110	4.150	1.270
2002	2.554	765	4.504	1.446	2.383	838
2003*					8.400	7.200

Amounts written in *italic* are extrapolated.
Source: Lauwers et al (2004), *VCM (2004)

Table 4 shows an estimation of fresh and dry weight of manure flows in Flanders. The latest part (manure treated) could be seen as a measure of the total manure waste for Belgium. The calculation is based on a mean content of 6.5 Kg N/ton of mixed (liquid and solid) manure (value for pigs following VLM, 2005), and 31,9 % dry matter for pig manure on straw (Texier & Levasseur, 2001).

Table 4: Manure import, export and treatment in Flanders (ton)

Year	Manure import		Manure export		Manure treatment	
	Tons	t MS	Tons	t MS	Tons	t MS
1995	146.462	46.721	405.385	129.318	0	0
1996	173.846	55.457	305.846	97.565	11.846	3.779
1997	296.769	94.669	532.615	169.904	31.538	10.061
1998	349.077	111.356	430.000	137.170	107.385	34.256
1999	326.615	104.190	450.769	143.795	178.154	56.831
2000	343.846	109.687	280.923	89.614	447.692	142.814
2001	381.538	121.711	967.692	308.694	638.462	203.669
2002	392.923	125.342	692.923	221.042	366.615	116.950

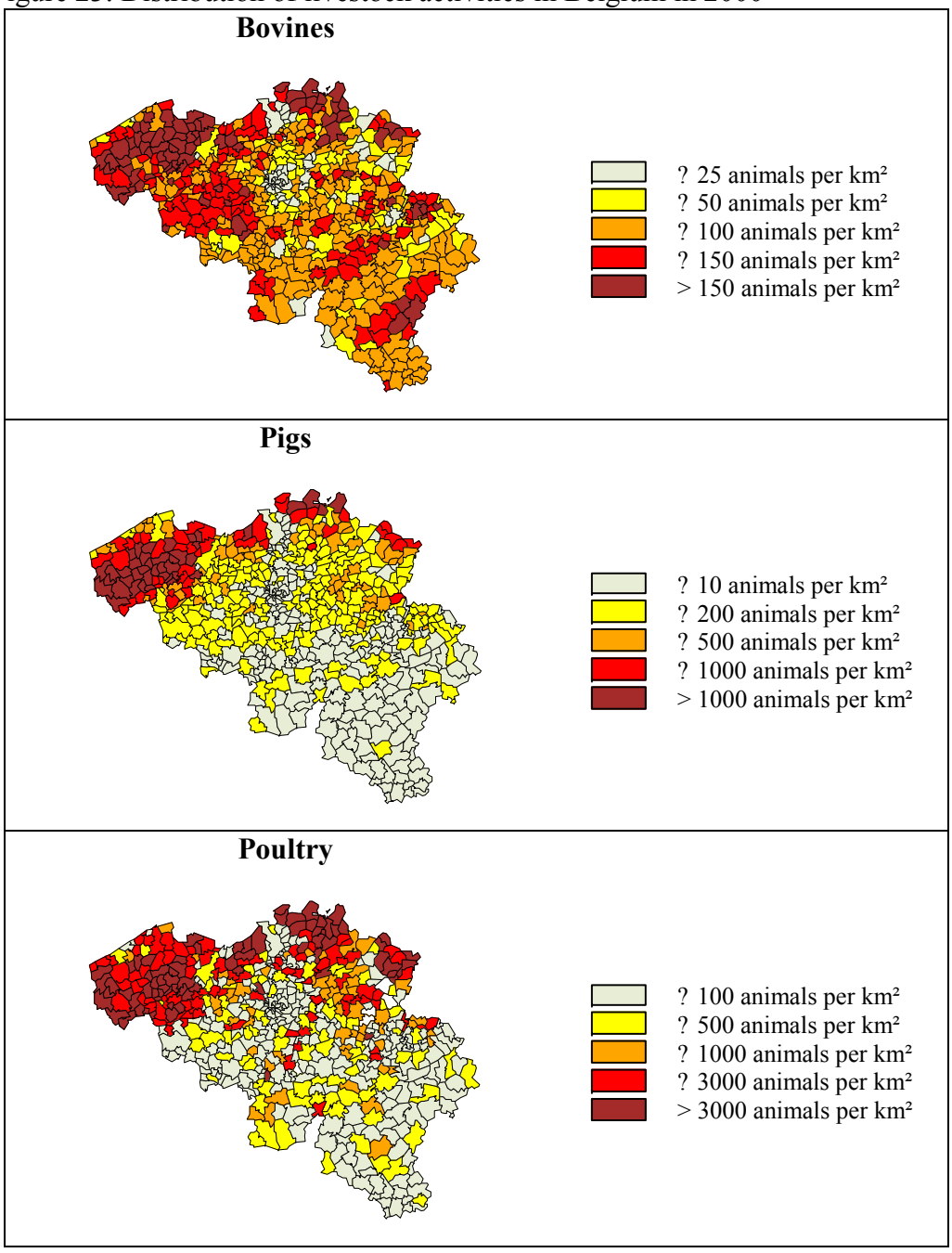
Source: NIS

Table 5 is the result of a survey over (excess) manure treatment in Flanders.

		Ton gross manure	**N (t)**	**P_2O_5 (t)**
Pig's manure	Total treatment	47.547	385,131	213,962
Pig's manure	Treatment small fraction	149.032	698,442	21,023
Pig's manure	Treatment big fraction	55053*	677,152	630,907
Poultry's manure	Export treated manure	196.957	5.312,915	3.870,205
Poultry's manure	Export gross manure	177.290	4.783,284	3.483,749
Bovine's manure		4.500	31,950	13,050
Calf's manure		31.296	93,888	40,681
Other manure°		5.500	53,563	73,287
Other organic matters		25.000		
TOTAL		637.122	12.036,325	8.346,864

* in tons of big fraction of pig's manure
°Other manure: manure of minks, horses, goats, sheep, rabbits, …

Figure 23: Distribution of livestock activities in Belgium in 2000



Source: Lauwers et al, 2004

The latest alternative is to have a look on the market price as a signal to determine if an animal manure has to be considered waste or not. In a survey, one could then ask to the respondent to include manure as waste unless he/she can sale it on positive price. Note that this kind of question would be very bad accepted by farmers.

Almost the total of manure production, at least in intensive out-soil production, would then be considered waste. The maximum possible waste production is given by the calculation of manure, which can be derived from table 4 and 5 for Belgium. Note that this kind of calculation suffers on the sensitivity to excretion coefficient used. Due to differences in farm management and breeds, actual excretion may differ

according to regions and farm types, and due to technological process, nutrient efficiency will change over time. As a consequence, it remains indispensable to actualise the nutrient emission coefficients (Lauwers et al, 2004, p. 64).

Table 4: Livestock N excretion (in tonnes N per year)

Year	Bovines	Pigs	Poultry	Other	Total
1990	222.639	73.843	15.982	3.697	316.161
1991	222.379	72.496	16.116	3.537	314.529
1992	219.139	74.864	16.068	3.564	313.636
1993	221.849	78.143	16.982	3.645	320.619
1994	221.466	77.378	18.442	3.281	320.567
1995	223.480	79.039	19.552	3.551	325.623
1996	218.678	79.010	21.384	3.988	323.060
1997	214.964	79.694	22.146	4.001	320.805
1998	210.817	82.259	22.975	4.275	320.325
1999	210.016	83.202	23.518	4.351	321.087
2000	208.838	75.041	22.863	4.264	311.006
2001	204.919	71.087	22.314	4.200	302.520
2002	199.782	67.612	21.917	4.220	293.530
2003	190.808	65.807	18.397	4.237	279.249

Source: NIS and calculations Lauwens et al (2004)

Table 5: Livestock P excretion (in tons P_2O_5 per year)

Year	Bovines	Pigs	Poultry	Other	Total
1990	85.284	40.020	8.968	1.622	135.894
1991	85.195	39.087	9.064	1.553	134.900
1992	83.912	40.425	9.001	1.555	134.892
1993	84.754	42.203	9.546	1.598	138.102
1994	84.743	41.816	10.401	1.430	138.390
1995	85.507	42.619	10.999	1.548	140.673
1996	83.730	40.099	12.048	1.765	137.642
1997	82.182	40.480	12.390	1.767	136.818
1998	80.347	41.798	12.649	1.894	136.688
1999	79.942	42.124	12.313	1.919	136.298
2000	79.466	33.470	10.868	1.871	125.675
2001	78.069	30.966	10.370	1.813	121.218
2002	76.196	29.153	10.015	1.813	117.176
2003	72.677	28.353	8.661	1.819	111.510

Source: NIS and calculations Lauwens et al (2004)

Annexe II: Treatment of waste by agriculture

Agriculture is the ending point of several waste streams, for example:
-“reuse” of used tires as weight for fermentation silages
-storage of own waste
-D10. Incineration (even if it is forbidden)
-R3. Recycling/reclamation of organic substances which are not used as solvents (including composting and other biological transformation processes)
-R10. Land treatment resulting in benefit to agriculture or ecological Improvement.

Scientific sources and literature can give some results and ideas of methodology.
Table 4 shows the non-conventional fertilizers use in Flemish agriculture.

This kind of information has to be further investigated, and translated, if relevant, in quantities of fresh waste.

Table 4: Use of non-conventional fertilizers on agricultural land in Flanders (tonnes N/year)

Year	Nitrogen (tonnes N/year)				
	Waste products	Sewage sludge	Urban compost	Champost	Total other fertilizers
1990	587	3.081	10	978	4.656
1991	587	3.081	10	978	4.656
1992	587	3.081	38	978	4.684
1993	587	3.081	45	978	4.691
1994	587	3.081	59	978	4.705
1995	587	3.081	109	978	4.755
1996	587	3.081	141	978	4.787
1997	587	3.081	171	978	4.817
1998	587	3.081	190	978	4.836
1999	587	3.081	209	978	4.855
2000	587	2.438	158	978	4.161

Source: Viaene et al., 1999

Table 5: Use of non-conventional fertilizers on agricultural land in Flanders (tonnes P/year)

Year	Phosphorus (tonnes P/year)				
	Waste products	Sewage sludge	Urban compost	Champost	Total other fertilizers
1990	513	770	2	265	1.550
1991	513	770	2	265	1.550
1992	513	770	8	265	1.556
1993	513	770	10	265	1.558
1994	513	770	13	265	1.561
1995	513	770	24	265	1.572
1996	513	770	31	265	1.579
1997	513	770	37	265	1.585
1998	513	770	42	265	1.590
1999	513	770	46	265	1.594
2000	513	499	34	265	1.311

Source: Viaene et al., 1999

Survey design and planning

A stratified sample of 1500 units has been designed for the pilot survey following several strata: regions x agricultural production types x economic size-classes (see chapter methodology below). We expect an answer rate of 10%. The goal of this pilot survey is to study the parameters of the routine survey: to test the questionnaire, definitions, the homogeneity of the strata etc.

The routine survey itself could possibly be supported by the agricultural accounts structure, with the field support of agricultural accountants who know well the surveyed farms. Grossing-up would be based on production statistics or other parameters following the strata considered.

It was previously foreseen to follow the respondents with a “waste journal” during year 2004. A sample was designed on the base of the 2003 census. We expect to get the full results of the 2004 census in time, end November, in order to be able to conduce an ex-post survey, covering waste of 2004, and to relate the answers to the agricultural production of same year. This would give us waste factors to be applied during several years on the agricultural statistics in order to estimate the waste production on a regular basis.

Questionnaire

We have designed a survey questionnaire with the help of agricultural statisticians, waste experts, surveyors and farmers. Ideally, the questionnaire should fill in one A4 page, and only cover the expected waste from the type of farm surveyed (+ an open question for additional waste not covered), named in a language close to the field. For example, as manure is not considered as waste by the farmers and by some regional legislation (and as we can get the related data from other sources), we do not ask for it in a “waste” survey.

A draft questionnaire was presented in the interim report for comments by European statisticians on one side, and to national “external” experts on the other side. It has then been submitted to selected farmers (“friends and family”) for latest check before the official landing of the survey.

The general layout (style) of the questionnaire had been prepared under a pilot study covering sectors 15-16 (food) and sector 45 (construction). The first had the same type of waste than agriculture, the second has the same typology: mainly small companies.

This pilot study aimed to solve problems of size of companies and problems of adaptation of a simple questionnaire to the activity surveyed The nomenclature used for the waste list was taken mainly from annexe 1, but in some cases in annexe III (EWCSTAT) for clarification.

For the agricultural survey, the labelling of some waste categories was adapted (see annexe). The advantage is to be more close to the language used by the respondents, taking into account the fact that the farmers does not consider some of our “waste” as “waste” (like animal and vegetal waste). The disadvantage is the lack of standardization. For potential further surveys, the “standard” language of EWCSTAT will be introduced step by step (in particular after the first publications of WSR will popularise its waste concepts).

Merge system for customized questionnaires

Our “agricultural” pilot study being included in the generic project, it can benefice from its developments. A merge system is thus implemented, which potentially allows adapting the list of waste shown on page 3 of the questionnaire (see annexe) to each individual sector, even within “agriculture” if we have the data.

Thus, each individual respondent would receive, in the future, a questionnaire adapted to his most probable waste production: animal waste for breeding sectors, wood waste for forestry, etc. For the time being, in the context of the pilot project, only a “generic agriculture” questionnaire is sent to the farmers.

Input system

The questionnaires were sent on paper form, by surface mail.

The questionnaire is designed in order to be, in the future, partially suitable for scanning (bar code for answers management, and image for distributed management) and partial digital recognition (OCR).

The input system developed in house on the Blaise platform (created by CBS) is designed to help the recording of paper format data with contextual help and checks. The user interface of the tool is showed in annexe III.

The potential is to use the concepts and tools developed during this phase in order to allow other types of surveys in the future, for which Blaise is particularly adapted:
-CATI (computer aided telephone interview), which is already done in practice when recalling respondents for precisions;
-CAPI (CA personal interview: this is not foreseen because too costly)
-Internet declaration

The latest solution is for the future only (the time for answering could be higher, and at the NSI census of may 2004, only 24% of the farmers were connected to internet: 28% in Flanders, where we expect to replace our survey by administrative data, 16% in Wallonie).

Administrative data

The negotiation with administrations is conduced at a high level (for the all waste statistics covered by the Regulation). Administrative agricultural waste data will only

exist for Flanders, where the administration started its own sample survey (on all environmental integrated matters) the same year and time as ours[17].

As the use of administrative data is by nature uncertain (no guaranty to receive the micro data in time, no guaranty that it fits all the needs, particularly in terms of coverage), our system foresee their use as "ex-post" use:

-at the latest moment, companies with probable administrative data are let out of the respondent list (thus, they do not receive the questionnaire, we impute their value with administrative file);
-and/or the administrative data are used to check the quality and consistency of answers;
-and/or the administrative data are used to calibrate the survey on existing common variables

This is particularly applicable to the biggest companies, which are well followed by the administrations.

Concerning farmers, it was not feasible to get administrative data during this pilot project.

At the time of closing the redaction of this report, both Flemish Minister of Environment (responsible for OVAM) and Minister of Economic affairs (responsible for Statistics Belgium) just agreed on a protocol of collaboration between the 2 administrations. This protocol foresee that OVAM will deliver a copy of its individual microdata to NSI (exclusively for WSR purpose), and in counterpart, NSI will not survey the Flemish region for waste data, neither publish any of its results at the level of the Flemish region (implicitly, for agricultural waste, this imply not publishing anything ourselves for Walloon region either). The obvious advantage of this protocol is to reduce the burden for the respondents.

For waste data, our objective is thus to reduce our survey to zero in Flanders, helping the administration to cover all our microdata needs concerning Belgian obligations (if necessary, an over sampling in Wallonie could cover week parts of Flanders data).

Sampling methodology

The main characteristics with respect to the sampling design are outlined below. Some of them will be refined after the pilot survey took place, because little auxiliary information is currently available for this survey[18], and we can't use yet any results of a previous survey covering a similar field and similar questions.

[17] We waited to send our questionnaire an half month later than the administration in order to not disturb this new important administrative regular survey. However, it seems that there was few overlap between the samples because none of our respondents complained, and only 2-3 of them answered positively to our starting question allowing them to simply send us a copy of their administrative declaration).

[18] E.g. for stratification: quite rudimentary for the 2004 pilot survey, because no data are yet available concerning the correlations between the possible stratification variables and the main variable of

- **Target population** used for the survey: all farms (called "agricultural enterprises" at Statistics Belgium) being active in the Belgian territory (Flanders, Walloon and Brussels); some 53074 farms left at the beginning of 2004
- **Sampling frame** from which the sample was drawn: the database containing the individual results (per farm) of yearly agriculture census; the most recent and complete edition of that census is used (table with 1 line for each farm); before drawing the sample, all farms that stopped their activity since the census (of which the result DB is used) was organised, are removed from the sampling frame.
- **Strata (a priori)**: there are 3 levels (= dimensions or criteria) of classification, and the strata are constructed by cross-classifying the different categories of a certain dimension with the different categories of both other dimensions; the criteria of classification are
  1. Region: 2 categories (North, consisting of Brussels and Flanders; South, constituted by Walloon)
  2. "Techno-economical orientation" ("TEO"): 4 categories (each being an orientation or combination of orientations, each of these grouping certain kinds of agricultural crops such as horticulture, milk)
  3. Size class: 2 categories, the border between them is determined by a certain threshold value for the variable "gross margin" (the threshold corresponds to the 80% percentile[19] for that variable; other percentiles could be taken in the future)
  - **Sampling units**: **local units** (being agricultural enterprises or parts of these)
  - **Analysis units**: these are the units about which results are reported; there are the local units as well.
  - **Frequency of the survey**: every 2 years (survey organised via a completely new sample); however, **reference period** relates to 1 (complete) year
  - **Moment of sample drawing**: for reference period 2004 (reference period = year; successively years 2004, 2006…), a sample was drawn in November 2003 (for organising the survey *before* the start of the reference period); the survey changed into an *ex post* survey, hence a new sample was drawn in October for reference year 2004 (depending on when the forms are sent to the farms);
    note that a completely new sample is drawn for each survey edition (corresponding to a certain reference period), hence no panel or other longitudinal study is organised.

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interest of the survey (quantity of waste produced). Similarly, the allocation of the total sample size to the various strata needs to be refined as well after the pilot survey, when more is known about the importance of each of the strata what concerns the quantities of waste produced (see 'representativity criteria' to be specified by the survey statisticians at the design stage of the sample for the next survey edition).
After recording the responses, extrapolation of the survey results can be done via a finer post-stratification.

[19] The value of 80 was inspired by the fact that very small strata have to be avoided (equilibration of the number of farms over the strata in the sampling frame) but that large farms have to be represented much more than small firms in the sample (compromise between both 'facts'!).

- **Expected Response** *fraction*: at is concerns a voluntary survey and a pilot version of the survey, the response rate is estimated to be only some 10% (keeping in mind the quite probable assumption that farmers – already burdened quite a lot by all kinds of surveys and other administrative duties – do not keep track of the quantities of waste they produce and don't like to start doing this)
- **Sampling design**: within each stratum, a sample is drawn *without* replacement via the SRS (simple random sampling[20]) method
- **Sampling algorithm**: a technique with *random number generation* for each element in the sampling frame and *ranking* the frame (per stratum) based on these numbers results in a fully random selection of the desired number of sampling units within each stratum.
- Total **sample size**: as 150 respondents sampling units (i.e. farms) are desired for this pilot study, and supposing the response rate to be 10% (see previous item), the required sample size (= number of farms to be contacted) needs to be 150/0,10=1500.
- **Sample size allocation**: the current way of allocating these 1500 sampling units over the 2x4x2=16 strata is based on the following principles (stemming from the experience of the statisticians in the agriculture and in the waste-environment team: no information about variability of waste quantity per stratum or survey cost per stratum is available currently for using an optimum allocation scheme!):

1. Relative part of sample in North region = 0,67 (see sampling frame: 2/3 of the farms are in North region)
2. Relative part of sample in the different TEO-categories: 0,40; 0,40; 0,10 and 0,10
3. Relative part of sample in size class 1 (= size below the 80%-percentile) = 0,30.

   These ratios (= relative shares) for the categories according to these 3 dimensions can simply be multiplied in order to obtain the relative share of each stratum in the total sample size; consequently the sample allocation is fixed by these ratios. Multiplying, for each stratum, the allocated ratio with the total sample size yields the sample size *n_strat* per stratum.
   For 1 stratum, the sample size thus obtained exceeded (with 1 unit) the size of that stratum in the sampling frame; hence, the sample size of that stratum was reduced with one, resulting in a simple complete enumeration of that stratum in the sampling frame; the reduction of that sample size (with 1) to the stratum size in the sampling frame was compensated for by sampling (1) additional unit in the closest neighbouring stratum (containing many more units in the sampling frame).

- **Sampling weights**: the size of each stratum in the *sampling frame* is called '*N_strat*'; from the variables *N_strat* and *n_strat*, the 1st order inclusion probability (= selection probability of a case in the sampling frame) can be calculated; it's a constant within each stratum, the value of the constant for

[20] The use of this method (with equal selection probabilities) is justified in case the strata are pretty homogeneous: as the units within a stratum belong to the same size class, to the same region *and* also have the same TEO-category, this can be assumed for the pilot study. Unequal selection probabilities (e.g. PPS) only improves the design if the size of the unit would heavily varies within a stratum.

that stratum = *n_strat/N_strat*. The inverse of this, being the sampling weight of the case under consideration, is calculated and stored into variable *w_sample = N_strat/n_strat*.

Sample size allocation per stratum

For sampling purpose, the Techno-economical orientation ("TEO") have been grouped in 4 categories (each being an orientation or combination of orientations):

1= Big cultures (1) + permanent cultures (3) + [herbivores except "pure milk"] (4xxx\41xx) + polyculture (6) + mixed culture & breeding (8)[21]
2= pure milk (41) (remark: homogeneous class; big waste production export expected[22])
3= pork + poultry (5+7)[23]
4= horticulture (2)

The classification North/South finds its logic in administrative division (other environmental legislation), but also in agricultural orientation (more intensive in Flanders). Brussels region is pragmatically included in Flanders, counting very rare farmers with a relatively intensive production (horticulture, cows). Flemish farmers produce in Brussels area, and Brussels farmers produce in Flanders area: it would be difficult to quantify the regional waste production, and confidentiality problems would occur if we did so.

The sample size allocation per strata is synthesised in table 6.

Table 6: Sample size allocation per stratum

Region	Sector / TEO	Small farms UDS <pct 80	Big farms UDS >=pct 80	TOT
North	1 Extensive farms	**120**	**280**	400
	2 Milk	**120**	**280**	400
	3 Grain-eating	**30**	**70**	100
	4 Horticulture	**30**	**70**	100
South	1 Extensive farms	**60**	**140**	200
	2 Milk	**60**	**140**	200
	3 Grain-eating	**15**	**35**	50
	4 Horticulture	**15**	**35**	50
Total		450	1050	1500

The expected answer rate is 10%, the objective being qualitative (on the feasibility of the survey) rather than quantitative.

[21] Remark: 'big cultures' occur mainly Walloon ("South"), that owns less but bigger farms than the North (Flanders + Brussels)
[22] Remark: "pure milk" producers occur mainly in Flanders.
[23] Pork occur mainly in Flanders, almost not in Walloon

Results

Out of 1500 questionnaires sent and after very few telephone calls mainly for clarifications, we received 554 answers including 357 complete answers and 87 partial answers on table C on waste quantities. This makes a proportion of 23.8% to 36.9% answer rate following the questions (of course, the simple Boolean questions were more popular than the waste quantities). The rate is much higher than foreseen (we expected 150 answers). It can be explained by the farmer's use to fill in NSI mandatory surveys (e.g. annual census, recent decennial census) and other administrative papers. The simple Boolean questions of the beginning of the questionnaire, and the possibility to add comments encourage certainly the respondents to send their questionnaire back with some input inside. However, some farmers complained about this supplementary administrative burden (mainly of table C on quantities), some others were afraid of potential new environmental constraints as a result of this survey. We were contacted by a representative of the Boerenbond (Flemish farmers trade union) who wanted to be sure that 1) this questionnaire was only statistical and that individual data would not be transmitted to the waste administration; and that 2) we would in the future make use of any administrative databank we could obtain, in order to reduce the burden for their members.

Answer rate

Questionnaire sent	Questionnaire received	Of which table C (quantities) empty	Of which partial table C	Of which table C complete	Partial + complete
1500	554	110	87	357	444
100%	36.9%	7.3%	5.8%	23.8%	29.6%

Answers to specific questions

We first present the gross answer rates of the total replies received. This does not take into account the differences between strata, neither the specific design of the strata, which is as such "not representative". ***The results presented here for information and methodological purposes are not representative of the farmer opinion and should not be quoted for any other purpose than methodological.***

B3. Do you declare waste to the waste administrations for year 2004?
(In NL questionnaires, OVAM is mentioned, or OWD for FR questionnaires)

		Frequency	Percent	**Valid Percent**	Cumulative Percent
Valid	Oui	28	1,9	**5,4**	5,4
	Non	276	18,4	**52,9**	58,2
	Pas d application	218	14,5	**41,8**	100,0
	Total	522	34,8	**100,0**	
Missing	System	978	65,2		
Total		1500	100,0		

522 farmers answered this question (94% of the respondents).
Only 28 (5%) of them say that they declared waste 2004 to a waste administration. Moreover, we received very few copies of the obligatory declaration to OVAM, most of the copies we received being in fact declarations to other institutions (like Phytofar or the manure bank). Given this situation, it is probable that administrative data would be insufficient for this sector. Some survey directed to the farmers, and statistical models, would still be needed to get representative statistics on the country level for this sector.

B4. Do you own a register of waste?

		Frequency	Percent	**Valid Percent**	Cumulative Percent
Valid	Oui	23	1,5	**4,5**	4,5
	Non	491	32,7	**95,5**	100,0
	Total	514	34,3	**100,0**	
Missing	System	986	65,7		
Total		1500	100,0		

514 farmers answered this question (93% of the respondents).
Only 4,5 % of them own a waste register. Remember that in our sample, big companies are over-represented: the adjusted percentage of farmers would thus be much lower; because bigger companies have more chances to own a waste register (however, some small bio farmers said us to own a waste register). This makes their correct answer more difficult. One can suspect a higher response error for the quantities given in table C by companies that do not own a waste register.

B5. Do you use waste from other enterprises as manure or for soil improvement?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Oui	146	9,7	**28,5**	28,5
	Non	367	24,5	**71,5**	100,0
	Total	513	34,2	**100,0**	
Missing	System	987	65,8		
Total		1500	100,0		

513 farmers answered this question (93% of the respondents).
21% of them declared to recycle waste from other enterprises.
If we consider that we contacted more big companies than small ones, the quantities could be relevant for WSR statistics, annexe II. Farmers should at least be contacted as waste eliminators.

B6. What do you do with your waste?

		Frequency	Percent	**Valid Percent**	Cumulative Percent
Valid	All waste is treated or eliminated externally	192	12,8	**39,4**	39,4
	A part of the waste is treated or eliminated externally	251	16,7	**51,5**	91,0
	All waste is treated or eliminated internally	44	2,9	**9,0**	100,0
	Total	487	32,5	**100,0**	
Missing	System	1013	67,5		
Total		1500	100,0		

487 farmers answered this question (88% of the respondents).
It is interesting to note that 9% of them treat all their waste themselves, and that a half at least treats some waste internally (of course, this is mainly the case for manure that they normally do not consider to be a waste). This question is very useful to identify some inconsistencies in the answers (e.g. a farmer answering this question but declaring no waste afterwards).

B7. The waste treated or eliminated externally, are managed by:

		Frequency	**Valid Percent**	Cumulative Percent
Valid	Municipality or intermunicipal society	368	**83,0**	71,5
	Private waste management company	131	**29,6**	112,6
	Other exploitations	26	**5,9**	118,5
	Other, please specify	80	**18,1**	**136,6**
	(See question B6 above)	443	**100,0**	

36,6 % of the respondents eliminates their waste through more than one external channel. This would complicate any statistics based on surveys to collectors only. The majority eliminates at least some waste through the municipal collecting system, as source where it would be difficult to identify the origin of the waste. Almost 30% also give some waste to private companies and 5% give waste (probably manure) to other exploitations.

The other collectors mentioned were mainly Phytofar, Rendac, the furnisher, containerparcs, foreign countries etc. The original answers are displayed on the note bellow[24].

[24] via mestvoerder naar frankrijk ;verbrandingsoven ;verbrand ;terug naar bedrijf voor hergebruik(retour) ;SCAM (phyto) ;repris par fournisseur(cartons et plastiques) ;rendac,phytofar-recover,containerpark ;rendac, phytofar -recover ;RENDAC(équarissage) ;RENDAC ; PHYTOFAR ;rendac ;rendac ;rendac ;rendac ;rendac-phytofar ;Rendac-Fytophar-recover ;recyclage ;recoverdienst ;récolte bidon PHYTO ;Phytofar, Rendac, Tiense suikerraffinaderij ;PHYTOFAR reprend emball. + ferrailleur pour métaux ;phytofar recover pour emballages phyto et rendac pour les cadavres ;Phytofar Recover ;phytofar recover ;phytofar recover ;phytofar recover ;Phytofar ;Phytofar ;phytofar ;phytofar ;phytofar ;phytofar ;phytofar ;phytofar ;phytofar ;phytofar ;phytofar ;phytofar ;phytofar ;phytofar-rendac ;phytofar-recover ;phytofar-recover ;parc à containers, ramassage bidons de produit à pulvériser ;parc à containers ;parc à containers ;oude plastic gaat naar holland ;ophaling lege verp.bestr.middelen ;ophalen verpakking spuitmiddelen ;matériel agr. repris par CUMAVAUX +collecte ;lisier (contrat d'épandage) + cadavres :RENDAC ;leverancier ;leverancier ;landbouwsector ;komt als mest op cultuurgrond ;inzameling verpakkingen pesticides ;gronden van andere landbouwers ;Grodan-leverancier ;garage ;fytoverpakkingen ;fytophar,oud ijzer, rendac ;FYTOPHAR - ;fytofar ;fytofar ;fytofar - recover ;fyto-ophaling ;fyto-far ;ferrailleur et phytofar ;ferrailleur ;Denolf recycling-Phytofar-Recover ;containerpark ;containerpark ;containerpark ;containerpark ;containerpark - rendac ;container park ;container ;clos d'équarrisage ;andere land- en tuinbouwers ;agrochim.=phytopfar - démolition=PIECK(recyclage)- plastic=INTRABEL - métaux= ferrailleur

B8. The waste treated or eliminated internally are:

		Frequency	**Valid Percent**	Cumulative Percent
	Incinerated	53	**18,0**	18,0
	Reused in production	197	**66,8**	84,7
	Land filled on the site of the enterprise	22	**7,5**	92,2
	Other, please specify	38	**12,9**	**105,1**
Valid	(See question B6 above)	295	**100,0**	

18 % of the respondents still incinerate some waste. More than 2/3 of them reuse some "waste" in the production. This part should probably not be considered waste, as they often claim themselves.

The "other" mentioned also an explanation of what they do concretely as internal reuse. The original remarks are given in the footnote[25]. Some of those remarks show that the concept of "internally" or "externally" is sometimes confusing. With "internally", some farmers understand that they transport it themselves (e.g. to a container park). This reflects also the opinion of some farmers that we had on the phone, saying for example "I have no waste, everything is collected by the municipality", which could be understood by "I have no waste *problem*".

This shows the usefulness of these questions "what do you do with your waste": they guide the respondent to consider all its waste, and they help us afterwards to understand or correct the meaning of some quantities reported (or not reported).

[25] verwerkt in akkerbouw; verhakseld; verdeeld op eigen bedrijf; spuitresten terug op 't veld spuiten; parc à conteneurs; op eigen gronden verwerkt; ondergeploegd; mesthoop; mestbank; mest spreiden op land; mest op weide; meegegeven met huisvuilkar, papierophaling, containerpark; lisier sur les champs; kompost; je ne sais pas ce qu'il en fait; hergebruik als beschermingsmiddel; grondverbeteraar; geen; gecomposteerd; fumier sert d'engrais sur les terres; fertilisation des sols; épandus sur les terres -> engrais; épandus sur des terrains; épandu sur le champs; épandage sur mes terres; épandage de la totalitéde lisier, fumier, purin sur l'exploitation; effluents épandus sur les terres de l'exploitation; door onszelf hergebruikt; containerpark; containerpark; conduit au container; compost verwerkt in grond; compost; bodemverbeterend; biologische afbr; akkerbouw; 02.01.06 épandu sur terres et prairies

B9. You obtain the quantities of waste produced using:

		Frequency	**Valid Percent**	Cumulative Percent
	Bills of the collectors and treatment plants	111	**25,0**	25,0
	Calculation methods	122	**27,5**	52,5
	Data obtained internally, e.g. by weighing	53	**11,9**	64,4
	Emission factors (e.g. ration waste/production)	27	**6,1**	70,5
	Other, please specify	76	**17,1**	**87,6**
Valid	At least one waste reported in table C	444	**100,0**	

The percentage answer to this question is relatively low but this is not important. The objective of this question is mainly to make the respondents aware of possible methods they could use for filling the difficult part of the questionnaire, which follows, and where quantities are to be reported.

The preferred method is "calculation methods", which probably means that they tried to recall and sum any kind of waste they might have produced during the year.

It is clear (also from the waste types where we had a precise answer) that the bills of collectors and treatment plants were used whenever possible. However, it should be mentioned that this attitude somewhat introduced a bias in the answer, as we will see for the manure (animal waste): total amount of manure was often reported even if there were no excess, all manure being reintroduced in the production.

Quite many (53) respondents weighted some waste, probably for knowing the weight of typical waste volumes they used to manage in order to calculate the yearly quantities. It is also possible that farmers usually weight some waste before giving it away, for example when some price is given or received for this waste, or when quantities are limited (e.g. if a limited amount of waste collected for free by the municipality). 27 even used emission factors, which is a good estimation method for farmers knowing very well its production.

The "other methods" answers were of 2 types (see footnote for original remarks[26]). The ones gave other methods, the other explained that they did not weight their waste

[26] zeer beperkte hoeveelheid ; word afgevoerd naar containerpark ; volume ; tentative d'estimation ; schatting ; schatting ; schatting ; schatting ; schatting ; schatting ; schatting ; schatting ; schatting ; schatting ; schatten ; rendac ; quantité d'effluents de réf. produit par bovin (normes Nitrawal)al ; pesé par phytofar ; per ton drijfmest, stalmest ; pas de poids calculé ; pas de poids ; pas de poids ; pas de poids ; pas de pesée des déchets ; pas de pesée ; pas de pesée-ferme suivie par nitrawalen ce qui concerne les matières azotées ; pas de pesage ; pas de pesage ; pas de pesage ; pas de calcul de poids possible sauf pour le lisier ou le fumier ; pas de calcul de poids ; pas de calcul de poids ; ophalingsverslag van Rendac ; ontvangstbewijs ; on ne connait pas les poids ; nous ne disposons pas des poids des déchets ; normes état ; normen VLM ; non mesurés ; non mesuré ; non mesurable ; non-pesés(sacs payants) ; nitrawal(calcul,base de données) ; niet van toepassing ; ne connait pas le poids des déchets ; mestbank VLM ; mestbank aangifte ; litres de lisiers tranportés par 1 entrepreneur ; je ne connais pas le poids des déchets ; inhouden van vacuumtanks ; inconnu ; hoeveelheid m3 ; geschat door gemeentepersoneel op het recyclagepark ; gegevens mestbank ; geen gewicht gekend ; geen ; geen

or were *unable* to give quantities. Rather than *another* method, it is the expression that they have *no method* for estimating this! This relatively big amount of spontaneous "desperate" answers[27] plaid for either a regular survey to the same farmers and or at least a letter asking them to track their waste at the beginning of the reference year and explaining them some methods to do this.

The other methods mentioned were mainly "estimates", which probably means what we could call "expert estimate" in statistical jargon. This applies also to the farmer saying that he has a small quantity (which suggest that it is easy for him to estimate). Finally, many mentioned that some wastes quantities were estimated for them by external persons, e.g. the collectors (Phytofar, container park, manure bank etc).

The conclusion is that this question is very useful for suggesting methods before the difficult questions on quantities (we could add "rough estimate"). The individual result of these questions can also serve to indicate us the relative credibility of the quantities given.

; geen ; expert ; estimation personnelle ; estimation ; estimation ; estimation ; estimation ; déchets pas pesés ; cubage ; containerpark ; containerpark ; containerpark ; containerpark ; containerpark - ? m3 ; camionlading met gewicht en analyse NP ; aucun poids ; attesten ; aantal geleverde zakken bij phytofar-recover ; 1 sac de bidons repris par PHYTOFAR

[27] We might think that most of the farmers who did not answer the questionnaire were in the same situation.

C. Waste resulting from your economic activity (quantity in tons) (distinction hazardous/non hazardous)

The agricultural wastes listed on the questionnaire are given bellow. The code is the original code (EURAL or EWCSTAT) from which the label is inspired. However, we proceeded to small spelling changes in order to clarify the question. The changes are highlighted bellow with strikeout or italics.

02 01 01	Sludge's from washing and cleaning (not dangerous)
02 01 06	Animal faeces, urine and manure (including spoiled straw), effluent, collected separately and treated off-site
02 01 02	Animal-tissue waste
02 01 03	Plant-tissue waste
09	Mixed animal and vegetal waste (except slurry and manure)
02 01 07	Wastes from forestry
02.11	Agrochemical waste ~~containing dangerous substances~~
02 01 10	Waste metal
07.1	Glass ~~*waste*~~
07.4	Plastic ~~*waste*~~
07.2	Paper and cardboard ~~*wastes*~~
01.3	Used mineral oil
08	Discarded equipment *(machines, tractor, oil filter, batteries, ...)*
12.A	Construction and demolition waste
12.2	Mixed and undifferentiated materials
000	*OTHER, SPECIFY*

11. ~~*Common*~~ sludge's ~~*(excluding dredging spoils)*~~

(Additional help desk is on site http://statbel.fgov.be/waste with definitions and calculator of waste quantities)(Inspired by CBS, 2002).

The number of respondents who mentioned a quantity of waste for each of these waste types is given bellow, together with the mean value, minimum and maximum.

Number of answers for each proposed waste type

Waste type	N	% of resp.	Minimum	Maximum	Mean	Std. Deviation
Sludges from washing and cleaning (NH)	126	**22,7%**	0	1,400	32.95	189.450
Animal faces, urine and manure (including spoiled straw), effluent, collected separately and treated off-site (NH)	**244**	**44,0%**	**0**	**30,003**	**1,099.63**	**2,775.047**
Animal-tissue waste (NH)	153	**27,6%**	0	7,000	84.38	610.105
Plant-tissue waste (NH)	132	**23,8%**	0	778	21.10	88.018
Mixed animal and vegetal waste (except slurry and manure)(NH)	98	**17,7%**	0	1,350	15.51	136.442
Wastes from forestry (NH)	94	**16,9%**	0	300	3.25	30.937
Agrochemical waste (NH)	124	**22,3%**	0	500	5.05	45.725
Agrochemical waste (H)	29	**5,2%**	0	20	.84	3.726
Waste metal (NH)	**185**	**33,3%**	**0**	**1,000**	**11.72**	**103.608**
Waste metal (H)	11	**2,0%**	0	3	.51	.935
Glass (NH)	148	**26,7%**	0	100	1.06	8.596
Plastic (NH)	**247**	**44,5%**	**0**	**200**	**1.91**	**13.424**
Paper and cardboard (NH)	**218**	**39,3%**	**0**	**300**	**2.91**	**22.149**
Used mineral oil (H)	144	**25,9%**	0	100	1.21	9.276
Discarded equipment (machines, tractor, oil filter, batteries, &) (NH)	**177**	**31,9%**	**0**	**100**	**1.59**	**10.586**
Discarded equipment (machines, tractor, oil filter, batteries, &) (H)	65	**11,7%**	0	1	.09	.173
Construction and demolition waste (NH)	111	**20,0%**	0	50	2.23	6.934
Construction and demolition waste (H)	20	**3,6%**	0	1	.05	.154
Mixed and undifferentiated materials (NH)	86	**15,5%**	0	117	3.33	15.609
Mixed and undifferentiated materials (H)	35	**6,3%**	0	2	.06	.338
Slib (NH)	13	**2,3%**	0	150	14.35	41.989
% Dry matter	4	**0,7%**	0	0	.00	.000
Slib (H)	3	**0,5%**	0	0	.00	.000
% Dry matter	2	**0,4%**	0	0	.00	.000
Total (NH)	**555**	**100,0%**	**0**	**30,009**	**531.27**	**1,964.864**
Total (H)	**555**	**100,0%**	**0**	**100**	**.38**	**4.822**
Valid N (listwise)	0	**0**				

NH = not dangerous; H= dangerous

The biggest occurrence of answers was observed for manure, plastic, cardboard, metal and discarded equipments (all not hazardous NH). The less common waste was slib. The most common dangerous waste was used oil.
Additional waste suggested was very few (wood, gross waste, …) and no one had all types of waste.

E. Remarks and suggestions (facultative)
E1. Time to answer this questionnaire

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	0:01:00	2	,1	,4	,4
	0:02:00	5	,3	1,1	1,5
	0:03:00	2	,1	,4	2,0
	0:05:00	14	,9	3,1	5,1
	0:08:00	1	,1	,2	5,3
	0:10:00	48	3,2	10,6	15,9
	0:15:00	63	4,2	13,9	29,7
	0:20:00	37	2,5	8,1	37,9
	0:25:00	6	,4	1,3	39,2
	0:30:00	112	7,5	24,7	63,9
	0:33:00	1	,1	,2	64,1
	0:35:00	6	,4	1,3	65,4
	0:40:00	6	,4	1,3	66,7
	0:45:00	11	,7	2,4	69,2
	0:46:00	1	,1	,2	69,4
	0:50:00	4	,3	,9	70,3
	1:00:00	63	4,2	13,9	84,1
	1:05:00	2	,1	,4	84,6
	1:10:00	5	,3	1,1	85,7
	1:12:00	1	,1	,2	85,9
	1:15:00	5	,3	1,1	87,0
	1:20:00	7	,5	1,5	88,5
	1:21:00	1	,1	,2	88,8
	1:30:00	14	,9	3,1	91,9
	1:45:00	2	,1	,4	92,3
	1:46:00	1	,1	,2	92,5
	2:00:00	9	,6	2,0	94,5
	2:15:00	3	,2	,7	95,2
	2:30:00	5	,3	1,1	96,3
	2:50:00	1	,1	,2	96,5
	3:00:00	5	,3	1,1	97,6
	3:15:00	1	,1	,2	97,8
	4:00:00	2	,1	,4	98,2
	4:10:00	1	,1	,2	98,5
	5:00:00	2	,1	,4	98,9
	5:10:00	1	,1	,2	99,1
	8:00:00	1	,1	,2	99,3
	10:00:00	1	,1	,2	99,6
	10:10:00	1	,1	,2	99,8
	20:00:00	1	,1	,2	100,0
	Total	454	30,3	100,0	
Missing	System	1046	69,7		
Total		1500	100,0		

454 farmers answered this question (82% of the respondents). 84% needed one hour or less to answer the questions. The effective burden of this questionnaire is thus rather limited. Additionally to the measurable burden on the respondents, we might

suppose a “burden feeling” by those who did not answer, but well received the questionnaire and had to decide to trash it! The technical choice for limiting the burden of a survey is:
-a mandatory questionnaire sent to few potential respondents
-a voluntary questionnaire sent to 3-4 times more potential respondents.
-and of course limiting the questions, as much as possible, to “multiple choices”

The solution of “multiple choice” should be considered for small farmers for which we could suggest fixed quantities to be checked in, based on their technical orientation, with the possibility to mention exact quantities if they want.

E2. In the future, would you like to receive the questionnaire:

		Frequency	Percent	**Valid Percent**	Cumulative Percent
Valid	Before the reference year (e.g., you receive the questionnaire end 2004 for beginning counting waste 2005)?	235	15,7	**78,9**	78,9
	After the reference year (like current)?	63	4,2	**21,1**	100,0
	Total	298	19,9	**100,0**	
Missing	System	1202	80,1		
Total		1500	100,0		

298 farmers (54% of the respondents) answered this methodological question.
The answer confirm our hypothesis, before launching the survey, that the farmers would much be able to answer such a questionnaire if they can measure their waste regularly during the year. **Almost 4/5 of the respondents would prefer to receive the questionnaire at the beginning of the reference year**.
This is confirmed by some “desperate” remarks given in the question “B9. How do you obtain the quantities of waste produced?)”.

The opportunity was explored to let accountants of the accounting surveys to give a “waste journal” to the farmers at the beginning of the year, explaining how to do this. The representative of the farmers accounts surveys agreed to collaborate in this direction (end 2003), but it was toot late to put this collaboration into practice this time.
The results suggest that the method of sending a questionnaire (or a letter) beginning of the year should be envisaged seriously in future agricultural waste surveys.

E3. In the future, would you like to receive and answer this questionnaire

		Frequency	Percent	**Valid Percent**	Cumulative Percent
Valid	Electronically ?	32	2,1	**8,5**	8,5
	By surface mail?	318	21,2	**84,6**	93,1
	With the help of a surveyor?	26	1,7	**6,9**	100,0
	Total	376	25,1	**100,0**	
Missing	System	1124	74,9		
Total		1500	100,0		

68% of the respondents answered to this question, which shows that they felt concerned.
84,6% of them does prefer a paper, surface mailed questionnaire. Only 26 would prefer to receive a surveyor, which goes against the idea to collaborate with the accounting surveyors. The fact that only 1/4 of the farmers are connected to Internet is reflected by the poor preference for electronic surveys.

E4. Did you consult the Web page http://statbel.fgov.be/waste?

		Frequency	Percent	**Valid Percent**	Cumulative Percent
Valid	Oui	30	2,0	**6,7**	6,7
	Non	415	27,7	**93,3**	100,0
	Total	445	29,7	**100,0**	
Missing	System	1055	70,3		
Total		1500	100,0		

80% of the respondent felt concerned by this question. The great majority answered that they did not consult our Internet helpdesk, of course. If we consider that on a mean, 24% of our farmers had access to Internet at the time of the survey, only 6,7% used this opportunity.

E5. Would you like to answer this survey

		Frequency	Percent	**Valid Percent**	Cumulative Percent
Valid	Yearly?	16	1,1	**3,6**	3,6
	Only if you are taken in the sample?	431	28,7	**96,4**	100,0
	Total	447	29,8	**100,0**	
Missing	System	1053	70,2		
Total		1500	100,0		

80% of the respondents where concerned by this question, to say us that they do prefer any solution which diminish the burden on them (96,4% prefer a sample survey

than a certain yearly survey). Some farmers added “never!”. It is quite surprising that 16 respondents preferred a yearly survey, probably in line with the fact that a yearly survey would be easiest to manage for them (foreseeable questions).

If you have additional remarks or suggestion, please feel free to note them here

The latest field let the farmers include free remarks and suggestions. This field was rather popular: A total of 255 remarks (46% of the respondents) where added. The full list of remarks is given in annexe IV.

Most of these remarks were precisions about waste quantities and waste types, given in free style. Some said that the quantities could potentially be measured but were not calculated; other said that the quantities are not easy to estimate. Many farmers indicated the recipient of some of their waste (private or public collecting companies), or indicated that they store some waste, like old machines kept as “ancestors”[28].

Many farmers spontaneous complained that manure and vegetal “waste” are no waste, but primary material for production[29].

Many farmers complained about this additional administrative burden, asking us to directly collect this data to the administrations: Rendac, Phytophar, Nitrawal, Mestbank, Val-I-Pak, Fost Plus and OVAM.

Some found the questionnaire too complicate (mainly the box C asking for quantities), few found it very clear, and some give an opinion about several types of waste (e.g. one asking why 02.11 agrochemical waste, 02.01.10 metal and 08 discarded equipments could be “dangerous”).

Some explained why they have almost no waste, that they are small farmers etc. In this category, there are also people saying that they “have no waste, everything going to the container park or being collected by the municipality”. Which means that they have no waste *problem*!

Apart from the technical precisions, we can hear the message of the farmers following 2 main problematics:
- Reduce the administrative burden by using the many data the farmers must already give to different administrations (this is possible only for several specific items).
-02 01 06 (manure) and 02 01 03 (vegetal) are most of the time no waste (except in rare specific cases)[30].

[28] remark that in this case, it is not a waste following the definition of waste, and the eventual answer should be reduced to zero.
[29] remark that in this case, it is not a waste following the definition of waste, and the eventual answer should be reduced to zero.
[30] Following the waste definitions, it is clearly no waste when they do not consider it a waste and have no legal excess. The farmers however reported data in this category because they knew those quantities very well.

Conclusion

The rate of answer to our pilot survey was rather high for such a sensitive matter (up to 37%). Most of the respondents answered the close and multiple-choice questions, and their reported quantities of waste for different types of waste proposed.

However, when using existing administrative data and bills, they sometimes did not answer the question very well. This is particularly true for the manure, for which the all manure production was mentioned (as reported to the manure databanks) in place of only the excess of manure which is the only possible waste following the waste definition and what the farmers use to claim themselves.

The farmers were able to estimate their waste, but they are largely in favour of receiving “fiches” or a questionnaire at the beginning of the year in order to be able to track the waste flows “on the fly”.

However, they complained on any supplementary administrative burden and asked us to make use of any administrative data available, and to come back to only a sample of them with only additional questions (e.g. not asking for animal and vegetal “waste” anymore).

Services to agriculture, hunting

Services to agriculture, hunting

As seen in table 1, about 11262 companies are classified as “service to agriculture”, and 15 as hunting companies. These sectors should be covered by a specific survey linked to the overall survey addressed to most economic sectors, using the Business statistics register, and using an adapted questionnaire close to the questionnaire showed in annex, but with a list of waste adapted to their situation.

Fisheries

Fisheries

A pilot survey was conduced by Gent University (Maes et al, 2004), in relation with the shipment regulation (Directive 2000/59/EC) and its implementation by Flemish government decree of 14 March 2003. We rely on the results of this pilot study to take conclusions for this report. Unfortunately, the survey did not cover the fish residues.

The survey started with 17 individual deep interviews of a sample of representative fishers, and interviews of the responsible authorities of the ports (supposed to collect waste). Then, a mail survey was sent to "all" companies[31], with a usable answer rate of 8%.

The universe is divided between the 3 main fishing ports of Belgium (Newport, Zeebrugge and Oostende), and 3 size classes of boats.

The waste produced during one year by Belgian fisheries is estimated to be (Maes et al, 2004):

-389211 litters household waste
-156600 litters used oil
-199000 litters bilges (a mixture of about 10% oils and 90% water)
-2092 oil filters
-3524 fuel filters
-4890 kg oily en fatty rags
-3852 paint cans of 5 litters
-2015 lamps
-85.9 tons fishing nets and ropes
-1155.5 tons chains
-223.6 km steel ropes
-114.3 tons net balls, buoys, weights etc.

It is forbidden to release these types of waste in waters, thus the authors make the hypothesis that this is the total quantity of waste produced (however, the authors report that some household waste is still released into the sea).

These quantities have to be translated in the WSR waste categories. Moreover, some weights per units have to be estimated (see annexe V).

Waste produced by Belgian fisheries

Original quantity	WSR nomenclature	Quantity (tons)
Fish residues	(02 01 02 Animal waste) 9. Animal and vegetal waste 9.11 Animal waste of food preparation and products	pm ("on site" release)[32]
156600 litters used oil	01.3 Used oils	143.3

[31] The total being about 80, certainly the most active fishing companies, out of the 188 companies registered in DBRIS via the VAT register.
[32] Estimates could be based on the study of Huse et al, (2002)

(915 kg/m3)		
199000 litters bilges (a mixture of about 10% oils and 90% water) 4890 kg oily en fatty rags	03.1 Chemical deposits and residues	5.1
1155.5 tons chains 223.6 km steel ropes *(2.679 t/km)*	06.0 Metallic waste	1754.5
3852 paint cans of 5 litters *(386 g/metallic can)*	06.0 Metallic waste (or 02 Packaging containing residues of or contaminated by dangerous substances (if paint contains organic solvents/dangerous substances)	1486.9
85.9 tons fishing nets and ropes	07.4 Plastic waste	85.9
2092 oil filters *(0.5 kg/filter)* 3524 fuel filters *(0.5 kg/filter)*	08 Discarded equipment, dangerous	2.8
2015 lamps *(60 g/lamp)*	08 Discarded equipment, not dangerous	0.1
389211 litters household waste *(0.1 kg/l)*	10.1 Household and similar wastes (not dangerous)	38.9
114.3 tons net balls (cement-concrete filled/PVC/PS), buoys (PS + steel), weights etc.	10.2 Mixed and undifferentiated materials	114.3
Total (excluding fish)		**3631.8**

The total (excluding fish) would around 3631.8 tons, given the various hypotheses. The vast majority of this waste is metallic (48%) or metallic cans containing rests of paints (41% metal, dangerous). Therefore, it is important to have, in the future, a better estimate of the real weight or typical composition of the related waste: which is the typical weight of steel ropes used there? And which is the typical weight and composition of a 5 litters empty paint can?

Forestry

Forestry

Forests cover about 23% of the Belgian territory, most of them being productive forests and being situated in the Walloon region (which is covered by 32.3% of forests).
Forest and wood production inventories and statistics, and scientific literature for emission factors, could easily be used in order to fulfil most of the requirements of the regulation, depending if wood waste should be included.

We think that wood waste should not be included because:
-wood remaining on the field could be considered as a normal release for the ecosystem;
-wood "waste" which is sent as firewood should not be considered waste, because the value added is high enough to cover more that the release costs.

If necessary, a sample survey could in the future be send to those companies, using a questionnaire close to the questionnaire shown in annexe, but adapted to the waste expected by these activity. Like for fisheries, we suspect that most of the waste would be metallic (e.g. ropes), discarded equipments and used oils.

Structure of the sector

The sector is characterized by a great part of household owners on one side, and public owners on the other side. In Walloon, 53% of the forests are owned by private persons, 34% by municipalities, 11% by the region, 2% by the provinces, churches fabrics, social services etc (Lecomte et al, 2001).

This makes difficult to identify the quantities of waste specifically produced by the forest "sector". However, it should be relatively easy to identify the waste produced by forestry as an activity (not as a sector), because of the existence of detailed forest inventories. After an estimate of the total waste produced by forest activities, it should be possible to split these quantities to each specific sector (forestry, government and household), because the forest inventories includes data on the ownership of the forests surveyed.

The forestry sector counts 2684 companies of which 99,7% of less than 10 employees and 92% without employee (table 1).

Existing data

Continuous forest inventories are running in Walloon and Flanders region following a similar methodology. In Brussels, the regional government owns and manage the forest, and it should be relatively easy to ask them the waste data needed for the regulation.

The forest inventories consist on an areola ire (field) survey on systematic surface sampling covered on a 10 years basis (every year, 1/10 of the points are visited). It gives detailed results on the species cover, volumes, phenotypic aspect, type of population (classes of age), type of relief, altitude, and the biomass including dead trees, dead wood on the ground, and additional (external) ownership information.

Wood trade statistics should complete this information in order to get an idea of the potential waste production, once waste factors are defined. For the latest, contacts with the foresters, or a simple survey to administrations, could be a work base.

Conclusion

Conclusion

We studied the feasibility of waste statistics for agriculture, forestry and fisheries. The full universe of waste producers can easily be derived from the register of companies. It is important to focus on small and medium sized companies, because they represent the large majority in these sectors, and they probably contribute to significant amount of waste production. However, the total amount of waste produced by these sectors depends on the definition used.

If we use the right definition of waste ("a substance that somebody want to discard or is obliged to discard"), many common "waste" are to be rejected, and considered as secondary products. This is independent of regional definitions, which may differ from region to region. It is true for animal slurries, vegetal waste, firewood, and probably rests of fishes. These natural materials go back to the natural cycle from which they come from. The farmers consider them as valuable by products, not as waste, and they generally do not "want" to eliminate them. It is thus most of the time no waste following the definition.

However, those natural products can become a waste when they are produced in excess. In this case, the manure administration tracks the excesses and obliges the producer to eliminate it. All those flows are carefully recorded in administrative databanks, which can be used to estimate the related amount of waste without surveying the farmers. Even using a more extensive definition of "waste", these databanks are sufficient for producing statistics on organic matters produced by these sectors.

For other waste flows, like dead animals or packaging, there are also administrative databanks that could serve as source. Finally, no other administrative databank is sufficient today for estimating for example the quantity of mixed and undifferentiated materials produced by the farmers and collected by the municipalities together with household waste. For those types of waste, a sample survey should preferably use paper sent at the beginning of the reference year by surface mail[33]. A limited amount of farmers could be contacted every year in order to maintain a "waste factors" database for each kind of agricultural activity, size of exploitation and region. Using the detailed results of the agricultural census, it will then be possible to estimate the evolution of waste produced by these activities every year.

We conclude that the requested waste statistics is feasible for most of the waste types requested by the regulation. It is possible to build this statistics without excessive additional burden to the farmers if the main administrative databanks can be imported and mixed with existing production statistics.

[33] For fisheries, a field survey to shipments and ports could be sufficient.

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Annexes

Annexe: homepage of the site
http://statbel.fgov.be/waste

Nationaal Instituut voor de Statistiek
Afval

Institut national de Statistique
Déchets

Uitleg	Explications
Uitgewerkte definities Onderscheid tussen gevaarlijk en niet-gevaarlijk afval Schatting van het gewicht van uw afvalstoffen	Définitions élaborées Distinction entre les déchets dangereux et non dangereux Estimation du poids de vos déchets
Nomenclaturen	**Nomenclatures**
Europese afvalstoffenlijst (EAC) Statistische afvalstoffennomenclatuur (EACStat) NACE-BEL	Code Européen des déchets (CED) Nomenclature statistique des déchets (CEDstat rev3) NACE-BEL

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Annexe 2: Waste questionnaire for agriculture

The questionnaire is light in order to favour willingness to answer, and quality: 1 page A3 including accompanying letter and very simple questions (check boxes) on the first page (inspired by ORAS, 2003) with the purpose of encouraging respondents, simple checks on statistics, and informing the respondents on definitions and methods to be used for the fundamental questions. The difficult questions come on page 3, where quantity of waste is asked following the philosophy of Netherlands (CBS, 2002): we ask for most probable waste related to each individual sector (the rest being mentioned as "others").

The label of waste was chosen in the regulation (EWSTAT or annexe 1), but not always at the same level, the idea being to clarify the question for the respondent.

In the same order of idea, we also sometimes changed the label of a specific waste in order to clarify the questionnaire. For example, the Regulation's annexe I ask for "32. Animal and vegetal wastes (excluding animal waste of food preparation and products; and excluding animal faeces, urine and manure)", which is not appealing for the farmers. We used a more precise example and we used the term "remains" in place of waste. This could introduce a bias, but we assume it:

- In agricultural sector, all "Animal waste (*excluding slurry and manure*)" would be considered to be part of "32. Animal and vegetal wastes (excluding animal waste of food preparation and products; and excluding animal faeces, urine and manure)".

- The same question for the food sector would be assumed to be "33. Animal waste of food preparation and products".

<u>Free (summarized) English translation of the questionnaire:</u>

B3. Do you declare waste to the waste administrations for year 2004?
(in NL questionnaires, OVAM is mentioned, or OWD for FR questionnaires)

B4. Do you own a register of waste?

B5. Do you use waste from other enterprises as manure or for soil improvement?

B6. What do you do with your waste?
-All waste is treated or eliminated externally
-A part of the waste is treated or eliminated externally
-All waste is treated or eliminated internally
-

B7. The waste treated or eliminated externally, are managed by:
-Municipality or intermunicipal society
-Private waste management company
-Other exploitations

-Other, please specify

B8. The waste treated or eliminated internally are:
-Incinerated
-Reused in production
-Land filled on the site of the enterprise
-Other, please specify

B9. You obtain the quantities of waste produced using:
-Bills of the collectors and treatment plants
-Calculation methods
-Data obtained internally, e.g. by weighing
-Emission factors (eg ration waste/production)
-Other, please specify

C. Waste resulting from your economic activity (quantity in tons) (distinction hazardous/non hazardous)[34]

02 01 01	Sludges from washing and cleaning
02 01 06	Animal faeces, urine and manure (including spoiled straw), effluent, collected separately and treated off-site
02 01 02	Animal-tissue waste
02 01 03	Plant-tissue waste
09	Mixed animal and vegetal waste (except slurry and manure)
02 01 07	Wastes from forestry
02.11	Agrochemical waste ~~containing dangerous substances~~
02 01 10	Waste metal
07.1	Glass ~~*waste*~~
07.4	Plastic ~~*waste*~~
07.2	Paper and cardboard ~~*wastes*~~
01.3	Used mineral oil
08	Discarded equipment *(machines, tractor, oil filter, batteries, ...)*
12.A	Construction and demolition waste
12.2	Mixed and undifferentiated materials
000	*OTHER, SPECIFY*

11. ~~*Common*~~ sludge's ~~*(excluding dredging spoils)*~~

(Additional help desk is on site http://statbel.fgov.be/waste with definitions and calculator of waste quantities)(Inspired by CBS, 2002).

E. Remarks and suggestions (facultative)

E1. Time to answer this questionnaire
E2. In the future, would you like to receive the questionnaire:

- After the reference year (like current)

[34] Remark that both labels from Eural and EWCSTAT are used, some times with changes indicated in *italic*.

- Before the reference year (e.g., you receive the questionnaire end 2004 for beginning counting waste 2005)

E3. In the future, would you like to receive and answer this questionnaire

- Electronically?
- By surface mail?
- With the help of a surveyor?

E4. Did you consult the Web page http://statbel.fgov.be/waste?

E5. Would you like to answer this survey

- Yearly?
- Only if you are taken in the sample?

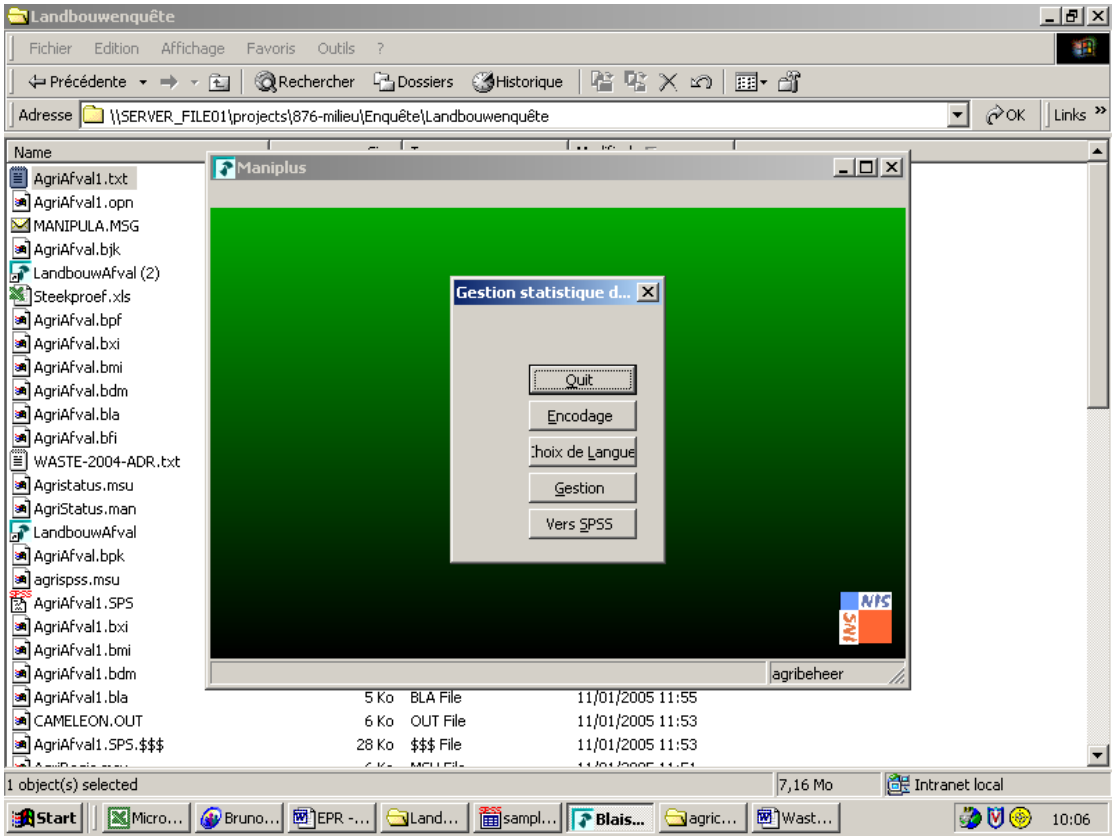
Other remarks and suggestions: …

Thank you.

Annexe III: Blaise application for data input

The Blaise application developed by NIS for data input and survey management of the WSR NSI pilot surveys was adapted to this specific agriculture pilot survey.

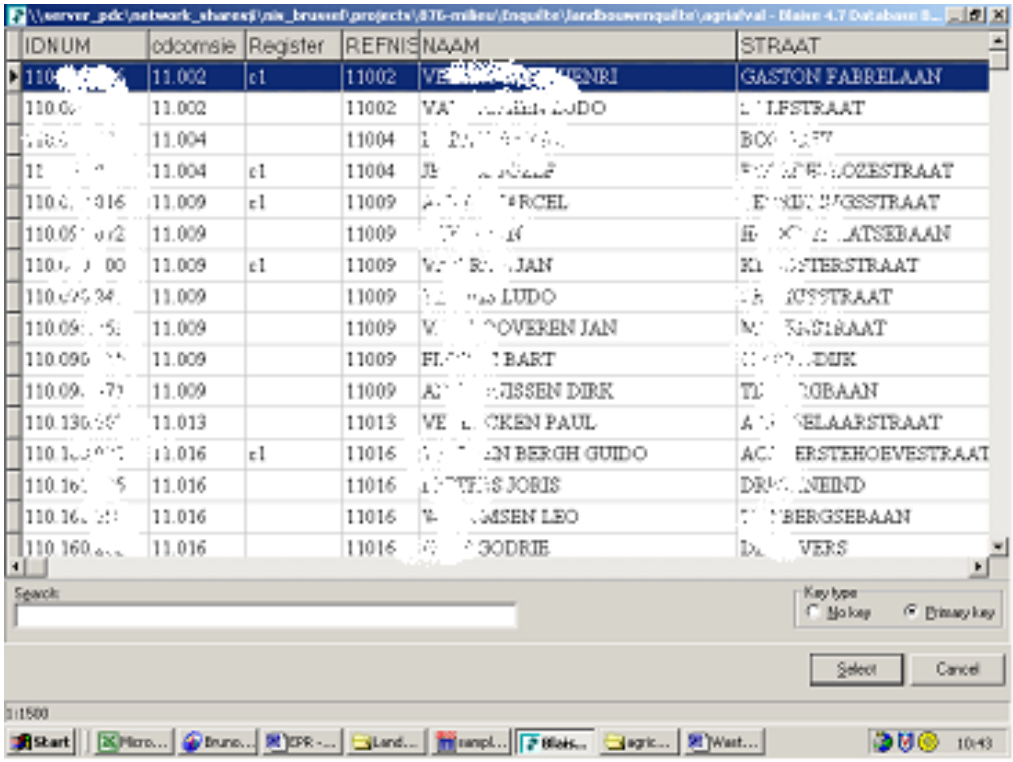
The different forms are illustrated bellow.



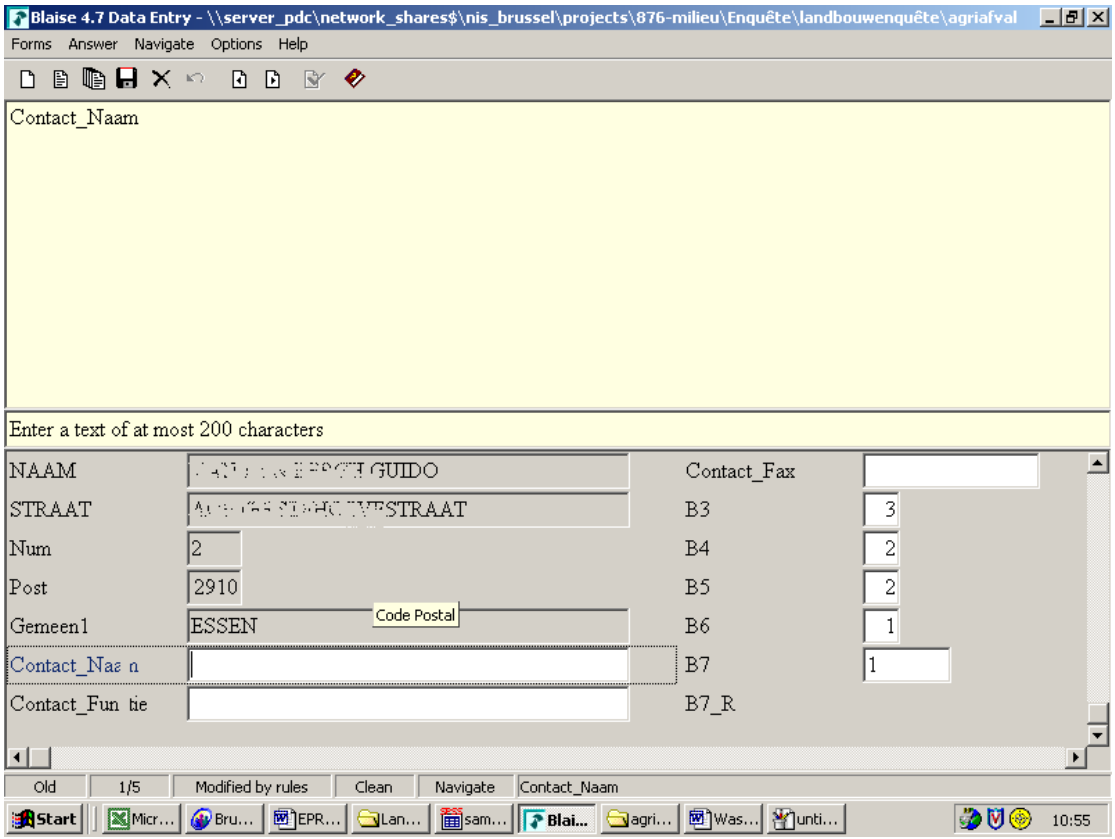
The first form allow to select the language (French of Dutch) of the user interface. The latest button “vers SPSS” is the export of the data to SPSS compatible format for further analysing.

With this tool, it is possible to export the results at any time. Making use of SPSS syntaxes, the statistician can calculate preliminary results and give a feedback to the operational unit where strange results occur or where the variance is too high: it is then possible to phone back to some respondents, or to try to augment the answer rate by sending recalls or phoning directly to respondents. For this pilot study, we did not use this possibility because we reached very soon our objective of 150 answers.

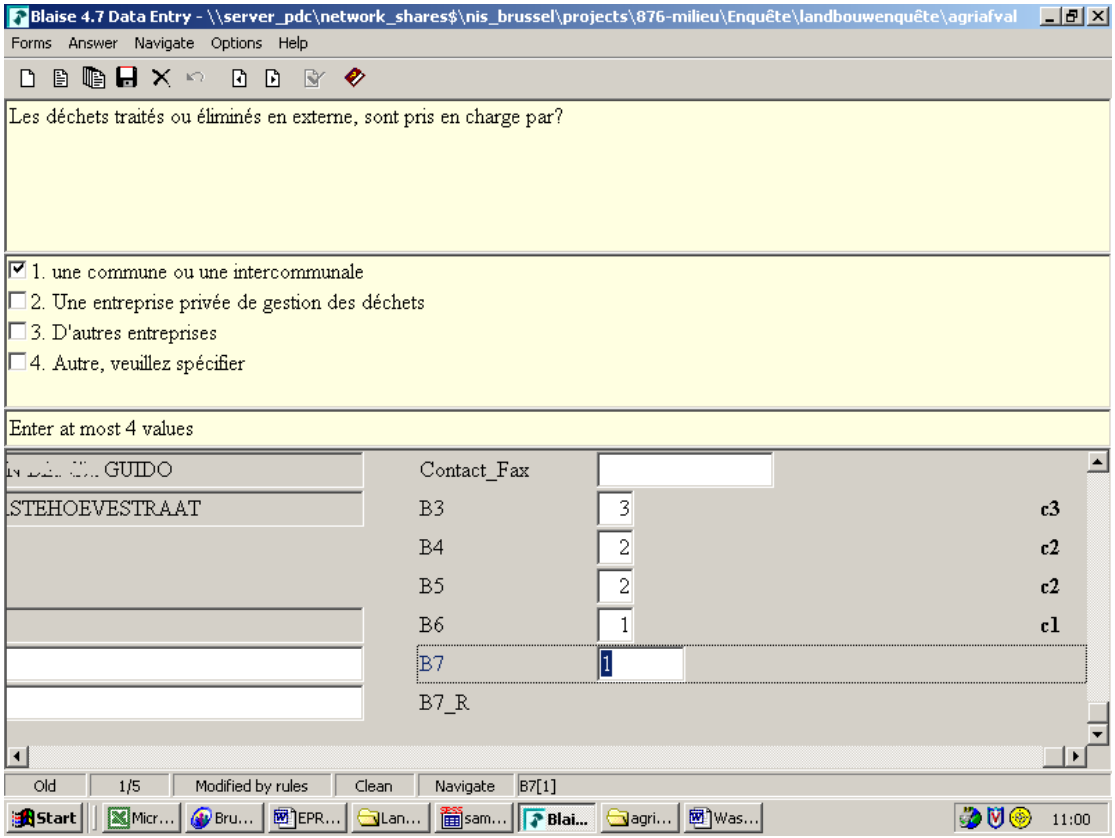
If we clik on “encodage” (recording) we first get a list of sampled farmers.



By looking on the list, or by searching the farmer number, we get to the individual answer form of the respondent.



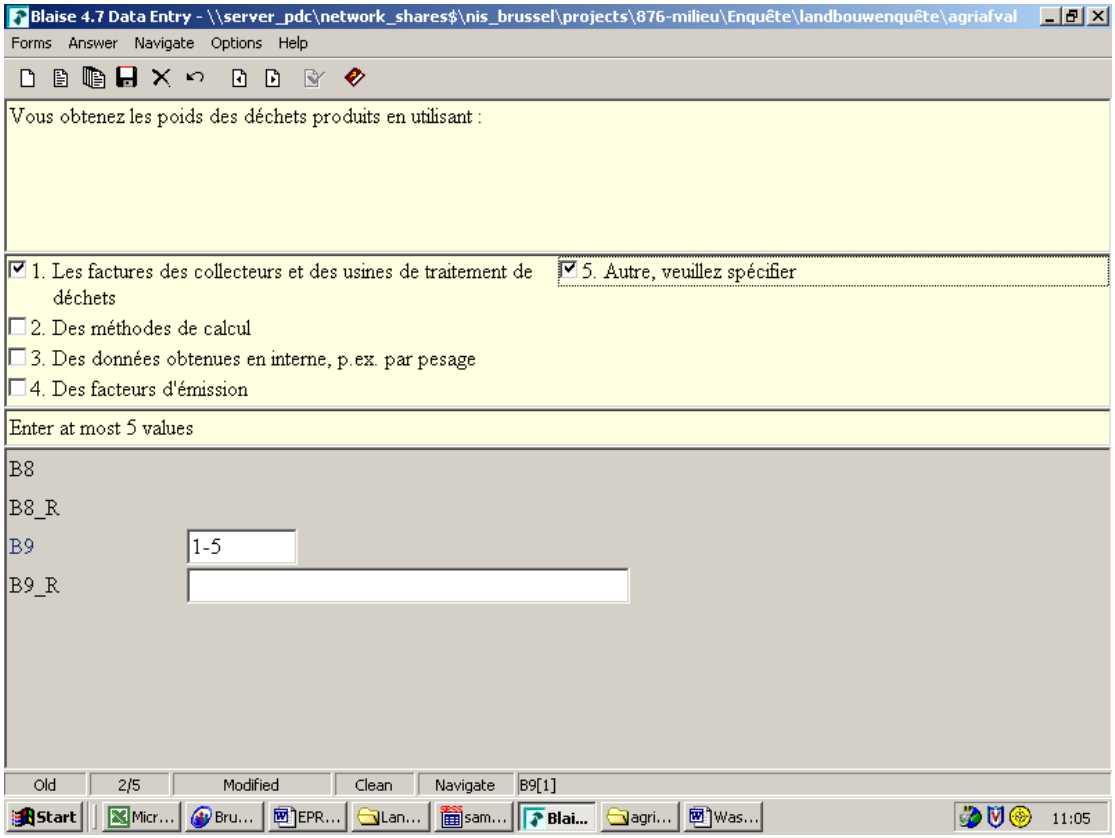
When filling the digital form, the agent gets automatically, for each field, contextual help, as in the examples bellow.



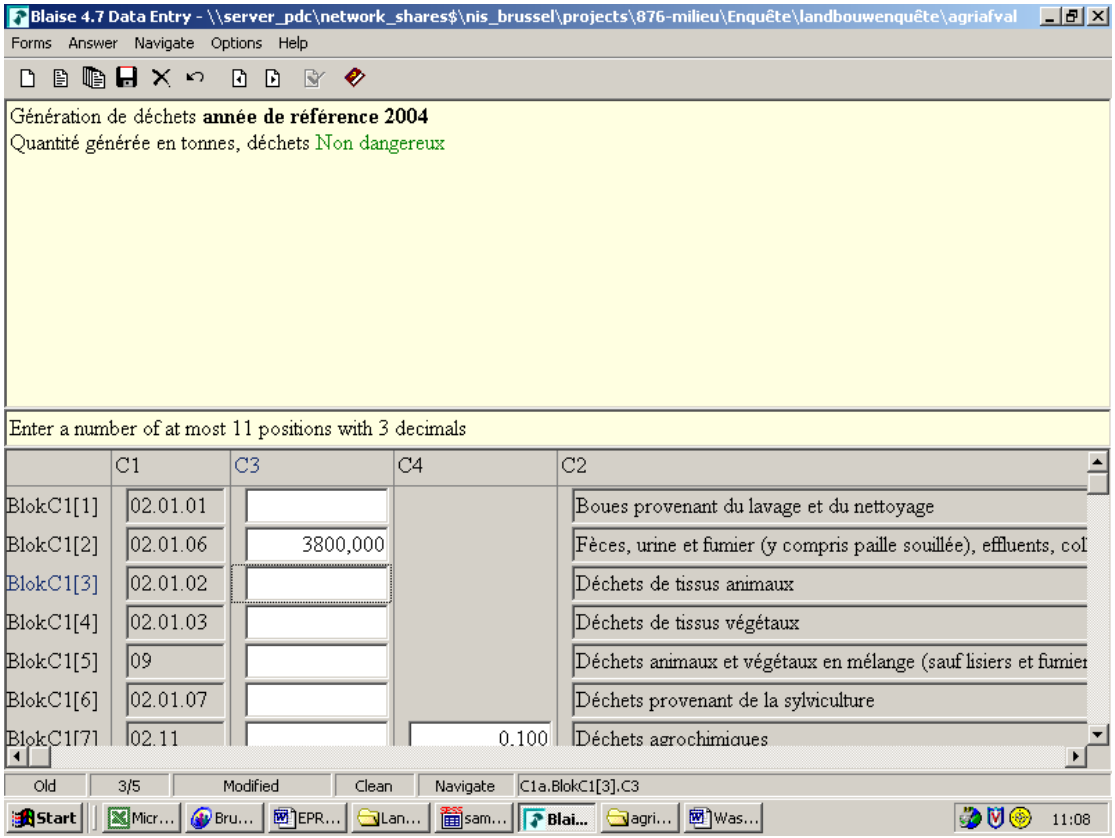
A series of automatic cheks is also foreseen.

Depending on the answers given, adapted forms appears. For example, in the following form, when the answer “other, please specify” is checked, a field for specifying is activated (field B9-R).

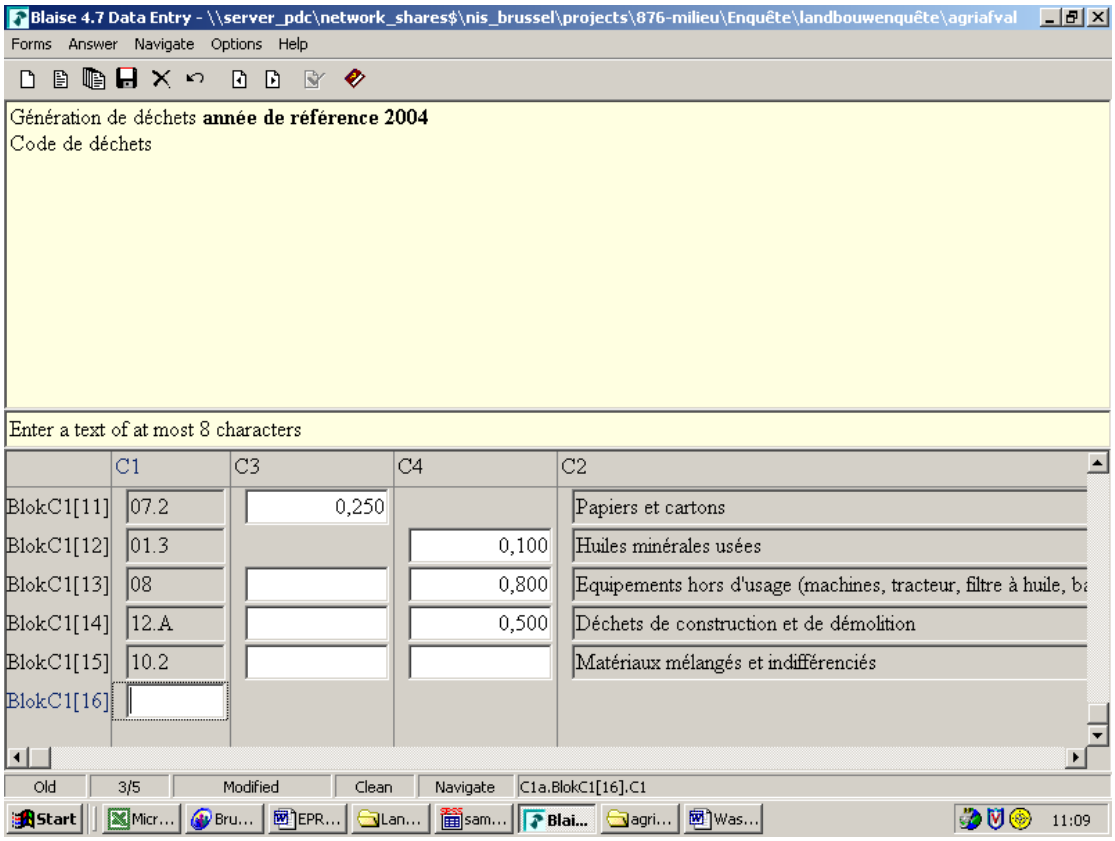
In many parts of the input form, such fields for remarks are foreseen, because many respondents add remarks “in the marge” of an answer. This information is often interesting to conceptualise or correct the answer given.



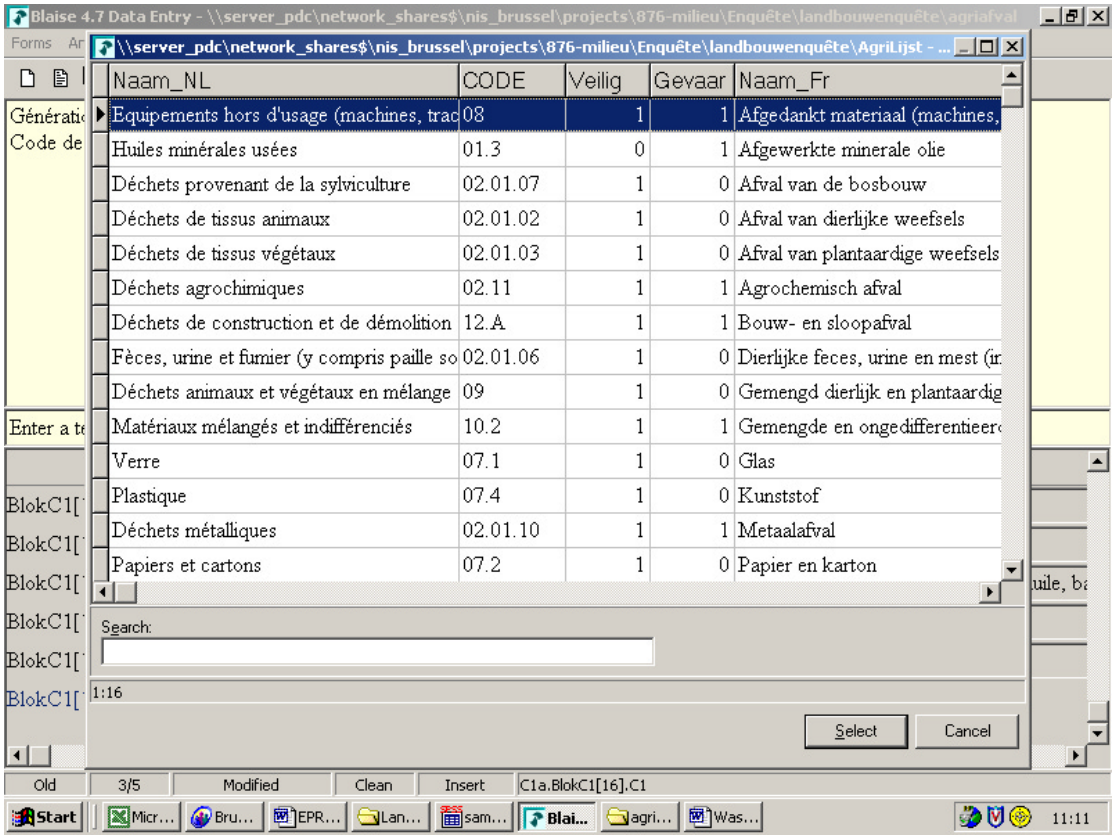
Then we get to the part of the questionnaire where quantities are to be reported.



At the end of this form; it is possible to add other types of waste.

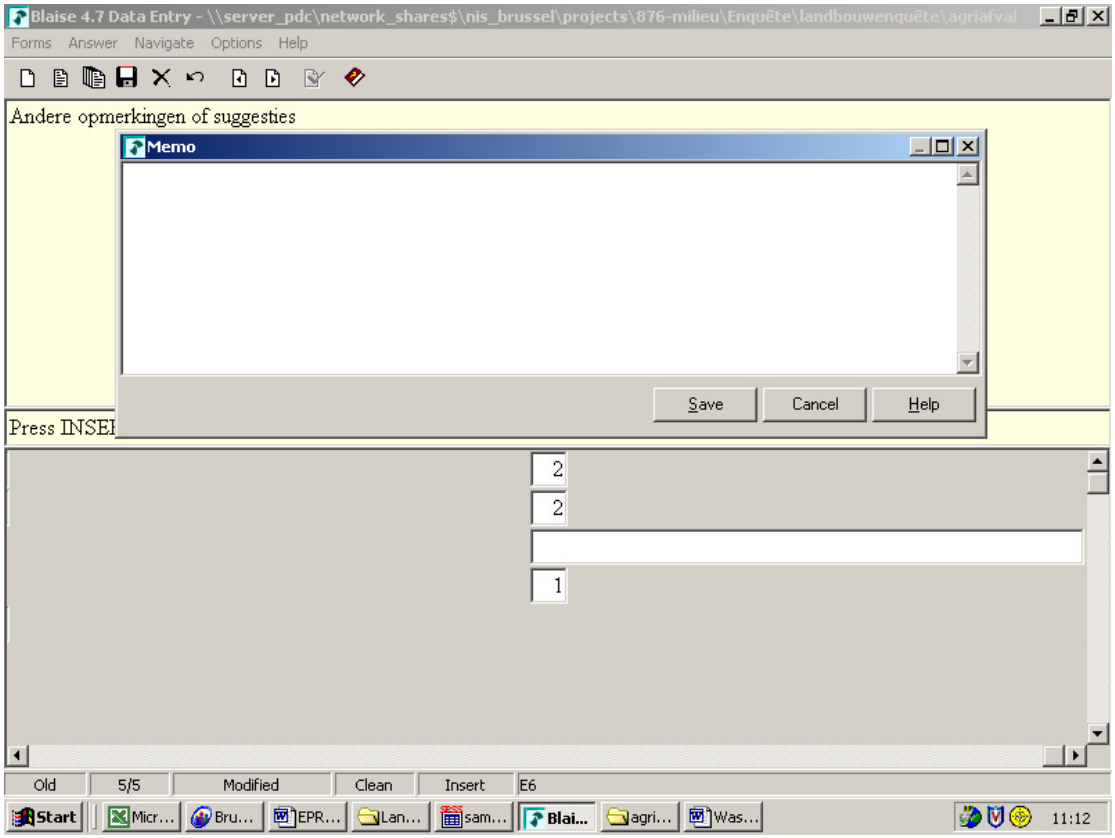


When cliking on this lates field, a list of waste appears, for the agent to select within the list of EWCSTAT items.

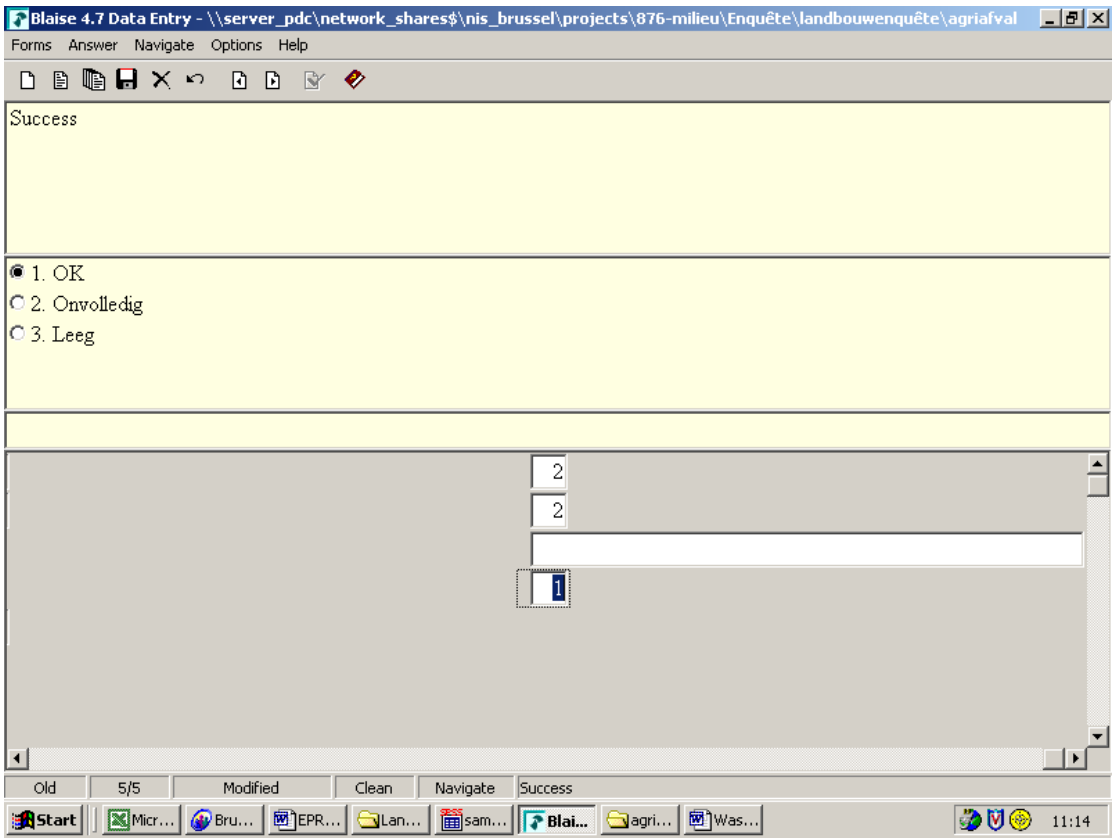


Potentially, a more complex system can be used here to find out waste within the EURAL list.

After some “burden” questions, suggestions and remarks can be entered in one of the latest fields.

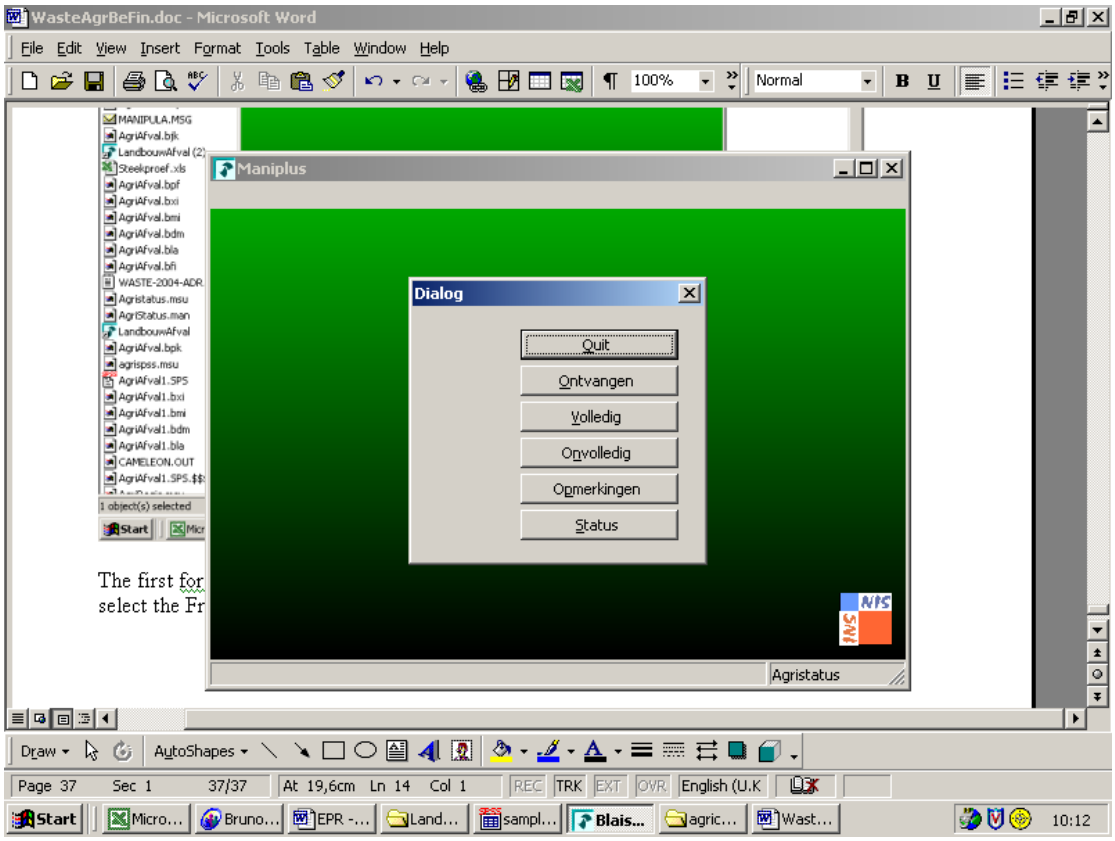


Finally, the agent gives a status of the form (full, incomplete or empty). This is usefull for day to day management of the survey.

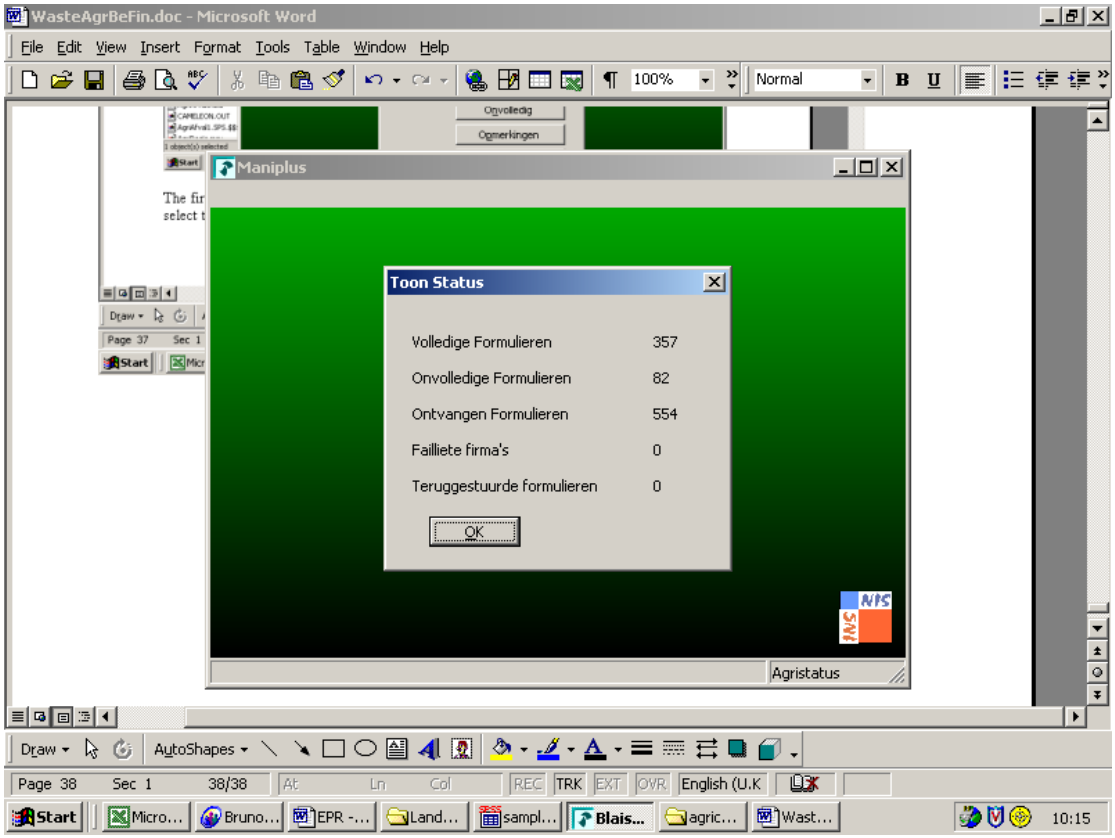


If we now come back to the first screen, another solution was to simply record the number of the firm, showing that we had received the form back or not. This is used mainly for recalling non-respondents (when obligatory surveys would be used, or when insufficient number of answers in a stratum is reached). This step is foreseen as a field in the database. The potential here is to use bars codes and automatic screening in the future. Remark that in the future, it will also be possible to scan the forms in order to make an image of it, and to use OCR for several fields.

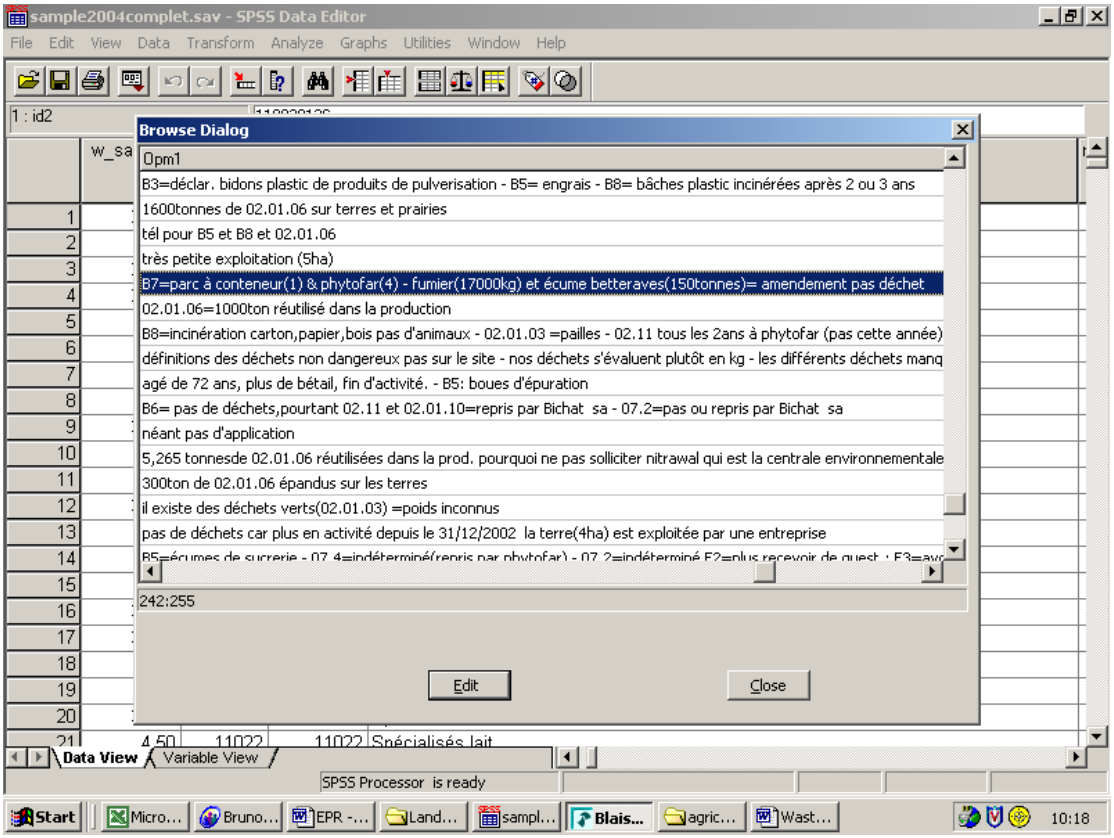
If we now clik on “gestion” (management of the survey), we get the following screen, with the buttons “quit”, “received”, “complete”, “incomplete” (giving simple statistics), “remarks” and “status”.



The status button gives the summary statistics “on the fly”.



The “remarks” button gives the list of all remarks recorded (latest “suggestions” field). The remarks are summarized and standardized by the recorders. This form indicates, during the first phases of the survey, the problems encountered by the respondents (the name and address of the respondent appears on the form). It is then useful for the statistician to guide the call centre with FAQs, or to call respondents who needed it.


sample2004complet.sav - SPSS Data Editor
File Edit View Data Transform Analyze Graphs Utilities Window Help
1 : id2
Browse Dialog
Opm1
B3=déclar. bidons plastic de produits de pulverisation - B5= engrais - B8= bâches plastic incinérées après 2 ou 3 ans
1600tonnes de 02.01.06 sur terres et prairies
tél pour B5 et B8 et 02.01.06
très petite exploitation (5ha)
B7=parc à conteneur(1) & phytofar(4) - fumier(17000kg) et écume betteraves(150tonnes)= amendement pas déchet
02.01.06=1000ton réutilisé dans la production
B8=incinération carton,papier,bois pas d'animaux - 02.01.03 =pailles - 02.11 tous les 2ans à phytofar (pas cette année)
définitions des déchets non dangereux pas sur le site - nos déchets s'évaluent plutôt en kg - les différents déchets manq
agé de 72 ans, plus de bétail, fin d'activité. - B5: boues d'épuration
B6= pas de déchets,pourtant 02.11 et 02.01.10=repris par Bichat sa - 07.2=pas ou repris par Bichat sa
néant pas d'application
5,265 tonnesde 02.01.06 réutilisées dans la prod. pourquoi ne pas solliciter nitrawal qui est la centrale environnementale
300ton de 02.01.06 épandus sur les terres
il existe des déchets verts(02.01.03) =poids inconnus
pas de déchets car plus en activité depuis le 31/12/2002 la terre(4ha) est exploitée par une entreprise
242:255
Edit
Close
Data View
Variable View
SPSS Processor is ready
Start
10:18

Annexe IV. Free style remarks

This annexe shows the remarks given in the box foreseen therefore, and on other places of the questionnaire. In the latest case, our team added the code of the question this remark was linked to. Our team sometimes summarizes the original remarks, and they added some own indications for future management.

Om de veertien dagen een container van 1200L die word opgehaald door private afvalverwerkkers
---
twijfel aan Ton/m3
---
mest : 930 m3
verpakking sproeistoffen : 2 stuks
---
ontvangen 20/12 , verplicht terug te snel 24/12. gelieve vroeger te sturen aub.
---
gelieve duiderlijke vragen te stellen
---
smeerolie van rollend materiaal wordt bij de garagist tegen bet. achtergelaten, alsook banden + batterij.De landbouwplastiek wordt jaarlijks teruggenomen door de plastiek verk. tegen vaste vergoeding. Verpakking van spuitprod. wordt jaarlijks ingeleverd bij phytofar-recover
---
gegevens bij de mestbank

Strooisel voor kalveren 30m3. gebeld voor inlichtingen en werd geholpen
---
steenwolpotten 210m3
EPS 404m3
koelvloeistof en antivries 0.450

020102 = vilbeluik = rendac
50 lit. olie
---
mest,stro zijn grondstoffen
---
ik hoop dat deze enquête niet gaat leiden tot nog meer verstrenging qua milieu = kost voor de landbouwers
---
Phytofar ophaling
mest van dieren op eigen bedrijf
versta niet alle vragen
---
heeft betrekking op afsluiting mestproductie 2004
---
onder dierlijk weefsel bedoel ik de dode dieren die naar rendac gaan
---
Gestopt

Alle dierlijke mest wordt gebruikt als natuurlijke meststof

Afval dierlijke weefsels => vilbeluik = Rendac

Hoeveelheid ontbreken
---
in mensentaal de vragen stellen(duidelijker)
geen professor vragen
---
hebben slechts een kleine hobby

Van tonnen (gewicht) heb ik geen gedacht en verschilt jaarlijks
Wel afval, geen hoeveelheid

Ik ben gepensioneerd. heb 15 schapen en 1 Ha weiland. Heb geen machines, de mest wordt gebruikt in de moestuin. De normale afval wordt wekelijks opgehaald of naar het containerpark gebracht.

1600 m3 kalvermest
---
onderhoud machines gebeurd bij de smit, afval blijft daar.

Alle zelfstandige activiteiten werden per 31/12/2003 gestaakt
2004 volledig nihil
---
ik wil wel invullen maar wil graag iets meer uitleg over de enquête
---
opgehaald door de gemeentediensten plastiek- glas - restafval - alles netjes gesorteerd : 15 Ton
---
phytofar
---
weer een fantastisch initiatief om de administratielast te verminderen
---
Code 11 : slib. Het gaat hier om grondbemesting afgenomen bij firma SEDE & Tiense Suiker
180m3

Gestopt 01/01/2004
---
de meeste vragen zijn te moeilijk voor mij
---
uitbollend landbouwer. B6/7/8/9(niet van toepassing)

Gelieve in eenvoudige en duidelijke taal te verwoorden,daar niet alle mensen evenveel tijd en intelligentie hebben om dergelijke brieven te begrijpen
---
correspondentieadressen volledig opnemen en vermelden in briefwisseling
---

lege verpakking sproeistoffen(phytofar)
oude banden (alfanet)

De vragen zouden duidelijker moeten zijn over welk product het juist gaat en sommige producten zijn in kg. of L of per stuk en niet altijd in m3
---
mijn bedrijf is te klein om belangrijk genoeg te zijn voor deze statistiek
---
leeggoed van sproeistoffen in speciale zakken terug naar leverancier.
Vragenlijst is niet echt van toepassing op ons bedrijf
Ik heb wel contact opgenomen met het tel.nr.
---
oliefliter- batterij geen hoeveelheid
---
geen afval
---
graag deze vragenlijst naar jonge mensen. Niet 65 plus.

Waarom moeten wij nogmaals zeggen waar ons afval naartoe gaat, als men al weet dat mest via de mestbank is gekend, verpakking van chemische middelen via phytofar wordt opgehaald en de krengen van dieren allemaal naar Rendac gaan die een monopolie heeft.Deze 3 zaken worden allen gekontrolleerd door de overheid en in het kader van de administratieve vereenvoudiging zou het logisch zijn dat de overheid daar zijn gegevens zelf gaat halen, door middel van ons uniek bedrijfsnummer.(heeft nog krengen maar kent het gewicht niet, Rendac)

Wij als landbouwers moeten al te veel papieren invullen in onze vrije tijd waar we niet voor betaald worden. U moet geen papieren meer opsturen want ze worden niet ingevuld
---
02.01.06=500t
---
specialisé dans la création et la conception d'étang,de fontaines etc... vends des plantes aquatiques et des poissons exotiques
---
la s.c. Kappendaele exploite 50ha , tout est fait par des entreprises extérieures?
la s.c. Kappendaelen'a pas de matériel, pas de bétail-> 0 déchet
---
Afvalwater van melkhuisje wordt gezuiverd met rietveld
---
stopt op 31/12/2004
---
vragen moeilijk en onduidelijk
---
wenst niet meer in te vullen
---
meldingsformulier OVAM

Ik behandel mijn afvalstoffen binnen de wettelijke normen en binnen mijn mogelijkheden.Proficiat voor de prachtige foto, het is waarschijnlijk maar het enige aspect dat jullie kennen van de landbouw

---

02.01.06= voor eigen weiden en land; 07.4 en 01.3=container park; 02.11=Fyto ophaling; 02.11=spiraal opgehaald

---

1 zak fytofar (400l)

---

1)waarom webside alleen in engels
2)waarom niet zoals mestbank : zuivere N
zuivere P2O5

Afval van plantaardige weefsels = 20 m3

---

08 : 3 oliefilters

02.01.06is geen afval - alle afval wordt door ons zelf naar gemeente gebracht (container park)

---

ook rendac,zie mestbank

---

gelieve bedrijven uit te kiezen die afval produceren,hebben praktisch geen afval

---

mest van 8 runderen op de akkers

Code 020106.afval wordt grondstof en wordt gebruikt op land of wordt opgehaald en verkocht.
Code 020102 gaat naar Rendac.
Code 020103 wordt compost

---

mest geen afval

---

moeilijk opgesteld

---

ik heb geen dieren,afval naar containerpark, composteer

---

weer een formulier on in te vullen

---

allemaal verloren papier
waar naartoe met al die administratie

---

de afgedankte filters worden weggebracht naar een erkende schroothandelaar die ze naar een erkende verwerker doet.
De afgedankte motorolie word samen met een transportteur opgehaald voor verwerking.
Alle plantaardige afval, alsook drijfmest,stalmest gier word gebruikt op het akkerland als humusaanbrenger.

---

dierlijke forces, urine en mest + stro via mestbank tegen 31/3/2005.Waarom al die verschillende aangiften voor hetzelfde
---
fyto afval ->fytofar
plantaardige rest terug op het veld
andere ->container park
geen slib en geen waswater
---
geen dieren
---
pensioen
---
gestopt op 31/12/2001
---
02 01 04 = 2000m3

Ook nog Rendac,reclame borden
---
overgelaten sinds 2002
---
hopelijk eindigd dergelijke enquêtes weeral niet in een jaarlijkse factuur. Liever had ik vooraan op de foto een fiere boer zien staan in een mooi landschap.
Alvast veel succes
---
mest op de akker
---
code 10.2 = 468 m3

Ik heb nog bij, andere landbouwers inlichtingen genomen maar weing zullen dit opsturen.
De reden is voor ons niet verstaanbaar, wat we moeten en hoe we dit moeten invullen.dank voor jullie begrip
---
mestbank
---
uitbating van akkerbouwbedrijf (12ha), alle werken worden uitgevoer door loonwerkers
---
runderfeces zijn geen afval
150 runderen

Deze vragenlijst is zo verkeerd naar vorm en inhoud dat ik er niet begin aan in te vullen.
Ik ben bereid mee te helpen aan het opstellen van een andere lijst
---
Als vollegrondsgroenteteler zijn de pellen van verschoonde groenten gecomposteerd. De plastiekfolie naar containerpark, gewogen. De afgewerkte olie = containerpark. De batterijen = oude metaalhandelaar + oude metalen. Snoeihout = verbrand op 100m van de huizen.
---

sommige gegevens die gevraagd worden, zijn moeilijk in te vullen(wat is inter - extern) hoeveelheden hangen ook sterf af van jaar tot jaar

---

Opmerking
Op B3 heeft hij ja geantwoord, maar Val-I-Pak vermeld

Enquete zeer duidelijk. Een landbouwer die mest produceert moet geen afvalregister invullen en niet melden aan OVAM wel aan de mestbank..

---

kunnenjullie daarvoor zorgen dat we onze plastiek weer plaatselijk naar de gemeente mogen doen.Desnoods met betaling. Vroeger was dat gratis; maar dat is ook overdreven. dank bij voorbaat.

---

is moelijk in te vullen, vooral C

---

papier invullen is belangrijker wordt dan effectief activiteiten uitoefenen.
het wordt zo erg dat we het bos door de bomenniet meer zien

---

mijn bedrijf is gestopt sedert 1 april 2000. Ik ben met pensioen. De oppervlakte van bedrijf is verkaveld.

---

sedert 10 jaar pensioengerechtigd - weinig landbouw als hobby

---

gepensioneerd

02.11=phytofar recover -

---

mestbank(vlm)

Wij zouden liever niet meer geselecteerd worden, ik heb al genoeg papieren om in te vullen

---

sommige vragen meer specifieren

---

ik heb gewoon mestvarkens en de enige afval die ik ervan heb is mest

---

02 01 06 = nitr.
02 01 02 = P2O5

---

zeer moeilijk in te vullen als kleine landbouwer

---

meer uitleg bij soorten afvalstoffen is gewenst
gegevens soms moeilijk te schatten

Lid OVAM , lid Val-I-Pac, lid Fost Plus , restafval opgehaald door Van gansewinckel

---

1 zak papier -karton fytofar-recover (inhoud zak is 400 l) Tel.

---

uitbollend landbouwer,gepensioneerd

---
het afval beperkt zich tot papier en plastiek.
---
gepensioneerd landbouwer
---
chemische meststoffen P205 = 1639
N = 7029
---
rendac, fytophar, containerpark, olie terug naar verkoper(geen hoeveelheden)
---
via Van Gansewinckel
---
snoeiafval wordt verhakseld rechtstreeks op het veld
---
rendac = 12 stuks
mest = geen afval
te veel te betalen
---
niet simpel om in te vullen

Agrochemisch afval - gevaarlijk = 1 zak phyto
---
boomkwekerij, heeft enkel snoeihout, wordt verhakselt of verbrand.
---
klein landbouwbedrijf , ons niveau is lager dan 90kg NO3 M/Ha

meststof geen afval (100% gerecycleerd)
---
bedrijf overgelaten op 1/04/2004
---
gepensioneerd landbouwer
---
rendac,phytofar
---
moeilijke woorden , ik niet lang naar school geweest

Plantafval in boomkwekerij wordt versnipperd en is onmogelijk te schatten naar hoeveelheid.Er zijn ook grote verschillen per jaar.
---
duidelijker formulieren
niet altijd goed verstaanbaar
---
gepensioneerd
---
mest
---
gepensioneerd
---
hout = 20 kg
grofvuil = 100 kg

---
mest in m3
---
verpakkingen sproeistoffen worden opgehaald door verkoper
---
weeral extra papier, is dat vereenvoudigen
---
mest geen afval
---
lisier déclaration à NITRAWAL - plus de questionnaire: trop de papiers
---
tél B5, B8,02.01.06?
---
fumier lisier purin=7428.35kgNorganique calculé par Nitrawal

02.01.06 = épandage de 600ton
---
b5=échange de paille contre fumier -07.4 : 3t de bidons phyto repris par phytophar inclus
---
a tél le 14/12/04 pour essayer de remplir le C.
02.01.06+02.01.03= fumier:1500T/an, lisier:1000m³/an, végétaux:25 T/an(retour sur cult->pas déchet)
10.2=5m³/an
E2: avant l'année de réf., si on recevait des fiches à remplir chaque fois qu'on se défait de déchets,on pourrait compter à la fin de l'année pour remplir ce quest.
---
calculer: (10.2)=déchets verts+ plastic+ emballages dans 1seul container de1200litres X 50/an -
l'intercommunale enlève les cartons 1X semaine (quantité variable)

épand de 2t (02.01.06)
---
service public- entretien des parcs, avenues, parterres publics et réfection des trottoirs de la commune de Mons, le service des plantations aide le service de propreté public(dépôt clandestins, poubelles des espaces publics etc..) et font également du travail de cantonnier.
---
etant horticulteur indépendant cette enquête ne me concerne pas
---
tâche administrative déjà assez lourde -
---
jardinier

02.01.06=2000 épandus sur terres - 02.11; 02.01.10; 08 pourquoi dangereux?
---
veut recevoir le quest.en néerlandais
---
propriétaire agée de 68 ans->travaux de la ferme sont faits par des ets agricoles :

02.01.06=500t sur champs

02.01.06=570ton engrais pour l'exploitation
01.3=100l/an repris parc à containers
07.4=plastics silo repris par la commune
bidons plast vide repris par phytofar
---
calculer 150litres de 01.3

B5=écumes de sucrerie
02.01.06=fumier et purin sont épandus(calcul de Nitrawal) sur terres
---
tél pout B8-1810tonnes 02.01.06 réutilisée dans la production?! - C1<-> avec B8 élevage de porcs
---
02.01.06=engrais épandus sur terrains exploités
bâches plast. pour silos portées au centre de ramassage organisé
autres déchets amenés au centre de tri
---
difficulté d'estimer les quantités de déchets - pas relié à internet
---
1200tonnes de lisier + 200 tonnes de fumier épandus sur toute la S.A.U.

02.01.06 totalité utilisée sur l'exploitation
---
je ne souhaite plus recevoir ce questionnaire
02.01.06; 02.01.10; 07.1; 07.4 et 07.2=pas pesé
---
beaucoup de paperasse pour peu de temps à y consacrer

Ne sait pas donner de poids, mais il existe:
07.1=bulle à verre, 07.4= parc à cont. , 07.2= ramassage communal , 01.3=stocker à la ferme , 08=pour le ferrailleur ,
---
matières secondaires=écumes de sucrerie, lisier wallon

E5=jamais-activité principale=transport express, exploite à titre accessoire 7 à 8ha ne se sent pas concerné

B7=1(containers);2(phytofar) - B8=2(bâches plast. silos servent 3X)-
02.01.06=300tonnes épandus sur les terres
---
maraîchage en plein air
---
lait et élevage laitier -
02.01.01=300kkg remis sur la terre
02.01.06=350 tonnes remis dans la production
02.01.03=1200 tonnes recyclé en interne

02.01.06=sur le champ; 07.1 - 07.4 - 07.2=parc à contenair; 08=ne se jette pas ;
12.A=pour remblayer des montées de champs
E1=beaucoup trop de temps
E2=plus jamais
E3=non
S.V.P. laissez les fermiers tranquille

---

impossible de remplir C génération de déchets

02.01.01 : boues? plutôt parler d'eau "blanche,verte ou bave" de nettoyage
02.01.02 : dechets? plutôt parler de cadavres
02.01.03 : dechets? rares souvent compostés ou envoyé au fumier
02.01.06 : plutôt parler de fientes, lisier et fumier
au §C les intitulés de déchets doivent être + précis - ajouter 1colonne supplémentaire pour la destination des déchets

---

né le 28/2/1937,pensionné,indépendant et encore actif,je vis seul.
questionn. peu approprié me concernant,(tonnage!).
Pas de déchets agrochim. ,de sylvicult. ni autres tissus animaux etc...
Comme tout citoyen,mes déchets(verre,papier,carton,plastique)sont triés et déposés au parc à containers communal. le reste est enlevé par le service de ramassage.
Ni construction, ni démolition.
Quant aux anciennes machines agricoles...vieux tracteurs...,ils sont conservés comme ancêtres.

---

cette enqu. est peut-être bonne et utile.Mais c'est 1 formulaire de + -> c'est du tps en - à consacrer à notre véritable métier!!! Agriculteur OUI-agriculteur fonctionnaire NON.
A quand la simplification administrative!

---

matériel agricole repris par CUMAVAUX

---

calculer 5 sacs de plastiques (phytofar recover)
matiéres organiques produites sont utilisées dans l'exploitation
02.01.02=rendac ; 02.01.10=BMV sa ;

---

merci de tenir compte des effluents(400ton = pas déchet) utilisés à bon escient selon des mesures spécifiques et selon le code de gestion agronomique

---

pas de déchets

---

uniquement du fumier étendu sur les pâtures

B7=plastic et carton repris par INTRADEL - B8=taille des haies incinérée et 1000tonnes lisier épandus sur champs

---

container plastic & carton partagé avec un horticulteur, huile de vidange de 2 tracteurs réutilisée pour entrtien rail porte et graissage des barrières de la ferme.

---

un agriculteur a très peu de déchet ; une bâche plastique couvrant le silo que la commune collecte annuellement(si elle n'est pas déchirée , elle est réutilisée l'année suivante.

Fumier et compost seraient considérés comme engrais naturels et non comme déchets si on taxait plus les engrais chimiques qui deviendraient vraiment plus chers!

---

sur votre site :estimation farfelue - définition non suffisante, imprécise
02.01.02=? - 09=? - 02.11=? - 02.01.10=? - 10.2=?

Enquête mal ciblée : producteur de lait uniquement -> pas concernés par cette problématique

---

tél pour les m³ de plastiq

---

pas de calcul de poids mais les déchets sont triés et portés au parc à containers.
Herbe et fumier sont compostés et répandus comme humus sur les prairies.

---

calculer 20m³bois? 08= pas chaque année mais va au ferrailleur

---

08= repris par garage ; 02.11=repris par Phytofar ; 07.4= plast.par collect Intradel

---

demande de bien orthographier son nom de famille

---

quest. trop vague(pas assez détaillé

---

matières secondaires=écumes

Pas de poids, il existe les déchets suivants :
02.01.10=ferrailleur - 07.1=bulle à verre - 07.4=porté chez Intradel - 07.2= collecté par la commune - 01.3=repris par garage agréé -

---

ik weet nog steeds niet wat deze enquête betekend voor mijn bedrijf

---

Hoeveelheid moeilijk te bepalen

Glas : 07.1 = 0.5 m3
kunststof : 07.4 = 50m3
Papier en karton 07.2 = 20m3
Bouw- en sloopafval : 12.A = 2m3

---

afgedankt materiaal 10 stuks

---

uitbollend bedrijf

---

niet van toepassing.heb een varkenmesterij met dierlijk mest die volledig volgens de regels van de mestbank word afgezet

---

Gepensioneerd

---

de ingevulde waarden zijn een schatting, hier kan dus een behoorlijke afwijking op zitten.
---
afvalproductie beter in m3 dan in Ton
---
1 zak pfytofar
---
pensioen

Gestopt
---
phytofar
---
glas container gemeente
pier en karton wordt opgehaald
nihil

Phytofar
---
vragen iets duidelijker
---
mest = geen afval
---
ik kan niet inschatten hoeveel het gewicht is

29ha, +/_ 50m3 m mest per ha

Mestbank, Rendac
---
de vragen zijn te moeilijk,op de webpagina in nl versie te veel frans,wat ik niet begrijp.
Adres : kessenicherweg 27

Phytofar
---
de omschrijving van afval is niet duidelijk genoeg

Geen PC kan niet kijken op Website

Phytofar
---
zeer veel afvalstoffen worden hergebruikt op een landbouwbedrijf
---
daar ik biologich boer hebben wij geen afval van sproeistoffen of meststoffen voor de rest mag alles in de container van 1000L die om de 2 weken leeg gemaakt worden door Van Gansewinckel.
---
fyto-produkten
---

hekel aan dingen die dubbel moeten ingevuld worden, mest is volledig aangegeven bij VLM mestbank
---
mest = grondstof
---
gestopt met waterkerskwekerij : geen afvalstoffen 31/12/2002
---
jhabite en Flandre et votre questionnaire est pour la wallonie. je n'ai aucun renseignements sur ns déchets que la commune ramasse
---
dode dieren : Rendac, betalen zelf.
lege verpakking : Phytofar Recover : betalen zelf
organisch materiaal : op eigen land.
oud materiaal : naar handelaar
landbouwplastiek : gemeente
mest dieren : mestbanknormen

1000 ton de 02.01.06 réutilisé dans la product
---
calculer :01.3 =100litres
1400 tonnes de 02.01.06 épandues sur les terres
1 bidon de plast vide de 40litres = qque 100taines de grammes -> négligeable
---
E2= peu importe
l'aide d'un enquêteurpour évaluer au plus juste-> génération du déchet
---
02.01.06=épandage sur champs - 09=compost - 01.3=4X8litres (vidange tracteur) - autres encombrants récoltés tous les 3mois par la commune
---
tél - E5=ne pas être sélectionné

800tonnes de 02.01.06 réutilisé
---
lait

élevage de bovins à viande

02.01.06=500t réutilisé
les agriculteurs doivent remplir trop de courriers gratuitement pour des personnes dans des bureaux
---
B5=chaux BIOCAL - B7=récolte plastic par la commune
---
utile d'avoir des chiffres-clés par unité(fumier - production animale annuelle de caprins,ovins etc...
idem pour le maraîchage, la transformation des productions
02.01.06=5tonnes sur champs

B8= Big-bag consignés
---

agriculture bio - épandage02.01.06 sur prés et cult.02.01.10;07.1;07.4;07.2;01.3=parc container

---

je n'ai pas de ferme, j'ai des herbivores divers

---

calculer 02.11=3/4 de sac phytofar

---

impossible de répondre par manque de tps.possibilité de faire remplir par 1 firme spécialisée moyennant la somme forfaitaire de 75€

B3=déclar. bidons plastic de produits de pulverisation - B5= engrais - B8= bâches plastic incinérées après 2 ou 3 ans

---

1600tonnes de 02.01.06 sur terres et prairies

---

tél pour B5 et B8 et 02.01.06

---

très petite exploitation (5ha)

B7=parc à conteneur(1) & phytofar(4) - fumier(17000kg) et écume betteraves(150tonnes)= amendement pas déchet

---

02.01.06=1000ton réutilisé dans la production

B8=incinération carton,papier,bois
pas d'animaux - 02.01.03 =pailles - 02.11 tous les 2ans à phytofar (pas cette année) - 07.4 couverture plastiq. des palettes; des silos remis au container de la commune - 67 ans, a entendu à la radio que seul 25% des >55ans travaillent, considère qu'il a déjà rempli assez de paperasses.

---

définitions des déchets non dangereux pas sur le site - nos déchets s'évaluent plutôt en kg - les différents déchets manquent de précision .

---

agé de 72 ans, plus de bétail, fin d'activité. - B5: boues d'épuration

---

B6= pas de déchets,pourtant 02.11 et 02.01.10=repris par Bichat sa - 07.2=pas ou repris par Bichat sa

---

néant pas d'application

5,265 tonnesde 02.01.06 réutilisées dans la prod.
pourquoi ne pas solliciter nitrawal qui est la centrale environnementale ?!

300ton de 02.01.06 épandus sur les terres

---

il existe des déchets verts(02.01.03) =poids inconnus

---

pas de déchets car plus en activité depuis le 31/12/2002
la terre(4ha) est exploitée par une entreprise

B5=écumes de sucrerie - 07.4=indéterminé(repris par phytofar) - 07.2=indéterminé
E2=plus recevoir de quest.; E3=avoir la paix ; E5=pas être sélectionné
problématiq. déchets agric. bien gérée & organisée(NITRAWALL; Phytofar; Rendac; parcs à cont.; communes; eaux usées). ces chiffres sont connus par organismes récolteurs il suffit de les adapter par type de spéculations agricoles.
De plus la mise aux normes se profile(construction de citernes, contenants, aire de stockage)
---
questionnaire pas adéquat pour exploit.agric. - voir normes Nitrawal - calculer700m³ de02.01.06
- 60litres de 01.3
---
laitier - 1500tonnes de 02.01.06 épandu sur terres

Annexe V: Specific weights

Oil filters

Oil filters: the respondent is able to give a number of filters. But which is the average weight?

Following Tim Wright (2005: http://www.shoclub.com/lubrication-oil/lubrication-oilpart5.htm), the capacity of oil filters ranges between 0.550 l and 0.919 l. Now, a waste filter is not necessarily full of oil. As a first approximation, we consider an average weight of 0.5 kg/filter.

Lamps

A given quantity of lamps is sometimes calculated. Are those TL lamps or bulb lamps? Big or smalls?

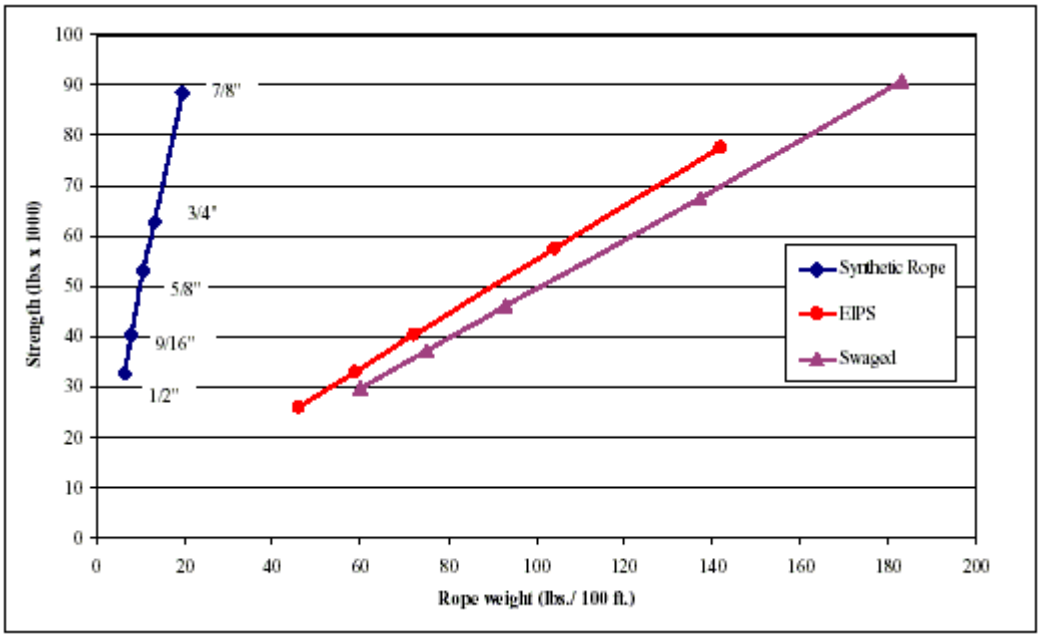
For fishing bulb lamps, we arbitrarily selected an outdoor lamp of 70-Watt Philips "Master City Lamp" (http://www.lighting.philips.com/be_fr/architect/applications/outdoor/products/mcw.php?main=be_fr&parent=1_7_2&id=be_fr_outdoor_lamps&lang=fr) which has a weight of 60 g.

Steel ropes (fishing)

Trawl fishing is the common fishing method used in the North Sea (Huse et al, 2002) and typically by the Belgian fishers. Various sizes of fish ropes are present on the market. A study (Harter et al, 2004) compares rope resistance in function of specific weight.

The 2 types of steel ropes studied ranged from 40 to 180 lbs/ft. For a rope of 100 lbs/ft, we have 100 x 3,2808399 / 2,20462262 = 1.488 t/km.

The range of the ropes in this study is thus: 0.595 to 2.679 t/km, for a resistance of about 25000 to 90000 lbs (11.34 to 40.823 t).



Source: Harter et al, 2004

The Belgian fishing ropes provider http://www.exsil.be/steelite.htm proposes high modulus polyethylene fibre ropes of diameters 12-80 mm with a breaking strength of 13.5-361 tons (29.8-796 lbs) for the cheapest type and a breaking strength of up to 1045 t (2304 lbs) for the most expensive ones. The typical applications for this ropes are said to be: winch lines, mooring lines, tow lines, tug assist lines, deep water lift lines, pipe pull lines, wire rope replacements, heavy duty slings, fishing lines, oceanographic cables, submerge turret lift ropes, and tethers. We use this information to estimate the strength of the typical ropes the Belgian fishing industry might need, taking into account that the trawl fishing should need the stronger ropes. For a mean breaking strength of 40 tons (90 lbs, which seems to be a minimum for this kind of fishing), we get a provisional mean rope weight of about (see graph) 180 lbs/ft or 2.679 t/km.

Paint cans

We did not find a specific weight for paint cans of 5 litter.
1-We make the hypothesis that paint cans for ships are metallic.
2-Val-I-Pac gives a weight of 17 kg for a metallic container of 220 litters.
3-The weight of a waste (unwashed) metallic can of 5 litter could be about 386 g.

Informatie

Federale Overheidsdienst Economie, KMO, Middenstand en Energie

De Algemene Directie Statistiek en Economische Informatie maakt deel uit van de Federale Overheidsdienst Economie, KMO, Middenstand en Energie. We hebben de opdracht om aan de informatiebehoeften van zowel overheid, bedrijfswereld als burgers te voldoen, en dit door hen allerlei actuele cijfers over de toestand van het land aan te bieden.

Waar vindt u de statistische en economische informatie ?

Op onze websites http://statbel.fgov.be (statistieken) en http://mineco.fgov.be (economie)

In vijf grote steden van het land heeft het publiek toegang tot :

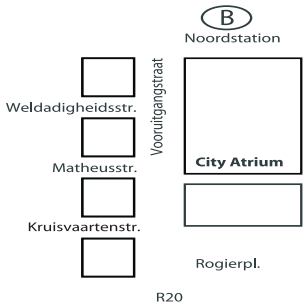
- ◊ Jaarboeken, gespecialiseerde publicaties en een selectie van diskettes en cd-rom's.
- ◊ Een leeszaal, waar men onze publicaties maar ook statistische publicaties van andere ministeries en Belgische en internationale instellingen kan raadplegen.

Al onze bibliotheken zijn op werkdagen open van 8u30 tot 16u30 (Brussel) en van 9 tot 12 en van 13 tot 16 uur (andere).

Brussel City Atrium C

Vooruitgangstraat 50, 1210 Brussel
tel. 02/277.55.03 – 02/277.55.04 fax 02/277.55.19
e-mail : info@statbel.mineco.fgov.be

Trein (B) : Noord station
Metro (M) : lijn 2, station Rogier
Trams : 3, 52, 55, 56, 81, 90
halte Rogier of Noord
Bus STIB : 38, 58, 61
halte Rogier of Noord
Bus De Lijn : 318, 351, 358, 410, 526, 554
halte Noord



Antwerpen

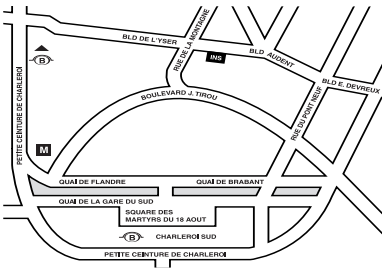
Italiëlei 124 - bus 85, 2000 Antwerpen
tel. 03/229 07 00 fax 03/233 28 30
e-mail : info.antwerpen@statbel.mineco.fgov.be

Trein (B) : Centraal Station
Metro (M) : halte Opera
Tram-Bus : vlakbij (Fr. Rooseveltplaats)

Charleroi

Tour Biarent, Bd Audent 14/5., 6000 Charleroi
tel. 071/ 27.44.14 fax 071/ 27.44.19
e-mail : info.charleroi@statbel.mineco.fgov.be

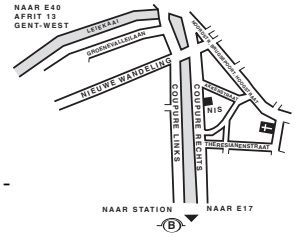
Trein (B) : Charleroi Sud, 20 min van het station (Place Buisset, Rue du Collège, Place Charles II, Boulevard Tirou, Rue de la Montagne)
Bus : halte Tirou
Autoweg : kleine ring van Charleroi - uitrit Gare du Sud
Parking (P) : betaalparking tegenover het NIS



Gent

Coupure rechts 620, 9000 Gent
tel. 09/267 27 00 fax 09/267 27 29
e-mail : info.gent@statbel.mineco.fgov.be

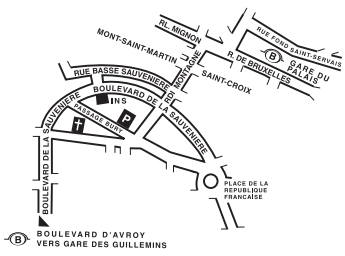
Trein (B): Gent St.-Pieters
Tram-Bus : 40, 43 halte Theresianenstraat
Autoweg: gemakkelijk bereikbaar langs E40 (uitrit 13 - Gent-West/Drongen)
Parking (P): op de "Coupure Rechts"



Luik

Bd de la Sauvenière 73-75, 4000 Luik
tel. 04/223 84 11 fax 04/222 49 94
e-mail : info.liege@statbel.mineco.fgov.be

Trein (B): station Guillemins of Palais
Tram-Bus : (Guillemins) 1 en 4 halte Sauvenière
Parking (P): Neujean (op 20 m - zelfde straatkant)
Mercure (tegenover)



We verspreiden tal van producten die de Belgische socio-economische realiteit in cijfers weergeven. Al deze producten, opgenomen in onze catalogus, kunt u verkrijgen in onze regionale centra of bij onze dienst documentatie - verkoop in Brussel. Onze catalogus wordt u op eenvoudige aanvraag toegestuurd. (zie adressen hiernaast) .

Een keuze uit onze gegevens en de lijst van onze publicaties vindt u eveneens op onze website: **http://statbel.fgov.be**

Andere publicatie met betrekking over het milieu

Overzicht van de leefmilieustatistieken

De dienst Leefmilieustatistieken verwerkt zowel eigen gegevens (bv. over de bedrijfsinvesteringen ten bate van het leefmilieu en over het bodemgebruik) als een selectie van gegevens afkomstig uit diverse andere bronnen (uitstoot en concentratie van verontreinigende stoffen, vervuiling van rivierwater en zeewater, zuivering van het afvalwater, ozon, productie, samenstelling en verwerking van afval, recyclage, biodiversiteit, natuurgebieden, gezondheidstoestand van de bossen, nucleair afval en radioactieve neerslag, milieudelicten,…). Al deze informatie is nu verzameld in een handig overzicht in de vorm van tabellen, grafieken en cartogrammen. Ze zijn ingedeeld per thema: lucht, water, afval, radioactiviteit, effect van de vervuiling op het leefmilieu, landschap, natuur, economische activiteiten en milieurecht. De statistieken worden op het niveau van België gepubliceerd, zodat ze complementair zijn met de al bestaande gegevens die door de gewesten gepubliceerd worden. Een systematische link naar de bronnen toont de weg aan de gebruikers die meer gedetailleerde of meer locale of internationale informatie zoeken. - *Jaarlijks*

Enkele andere publicaties

Algemene Publicaties

Regionaal Statistisch Jaarboek
Statistisch tijdschrift – *Maandelijks*

Grondgebied en leefmilieu

Statistiek van de bodembezetting (diskette)

Bevolking

Huishoudens en familiekernen – *Jaarlijks*
Totale bevolking op 1 januari - *Jaarlijks*

Samenleving

Verkeersongevallen – *Jaarlijks*
Huishoudbudgetenquête – *Jaarlijks*

Economie en financiën

Verkoop van onroerende goederen – *Jaarlijks*

Landbouw

Land- en tuinbouwtelling op 15 mei - *Jaarlijks*

Industrie

Industriële productie en bouwbedrijf - *maandelijks*

Handel, diensten en vervoer

Compendium Informatiemaatschappij - J*aarlijks*
Binnenlandse handel - *Jaarlijks*

Statistiek en
Economische Informatie

Eerste uitgave

Gedrukt door de
drukkerij van de ADSEI
B-1000 Brussel

September 2005