



PFRPP



**Pilot study on estimating non-agricultural use of pesticides in Belgium
for Service Public fédéral Santé Publique, Sécurité de la Chaîne alimentaire et
environnement-Direction générale Animaux, Végétaux et Alimentation**

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Executive summary

This pilot study financed by Eurostat aims at estimating the non-agricultural uses of plant protection products (PPPs) in Belgium in order to fulfil the requirements of Regulation (EC) n°1185/2009¹ and is a part of work on the Federal Pesticide Reduction Programme as indicated at the federal action 10.4 in Annex I of the Royal Decree of 15 december 2013². This estimation of non-agricultural uses of PPPs in Belgium consists of a collection of Belgian statistics on the used quantities of PPPs including at least the names of active substances and their quantities (expressed in kilograms) used in a given year. This study will lead to a better control of risk for human health as well as for the environment and will bring to consolidate current available statistics, to ensure the transfer of training in terms of data on pesticides at European scale and to establish a common framework for the systematic production of statistics on the use of PPPs at Belgian scale.

As a first step to reach this global objective, the non-agricultural uses of plant protection products have been identified in Belgium and divided into seventeen categories (green areas, golf courses, road infrastructure...). Each single category corresponds to specific uses (places where PPPs are applied) and includes a panel of users applying PPPs (= interlocutors) that have been identified accurately too. Given the complex federal structure of Belgium, collecting information for identification of the different uses and users of PPPs is somehow difficult because of the lack of answers from some potential interlocutors and the implementation of new legal measures at federal and regional levels.

The second step is to develop a global methodological approach to estimate the non-agricultural uses of PPPs in Belgium based on the expertise developed by the two Belgian partners (UCL and UGent) in data collection of PPPs and based on the evolving legal context around plant protection products in Belgium. This particular approach is not focused on collecting and processing data on uses of PPPs but only on the implementation of a methodology that is in line with the general objective. For this, a review of all different methods of data collection already tested has been performed for each category of users of PPPs. Sixteen different methods were identified in total for Wallonia and Flanders. Each method of data collection was investigated in detail with its advantages, its disadvantages and its own degree of certainty allocated by experts in order to identify best method of data collection. At the same time, best methods of data collection for each category of users of PPPs have been studied through the implementation of different tools taking into account the Belgian changes of legislative requirements in pesticide issues and the barriers which prevent the estimation of non-agricultural uses of PPPs. In addition, perspectives to get more information on used quantities of PPPs have been proposed for each category of users.

Third, a methodology for verifying the pesticide statistics of sales and uses of PPPs was set up. For this, data on uses of PPPs in agriculture have been collected in Wallonia and in Flanders for the year 2010. Based on those figures, a statement of data on the used or sold quantities of active substances was performed for each type of users for the base year 2010 at Belgian level (more specifically, at two major Walloon and Flemish levels). In 2010, the share of non-agricultural uses of PPPs in Belgium is equivalent to 914 tons out of a total of 5.472 tons of active substances (roughly 17%) sold on the Belgian market. Of these 914 tons of active substances, 138 tons (15%) correspond to the sold quantities to non-professional users and 776 tons (85%) are allocated to the estimated quantities of active substances used by the non-agricultural professional users.

¹ Regulation (EC) n°1185/2009 of the European Parliament and of the Council of 25 November 2009 concerning statistics on pesticides.

² Royal Decree of 15 December 2013 on the federal pesticide reduction programme for the period 2013-2017.

The allocation of those 776 tons of used active substances between the categories of identified users of PPPs was examined very accurately. First, the seventeen non-agricultural categories of users of PPPs were investigated in relation to the identified interlocutors at Walloon and Flemish levels. Given the complexity of relations between interlocutors and categories of users in Wallonia and in Flanders, a ranking on the seventeen categories of users of PPPs according to their importance in terms of using PPPs and according to the accessibility of data was set up based on expert judgement. This expert judgment combined with statistical tools highlighted that the main key players in the non-agricultural use of plant protection products are private companies of parks and gardens (for public or private institutions) and private companies. Then come amateur gardeners that represents an interlocutor where data are readily accessible and where the uses of PPP are considered as important in 2014 and in 2020 in both Flanders and Wallonia. In order to acquire additional data from those interlocutors, an innovative data collection scheme was developed from a statistical perspective. The tools to implement are exhaustive investigations for private companies of parks and gardens and investigation into sample for private companies (asbl, s.a., sprl, sclr...) with a focus on private companies for water, electricity, gas and phone through an exhaustive investigation. The inquiries have to be combined with data collection for amateur gardeners based on the sales figures of PPPs provided by Federal Public Service Health, Food Chain Safety and Environment.

Conducting inquiries for those targeted interlocutors shall contribute efficiently to the estimation of non-agricultural uses of PPPs in Belgium and shall serve as the basis for the definition of the guidelines of the European methodology. At the same time, the project results shall facilitate the transition to the changes expected from Directive 2009/128/EC for the estimation on the used quantities of PPPs according to the years, involving an expected reduction in the used quantities of active substances for most of categories of users of PPPs. The targets and the measures deriving from Directive 2009/128/EC shall lead to a major change in the plant protection practices and uses in the near future.

Introduction

This pilot project aims at estimating the non-agricultural use of pesticides in Belgium in order to fulfil the requirements of Regulation (EC) n°1185/2009³. The project is financed by Eurostat in the framework of this legislative context and is realised in the framework of the Federal Pesticide Reduction Programme as indicated at the federal action 10.4 in Annex I of the Royal Decree of 15 December 2013⁴. The estimation of non-agricultural uses of PPPs in Belgium will take the form of a collection of Belgian statistics on the used quantities of PPPs including at least the names of active substances and their quantities (expressed in kilograms) used in a given year.

As a reminder, pesticides include plant protection products and biocides⁵. In the framework of this study, the term pesticide **refers only to plant protection products** as defined in Article 2, §2 of Regulation (EC) n° 1107/2009⁶:

“Products, in the form in which they are supplied to the user, consisting of or containing active substances, safeners or synergists, and intended for one of the following uses:

(a) protecting plants or plant products against all harmful organisms or preventing the action of such organisms, unless the main purpose of these products is considered to be for reasons of hygiene rather than for the protection of plants or plant products;

(b) influencing the life processes of plants, such as substances influencing their growth, other than as a nutrient;

(c) preserving plant products, in so far as such substances or products are not subject to special Community provisions on preservatives;

(d) destroying undesired plants or parts of plants, except algae unless the products are applied on soil or water to protect plants;

(e) checking or preventing undesired growth of plants, except algae unless the products are applied on soil or water to protect plants.

These products are referred to as ‘plant protection products’.

In the section 6 (Quality reports) of Annex II of Regulation (EC) n° 1185/2009, an indent stipulates that:

“A summary description of the commercial non-agricultural uses of pesticides obtained in the framework of pilot studies to be led by the Commission (Eurostat)” has to be supplied by the Member States.

According to this indent, Eurostat will take a lead in identifying the importance of commercial non-agricultural use of pesticides. However, Eurostat considers that knowing only the commercial use of pesticides would create potential incoherence in data availability and lead to possible false conclusions on the non-commercial and non-agricultural use of pesticides. Therefore, Eurostat decided to carry out a pilot study on both commercial and non-commercial non-agricultural use of pesticides.

³ Regulation (EC) n°1185/2009 of the European Parliament and of the Council of 25 November 2009 concerning statistics on pesticides.

⁴ Royal Decree of 15 December 2013 on the federal pesticide reduction programme for the period 2013-2017.

⁵ The definition of « biocides » can be found in Article 3 (point 10a)) of Directive 2009/128/EC of the European Parliament and of the Council of 21 October 2009 establishing a framework for Community action to achieve the sustainable use of pesticides.

⁶ Regulation (EC) n° 1107/2009 of the European Parliament and of the Council of 21 October 2009 concerning the placing of plant protection products on the market and repealing Council Directives 79/117/EEC and 91/414/EEC.

In this context, “non-commercial” use means “non-professional” use of plant protection products (PPPs). Non-professional use of plant protection products includes all uses where the user is a private person and the aim is not to produce any product aimed for the market, i.e. the product is used only in the private household. Conversely, “commercial” use means “professional” use of plant protection products. All use of PPPs by private companies, public or semi-public institutions, non-governmental organizations... is considered as a professional use. Agricultural use covers the production of all agricultural products as defined in the FSS Regulation (1166/2008)⁷. For clarity, it is considered that production of such agricultural products only for own consumption is not included in agricultural production.

In the framework of this pilot study on the estimation of non-agricultural uses of PPPs in Belgium, a consortium has been set up between Ghent University (UGent) and Catholic University of Louvain-la-Neuve (UCL) in order to promote exchanges and to share their experience in collecting data on PPPs in Flanders (UGent) and in Wallonia (UCL). It is important to underline that Brussels is not included in the scope of this survey. The study has been focused only on Wallonia and Flanders.

The estimation of non-agricultural uses of pesticides in Belgium shall lead to a better control of risk for human health as well as for the environment. It shall bring to consolidate current available statistics, to ensure the transfer of training in terms of data on pesticides at European scale and to establish a common framework for the systematic production of statistics on the use of PPPs at Belgian scale.

In order to answer the global objective, the pilot project has been divided into three specific tasks (Figure 1):

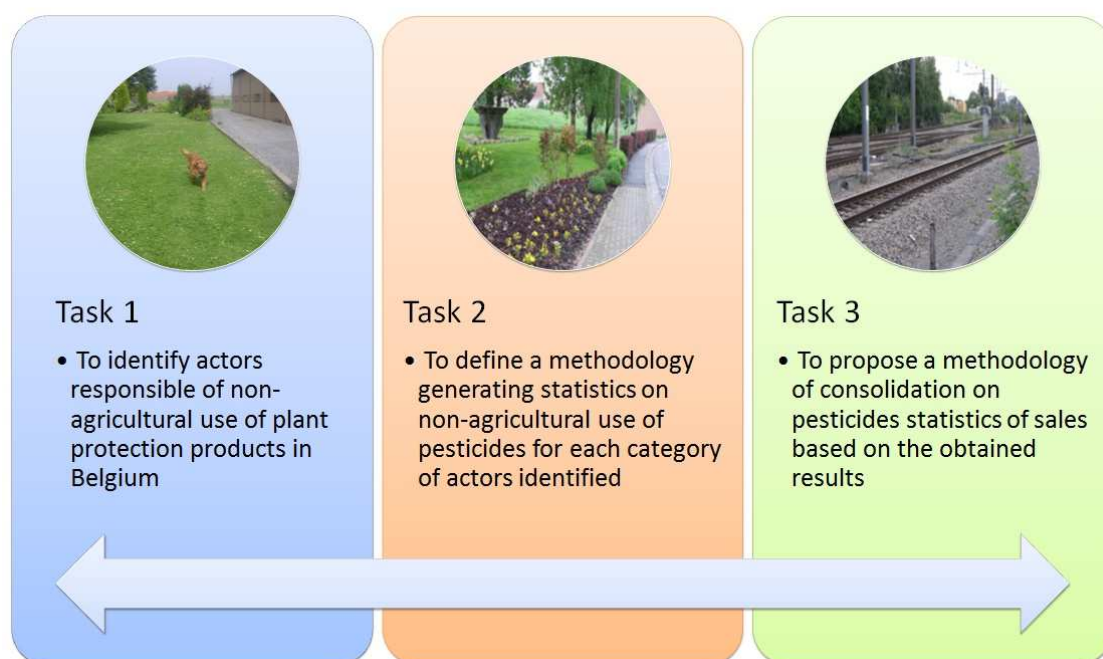


Figure 1: Objectives of three tasks

⁷ Regulation (EC) N°1166/2008 of the European Parliament and of the Council of 19 November 2008 on farm structure surveys and the survey on agricultural production methods and repealing Council Regulation (EEC) n° 571/88.

Task 1: Identification of pesticide users

Task 1 aims at identifying the users of plant protection products in Belgium. A list of actors that contribute to non-agricultural pesticide use has been established. In order to do this work, the results of previous studies on non-agricultural use of pesticides have been analysed and potential professional users of pesticides have been contacted. The actions realized to reach the objectives of Task 1 are:

- a general gathering of the available information on the use of plant protection products (at Belgian scale and more precisely, in Wallonia and in Flanders). The action has been split into two parts:
 - ➔ Identified non-agricultural users of plant protection products in Flanders
 - ➔ Identified non-agricultural users of plant protection products in Wallonia
- an identification of existing data collections on sales and uses of plant protection products (at Belgian scale and more precisely, in Wallonia and in Flanders) and a determination of known and unknown data.

In Belgium, the users of plant protection products can be distinguished between professional and non-professional users thanks to the “Separation of approvals” which has been implemented on 18th August 2012⁸. Indeed, a distinction can be made between approvals for products intended for professionals and approvals for products intended for amateur gardeners. The sale of professional products and the sale of non-professional products will be totally separate by 2014, including in regard to packaging (easier to use), labelling (more readable) and uses. Only amateur gardeners can be found in the non-professional users. Among professional users, a distinction between agricultural and non-agricultural users can be made thanks to the implementation of the system of licensing certificates and the record-keeping for PPPs uses (required under article 67 of Regulation n°1107/2009). Those systems can bring some information about the professional uses of PPPs. The figure 2 illustrates the current situation on uses of plant protection products in Belgium.

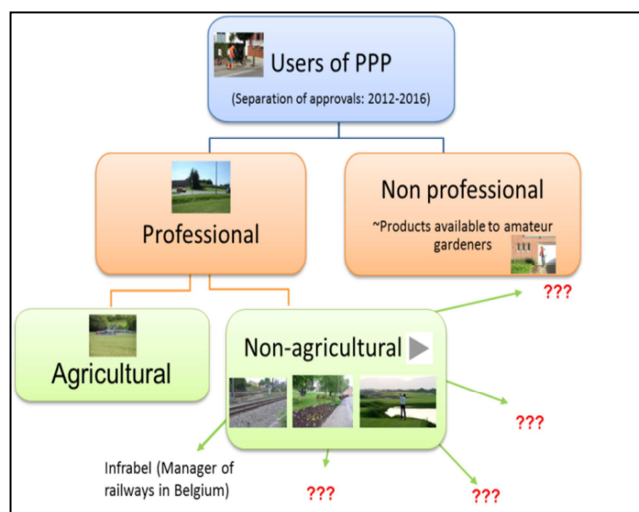


Figure 2: Situation on uses of PPPs in Belgium

⁸ Royal Decree of 10 January 2010 modifying Royal Decree of 28 February 1994 concerning the storage, the placing on the market and the use of pesticides for agricultural use

The main issue was to identify precisely the non-agricultural users of PPPs. By doing some research, 17 categories of non-agricultural users of plant protection products have been identified in task 1 (Figure 3). Category of non-agricultural users of PPPs has to be understood as uses (places where PPPs are applied). Real users or interlocutors hide behind each category of user.



Figure 3: Distribution of non-agricultural users of PPPs in Belgium

Private companies in this report refer to a non-profit association⁹, a limited company¹⁰, a limited liability company¹¹, a private limited company¹²...

⁹ Association sans but lucrative (asbl) in french

¹⁰ Société anonyme (sa) in french

¹¹ Société cooperative à responsabilité limitée in french

¹² Société privée à responsabilité limitée in french

1.1. Private use

Private use of plant protection products can be represented by different actors in Belgium: amateur gardeners and private companies of parks and gardens. Amateur gardeners are non-professional users of plant protection products. That means that the user is a private person and the aim is not to produce any products aimed for the market, i.e. the product is used only in the private household. In Belgium, amateur gardeners can only use products for a non-professional use. Amateur gardeners refer also to individuals who own pastures for animals (horses, sheep, goats...). Moreover, private use includes areas belonging to private owners which are open or not open to the public. The table below shows the actors involved in the use of plant protection products for private use.

Private use		
1a. Amateur gardeners	Federal:	
	The Federal Public Service Health, Food Chain Safety and Environment (FPS) is the competent authority delivering the authorization for the placing on the market of plant protection products at federal level.	
1b. Private companies of parks and gardens	Wallonia:	Flanders:
	Examples: LBO Service...	Phytofar is the Belgian Association of the industry of plant protection products.



Figure 4: Amateur gardener

1.2. Green areas (parks, gardens, cemeteries...)

The manager and person in charge of green areas (parks, gardens, cemeteries...) can be represented by different actors in Belgium. More precisely, green areas can be divided into public or private green areas. This distinction between public and private green areas involves that the actors responsible for the maintenance are different. This category excludes green areas belonging to private owners which are open to the public¹³. The table below shows the actors involved in the use of plant protection products for public green areas and for private green areas.

Actors of "Public green areas"					
	Wallonia/Flanders:				
2a. Municipality	Local alderman/service of the commune who is responsible for public green, environment or public work. Some municipalities have already switched to alternative control methods; others reduce their use systematically to a zero-use of PPPs. Some municipalities have their own maintenance team, others contract weed control to subcontractors. Sometimes both are used.				
2b. Intermunicipality	Intermunicipality means an association of municipalities which shares knowledge, expertise and means (pure intermunicipality). Sometimes private partners and the province council can also participate (mixed intermunicipality). Some of them have already switched to alternative control methods; others reduce their use systematically to a zero-use of PPPs. Some intermunicipalities have their own maintenance team, others contract weed control to subcontractors. Sometimes both are used.				
2c. Province	Delegate/representative of the province who is responsible for public green, environment or public work. Some provinces have already switched to alternative control methods; others reduce their use systematically to a zero-use of PPPs. Some provinces have their own maintenance team, others contract weed control to subcontractors. Sometimes both are used.				
2d. Region	<table border="1"> <thead> <tr> <th>Wallonia:</th> <th>Flanders:</th> </tr> </thead> <tbody> <tr> <td>Region can attribute grants to the Provinces, Municipalities and association of Municipalities in order to purchase some fields with a view to preserve, create and convert green areas. The authorities which are beneficiary of grants have to assume the responsibility and the management of public green areas. Region has got its own maintenance team for weed control for some green areas: park of Mariemont, Jumet (parc Bivort), Verviers (domaine de Séroule) and Rendeux (arboretum Lenoir).</td> <td>Agentschap voor Natuur en Bos (ANB) is an agency of the Flemish government that works for the preservation, protection and development of natural areas, forests and parks in Flanders. ANB has a team responsible for weed control. They especially use herbicides. It happens sometimes that they contract weed management to subcontractors.</td> </tr> </tbody> </table>	Wallonia:	Flanders:	Region can attribute grants to the Provinces, Municipalities and association of Municipalities in order to purchase some fields with a view to preserve, create and convert green areas. The authorities which are beneficiary of grants have to assume the responsibility and the management of public green areas. Region has got its own maintenance team for weed control for some green areas: park of Mariemont, Jumet (parc Bivort), Verviers (domaine de Séroule) and Rendeux (arboretum Lenoir).	Agentschap voor Natuur en Bos (ANB) is an agency of the Flemish government that works for the preservation, protection and development of natural areas, forests and parks in Flanders. ANB has a team responsible for weed control. They especially use herbicides. It happens sometimes that they contract weed management to subcontractors.
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2e. Private companies of parks and gardens	"Fédération royale des sociétés horticoles de la Communauté française », Edialux (a private company that gathers the most important distributors of garden products in Belgium)...				
Actors of "Private green areas"					
	Wallonia/Flanders:				
2f. Private companies	Some private companies have their own maintenance crew for chemical weed control on private green areas.				
2g. Private companies	The maintenance of private green areas belonging to private companies can be				

¹³ Green areas belonging to private owners and which are open to the public are included in the category 1: Private use.

of parks and gardens

managed by private companies of parks and gardens.



Figure 5: Cemetery



Figure 6: Public green areas



Figure 7: Park

1.3. Road infrastructure

The manager and person in charge of road infrastructure can be represented by different actors in Belgium. More precisely, road infrastructure can be divided into public or private road infrastructure. The table below shows the actors involved in the use of plant protection products for public road infrastructure and for private road infrastructure. Road infrastructure refers to motorways, roads, streets, paths... but does not refer to access pathways to public or private buildings which are count as part of the infrastructure of buildings¹⁴.

Actors of "Public road infrastructure"	
3a. Municipality (communal roads)	Wallonia/Flanders:
	Local alderman/service of the commune who is responsible for public roads/works or road network. Some municipalities have already switched to alternative control methods; others reduce their use systematically to a zero-use of PPPs. Some municipalities have their own maintenance team, others contract weed control to subcontractors. Sometimes both are used.
3b. Province (provincial roads)	Wallonia:
	Delegate/representative of the province who is responsible for public works or road network. Some provinces have already switched to alternative control methods; others reduce their use systematically to a zero-use of PPPs. Some provinces have their own maintenance team, others contract weed control to subcontractors. Sometimes both are used.
3c. Region (motorways and regional roads)	Wallonia:
	Direction générale opérationnelle Route et Bâtiments (DGO1) is an integral part of the « Service Public de Wallonie » which is specifically responsible for the management of the regional road network and motorway and technical expertise. DGO1 has got his own maintenance team for weed management. They can also contract weed control to subcontractors.
3d. Private companies of parks and gardens	Flanders:
	Agentschap Wegen en Verkeer (AWV) is an internal autonomous agency of the Flemish government with the task of managing and maintaining the road network in the Flemish Region. From January 2015, only alternative methods will be used to control weed. The actual use figures of pesticides so far can be obtained by contacting municipalities and provinces.
	Wallonia/Flanders
	Some private companies of parks and gardens can supervise weed control for public road infrastructure.
Actors of "Private road infrastructure"	
	Wallonia/Flanders:
3e. Private companies	Some private companies have their own maintenance crew for chemical weed control on private road infrastructure.
3f. Private companies of parks and gardens	The maintenance of private road infrastructure belonging to private companies can be managed by private companies of parks and gardens.

¹⁴ Access pathways to public or private buildings which are count as part of the infrastructure of buildings are included in the category 5: Industrial areas and tertiary sector. The individuals who manage themselves their private roads are included in the category 1: "Private use".



Figure 8: Public roads



Figure 9: Private roads



Figure 10: Public roads

1.4. Transport service

The manager and person in charge of transport service can be represented by different actors in Belgium. More precisely, transport service can be divided into public or private companies who are responsible for train, bus, underground, touristic tramway or train way, tramway, plane in the common airports and aerodromes, boat in the ports, bicycle and railbikes. This distinction between public and private transport services involves that the actors responsible for the maintenance are different. The table below shows the actors involved in the use of plant protection products for public transport services and for private transport services.

4a. Train					
Federal	<p>Federal:</p> <p>INFRABEL is a public limited company which receives annual grants from the federal government. Infrabel is responsible for the Belgian railway network. Infrabel ensures optimum performance of its equipment: railways, catenaries, switches, signals, maintenance of railway tracks... Concerning the maintenance of railway tracks, Infrabel uses a specially equipped spray train which allows the removal of weeds along railway lines by application of herbicides. This train uses a camera and a powerful computer program to track automatically the biggest concentrations of weed along the tracks, which are then sprayed with herbicides. In this way, the amount of herbicides used is reduced involving a decrease of unwanted vegetation.</p>				
4b. Bus/Coach					
Region	<table border="1"> <thead> <tr> <th>Wallonia:</th> <th>Flanders:</th> </tr> </thead> <tbody> <tr> <td> <p>TEC or "Transport En Commun" includes five public transport companies active on the Walloon territory¹⁵. TEC is supervised by the "Société Régionale Wallonne du Transport" (SRWT) which is a public transport company which manages the busses in Wallonia. TEC uses PPPs near bus depots, buildings belonging to TEC...</p> </td> <td> <p>De Lijn is the commercial name of the Flemish Transport Company, and is an independent public company in charge of the urban and regional transport by bus and tram in Flanders. Each province has its own department. Weed control is especially done by herbicides on bus depot areas. The operators vary from entity to entity. Some have a team for weed management, others contract weed control to subcontractors.</p> </td> </tr> </tbody> </table>	Wallonia:	Flanders:	<p>TEC or "Transport En Commun" includes five public transport companies active on the Walloon territory¹⁵. TEC is supervised by the "Société Régionale Wallonne du Transport" (SRWT) which is a public transport company which manages the busses in Wallonia. TEC uses PPPs near bus depots, buildings belonging to TEC...</p>	<p>De Lijn is the commercial name of the Flemish Transport Company, and is an independent public company in charge of the urban and regional transport by bus and tram in Flanders. Each province has its own department. Weed control is especially done by herbicides on bus depot areas. The operators vary from entity to entity. Some have a team for weed management, others contract weed control to subcontractors.</p>
Wallonia:	Flanders:				
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Municipalities	<p>Wallonia:</p> <p>Weed control for bus shelters is managed by the municipalities if there are no advertising posters.</p>				
Private companies	<p>Wallonia/Flanders:</p> <p>FBAA has got a listing of each private company of coaches or autobusses in Belgium and more specifically in Wallonia and in Flanders. FBAA includes 339 bus companies in Flanders. For the identification of the use of PPPs, every company should be contacted individually. Most of them use alternative methods to control weed. This is most of the time done by their own staff, but sometimes the weed control is outsourced to subcontractors.</p>				
Private companies of parks and gardens	<p>Wallonia/Flanders:</p> <p>JCDecaux Group (Euronext: DEC) is a multinational corporation that focuses on supporting advertising street furniture. They are responsible for the maintenance of bus shelters in Belgium. An own maintenance team applies PPPs for weed control. In Wallonia, if there are advertising posters posted on bus shelters, PPPs are used for weed control by the advertising companies (ex: Clear Channel, JCDecaux...).</p>				

¹⁵ The five public transport companies active on the Walloon territory are TEC Walloon Brabant, TEC Charleroi, TEC Hainaut, TEC Liège-Verviers and TEC Namur-Luxembourg.

4c. Underground					
	Wallonia:				
Region	TEC Charleroi operates the “light rail” ¹⁶ of Charleroi which is currently composed of four lines and of 44 vehicles and includes 9 underground stations. TEC Charleroi is one of five companies responsible for all public transport in Wallonia, which is supervised by a parent company: the “Société Régionale Wallonne du Transport” (SRWT). A tramway in Liège will appear over the coming years and will be managed by TEC-Liège.				
4d. Touristic tram or train way					
Private companies	<table border="1"> <thead> <tr> <th>Wallonia:</th> <th>Flanders:</th> </tr> </thead> <tbody> <tr> <td>7 touristic tramways qualified “private companies” in Wallonia. Most of the managers responsible for the touristic tramways are volunteers integrated in non-profit making organizations or in limited companies. More information about the touristic tramways is provided in Annex 1 (point 1.1). Weed control involving usually a use of pesticides is managed by the volunteers of those associations.</td> <td>Het Stoomcentrum Maldegem is the center of a historic railway, the former railway station site in Maldegem. Their own maintenance team is required to keep the railroad free from weeds in order to ensure the maximum water drainage from the railroad. They especially use herbicides. Stoomspoorlijn Dendermonde-Puurs (SDP) is a tourist railway in the Belgian provinces of East Flanders and Antwerp, that after the closure of the line through the association BVS (Belgische Vrienden van de Stoomlocomotief) is operated. VZW Kolenspoor is an association which has a commitment for decades in organizing tourist train rides. They have their own maintenance team to control weed and use only herbicides.</td> </tr> </tbody> </table>	Wallonia:	Flanders:	7 touristic tramways qualified “private companies” in Wallonia. Most of the managers responsible for the touristic tramways are volunteers integrated in non-profit making organizations or in limited companies. More information about the touristic tramways is provided in Annex 1 (point 1.1). Weed control involving usually a use of pesticides is managed by the volunteers of those associations.	Het Stoomcentrum Maldegem is the center of a historic railway, the former railway station site in Maldegem. Their own maintenance team is required to keep the railroad free from weeds in order to ensure the maximum water drainage from the railroad. They especially use herbicides. Stoomspoorlijn Dendermonde-Puurs (SDP) is a tourist railway in the Belgian provinces of East Flanders and Antwerp, that after the closure of the line through the association BVS (Belgische Vrienden van de Stoomlocomotief) is operated. VZW Kolenspoor is an association which has a commitment for decades in organizing tourist train rides. They have their own maintenance team to control weed and use only herbicides.
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4e. Tramway					
Region	Flanders: De Lijn is the commercial name of the Flemish Transport Company, an independent public company in charge of the urban and regional transport by bus and tram in Flanders. Each province has its own department. Weed control is especially done by herbicides on the tram bedding and the rails. The operators vary from entity to entity. Some have a team for weed management, others contract weed control to subcontractors.				
4f. Plane in the common airports and aerodromes					
	Flanders:				
Intermunicipality	International airport of Kortrijk-Wevelgem is an airport located at 2 km from Kortrijk. The airport is situated near the municipalities Wevelgem and Bissegem. This airport contracts weed control to subcontractors. Only around the security lightning, herbicides are still used.				
Region	International airport of Oostende: The traffic consists mainly of goods traffic. The passenger traffic consists of charter flights organized by tour operators. This airport has a team responsible for the maintenance of unwanted vegetation on taxiways, runways, lawn areas and aprons by especially herbicides. Antwerp International Airport is used primarily as a business airport. This airport contracts weed control to subcontractors. Herbicides are still used for spraying the wire fences, car parks, roads and the runway.				
Private companies	<table border="1"> <thead> <tr> <th>Wallonia:</th> <th>Flanders:</th> </tr> </thead> <tbody> <tr> <td>Brussels South Charleroi Airport (located</td> <td>9 airfields qualified “private companies”</td> </tr> </tbody> </table>	Wallonia:	Flanders:	Brussels South Charleroi Airport (located	9 airfields qualified “private companies”
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Brussels South Charleroi Airport (located	9 airfields qualified “private companies”				

¹⁶ Light rail or “Métro léger” is a public transport system permanently guided at least by one rail, operated in urban, suburban and regional environment with self-propelled vehicles and operated segregated or not segregated from general road and pedestrian traffic. Light rail includes all possible forms inside the continuum from a classical tram (not segregated) to a metro (fully segregated).

	<p>in Gosselies) is the third largest passenger airport in the Benelux and is the third best low-cost airport in Europe. The Airport is also home of some important flight schools that offer complete pilot training and Brussels Aviation School offering private Pilot and Night Flight Qualification training. The airport contract weed management out mainly to a private company of parks and gardens. The maintenance department of this airport has also a small team (5 workers) which can use sometimes PPPs to remove mosses between cracks of sidewalks.</p> <p>Liège-Bierset airport (located in Grâce-Hollogne) is a public limited company ("société anonyme in French"). This airport is the biggest cargo airport in Belgium and is the seventh European cargo airport. It is mainly used for freight operation but also serves more than 23 destinations for passengers (mainly charters). This airport has got a team responsible for weed control. It happens sometimes that they contract weed management to subcontractors. They can use pesticides.</p> <p>Spa-La Sauvenière airfield (located in Spa) is mainly used for pleasure flying and skydiving.</p> <p>Saint-Hubert airfield is a cooperative company with limited liability ("scrl in French") and is mainly used for gliding. In 2009, the main shareholder of this airfield became IDELUX¹⁷ in order to promote the development of provincial territory. The remainder still owned by the SOWAER. The Saint-Hubert airfield has a team responsible for the maintenance of unwanted vegetation and does not subcontract with private companies of parks and gardens. They can use pesticides.</p> <p>Cerfontaine airfield: an operating license of the Cerfontaine aerodrome was granted to a private company which develops a concept called "Gravity Park". The airfield is managed by the public limited company ("société anonyme in French"): EBCF¹⁸. The maintenance of ornamental areas is managed by a private company of parks and gardens.</p>	<p>in Flanders. More information about the airfields in Flanders is provided in Annex 1 (point 1.3). Some of these companies don't use any PPPs, others have their own maintenance team to control weed. Mainly to keep the wild growth of weeds between the paved areas under control, herbicides are still used</p>
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¹⁷ Idelux is an intermunicipality organization that provides the infrastructure to develop and to support economically, financially and ecologically the Belgian region of Luxembourg.

¹⁸ By e-mail dated 19 August 2014

	<p>The Cerfontaine airfield maintains the runways without using plant protection products.</p> <p>17 airfields qualified “private companies” in Wallonia. Some of them have got their own team for controlling the growth of undesired vegetation or they spray themselves plant protection products. Others do not use pesticides on their airfield. Also, some of them subcontract weed control to private companies of parks and gardens. It depends on the studied airfield. More information about those airfields in Wallonia is provided in Annex 1 (point 1.2).</p>	
Private companies of parks and gardens	<p>Wallonia/Flanders</p> <p>The maintenance of aerodromes and areas surrounding airports can be managed by private companies of parks and gardens by using PPPs.</p>	
4g. Boat in the ports		
Municipal companies for water transport	Public	<p>Flanders:</p> <p>Port of Antwerp is the largest seaport in Belgium and the second largest port in Europe after Rotterdam. The port of Antwerp is a municipal port authority. Since 2013, they no longer use any plant protection products. Subcontractors control weed by alternative methods like burning, steaming, sweeping and brushing.</p> <p>The port of Brugge-Zeebrugge is the second largest port in Belgium and one of the most important in Europe. The principal shareholder of the port is the municipality of Brugge. Weed management in the port of Zeebrugge is contracted to subcontractors. They use especially herbicides.</p> <p>The Port of Oostende is a seaport in the Belgian city of Oostende. Weed management in the port of Oostende is contracted to subcontractors. PPPs are no longer used, but alternative methods like spraying under high pressure hot water mixed with salt.</p> <p>The port of Gent is a seaport in the Belgian city of Gent. The port of Gent switched completely to alternative control methods applied by their own staff.</p>
Private companies of parks and gardens		<p>Flanders:</p> <p>The maintenance of areas surrounding ports can be managed by private companies of parks and gardens by using PPPs.</p>
4h. Bicycle		
Private companies	<p>Wallonia:</p> <p>Weed management of Bicycle hire sites is done by the staff of five “Maison des Cyclistes” in Wallonia. Those « Maison des Cyclistes » are managed by « Provelo » which is a non-profit organization (called “asbl” in French). Provelo is mainly financed by the Walloon region. In those bicycle hire sites, some blue-bikes can be found. The staff of « Maison des Cyclistes » uses none or very few plant protection products.</p>	<p>Flanders:</p> <p>FIETSenWERK is a membership organization for bicycle companies in the social economy which also in terms of employment and mobility pursue a number of social gains alongside their entrepreneurship. FIETSenWERK wants to encourage new developments about bicycle mobility and support and actively contribute to a sustainable. FIETSenWERK is a non-profit organization and has some 45 bike points in Flanders and Brussels. This concept is grown from a call from the NMBS-holding about the management of bicycle. Weed control is done by the staff of the bike points and only alternative methods are applied.</p>
Municipality	<p>Wallonia:</p>	<p>Flanders:</p>

	<p>Municipalities - are responsible for weed management on <u>the RAVeL network</u>. The RAVeL network means the autonomous network of slow ways reserved for pedestrians, cyclists, horse riders and people with reduced mobility. The network makes use of towpaths on waterways, disused railway or vicinal tramway lines. There are other greenways or paths reserved for pedestrians, cyclists and horseriders located in the communal roads but those greenways are managed by municipalities and are not included in the RAVeL network. Most of the Municipalities signed a convention of maintenance for the older railways used as the sections of RAVeL which goes through their territory. The municipalities are in charge of the grass-lawning, the tree trimming...</p> <p>Municipalities are also involved in the implementation of <u>Plan d'Itinéraires Communaux Verts (PICVerts)</u> which aimed at creating a local network of communal roads for non-motorized users (greenways, paths and vicinal paths). Unlike RAVeL, its roads are completely adapted and managed by Municipalities. Wallonia is a subsidizing authority and an adviser for the Municipalities.</p> <p>Municipalities manage <u>the Pré-RAVeL network</u> which is a provisional solution before the definitive conversion of RAVeL. It is usually an older railway where a basic conversion has been realized allowing the passage of pedestrians, cyclists, horse riders and people with reduced mobility but which has not yet been converted in a section of RAVeL.</p>	<p>Velo Antwerpen - is a form of public transport with the bicycle in Antwerpen. This organization doesn't use any plant protection products.</p>
Region	<p>Wallonia:</p> <p>Service Public de Wallonie - is responsible for weed management on the sections of Ravel network which are located on towpaths and on older railways of some municipalities which are refused in the convention of maintenance for RAVeL. More precisely :</p> <ul style="list-style-type: none"> • Direction générale opérationnelle "Mobilité et Voies hydrauliques" (including the different « Direction des Voies Hydraulique ») for some sections of RAVeL located on the path services along waterways • Direction générale opérationnelle des Routes et des Bâtiments for some 	

		sections of RAVeL located on former railways and vicinal or regional roads	
4i. Railbikes			
Municipal companies	Public	Flanders: Railbike Tessenderlo: the maintenance and weed control is within the competence of the municipality of As. They still use some PPPs, but from January 2015 only alternative methods will be allowed.	
Private companies		Wallonia: Railbikes of Molinee: an old railway (7 km-long) is located along the picturesque valley of the Molinee, between Falaën and Maredsous. The volunteers who work for the railbike of Molinee which is a non-profit organization (called "asbl" in French) rely on one firm for weed management. Railbikes of "Hautes-Fagnes": the railbikes are used on an old railway of Venbahn between Kalterherberg and Sourbrodt in the landscape of "Hautes Fagnes". The length on which the railbikes move is around 7 km between the two train stations.	Flanders: Railbike Limburg: On the traject (Eisden-As) vzw Railbike which subcontracts to vzw Kolenspoor, drives with some 14 railbikes. VZW Kolenspoor is an association which has a commitment for decades in organizing tourist train rides. They have their own maintenance team to control weed and use only herbicides.
		Wallonia:	
Private companies of parks and gardens		Only one firm uses plant protection products to destruct unwanted vegetation for Railbikes of Molinee.	



Figure 11: Touristic tramway



Figure 12: Train



Figure 13: Coach

1.5. Industrial areas, tertiary sector (commercial, touristic, car park ...)

The manager and person in charge of industrial areas and tertiary sector can be represented by different actors in Belgium. More precisely, industrial areas and tertiary sector can be divided into public or private industrial areas and tertiary sector. This distinction between public and private involves that the actors responsible for the maintenance are different. The table below shows the actors involved in the use of plant protection products for public industrial areas and tertiary sector and for private industrial areas and tertiary sector.

Actors of "Public industrial areas and tertiary sector"	
	Wallonia/Flanders:
5a. Municipality	Local alderman/service of the municipality who is responsible for economy, land management, environment, urban planning or public works. Some municipalities have already switched to alternative control methods; others reduce their use systematically to a zero-use of PPPs. Some municipalities have their own maintenance team, others contract weed control to subcontractors. Sometimes both are used.
5b. Intermunicipality	Intermunicipality means an association of municipalities which shares knowledge, expertise and means (pure intermunicipality). Sometimes private partners and the province council can also participate (mixed intermunicipality). Some intermunicipality workers can ensure weed control for their areas which belong to the involved intermunicipality. Some intermunicipalities contract weed control to subcontractors. Sometimes both are used. Some intermunicipalities have already switched to alternative control methods, others reduce their use systematically to a zero-use of PPPs.
5c. Province	Delegate/representative of the province who is responsible for economy, land management, environment, urban planning or public works. Some provincial workers can ensure weed control for their provincial areas. Some provinces contract weed control to subcontractors. Sometimes both are used. Some provinces have already switched to alternative control methods, others reduce their use systematically to a zero-use of PPPs.
5d. Region	Wallonia:
	Flanders:
	Service public de Wallonie - Direction générale opérationnelle de l'Aménagement du territoire, du Logement, du Patrimoine et de l'Énergie (DGO4) of Service Public de Wallonie
	Agentschap Ondernemen is an internal autonomous agency unincorporated. It belongs to the Economy, Science and Innovation (EWI). The agency is housed in buildings whose management is entrusted to the facility management agency. This agency only sets requirements for the subcontractor. They use and buy no plant protection products. In the context of the maintenance or renovation of buildings, they ensure that the contractor respects the current regulations.
5e. Private companies of parks and gardens	Wallonia/Flanders
	Private companies of parks and gardens can supervise in some cases weed management for public industrials and tertiary sector.
Actors of "Private industrial areas and tertiary sector"	
	Wallonia/Flanders:
5f. Private companies	Some private companies have got their own maintenance crew for weed control on their private areas.
5g. Private companies	Private companies of parks and gardens can ensure weed control for private

of parks and gardens

companies of tertiary sector or which own their own private industrial areas.

Examples: consulting firms specialized in environment, in remediation of polluted soils...



Figure 14: Industrial areas¹⁹

¹⁹ <http://www.panoramio.com/>

1.6. Sport areas (stadium, race course, tennis court...)

The manager and person in charge of sport areas can be represented by different actors in Belgium. More precisely, sport areas can be divided into public or private sport areas. This distinction between public and private sport areas involves that the actors responsible for the maintenance are different. The table below shows the actors involved in the use of plant protection products for public sport areas and for private sport areas.

Actors of "Public sport areas"	
	Wallonia/Flanders:
6a. Municipality	Local alderman/service of the municipality who is responsible for sport. Most of the time, some municipalities rely on their own maintenance crew for weed control or they delegate weed control to the members of sport clubs which are usually volunteers. Some municipalities have their own communal workers to proceed to the use of pesticides on weeds of their areas. Some municipalities can contract weed and disease controls to subcontractors. Sometimes both are used. Some municipalities have already switched to alternative control methods, others reduce their use systematically to a zero-use of PPPs.
6b. Intermunicipality	Intermunicipality means an association of municipalities which shares knowledge, expertise and means (pure intermunicipality). Sometimes private partners and the province council can also participate (mixed intermunicipality). Some intermunicipalities own their own maintenance crew for weed management. Some intermunicipalities contract weed and disease controls to subcontractors. Sometimes both are used. Some of them have already switched to alternative control methods, others reduce their use systematically to a zero-use of PPPs.
6c. Province	Delegate/representative of the province who is responsible for sport. Provinces have their own maintenance crew for their own sport areas. Some provinces have got their own gardeners to treat weeds. Some provinces contract weed and disease controls to subcontractors. Sometimes both are used. Some provinces have already switched to alternative control methods, others reduce their use systematically to a zero-use of PPPs.
6d. Public Social Assistance Centre	Some Public Social Assistance Centres are the owners of some sport areas. They have their own maintenance crew for weed and disease controls or can rely on some communal workers of some municipalities.
6d. Community	Flanders: Agentschap voor de Bevordering van de Lichamelijke Ontwikkeling, de Sport en de Openluchtcreatie (BLOSO) is a Flemish public institution. It is the administration of the Flemish Community responsible for sport. BLOSO has their own staff to control weed, but contract weed management also to subcontractors. Herbicides are used on football fields and multi-sports fields, on paved roads and in plant and flower beds.
6e. Fédération Wallonie-Bruxelles	Wallonia: Fédération Wallonie-Bruxelles is an institution at the service of French-Speaking Belgians. Fédération Wallonie-Bruxelles has got its own sport areas which are managed by their own maintenance crew.
6f. Private companies of parks and gardens	Wallonia/Flanders: The public actors which own a sport area can rely on private companies of parks and gardens for weed control.
Actors of "Private sport areas"	
6g. Private companies	Wallonia: Sport clubs are usually private companies. Sport clubs for high performance sport are private companies like "s.a.", "srl" and "sprl". For the
	Flanders: Vlaams Instituut voor Sportbeheer en Recreatiebeleid vzw (ISB) is the group of officials active in the municipal and provincial sport and sports services,

	<p>biggest sport clubs, they often use selective herbicide once or twice a year and they rely on private companies of parks and gardens for the use of PPPs to ensure weed control.</p> <p>Sport clubs for low performance sport are private companies like “asbl” or “association de fait”. Weed control is often managed by the members of sport clubs (or sometimes, they rely on private companies of parks and gardens). The use of PPPs in their small clubs is really limited.</p>	<p>sheriffs and managers of sports facilities, swimming pools and leisure centers. They don’t use PPPs, but the maintenance of the sport areas is done by the municipalities themselves. They just give information to the municipalities.</p>
<p>6h. Private companies of parks and gardens</p>	<p>Wallonia/Flanders:</p> <p>Private companies of parks and gardens can supervise weed management for private sport areas by using PPPs.</p> <p>Examples: Jardin Net-François Baudot (Corroy-le-Grand)...</p>	



Figure 15: Stadium²⁰



Figure 16: Racecourse²¹



Figure 17: Tennis court²²

²⁰ <http://www.wikistadiums.org>

²¹ <http://www.lalibre.be>

²² <http://archive.canalc.be/>

1.7. Golf courses²³

The manager and person in charge of golf courses can be represented by one actor in Belgium. The Greenkeepers association of Belgium is a private company (more precisely, an “asbl”) which centralizes information on all golf courses in Belgium.

Actors of “Private golf courses”	
7a. Private companies	<p>Wallonia/Flanders:</p> <p>Royal Belgian Golf Federation includes 51 golf courses in Flanders (Annex 1 point 1.5) and 32 golf courses in Wallonia (Annex 1, point 1.6). Private companies owning golf courses have a maintenance crew for weed management. Greenkeepers association of Belgium is responsible for the maintenance of the golf courses in Belgium. Weed and disease controls are done by their own maintenance team (herbicides and fungicides).</p>

The category 6 (Sport areas) is closely related with the category 7 (Golf courses). But the difference between them is that the treatments of plant protection products, the frequency of application of plant protection products and the treated surface areas are different (except for sport areas for high performance). Moreover, golf courses are only private areas.



Figure 18: Golf course

²³ The category 6 (Sport areas) is closely related with the category 7 (Golf courses). But the difference between them is that the treatments of plant protection products, the frequency of application of plant protection products and the treated surface areas are different (except for sport areas for high performance). Moreover, golf courses are areas which are only private areas. The data on use of plant protection products can be obtained by the greenkeeper for Wallonia and for Flanders (<http://www.greenkeeper.be/fr/index.php>).

1.8. Military fields and airport for military fields

The manager and person in charge of military fields can be represented by different actors in Belgium. The table below shows the actors involved in the use of plant protection products for military fields and airports for military fields. The military area is not a public space or a private space but the manager and person in charge of military fields are invited to respect notably the environmental law implemented in Belgium. In the framework of this study, military fields and airport for military fields have been considered as public spaces.

Actors of "Public military fields and airport for military fields"	
8a. Region	<p>Flanders:</p> <p>Agentschap voor Natuur en Bos (ANB) is an agency of the Flemish government that works for the preservation, protection and development of natural areas, forests and parks in Flanders. ANB manages 28 military fields and 7 airports for military fields. More information about the military fields and airports is provided in Annex 1 (point 1.7). ANB has a team responsible for weed control. They especially use herbicides. It happens sometimes that they contract weed management to subcontractors.</p>
8b. Belgian Army	<p>Wallonia/Flanders:</p> <p>"Belgian Army" is the national army of Belgium. According to the constitutional law, the King is the chief of Belgian Army. However, he relies on a structure composed by a Minister competent for the defense in the Belgian federal government. Belgian Army is divided into 4 different branches: the Land Component, the Air Component, the Maritime Component and the Medical Component</p> <p>The Belgian Land Component</p> <p>The Belgian Land Component is the Ground Arm of the Belgian Defense. The Land Component consists of one staff (COMOPSLAND), two brigades²⁴ (Light or Medium) and several support units. Each unit is supervised by a general officer. For each unit (Annex 1, point 1.8), there is a military person who is in charge of environmental management.</p> <p>In Wallonia, military camps (Marche-en-Famenne, Elsenborn and Lagland) have a notable ecological potential and are included in the Natura 2000 network. These camps represent 3,4% of the Walloon part. The military authority has concluded an agreement with the scientific authorities and the DNF²⁵ through a LIFE scheme (called "L'instrument Financier en Europe") to implement a sustainable management system allowing the preservation of biodiversity and the military training.</p> <p>The Belgian Air Component</p> <p>The Air Component is the air arm of Belgian Army originally founded in 1909. The Air Component has got different Air Bases located on the Walloon territory (Annex 1, point 1.9). These Air Bases require an environmental management that is supervised by a specialized military staff.</p> <p>Bierset²⁶ and Brustem²⁷ Air Bases located in Wallonia are not functional anymore. Note that Jehonville Air Base (located in Bertrix (Luxembourg)) is a NATO reserve airfield, built in the early 1950s at the request of NATO. It is operated by the Belgian Air Component even though there are no regular operations at that field.</p> <p>The Maritime Component</p> <p>The Maritime Component of Belgian Army is the naval service of Belgium. This Component aims at ensuring the presence of Belgium at sea, giving a support for our diplomacy and our foreign trade... There is no unit from the Maritime Component in</p>

²⁴ Light Brigade or Medium Brigade. The Light Brigade is used for rapid interventions by air or sea, on foot or with light vehicles. The men in the brigade are all qualified Paratrooper and Commando personnel, except for the light infantry battalion. The Medium Brigade is used for actions where heavy firepower and vehicles are needed.

²⁵ DNF: Département de la Nature et des Forêts of Service Public de Wallonie

²⁶ Located in the province of "Liège"

²⁷ Located in the province of "Limbourg"

	<p>Wallonia.</p> <p>The Medical Component</p> <p>The Medical Component of Belgian Army is the military medical service which provides medical support for its members in home and abroad operations, participating in humanitarian aid and providing certain services to the civilian society. The units of the Medical Component which are located in Wallonia are:</p> <ul style="list-style-type: none"> - 1 Operational Medical Centre (CMO), located in Marche-en-Famenne. - 1 Medical Intervention Elements (EMI), located in Ghlin which provides the means of transportation for the wounded as well as more specialized medical care in the field. - 1 Medical Technical Intervention Element (EMI-Tech), located in Nivelles, which is responsible for medical supplies in Belgium and abroad. <p>The use of plant protection products is managed by the members of different Components of Belgian Army for some military areas. Belgian Army implemented alternative practices without chemical weeding on their areas. The willingness of Belgian Army is to carry all weed control out (at maximum) to the private companies of parks and gardens in the future.</p>
8c. NATO	<p>Wallonia:</p> <p>The Supreme Headquarters Allied Powers in Europe (SHAPE) is the Headquarters of Allied Command Operations (ACO), one of NATO's two strategic military commands. It is located at Casteau, north of the city of Mons in the province of Hainaut in Wallonia. ACO is commanded by the Supreme Allied Commander Europe (SACEUR) and is responsible for all Alliance military operations. Chièvres Air Base is a United States military airbase, located in the Belgian town of Chièvres about 20 km from SHAPE, which is mainly used to provide logistic support to NATO and SHAPE.</p> <p>NATO in Wallonia has its own team for weed management.</p>
8d. War Graves institutions or commissions	<p>Wallonia/Flanders:</p> <p>The maintenance of English cemeteries in Belgium is managed by the Commonwealth War Graves Commission (CWGC) which is an intergovernmental organization of six independent member states whose principal function is to mark, record and maintain the graves and places of commemoration of Commonwealth of Nations military service members who died in the two World Wars. They care for cemeteries and memorials from building and maintaining the cemeteries and memorials to preservation of their records. Most of the time, they have their own maintenance crew to manage weeds around graves of foreign soldiers which are located in Belgium but PPPs are not used or in small quantities.</p> <p>The maintenance of German cemeteries in Belgium is managed by the German War Graves Commission (Volksbund Deutsche Kriegsgräberfürsorge in German). This Commission is responsible for the maintenance and upkeep of German war graves in Europe and North Africa.</p> <p>The maintenance of American cemeteries in Belgium is managed by the American Battle Monuments Commission.</p> <p>The maintenance of French cemeteries in Belgium is managed by France. More precisely, the maintenance of sites is ensured by diplomatic posts (embassies or consulates) which receive grants from the "Direction de la mémoire, du patrimoine et des archives" (DMPA)²⁸ of French State. Weed control is managed by their own team under the control of embassies and consulates.</p>

²⁸ The ONACVG is the local operator of DMPA for the maintenance and the renovation of graves.

8e. Private companies of parks and gardens²⁹

Private companies of parks and gardens are often engaged for weed control on some military fields. Belgian army is in charge of the maintenance of Belgian cemeteries since 2004 but weed control is only managed by private companies of parks and gardens which use PPPs to remove weeds. The objective of Belgian Army is to carry all weed control out (at maximum) to the private companies of parks and gardens in the future. Moreover, the workers for NATO which live on the military field can carry weed management out to private companies of parks and gardens for their own private spaces.



Figure 19: Military field³⁰



Figure 20: Airport for military fields³¹

²⁹ Private companies of parks and gardens using PPPs on the military areas have been considered as private companies of parks and gardens working for public institutions.

³⁰ <http://www.cdomuseum.be/>

³¹ <http://www.museespitfire.be/>

1.9. Leisure Park, Adventure Park, campsites and miniature golf

The manager and person in charge of Leisure Park, Adventure Park, campsites and miniature golf can be represented by different actors in Belgium. More precisely, Leisure Park, Adventure Park, campsites and miniature golf can be divided into public or private areas. This distinction between public and private leisure park, Adventure Park, campsites and miniature golf involves that the actors responsible for the maintenance are different. The table below shows the actors involved in the use of plant protection products for public and private areas.

Actors of "Public Leisure Park, Adventure Park, campsites and miniature golf"	
	Wallonia/Flanders:
9a. Municipality	Local alderman/service of the commune who is responsible for tourism, recreational areas... The municipal domains are mainly managed by their own municipal workers which eliminate weeds. Some municipalities contract weed control to subcontractors. Sometimes both are used. Some municipalities have already switched to alternative control methods; others reduce their use systematically to a zero-use of PPPs. Moreover, there are some campsites which are managed by some municipalities and the maintenance of those campsites is ensured by the municipal workers.
9b. Intermunicipality	Intermunicipality means an association of municipalities which shares knowledge, expertise and means (pure intermunicipality). Sometimes private partners and the province council can also participate (mixed intermunicipality). Some intermunicipalities have already switched to alternative control methods; others reduce their use systematically to a zero-use of PPPs. Some intermunicipalities have their own maintenance crew; others contract the weed control to subcontractors. Sometimes both are used.
9c. Province	Delegate/representative of the province who is responsible for tourism, recreational areas... The provincial domains are mainly managed by their own provincial workers which eliminate weeds. Some provinces have contract weed control out to subcontractors. Sometimes both are used. Some provinces have already switched to alternative control methods, others reduce their use systematically to a zero-use of PPPs.
9d. Region	Flanders: Toerisme Vlaanderen is an agency of the Flemish Government. It reports directly to the authority of the Flemish Minister of "Administrative Affairs, Foreign Policy, Media and Tourism". This agency doesn't use any PPPs. To collect information about PPPs-use, representatives of tourism should be contacted individually. Agentschap Plantentuin Meise of the Flemish Government. The agency is an international scientific research institution and a botanical garden which mainly states tropical and European botany central. They are doing research in botany to increase knowledge about plants and to contribute to the protection of biodiversity. The agency manages, preserves and promotes documented scientific collections of living and dried plants, fungi, seeds and plant tissues and has a museum, tourist and educational function. Their own maintenance team is responsible for weed and pest control especially in the greenhouses. Herbicides are especially used on pavements and roads. Insecticides are used in the greenhouses to combat pests.
9e. Private companies of parks and gardens	Wallonia/Flanders: Private companies of parks and gardens can supervise weed management on the public areas where there are leisure parks, campsites...
Actors of "Private Leisure Park, Adventure Park, campsites and miniature golf"	
9f. Private companies	Wallonia: Flanders³²:

³² Private leisure park, adventure park, campsites and miniature golf under the control of private companies but publicly accessible.

	<p>In Wallonia, there are a lot of leisure parks such as Walibi Belgium, Pairi Daiza, Monde sauvage d’Aywaille... which are managed by private companies (“asbl”, “sa”, “scrl”...). Most of private companies have their own maintenance crew for chemical weed control. Sometimes, private companies can contract weed management out to subcontractors. Moreover, some private companies have already switched to alternative control methods. Most of campsites are subject to a private or semiprivate management.</p>	<p>In Flanders, there are a lot of leisure parks such as Bobbejaanland, Plopsaland, Bellewaerde ... but also zoos and amusement parks such as the Zoo of Antwerp, Boudewijnpark, Plankendael, Serpentarium ... Some of these parks do not use any plant protection products, but only mechanical weed control methods applied by their own staff. In other parks the maintenance team is responsible for weed, disease and pest control and occasionally herbicides, insecticides and fungicides are applied when necessary. Rodenticides are sometimes applied by subcontractors.</p>
<p>9g. Private companies of parks and gardens</p>	<p>Wallonia/Flanders: Private companies of parks and gardens can supervise weed management on the private areas where there are leisure parks, adventure parks...</p>	



Figure 21: Leisure park



Figure 22: Campsite



Figure 23: Miniature golf³³

³³ Picture from http://www.malonne.be/old/associations/golf/golf3_bis.jpg

1.10. Schools

The manager and person in charge of schools can be represented by different actors in Belgium. Actors of education are classified differently in Flanders and Wallonia; this is why they are regarded separately. Most of schools in Wallonia and in Flanders have got their own gardeners or subcontract with private companies of parks and gardens. The type of education (free or official) does not influence the use of plant protection products. Anyway, some schools do not use plant protection products (only alternative control methods) and the others use few pesticides (especially herbicides) on their areas. The Walloon legislation³⁴ foresees to prohibit the use of pesticides on the areas of schools from 1st June 2018, more specifically inside and less than 50 meters from schools. The Flemish legislation³⁵ foresees to prohibit the use of pesticides on the areas of schools from the first of January 2015.

FLANDERS	
10a. Municipality	Local alderman/service of the commune who is responsible for education Onderwijssecretariaat van de Steden en Gemeenten van de Vlaamse Gemeenschap vzw (official subsidized education, actor of official education) (OVSG) is an educational organization of the Flemish Community.
10b. Province	Delegate/representative of the province who is responsible for education Provinciaal Onderwijs Vlaanderen (official subsidized education, actor of official education) is the overarching organization of the provincial schools and centers in Flanders.
10c. Community	Agentschap voor Infrastructuur in het Onderwijs (actor of official education) subsidizes and finances the purchase, construction and renovation for school buildings of schools with compulsory and High schools. AGIO also ensures the coordination and facilitation of public-private partnership involving the construction of infrastructure what is a partnership of the government and the organizing bodies with the private sector. Go! Onderwijs van de Vlaamse Gemeenschap (community education, actor of official education): These schools were formerly state schools. They are appointed by the Flemish community, using a "Council for community education shortened RAGO". Obviously they work with the money of the Flemish Community.
10d. Confessional schools	Vlaams Secretariaat van het Katholiek Onderwijs (VSKO) (actor of free education) is the overarching organization of the organizing bodies of Catholic education in Flanders. Onderwijskoepel van de Scholen met de Bijbel in Vlaanderen en Brussel (IPCO) (actor of free education), School with the Bible is the official name of a Flemish school with Protestant inspiration. VZW Jesode-Hatora-Beth-Jacob-Scholen (actor of free education).
10e. Non-confessional schools	Federatie Steinerscholen (actor of free education) is a school for nursery and primary (junior) and secondary education/secondary education (upper), based on the anthroposophical ideas of Rudolf Steiner. Freinetonderwijs Vlaanderen (actor of free education) is a form of education according to the philosophy and practice of the French teacher and educator Célestin Freinet. Federatie van Onafhankelijke Pluralistische Emancipatorische Methodescholen vzw (FOPEM) (actor of free education) is a group of different method Freinet schools and experiential project schools. Vlaams Onderwijs OverlegPlatform (VOOP) (actor of free education) is a group of fourteen schools in Flanders ranging from primary education (ordinary and extraordinary) to secondary education (general and special) and higher education to

³⁴ Article 4 of Walloon Government Decree of 11 July 2013

³⁵ Decree of Flemish government of 8 February 2013

	adult education.
10f. Private companies	They can have their own gardeners for weed control.
10g. Private companies of parks and gardens	Most of schools in Flanders subcontract chemical weed management with private companies of parks and gardens , whether it is the official education or the free education.

WALLONIA	
10a. Fédération Wallonie-Bruxelles (non-confessional)	Fédération Wallonie-Bruxelles (actor of official education): university, "Haute Ecole", agricultural school and boarding school... Fédération Wallonie-Bruxelles can have their own gardeners for chemical weed control.
10b. Province	Provinces (actors of official education) are the educational authorities for the officially subsidized education. Provincial workers can supervise weed management for provincial schools.
10c. Municipality	Municipalities (actors of official education) are the educational authorities for the officially subsidized education. Communal workers can supervise weed management for municipal schools.
10d. Diocese and religious congregation	Dioceses and religious congregations (actors of free education) for private people or organisations (mainly religious schools (catholic, protestant, Jewish...)) are the educational authorities for the free subsidized education (confessional). They can have their own gardeners for weed control.
10e. Private companies	Private companies (actors of free education) can have their own gardeners for weed control. There are a lot of non-profit making associations which are the educational authorities for the free subsidized education (non-confessional) and for the free subsidized education which are not confessional and confessional. They can have their own gardeners for weed control.
10f. Private companies of parks and gardens	Most of schools in Wallonia subcontract chemical weed management with private companies of parks and gardens , whether it is the official education or the free education.



Figure 24: Childrens playground

1.11. Health care establishment, rest home, hospital, day-nursery, childcare facilities

The manager and person in charge of health care establishments can be represented by different actors in Belgium. The table below shows the actors involved in the use of plant protection products for public and for private health care establishment.

Actors of "Public health care establishment, rest home..."	
	Wallonia/Flanders:
11a. Public Social Assistance centre	A lot of « Public Social Assistance Centres » are owners of nursing homes. Weed control is usually managed by their own maintenance crew or by communal workers.
11b. Municipality	Local alderman/service of the municipality who is responsible for welfare, health and family... Some municipal workers can remove weeds (for example) for some nursing homes which are managed by Public Social Assistance Centre. Some municipalities have already switched to alternative control methods; others reduce their use systematically to a zero-use of PPPs. Some municipalities have their own maintenance team, others contract weed control to subcontractors. Sometimes both are used.
11c. Province	Delegate/representative of the province who is responsible for welfare, health and family... Weed management for nursery facilities are realized for example by the provincial workers. Some provinces have their own maintenance team, others contract weed control out to subcontractors. Sometimes both are used. Some provinces have already switched to alternative control methods, others reduce their use systematically to a zero-use of PPPs.
11d. Intermunicipality	Wallonia: Some intermunicipalities are owners of some public health care establishments. Sometimes, they have their own maintenance team for chemical weed control.
11e. Community	Flanders: Vlaams Agentschap Zorg en gezondheid supports and regulates a range of care and health initiatives: from clean drinking water to healthy food, from cancer to infectious diseases and from preventive organizations to palliative care. Vlaams Agentschap Zorg en gezondheid doesn't use any plant protection products. The agency is housed in buildings whose management is entrusted to the facility management agency. This agency only sets requirements for the subcontractor. They use and buy no plant protection products. In the context of maintenance or renovation of buildings, they ensure that the contractor respects the current regulations. Het Vlaams Infrastructuurfonds voor Persoonsgebonden Aangelegenheden (VIPA) is an agency of the Flemish government that provides financial support to the VIPA welfare and health provisions that want to execute their infrastructure. VIPA doesn't use any plant protection products. The agency is housed in buildings whose management is entrusted to the facility management agency. This agency only sets requirements for the subcontractor. They use and buy no plant protection products. In the context of maintenance or renovation of buildings, they ensure that the contractor respects the current regulations. Kind en Gezin is a Flemish government agency that deals with preventive health care for young children. This agency uses some herbicides to control weed on their car parks. This is done by the concierge of the building. Vlaams Agentschap voor Personen met een Handicap (VAPH) wants the participation, integration and equal opportunities of persons with disabilities in all areas of social life. The goal is to have the maximum possible autonomy and quality of life reach. VAPH does not use any plant protection products. Fonds Jongerenwelzijn (FJW): A small amount of plant protection products are still applied especially to combat weeds. Those institutions have their own weed management teams.
	Wallonia/Flanders:

11g. Private companies of parks and gardens	Most of the public health care establishments subcontract with private companies for the maintenance of their green areas.
Actors of "Private health care establishment, rest home..."	
	Wallonia/Flanders:
11h. Private companies	Some nursing homes, nursery facilities and hospitals are classified as private companies. Sometimes, they have their own maintenance crew for weed management or they do it themselves.
11i. Private companies of parks and gardens	Private companies of parks and gardens can supervise chemical weed management on the private areas for private health care establishments, rest homes, nursery facilities...



Figure 25: Hospital³⁶



Figure 26: Rest home³⁷



Figure 27: Childcare facility³⁸

³⁶ <http://www.apsyucl.be/>

³⁷ <http://www.maisonsderepos.be/>

³⁸ <http://www.levif.be/>

1.12. Public Social Assistance Centre and housing corporations

The manager and person in charge of Public Social Assistance Centre and housing corporations can be represented by different actors in Belgium. The table below shows the actors involved in the use of plant protection products for that category.

Actors of "Public companies"		
12a. Public Social Assistance Centre	Wallonia: Centre Public d'action sociale (CPAS) is a public institution with legal personality. The CPAS delivers a number of social services and ensures the well-being of every citizen. Each municipality has got its own CPAS. Most CPASs usually have accommodation, fields, community gardens... The CPASs usually have their own maintenance crew for managing weeds on their areas. Or, sometimes, they can rely on communal workers to remove weeds by using PPPs.	Flanders: Openbaar Centrum voor Maatschappelijk welzijn (OCMW) is a public organization by municipality in Belgium. Most OCMWs only use alternative pest control methods, biocides like ant baits are still used. Others reduce their use of PPPs systematically to a zero-use. Most OCMWs have their own trained staff to apply plant protection products.
	Wallonia/Flanders:	
12b. Municipality	Each Municipality has its own CPAS offering a wide range of services. Communal workers can manage the elimination of weeds on the areas belonging to public actors (CPAS, Municipalities...).	
	Wallonia/Flanders:	
12c. Province	Some provincial workers can work on weed management for some housing corporations of public service, others contract weed control to subcontractors. Sometimes both are used. Some provinces have already switched to alternative control methods, others reduce their use systematically to a zero-use of PPPs.	
12d. Intermunicipality	Intermunicipality means an association of municipalities which shares knowledge, expertise and means (pure intermunicipality). Sometimes private partners and the province council can also participate (mixed intermunicipality). Some intermunicipalities have already switched to alternative control methods; others reduce their use systematically to a zero-use of PPPs. Some intermunicipalities have their own maintenance team, others contract weed control to subcontractors. Sometimes both are used.	
12e. Region	Wallonia: Direction générale opérationnelle de l'Aménagement du territoire, du Logement, du Patrimoine et de l'Énergie (DGO4) du Service Public de Wallonie. Société wallonne du Logement (SWL) is the main institutional operator of the public housing policy in Wallonia. Organization of public interest, the SWL ensures, for account of the Wallonia Government, the supervision, the council and the technical aid, financial and administrative of the 64 Companies of Housing of Public utility (SLSP). It coordinates with local authorities (Municipalities, CPAS, Provinces) the development and the rental management of a park of more than	Flanders: Vlaamse Maatschappij voor Sociaal Wonen (VMSW) allows for the planning of social housing in Flanders by the timely preparation of the annual implementation program. VMSW contracts weed control to subcontractors. Especially herbicides are sometimes used.

	103.000 residences of public utility (mainly social and average) as well as the creation of residences intended for acquisition under social conditions, allowing the accession of the households the property of their housing. The Walloon housing corporations usually have their own maintenance crew for weed management on their green areas.	
12f. Private companies of parks and gardens	Wallonia/Flanders: Private companies of parks and gardens can supervise weed management on the public areas for CPAS and housing corporation.	
Actors of "Private companies"		
	Wallonia/Flanders:	
12g. Private companies	Some private companies invest in the housing corporations. There are some partnerships between public and private companies. Moreover, there are some private companies which are specialized in the private housing corporations.	
12h. Private companies of parks and gardens	Private companies of parks and gardens can supervise weed management on the private areas for private housing corporations.	



Figure 28: Public Social Assistance Centre³⁹

³⁹ <http://fr.yelp.be>

1.13. Water, electricity, gas and phone companies

The manager and person in charge of water, electricity, gas and phone companies can be represented by different actors in Belgium. More precisely, water, electricity, gas and phone companies can be divided into public or private companies. This distinction between public and private involves that the actors responsible for the maintenance are different. The table below shows the actors involved in the use of plant protection products for public and for private water, electricity, gas and phone companies.

Actors of "Public companies" ⁴⁰					
13a. Municipality	<p>Wallonia:</p> <p>41 municipalities are active in Wallonia in the provision of drinking water. Some municipalities rely on their communal workers to eliminate weeds.</p>				
13b. Intermunicipality	<p>Wallonia/Flanders:</p> <p>Intermunicipality means an association of municipalities which shares knowledge, expertise and means (pure intermunicipality). Sometimes, private partners and the province council can also participate (mixed intermunicipality). The maintenance of "green areas" around water treatment plant can directly realized by the intermunicipality structures. Some intermunicipalities have already switched to alternative control methods; others reduce their use systematically to a zero-use of PPPs. Some intermunicipalities have their own maintenance team, others contract weed control out to subcontractors. Sometimes both are used. In Wallonia, 8 intermunicipality structures are active as water distributors.</p>				
13c. Private companies of parks and gardens	<p>Wallonia/Flanders:</p> <p>Private companies of parks and gardens can sometimes supervise chemical weed management for intermunicipalities.</p>				
Actors of "Private companies"					
13d. Private companies	<table border="1"> <thead> <tr> <th>Wallonia:</th> <th>Flanders:</th> </tr> </thead> <tbody> <tr> <td> <p>Water: "Société wallonne des eaux" (a public company with industrial and commercial interests) is the most important producer and supplier of drinking water in Wallonia. That company does not use any PPPs. They have already switched to alternative control methods. Weed control around water treatment plant can be realized by subcontractors (private companies). Some of them use plant protection products for the maintenance of their sites. Others use alternative techniques. The situation depends on the geographical area.</p> <p>Electricity/Gas Transmission grid operators: <u>Electricity transmission:</u> ELIA is Belgium's high-voltage transmission system operator (30 kV to 380 kV), operating over 8.000 km of</p> </td> <td> <p>Water: 10 distributors are active in Flanders.⁴³ The maintenance of "green areas" around water treatment plant is realized by subcontractors or by their own staff depending on the distributor. Since 2004, most of them switched to alternative control methods to maintenance their areas. Only to combat invasive alien species, PPPs are still used. From January 2015, PPPs will no longer be used.</p> <p>Electricity/Gas Transmission grid operators: <u>Electricity transmission:</u> ELIA is Belgium's high-voltage transmission system operator (30 kV to 380 kV), operating over 8.000 km of lines and underground</p> </td> </tr> </tbody> </table>	Wallonia:	Flanders:	<p>Water: "Société wallonne des eaux" (a public company with industrial and commercial interests) is the most important producer and supplier of drinking water in Wallonia. That company does not use any PPPs. They have already switched to alternative control methods. Weed control around water treatment plant can be realized by subcontractors (private companies). Some of them use plant protection products for the maintenance of their sites. Others use alternative techniques. The situation depends on the geographical area.</p> <p>Electricity/Gas Transmission grid operators: <u>Electricity transmission:</u> ELIA is Belgium's high-voltage transmission system operator (30 kV to 380 kV), operating over 8.000 km of</p>	<p>Water: 10 distributors are active in Flanders.⁴³ The maintenance of "green areas" around water treatment plant is realized by subcontractors or by their own staff depending on the distributor. Since 2004, most of them switched to alternative control methods to maintenance their areas. Only to combat invasive alien species, PPPs are still used. From January 2015, PPPs will no longer be used.</p> <p>Electricity/Gas Transmission grid operators: <u>Electricity transmission:</u> ELIA is Belgium's high-voltage transmission system operator (30 kV to 380 kV), operating over 8.000 km of lines and underground</p>
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⁴⁰ The « Commissie voor de Regulering van de Elektriciteit en het Gas (CREG) » of the federal state is an instrument for the regulation of the electricity and gas market in Belgium. This Commission does not require weed control because the Commission includes only offices and is not a distributor. In Wallonia, the "Commission wallonne pour l'énergie" does not require weed control because the Commission is a regulator including only offices and is not a distributor with electrical infrastructure requiring weed control.

⁴³ The website '<http://www.habitos.be/nl/bouwen/overzicht-watermaatschappijen-4985/>' presents a list with all water distributors in Flanders

	<p>lines and underground cables throughout Belgium. ELIA subcontracts with private companies of parks and gardens for the maintenance of their own sites but ELIA defines the methodology and the used products.</p> <p><u>Gas transmission:</u> Fluxys is the independent operator of the natural gas transmission and storage infrastructure in Belgium. Its subsidiary Fluxys LNG is the independent operator of the liquefied natural gas (LNG) terminal at Zeebrugge. Fluxys subcontracts with the company of parks and gardens « Vande Vijvere Fyto » for weed control of gravel surfaces in their facilities and « Krinkels » for the maintenance of plantations around their facilities.</p> <p>Electricity/Gas distribution grid operators: There are some <u>electricity</u> and natural <u>gas distribution</u> grids ensuring electricity transmission at medium and low voltage and ensuring gas transmission at medium and low pressure up to the companies and the residential customers. Distribution grids are local grids and have their own specific working area. This mission is assumed by the intermunicipality structures (association of Municipalities). ORES is a limited liability cooperative company which is in charge of managing electricity and natural gas distribution grids in 198 Municipalities in Wallonia. ORES is held entirely by the mixed intermunicipality companies which are the distribution grid operators (IEH, IGH, IDEG, INTEREST (OST), INTERLUX, INTERMOSANE, SEDILEC and SIMOGEL). The mixed intermunicipality companies have been appointed as electricity and/or natural gas grid operators for their respective regions. The term “mixed” refers to the fact that their shareholding bodies comprise both the Municipalities (majority holding) and a private company with a minority holding (Electrabel). More information about gas and electricity grid operators is provided in Annex 1 (point 1.10).</p> <p>Electricity/Gas suppliers: They sell electricity⁴¹ and/or natural gas⁴² which they purchase from producers or produce</p>	<p>cables throughout Belgium. ELIA subcontracts with private companies of parks and gardens for the maintenance of their own sites but ELIA defines the methodology and the used products.</p> <p><u>Gas transmission:</u> Fluxys is the independent operator of the natural gas transmission and storage infrastructure in Belgium. Its subsidiary Fluxys LNG is the independent operator of the liquefied natural gas (LNG) terminal at Zeebrugge. Fluxys subcontracts with the company of parks and gardens « Vande Vijvere Fyto » for weed control of gravel surfaces in their facilities and « Krinkels » for the maintenance of plantations around their facilities.</p> <p>Electricity/Gas distribution grid operators: There are some <u>electricity</u> and natural <u>gas distribution</u> grids ensuring electricity transmission at medium and low voltage and ensuring gas transmission at medium and low pressure up to the companies and the residential customers. Distribution grids are local grids and have their own specific working area. The distribution networks are managed by pure or mixed intermunicipal companies.⁴⁴ EANDIS is a Belgian subsidiary of the distribution of electricity and natural gas, which is active in 239 municipalities in Flanders. The shareholders of EANDIS are mixed Flemish distribution grid operators of electricity and natural gas, especially Gaselwest, IMEA, Imewo, Intergem, Iveka, Iverlek and Sibelgas. 79% of the shares of EANDIS are owned by the municipalities. The remaining 21% are still owned by the private company Electrabel. According to the Flemish decree on intermunicipal cooperation Electrabel should be stepped out completely by 2018 from the capital of EANDIS.</p> <p>Electricity/Gas suppliers⁴⁵: They sell electricity and/or natural gas which they purchase from producers or produce</p>
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⁴¹ The website “<http://www.cwape.be/?dir=4.1.02&title=Fournisseurs>” of the “Commission wallonne pour l’Energie” presents a list with all electricity distributors in Wallonia

⁴² The website “<http://www.cwape.be/?dir=4.2.02>” of the “Commission wallonne pour l’Energie” presents a list with all gas distributors in Wallonia.

⁴⁴ The website ‘<http://www.vreg.be/overzicht-van-alle-netbeheerders>’ presents a list with all gas/ electricity grid operators in Flanders.

⁴⁵ The website ‘<http://www.vreg.be/overzicht-energieleveranciers>’ presents a list with all energy suppliers in Flanders.

	<p>themselves. They also provide services for the sale of energy to the customer. They call upon the companies of parks and gardens around the facilities. Examples: Electrabel, EDF Luminus, Lampiris, OCTA+ Energie, Renogen, SEVA... Phone: Operators for phone (Proximus, Mobistar...) call upon private companies to maintain their sites. Operators for phone coordinate directly the activities of maintenance but they subcontract with private companies of parks and gardens for the maintenance of their own sites.</p>	<p>themselves. They also provide services for the sale of energy to the customer. Most of them only use alternative weed control methods, others are still using some herbicides. The maintenance of the areas is outsourced to subcontractors. Examples: Electrabel, Luminus, Lampiris, OCTA+ Energie, Eneco... Phone: Operators for phone (Belgacom, Mobistar...) call upon private companies to maintain their sites. Operators for phone coordinate directly the activities of maintenance but they subcontract with private companies of parks and gardens for the maintenance of their own sites.</p>
13e. Private companies of parks and gardens	<p>Wallonia/Flanders: Some private companies of parks and gardens can ensure chemical weed management for some private companies.</p>	



Figure 29: Electricity grid

1.14. Forests and nature management

The manager and person in charge of the forests and nature management can be represented by different actors in Belgium. More precisely, the forests can be divided into public or private forests and nature management. This distinction between public and private involves that the actors responsible for the maintenance are different. The table below shows the actors involved in the use of plant protection products for public and for private forests and nature management. It is important to note that in Wallonia, the use of herbicides, fungicides and insecticides is prohibited⁴⁶ since 2009 except in some cases laid down by the Walloon Government⁴⁷. In Flanders, the use of PPPs is prohibited since 1990 according to the decree⁴⁸ that has been adapted on 9/05/2014.

Actors of "Public forests and nature management"	
	Wallonia/Flanders:
14a. Municipality	Local alderman/service of the municipality who is responsible for forest or public works. Some communal workers can manage weed and disease controls for forests belonging to their municipalities, others contract weed and disease control to subcontractors. Sometimes both are used. Some municipalities have already switched to alternative control methods, others reduce their use systematically to a zero-use of PPPs.
14b. Province	Some provincial workers can manage weed and disease control for forests belonging to their provinces, others contract weed and disease control to subcontractors. Sometimes both are used. Some provinces have already switched to alternative control methods, others reduce their use systematically to a zero-use of PPPs.
14c. Intermunicipality	Intermunicipality means an association of municipalities which shares knowledge, expertise and means (pure intermunicipality). Sometimes, private partners and the province council can also participate (mixed intermunicipality). Some intermunicipalities are owners of some forests like Vivaqua. Some intermunicipalities have their own maintenance team, others contract weed and disease controls to subcontractors. Sometimes both are used. Some intermunicipalities have already switched to alternative control methods, others reduce their use systematically to a zero-use of PPPs.
14c. Legal person under belgian public law	The groups of " Legal person under Belgian public law " are for example Société wallonne des Eaux... Those groups are the owners of some forests and they can manage weed control in some cases.
14d. Public Social Assistance Centre	Some CPASs own their own forests. Some CPASs have their own maintenance team. Municipal workers can ensure the maintenance of those forests for some CPASs, others contract weed control to subcontractors. Some CPASs have already switched to alternative control methods, others reduce their use systematically to a zero-use of PPPs.
14e. Church wardens	Some church wardens own their own forests. The communal workers often are responsible for using PPPs against weeds.
14f. Region	Wallonia:
	Flanders:
	Département de la Nature et des Forêts (of the Direction Générale Opérationnelle Agriculture, Ressources Naturelles et Environnement (DGO3) of Service Public de Wallonie) is a department of the Walloon Government
	Agentschap voor Natuur en Bos (ANB) is an agency of the Flemish government that works for the preservation, protection and development of natural areas, forests and parks in Flanders. ANB has a team responsible for weed control,

⁴⁶ Article 42 - Décret relatif au Code forestier du 15 juillet 2008 (M.B. 12.09.2008 - entré en vigueur le 13 septembre 2009 : A.G.W. 27 mai 2009 - M.B. 04.09.2009)

⁴⁷ Article 27 - Arrêté du Gouvernement wallon du 27 mai 2009 relatif à l'entrée en vigueur et à l'exécution du décret du 15 juillet 2008 relatif au Code forestier (M.B. 04.09.2009 - err. 05.11.2009)

⁴⁸ Artikel 20-Bosdecreet van 13 juni 1990

	which aims at managing forests, implementing the forest code, the laws on the preservation, protection and development of natural areas, forests and parks.	especially herbicides are used It happens sometimes that they contract weed management to subcontractors. Instituut voor Natuur- en Bosonderzoek (INBO) is the Flemish research and knowledge center for nature and the sustainable management and use of it. INBO conducts research and provides knowledge to those who prepares, performs or is interested in policies. Since 2006, INBO uses no longer plant protection products.
	Federal:	
14g. Federal	Some forests belong to the “Belgian State” (for example, more precisely to the Department of National Defense).	
	Wallonia/Flanders:	
14h. Private companies of parks and gardens	The treatments with plant protection products are sometimes realized by private companies of parks and gardens for municipalities, provinces, legal person under Belgian public law, CPAS, church wardens, federal state and Regions.	
Actors of “Private forests and nature management”⁴⁹		
	Wallonia/Flanders:	
14i. Private companies	Some private companies are owners of some forests. Sometimes, some members of private companies can eliminate weeds or they can have a maintenance crew for weed management or they can rely on private guards and forest experts which ensure the supervision and manage the maintenance of forests. Forest experts are presented in the list of “Fédération Nationale des Experts Forestiers”: http://www.experts-forestiers.be/	
14j. Private companies of parks and gardens	Wallonia:	Flanders:
	The website “Union des Entrepreneurs de Travaux forestiers en Wallonie” http://www.woodnet.com/fr/home.asp presents specialized private companies in the matter of forest management.	The website “Unie van de Vlaamse bosbouw” www.uvb.be presents specialized private companies in the matter of forest management.

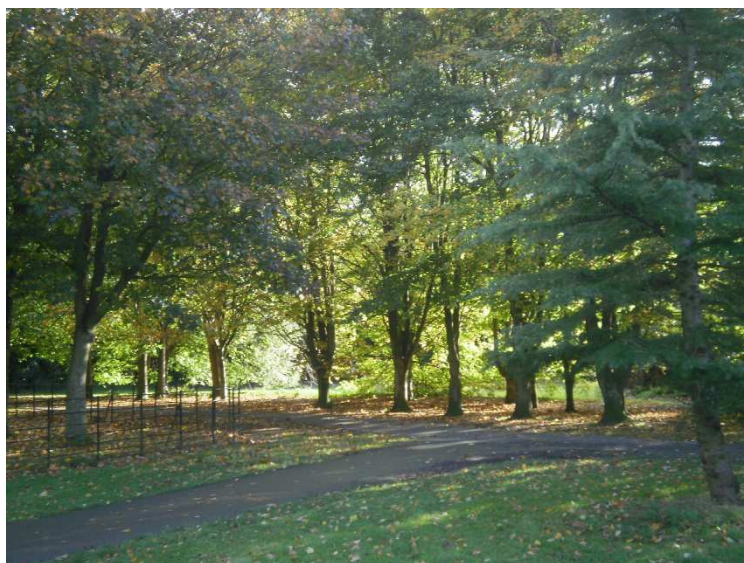


Figure 30: Forest

⁴⁹ A high proportion of private owners manages their forest themselves by devoting a lot of time, but without necessarily planning management. Their forests can be open to the public. They can sometimes rely on private guards and forest experts who ensure the supervision and manage the maintenance of forests. Those private owners are included in the category 1: “Private use”.

1.15. Navigable waterways

The manager and person in charge of navigable waterways can be represented by different actors in Belgium. The table below shows the actors involved in the use of plant protection products for public navigable waterways in Belgium.

Actors of "Public companies"	
	Wallonia :
15a. Municipality	Some municipalities can rent quays of navigable waterways to the Walloon Region or can supervise weed control for car parks dedicated to the boats. Some of them have already switched to alternative control methods; others reduce their use systematically to a zero-use of PPPs. Some municipalities have their own maintenance team, others contract weed control out to subcontractors. Sometimes both are used.
15b. Intermunicipality	Intermunicipality means an association of municipalities which shares knowledge, expertise and means (pure intermunicipality). Some intermunicipalities can rent quays of navigable waterways to the Walloon Region or can supervise weed control for car parks dedicated to the boats. Some of them have already switched to alternative control methods; others reduce their use systematically to a zero-use of PPPs. Some intermunicipalities have their own maintenance team, others contract weed control out to subcontractors. Sometimes both are used.
15c. Province	Some provinces have already switched to alternative control methods; others reduce their use systematically to a zero-use of PPPs. Some provinces have their own maintenance team, others contract weed control out to subcontractors. Sometimes both are used.
15d. Region	Wallonia: Service Public de Wallonie (Direction générale opérationnelle "Mobilité et Voies hydrauliques" including the five « Direction des Voies Hydrauliques ») – is in charge of the maintenance of the network for waterways and for paths along waterways. The towpaths which are the sections of Ravel network are managed by the Direction too. Sometimes, they can use few pesticides on some towpaths or areas which are distant from the waterways. They usually do not use pesticides along waterways and paths which are located close to the waterways. Also, "Direction Générale Opérationnelle de la Mobilité et des Voies hydrauliques du Service Public de Wallonie" manages the infrastructure and the regulation of the use for water transport. The Direction manages water tourism which means the 17 marinas, nautical stopping point and nautical relay. More information about the 17 marinas is provided in Annex 1 (point 1.4). Each Direction manages its own maintenance crew for weed control. They have a contract for the maintenance of some areas (invasive
	Flanders: NV Scheepvaart is an agency of the Flemish government that has the most important waterways under his management in the Belgian provinces of Antwerp and Limburg. It has the primary task of maintenance, operation, management and commercialization of the Albert Canal, the Kempen channels, the Schelde-Rijn Canal and the Common Maas. Plant protection products are used at the height of warehouses and around lock and bridge complexes. An own team is responsible for the maintenance of the areas. According to the quickly evolving legislation, these tasks will be contracted to subcontractors in the future. Waterwegen en Zeekanaal NV is an external autonomous agency of the Flemish government, responsible for the management of the waterways in central and western Flanders. Plant protection products are used on several pavements, parkings, bridges and beyond street furniture. An own maintenance team is responsible for weed control. From 2015, plant protection products will no longer be used. Agentschap Maritieme Dienstverlening

	<p>vegetation) with private companies of parks and gardens. The « Commissariat Général au Tourisme » of Service public de Wallonie manages the touristic infrastructure (accommodation, informative boards...).</p>	<p>en Kust is responsible for the security of the Flemish coast from flooding and strives for an integrated and sustainable management of the coastal zone. Further the agency is responsible for safe and efficient shipping to and from the Flemish ports. They don't use any PPPs.</p> <p>Afdeling Maritieme toegang of the policy indemnifies Mobility and Public Works, manages and maintains all maritime access to the Flemish maritime ports of Antwerp, Gent, Oostende and Zeebrugge. This department uses no longer any plant protection products. Also a ban on the use of PPPs is invariably included in maintenance specifications with third parties (subcontractors) for land in their ownership.</p>
	Wallonia:	
15e. Fédération Wallonie-Bruxelles	<p>Fédération Wallonie-Bruxelles is an institution at the service of French-Speaking Belgians. Fédération Wallonie-Bruxelles has got its own quays which are leased to concessions. They can be managed by their own maintenance crew.</p>	
15e. Public interest organizations	<p>Wallonia:</p> <p>In Wallonia, "Port Autonomes" are public interest organizations which aim at ensuring the management, the development and the equipment of industrial and port areas. The Ports are supported technically by the "Direction générale Mobilité et Voies hydrauliques du Service Public de Wallonie" for studies and the creation of port infrastructure (quays, docks...). The ports grant concessions and licenses to potential investors and users of waterways. Those ports are responsible for the management of public port lands which are located along waterways and which cannot be sold to a company. Many of them do not use PPP's anymore and have already switched to alternative control methods (mainly by using mechanical weeding), others reduce their use systematically to a zero-use of PPPs. Ports have usually their own maintenance team to destruct unwanted vegetation. In Wallonia, there are 4 ports:</p> <p>"Port autonome de Liège" is a public interest organization which is supervised by Wallonia and the City of Liège. The port is the largest inland port in Belgium and the third leading one in Europe (21 million tons in 2010). Located at the hub of a closely linked network of multimodal communications, the Liege port authority oversees 32 port areas (370 hectares available to the users of the waterway). It is currently developing Liege Trilogiport, a 100 hectares multimodal platform along the Albert Canal, 15h sailing time from the Port of Antwerp and 24h from the Port of Rotterdam.</p> <p>"Port autonome de Namur" aims at managing port areas located along the Meuse and Sambre in the province of Namur and at promoting transport by water and river tourism. Until now, the Namur Port Authority manages 15 industrial areas, 9 ports and 6 public ports and 8 marinas. The port areas are expending on 161 ha and offer 8 km of quays. The port is the result of an association between public authorities: Wallonia, the province of Namur, the City of Namur, the City of Andenne, the Commune of Floreffe, the intermunicipality company of management and economical equipment of Namur, of Famenne, Condroz and Haute-Meuse.</p> <p>"Port autonome de Charleroi" is an association of public of public authorities bringing together Wallonia, the intermunicipality association Igretec, the City of Charleroi and the Province of Hainaut. The Port can boast management of 460 hectares of land along 30 km of waterway between the Sambre and the entrance to the Charleroi-Bruxelles Canal, 70% of which are at present being used by more than</p>	

	80 businesses benefiting from high quality sites at good prices. “Port autonome du Centre et de l’Ouest” is an association between Wallonia and public and private companies. The port aims at managing port areas expending on industrial and commercial areas located on the territory of port areas of “Canal du Centre, de Nimy-Blaton-Péronnes, de Pommeroeul-Condé, de Blaton-Ath, de la Dendre, du Haut-Escaut et de la Lys ainsi que du canal Bruxelles-Charleroi.
	Wallonia/Flanders:
15f. Private companies of parks and gardens	Some private companies of parks and gardens can supervise weed management for Region and for businesses located along watercourses.
Actors of “Private companies”	
	Wallonia:
15g. Private companies	A lot of businesses located along watercourses lease quays in concessions to the Regions. They can use plant protection products to spread unwanted vegetation near the buildings, on their car parks... Some of them can have their own team for chemical weed management. Also, some private companies own some waterways areas and manage weed control for their own areas. Private companies located along watercourses are included in the category 5: Manager and person in charge of industrial areas, tertiary sector (commercial, touristic...).
15h. Private companies of parks and gardens	Some private companies of parks and gardens can supervise weed management for businesses located along watercourses.



Figures 31-32: Navigable waterways for water transport

Figure 33: Water tourism

1.16. Donation Royale

The manager and person in charge of “Donation Royale” can be represented by two actors in Belgium. The table below shows the actors involved in the use of plant protection products for “Donation Royale”.

Actors of “Public company”	
	Wallonia/Flanders:
16a. Autonomous public institution	Donation Royale is a Belgian independent public body which manages numerous grounds, castles and other buildings that King Leopold II of Belgium gave to the Belgian state in 1900.
16b. Private companies of parks and gardens	Private companies of parks and gardens can supervise weed control for some green areas belonging to “Donation Royale”.



Figure 34: Donation Royale

1.17. Immovable heritage

The manager and person in charge of immovable heritage can be represented by different actors in Belgium. More precisely, immovable heritage can be divided into public or private immovable heritage. The table below shows the actors involved in the use of plant protection products for public and for private immovable heritage. In Wallonia, approximately 3 350 real estate properties are classified as monuments, sites or archaeological sites. In Flanders, there are some 80 000 real estate properties classified as architectural heritage, historic parks and gardens, historic organs and World War Heritage. Immovable heritage refers also to cultural buildings (operas, theatres...).

Actors of “Public immovable heritage”					
	Wallonia/ Flanders:				
17a. Municipality	Local alderman/service of the commune who is responsible for public green, environment or public work. Some municipalities and some cities are owners of some heritage properties. In some municipalities and cities, the municipal workers are responsible for weed control on those sites, others contract weed control to subcontractors. Sometimes both are used. Some municipalities have already switched to alternative control methods, others reduce their use systematically to a zero-use of PPPs.				
17b. Province	Technical service of immovable heritage of provinces that is in charge of the maintenance of immovable heritage. Some provinces are owners of some heritage properties. In some provinces, the provincial workers are responsible for weed control; others contract the weed control to subcontractors. Sometimes both are used. Some provinces have already switched to alternative control methods, others reduce their use systematically to a zero-use of PPPs.				
17c. Intermunicipality	Technical service of immovable heritage of intermunicipalities that is in charge of the maintenance of immovable heritage. Some intermunicipalities are owners of some heritage properties. In some intermunicipalities, the workers from intermunicipalities are responsible for weed control. Some intermunicipalities have already switched to alternative control methods, others reduce their use systematically to a zero-use of PPPs.				
17d. Fédération Wallonie-Bruxelles	Wallonia: Fédération Wallonie-Bruxelles is an owner of several heritage properties. Federation Wallonie-Bruxelles has got a team for weed control in some of their heritage properties.				
17e. Region	<table border="1"> <thead> <tr> <th>Wallonia:</th> <th>Flanders:</th> </tr> </thead> <tbody> <tr> <td>Wallonia (more precisely, “l’Institut du Patrimoine wallon”) is an owner of its own listed assets. For example, we can find “casemates” and the “chapelle du béguinage” in Mons, the “auditorium” And the museums of « moulins de Beez » in Namur, the Forum and the Archéoforum in Liège and the park of “l’Harmonie” in Verviers. Wallonia has got its own teams for weed control in function of the listed assets. Moreover, Fonds du logement des familles nombreuses de Wallonie and public housing corporations are also owners of some listed assets in Wallonia. Most of those structures have got their own maintenance crew for weed control.</td> <td>Agentschap Onroerend Erfgoed Vlaanderen is an agency of the Flemish government. Immovable heritage are both architectural and archaeological heritage, landscape, heraldic and maritime heritage. This agency uses no plant protection products.</td> </tr> </tbody> </table>	Wallonia:	Flanders:	Wallonia (more precisely, “l’Institut du Patrimoine wallon”) is an owner of its own listed assets. For example, we can find “casemates” and the “chapelle du béguinage” in Mons, the “auditorium” And the museums of « moulins de Beez » in Namur, the Forum and the Archéoforum in Liège and the park of “l’Harmonie” in Verviers. Wallonia has got its own teams for weed control in function of the listed assets. Moreover, Fonds du logement des familles nombreuses de Wallonie and public housing corporations are also owners of some listed assets in Wallonia. Most of those structures have got their own maintenance crew for weed control.	Agentschap Onroerend Erfgoed Vlaanderen is an agency of the Flemish government. Immovable heritage are both architectural and archaeological heritage, landscape, heraldic and maritime heritage. This agency uses no plant protection products.
Wallonia:	Flanders:				
Wallonia (more precisely, “l’Institut du Patrimoine wallon”) is an owner of its own listed assets. For example, we can find “casemates” and the “chapelle du béguinage” in Mons, the “auditorium” And the museums of « moulins de Beez » in Namur, the Forum and the Archéoforum in Liège and the park of “l’Harmonie” in Verviers. Wallonia has got its own teams for weed control in function of the listed assets. Moreover, Fonds du logement des familles nombreuses de Wallonie and public housing corporations are also owners of some listed assets in Wallonia. Most of those structures have got their own maintenance crew for weed control.	Agentschap Onroerend Erfgoed Vlaanderen is an agency of the Flemish government. Immovable heritage are both architectural and archaeological heritage, landscape, heraldic and maritime heritage. This agency uses no plant protection products.				

17f. Federal	Federal: Some listed assets are in federal State hands. For example, we can have courthouses, “Régie des Bâtiments”, the ruins of “Villers-la-Ville”... They can have a team for chemical weed control or they can contract weed management out to private companies of parks and gardens. Sometimes, both are used.
17g. Public interest organization	Wallonia/Flanders: Some public interest organizations (for example, Commissariat général au Tourisme...) are owners for its own listed assets. They usually have a maintenance crew for weed control.
17h. Public Interest Fondation	Some Public Interest Fondations (for example, “Fondation Roi Baudoin”) have got its own listed assets and its own staff for weed control.
17i. Public Social Assistance Centre	Some Public Social Assistance Centres have got its own listed assets and its own staff for weed control or can rely on municipal workers in some cases.
17j. Private companies of parks and gardens	Private companies of parks and gardens can supervise weed control for some public immovable heritage belonging to municipalities, provinces, intermunicipalities, Fédération Wallonie-Bruxelles or Wallonia and Public Interest Fondation.
Actors of “Private immovable heritage”⁵⁰	
	Wallonia/Flanders:
17k. Private companies	Some private companies (non-profit making associations (“asbl”), limited company (“s.a.”)...) are owners for some listed assets. Most of private companies have got their own maintenance crew for weed management. Sometimes, they can subcontract weed control to the private companies of parks and gardens.
17l. Private companies of parks and gardens	Private companies of parks and gardens can supervise weed control for some private immovable heritage belonging to private companies and private owners.



Figures 35 and 36 : Immovable heritage

⁵⁰ Some private owners have got real estate properties which can be open or not to the public. Private owners which supervise weed control themselves are included in the category 1: “Private use”.

1.18. Remarks

The achievement of task 1 allowed highlighting difficulties in collecting information on the identification of different uses and the real users in Belgium.

As a reminder, Belgium is a federal state, comprised of the communities and the regions. This means that decision-making powers in Belgium are not centralized but divided between the federal state, three communities and three regions, all three of which are equal from the legal viewpoint. They are on an equal footing but have powers and responsibilities for different fields.

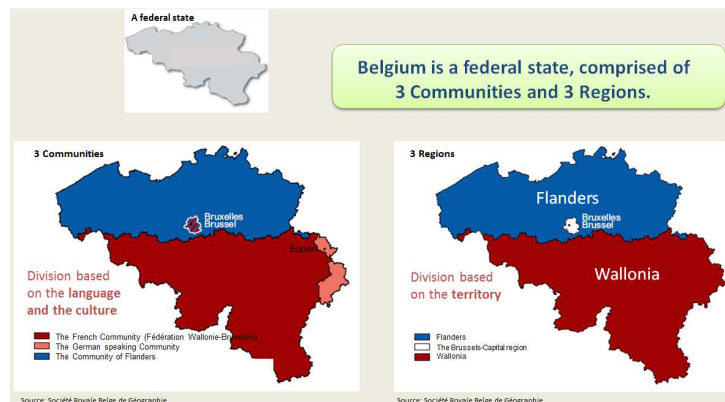


Figure 37 : Context in Belgium: Federal state, 3 Communities and 3 Regions

The federal state has important powers, for example in the area of foreign affairs, national defense, justice, finance, social security, important parts of national health and domestic affairs... The three communities are political entities which are based on the language (Dutch, French and German) and the culture: Fédération Wallonie-Bruxelles (formerly called “French Community), Flemish Community and German speaking Community. Belgium is also divided into three Regions which are territorial entities: Wallonia, Flanders and the Brussels-Capital Region. Regions have powers in fields that are connected with their region or territory in the widest meaning of the term. So, the Flemish Region, the Brussels-Capital Region and the Walloon Region have powers relating to the economy, employment, agriculture, water policy, housing, public works, energy, transport (except Belgian Railways), the environment, town and country planning, nature conservation, credit, foreign trade, supervision of the provinces, municipalities and intermunicipal utility companies. They also have powers relating to scientific research and international relations in those fields. The country is also divided into 10 provinces and 589 municipalities.

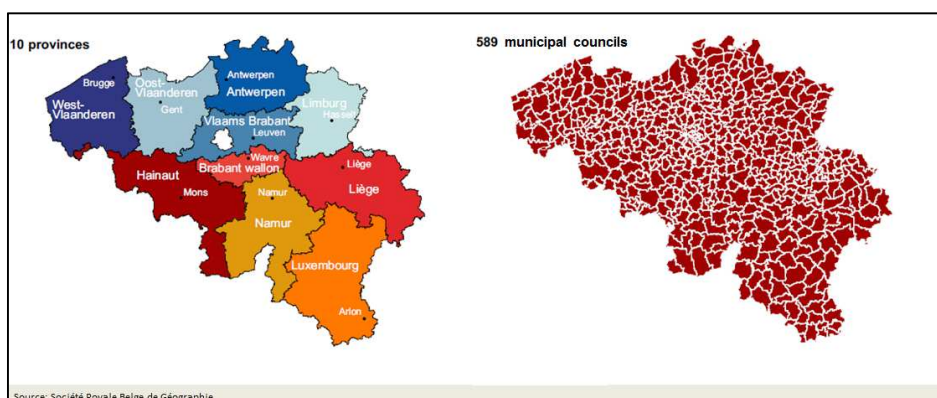


Figure 38 : Provinces and municipalities in Belgium

The provinces are autonomous institutions but they are under the supervision of the federal State, the Communities and mainly, the Regions. The provinces have extensive powers. They have devised initiatives in the fields of education, social and cultural infrastructures, preventive medicine and social policy. They also deal with the environment, with highways and waterways, the economy, transport, public works, housing, use of official languages... The powers of 589 municipalities are very extensive and cover everything that is linked to the collective needs of population. But they are subordinate local authorities. They are obliged to execute some decisions taken by higher authorities.

Given the complex federal structure of Belgium, the real user of plant protection products according to each use was sometimes hard to find out. Some categories of uses or some users may not be taken into account in this study.

Another difficulty was to obtain information about the uses of plant protection products for some categories of users. Moreover, a large block of powers were transferred on 1st July 2014 from federal level towards the federated entities in the context of the sixth Belgian State reform. The transfer of powers goes hand in hand with a transfer of budget and staff which will be effective on 1st January 2015 for the budget and on 1st April 2015 for the staff. In other terms, the transfer of competences involved some difficulties in obtaining information because for some categories of users, some individuals interviewed do not identify the institution or the person responsible for using plant protection products.

Given the implementation of Directive 2009/128/EC⁵¹ which has been adopted on 21st October 2009 and which aims at reducing the risk of PPPs to human health and the environment, the legislative texts in Wallonia and in Flanders have been adapted in order to respect the requirements (especially, provided for under Article 12) of that Directive. In Wallonia, the general banning of plant protection products will be implemented from 1st June 2019 in public spaces⁵². In Flanders, the use of plant protection products will be prohibited from 1st January 2015 for all public services⁵³ and from 1st June 2018 in some specific areas. In the framework of this study, all users of PPPs have been considered, to the extent possible. Also, a lot of users have been reducing their use systematically to a zero-use of pesticides. It is important to draw attention to the difficulties linked to the implementation of Directive 2009/128/EC on the estimation of used quantities of active substances over time. The objective targets deriving from Directive 2009/128/EC will impact the estimation on the used quantities of PPPs according to the years due to the implementation of new legal measures at federal and regional levels.

Another observed barrier is the lack of understanding for most people on the term “pesticides” or “plant protection products”. A lot of people think that they do not use PPPs but when defining the term “pesticides”, they realize that they may be defined as PPPs users. when more questions are asked. The meaning of “pesticide” is not always understood for most people.

⁵¹ Directive 2009/128/EC of the European Parliament and of the Council of 21 October 2009 establishing a framework for Community action to achieve the sustainable use of pesticides

⁵² Décret du 10 juillet 2013 instaurant un cadre pour parvenir à une utilisation des pesticides compatible avec le développement durable et modifiant le Livre Ier du Code de l'Environnement, le Livre II du Code de l'Environnement, contenant le Code de l'Eau, la loi du 28 décembre 1967 relative aux cours d'eau non navigables et le décret du 12 juillet 2001 relatif à la formation professionnelle en agriculture (M.B. 05.09.2013) et Arrêté du Gouvernement wallon du 11 juillet 2013 relatif à une application des pesticides compatible avec le développement durable et modifiant le Livre II du Code de l'Environnement, contenant le Code de l'Eau et l'arrêté de l'Exécutif régional wallon du 5 novembre 1987 relatif à l'établissement d'un rapport sur l'état de l'environnement wallon (M.B. 05.09.2013)

⁵³ Decree of 21/12/2001 on the reduction of pesticide use by public services in the Flemish Region (December 21, 2001) and decision of the Flemish Government on the detailed rules for the reduction programs to reduce pesticide use by public services in the Flemish Region (December 19, 2008).

Task 2: Methodology description for data collection on non-agricultural use of plant protection products

Based on previous investigations and due to the evolving legal context around plant protection products use in Belgium, a methodological approach has been developed in Belgium with a focus only on the definition of best methods for data collection on the pesticide use without trying to start collecting and processing data on uses of PPPs.

For each actor identified in task 1, the definition of best methods to collect the information on the pesticide use has been split into four parts:

- a review of all different methods of data collection already tested has been performed for each category of users
- an identification of advantages and disadvantages of all different methods of data collection already tested has been explained
- a degree of certainty related to each method of data collection already tested has been implemented
- a proposal of best methods of data collection for each category of user has been presented. The different proposals are based not only on the past experience but also on possible evolutions of legislation (book keeping obligation, registration of professional pesticide users...)

The subtasks include:

- a creation of an Excel table comprising :
 - different potential non-agricultural users of pesticides
 - unknown and known data on use of pesticides
 - tools which have been implemented to obtain some results for the unknown data
- a definition of a methodology taking into account the changes of legislative requirements in Belgium
- a realisation of small-scale surveys focused on the non-agricultural use of plant protection products for different category of users
- state-of-the-art on the current methodologies and the data developed in Belgium on the estimation of use of pesticides (both agri- and non-agricultural). Each methodology will be associated to a degree of certainty

2.1. Methods of existing data collection

Federal methods	
<ul style="list-style-type: none"> • Method 1: Data on sales figures of active substances in Belgium • Method 2: Data on sales figures of plant protection products in Belgium 	
Wallonia	Flanders
<ul style="list-style-type: none"> • Method 3: Survey on the use of pesticides by Walloon households • Method 4: Survey realized at Libramont Fair in 2012 on the use of pesticides by amateur gardeners • Method 5: Survey carried out for amateur gardeners in the framework of the study « Recherche relative à l'actualisation des indicateurs des rapports sur l'état de l'environnement wallon relatifs à l'utilisation de PPP en Région wallonne » • Method 6: Survey conducted by Ph. Ruelle defining the share of use of pesticides by amateur gardeners • Method 7: Distribution keys from Marot <i>et al.</i> (2008) allowing the allocation of used quantities of active substances between different types of users and between the different types of crops for agricultural use • Method 8: Distribution key of pesticides between different uses in Belgium from CERVA/CODA/VAR • Method 9: Survey on the impacts of plant protection practices for Municipalities and the Ministry for Equipment and Transport in Walloon Region (October 2006-March 2007) • Method 10: Survey carried out for Municipalities in the framework of the study « Recherche relative à l'actualisation des indicateurs des rapports sur l'état de l'environnement wallon relatifs à l'utilisation de PPP en Région wallonne » • Method 11: Data on active substances by Infrabel (kg) in Wallonia between 2005 and 2010 (chemical weeding of railway tracks and sites) • Method 12: Survey carried out for golfs in the framework of the study « Recherche relative à l'actualisation des indicateurs des rapports sur l'état de l'environnement wallon relatifs à l'utilisation de PPP en Région wallonne » • Method 13: Data on orders of herbicides (+ the place of destination) in 2010 and 2011 in military fields and airport 	<ul style="list-style-type: none"> • Method 14: Data on pesticide use by amateur users in Belgium • Method 15: Data on sales figures (non-public) of plant protection products of private companies in Belgium • Method 16: Data on pesticide use by public authorities in Flanders

2.2. Description, used methodology, advantages and disadvantages on methods of existing data collection

Method 1: Data on sales figures of active substances in Belgium

Type of methodology: Data collection

Description: The national sales figures of active substances have been made available by “Federal Public Service Health, Food Chain Safety and Environment” between 1992 and 2010 (except for 2006). The sales figures are all expressed in kilograms for each active substance. Sales figures of active substances are collected according to the requirements of Article 3 of Royal Decree of 28 February 1994⁵⁴ (modified by Royal Decree of 16 October 2007) on the authorization of manufacturing, import, export or packaging companies of pesticides for agricultural use⁵⁵. The authorization holders are obliged to give each year their statistical declaration on the manufacturing, the import, the export, the packaging, the sale or the storage of pesticides for agricultural use to the Federal Public Service Health, Food Chain Safety and Environment. The statistical declaration includes the quantities of pesticides expressed in weight or in volume concerning the manufacture, the import, the export, the package, the sale and the storage of plant protection products. The data are provided by commercial product and are converted to active substances based on authorized numbers. The final sales data correspond to the values reported for sales without the exports after placing on the market. The negative results are adjusted to zero. The statistical declaration has to be fulfilled through a form of which the template is defined in the annex of Royal Decree of 16 October 2007. The template can be found on the website of Phytoweb⁵⁶: www.phytoweb.be. This statistical declaration of which data are related to the year N-1 has to be transmitted to the FPS in January of the year N. Currently, Regulation (EC) n°1185/2009⁵⁷ establishes a common framework for the systematic production of Community statistics on the placing on the market and use of those pesticides which are plant protection products. The statistics shall apply to the annual amount of pesticides placed on the market and used in accordance with different annexes defined in this Regulation. Moreover, Article 67 (3°) of Regulation (EC) n°1107/2009⁵⁸ stipulates that authorization holders shall provide the competent authorities of the Member States with all data relating to the volume of sales of plant protection products in accordance with Community legislation concerning statistics on plant protection products.

Advantages:

- Mandatory data collection would allow the development of accurate and reliable data on the placing on the market and use of pesticides quickly and cost-efficiently;
- Data sales of active substances are the only data available which can be used to estimate the quantities used of active substances by each type of users;
- Data sales of active substances are published by the European Commission during the year N+2 and are accessible to the general public at that period. The data are also available on request to the FPS as soon as they are implemented in the year N+1⁵⁹.

⁵⁴ Royal Decree of 28 February 1994 on the authorization of manufacturing, import, export of packaging companies of pesticides for agricultural use has been modified by Royal Decree of 16 October 2007.

⁵⁵ Pesticides for agricultural use refer to the plant protection products and other pesticides which can be used in agriculture (article 1 (1°) of Royal Decree of 28 February 1994 concerning the storage, the placing on the market and the use of pesticides for agricultural use. The definition of plant protection products is indicated in Article 2 (1°) of the Directive 91/414/EEC concerning the placing of plant protection products on the market.

⁵⁶ Phytoweb is an official website managed by Federal Public Service Health, Food Chain Safety and Environment which gives access to the database on plant protection products authorized in Belgium. More specifically, the statistical declaration can be found according to the following links: Infos pour l'industrie- Lignes directrices administratives - Cotisation annuelle (tableau à remplir).

⁵⁷ Regulation (EC) n°1185/2009 of the European Parliament and of the Council of 25 November 2009 concerning statistics on pesticides.

⁵⁸ Regulation (EC) n°1107/2009 of the European Parliament and of the Council of 21 October 2009 concerning the placing of plant protection products on the market and repealing Council Directives 79/117/EEC and 91/414/EEC

⁵⁹ Article 3 (2) of Regulation (EC) n° 1185/2009 of the European Parliament and of the Council of 25 November 2009 concerning statistics on pesticides.

Disadvantages:

- The sold quantities of active substances are not equal to the used quantities. Indeed, the actual use of products in a given year may differ from the sales data. The storage or destocking realized by users and the exports or imports (legal or illegal) to other countries (especially in border areas) can explain some differences. According Pissart *et al.* (2005), the quantities of active substances which are actually used are lower than the sold quantities in 80% of cases;
- The reliability of some data supported by the authorization holders can be sometimes questioned regarding (especially) the import-export values;
- The use of an automatic calculation program which allows directly the conversion of plant protection products in their commercial form into active substances does not remove negative sales values. This involves that the real values of the sold quantities of active substances can be underestimated;
- For some active substances, the sold quantities are negative. How to explain these values on a reliable manner?
- The obtained data are applied to Belgium and are not based on Regions;
- Overestimates are also possible due to double declarations for the same product by the first and subsequent distributors. Double-reporting should in principle be avoided since only the company that places the product on the Belgian market for the first time should report the sold quantities but this rule might not be fully understood and errors are difficult to detect so far.

Source: Federal Public Service Health, Food Chain Safety and Environment, 2010.

Method 2: Data on sales figures of plant protection products in Belgium

Type of methodology: Data collection

Description: The national sales figures of plant protection products in their commercial form have been made available by “Federal Public Service Health, Food Chain Safety and Environment” in 2005 and 2010. The sales figures for plant protection products are all expressed in kilograms. Sales figures of commercial products are collected according to the requirements of Article 3 of Royal Decree of 28 February 1994⁶⁰ (modified by Royal Decree of 16 October 2007) on the authorization of manufacturing, import, export of packaging companies of pesticides for agricultural use. The authorisation holders are obliged to give each year their statistical declaration on the manufacturing, the import, the export, the packaging, the sale or the storage of pesticides for agricultural use to the Federal Public Service Health, Food Chain Safety and Environment. The statistical declaration includes the quantities of pesticides expressed in weight or in volume concerning the manufacture, the import, the export, the package, the sale and the storage of plant protection products. The data are provided by commercial product and converted to active substances based on authorized data by Federal Public Service Health, Food Chain Safety and Environment. The final sales data correspond to the values reported for sales without the exports after placing on the market. The negative results are adjusted to zero. The pesticides for agricultural use have to be listed in numerical order of authorization or authorization for parallel trade. The statistical declaration has to be fulfilled through a form of which the template is defined in the annex of Royal Decree of 16 October 2007. The template can be found on the website of Phytoweb⁶¹: www.phytoweb.be. This statistical declaration of which data are related to the year N-1 has to be transmitted to the FPS in January of the year N. Currently, Regulation (EC) n°1185/2009⁶² establishes a common framework for the systematic production of Community statistics on the placing on the market and use of those pesticides which are plant protection products. The statistics shall apply to the annual amount of pesticides placed on the market and used in accordance with different annexes defined in this Regulation. Moreover, Article 67 (3°) of Regulation (EC) n°1107/2009⁶³ stipulates that authorisation holders shall provide the competent authorities of the Member States with all data relating to the volume of sales of plant protection products in accordance with Community legislation concerning statistics on plant protection products.

Advantages:

- Mandatory data collection by authorization holders would allow the development of accurate and reliable data on the placing on the market and use of pesticides quickly and cost-efficiently.
- Data on sales plant protection products in commercial form can be converted into sales figures of active substances which can be used to estimate the quantities used of active substances for each category of user.

Disadvantages:

- The sold quantities of commercial products are not equal to the used quantities. The storage or destocking realized by users and exports or imports (legal or illegal) to other countries (especially in border areas) can explain the difference. According Pissart *et al.* (2005), the quantities of active substances which are actually used are lower than the sold quantities in 80% of cases.
- The reliability of some data supported by the authorization holders can be sometimes questioned (for example: seed treatment).
- The sales figures of commercial products are converted into sales figures of active substances with an automatic calculation program implemented by FPS. This program does not remove negative sales

⁶⁰ Royal Decree of 28 February 1994 on the authorization of manufacturing, import, export of packaging companies of pesticides for agricultural use has been modified by Royal Decree of 16 October 2007.

⁶¹ Phytoweb is an official website managed by Federal Public Service Health, Food Chain Safety and Environment which gives access to the database on plant protection products authorized in Belgium. More specifically, the statistical declaration can be found according to the following links: Infos pour l’industrie-Lignes directrices administratives-Cotisation annuelle (tableau à remplir).

⁶² Regulation (EC) n°1185/2009 of the European Parliament and of the Council of 25 November 2009 concerning statistics on pesticides.

⁶³ Regulation (EC) n°1107/2009 of the European Parliament and of the Council of 21 October 2009 concerning the placing of plant protection products on the market and repealing Council Directives 79/117/EEC and 91/414/EEC

values. This involves that the real values of the sold quantities of active substances can be sometimes underestimated.

- For some active substances, the sold quantities are negative. How to explain these values on a reliable manner?
- The national sales figures of plant protection products in their commercial form are not available for the general public for reasons of confidentiality;
- No control about the quality of data which are supplied;
- Overestimates are also possible due to double declarations for the same product by the first and subsequent distributors. Double-reporting should in principle be avoided since only the company that places the product on the Belgian market for the first time should report the sold quantities but this rule might not be fully understood and errors are difficult to detect so far.

Source: Federal Public Service Health, Food Chain Safety and Environment, 2010.

Method 3: Survey on the use of pesticide by Walloon households

Type of methodology: Online surveys (CAWI) + Paper and Pencil survey (PAPI)

Description: The survey was carried out during the year 2011 and was divided into two parts for a panel including 1702 Walloon households in order to find out their motivations on the (non)-use of plant protection products and to identify the alternative methods used. Postal (PAPI) and online surveys (CAWI) have been used to obtain some information on the use of plant protection products by amateur gardeners (Table 1).

Table 1: Composition of the base sample

Methodology	Number of sent questionnaires	Number of answers	Response rate (%)
CAWI	467	358	77%
PAPI	204	167	82%
TOTAL	671	525	78%

Online survey (CAWI⁶⁴) is an Internet surveying technique in which the interviewee follows a script provided in a website. Respondents can reach the survey in different ways, most frequently by clicking on a link in a personalized invitation mail or by clicking on a banner or a pop-up on a website. The questionnaires are made in a program for creating web interviews. Multimedia materials (pictures, audio or music files) can be integrated into the questionnaire. The website is able to customize the flow of questionnaires based on the answers provided, as well as information already known about the participant.

Paper And Pencil survey (PAPI) is a survey data collection which refers to the mailing of self-completion questionnaires to target groups. Postal surveys come in the form of a set of questions set out in a questionnaire which aim to ascertain people's opinions on particular topics. The questionnaire also generally provides the customer with the opportunity to make her own comments. The first part of the questionnaire indicates that nearly 60% of panel (950 households) completed the questionnaire. Among Walloon households who have got a garden (756 households) and who manage themselves their garden (655 households), a little more than half of households use plant protection products.

The second part of the survey on the use of pesticides by Walloon households was carried out from 1 to 25 September 2011. The analysis was based on a base sample of 671 Walloon households. In total, 525 answers were obtained in the framework of the survey. The inquiry underlines that 39% of households (205 households) use plant protection products among 525 Walloon households who have got a garden.

Advantages for online surveys (CAWI):

- Multimedia materials (pictures, audio or video files) can be integrated into the survey. The administrator has larger flexibility in displaying questions;
- The respondents can complete the survey in their own time;
- Cost efficient because of the lack of printing, interviewer and data input costs;
- Fast because respondents can be recruited and reached immediately, with the possibility to continuously track fieldwork;
- Less mistakes are made because of computerized filtering of the survey and because of automatic data collection;
- No interviewer bias;
- Respondents are anonymous and less likely to give socially desirable or politically correct answers;
- Reduction of the collection time;
- Real time processing;
- Real time data follow-up;
- Better access to certain targets (net surfers, working population...);
- No geographical constraint.

⁶⁴ Computer-Assisted Web Interviewing

Advantages for Paper and Pencil survey (PAPI):

- The collect of answers from a fairly large amount of persons is possible, within a relatively short time span, and a relatively limited economic range;
- The respondents get the possibility to answer the questionnaire when they feel like it and can find the time and space. In this manner, the respondents can use more time to think about difficult or complex questions when it is required, in order to provide the best answers;
- It is possible to present communication material or products etc. to the respondent, as long as it is possible to mail it along with the questionnaire;
- Coding, summarization and analysis of results by numbers, sample statistics and percentages (quantifiable results and statistical reliability);
- The results are easy to assimilate and communicate;
- It allows comparisons with previous exercises and exercises undertaken by others, if questions and samples are consistent;
- It can incorporate several issues in one survey (related issues best);
- It can provide baseline data for something you may wish to pursue.

Disadvantages for online surveys (CAWI):

- Not everyone has access to the Internet involving a limited response rate;
- A lot of people are not receptive to completing questionnaires online;
- The target is not representative of the national population. Senior citizens are poorly represented;
- Professionalization and spontaneous self-recruitment of certain panellists;
- Facility to quit the questionnaire;
- Obligation to protect the data.

Disadvantages for Paper And Pencil survey (PAPI):

- The response rate can be relatively low on a postal returned questionnaire survey;
- It represents a lot of administrative work;
- Questions related to the awareness are difficult to ask;

Common disadvantages for online surveys (CAWI) and for Paper And Pencil survey (PAPI):

- Difficulty to check the validity of answers and the respondent identity;
- Poor design can produce misleading results;
- Sample bias if too small and/or unrepresentative; is it a true snapshot of current opinion?
- It produces shallow qualitative data;
- No discussion or no dialogue with the respondents;
- The validation of responses without further follow up is difficult; there is a little control over who fills in the questionnaire; so results may not be representative;
- Questionnaires need to be kept short or they will put off respondents from filling them in.

Source: SPW-DGO3-DEMNA (panel GfK), 2010.

Method 4: Survey conducted at Libramont Fair in 2012 on the use of pesticides by amateur gardeners

Type of methodology: Face-to-face personal interviews (intercepting the respondents at Libramont Fair)

Description: A personal interview is a form of direct communication in which an interviewer asks respondents to answer questions face-to-face. The personal interviews were carried out by four interviewers over a period of four days (from 27 to 31 July 2012) at Libramont Fair. The Libramont agricultural, forestry and agri-food fair is a huge open-air exhibition that welcomes more than 200.000 visitors, along with 1.800 exhibitors and brands, on a site covering 300,000 m² every year. The locale for the personal interviews was located in the stand called “Comité régional PHYTO”. Two types of surveys were prepared before the event: one survey for households which use plant protection products and one survey for households which do not use plant protection product. During the Fair, the appropriate survey was given according to type of interviewed user. The total number of conducted surveys was 355 during the four days of the Fair. Among 355 surveys, 156 surveys were carried out by households which use PPPs and 199 surveys by households which do not use PPPs (Table 2).

Table 2: Number of surveys carried out according to the day

Friday, 27 July 2012		Saturday, 28 July 2012		Sunday, 29 July 2012		Monday, 30 July 2012	
Users of PPPs	Non-users of PPPs	Users of PPPs	Non-users of PPPs	Users of PPPs	Non-users of PPPs	Users of PPPs	Non-users of PPPs
28	40	46	74	48	49	34	36

Advantages:

- Opportunity for detailed feedback and clarification: the exchange with the interviewee generates dialogue and avoids misunderstandings (social experience). An interviewer who senses confusion can clarify the instruction or questions. Detailed questions can be asked and explained to the respondent. It can also include open-ended questions and more complicated or technical questions;
- Probing complex answers: the researcher may request a more comprehensive or clearer explanation with standardized questions;
- The questionnaire can often be longer;
- Cost-effective way of collecting data;
- Completeness of questionnaire: Questions are often fully answered due to the social interaction between a well-trained interviewer and a respondent in a personal interview;
- Offers a more personal approach, especially with the presence of four interviewers;
- The use of graphic, props and visual aids can be easily and economically incorporated into face-to-face surveys;
- High response rate: the presence of an interviewer generally increases the percentage of people willing to complete the interview. All they have to do is talk. Respondents typically are required to do not reading or writing;
- A means of gathering a snapshot on the views of a large number of people;
- Provides an efficient and often the only way of targeting opinions from consumers without internet access, email addresses or phone numbers, or who refuse to respond to other types of surveys;
- The results can be coded easily and quickly, analyzed and summarized in the form of numbers, percentages and sample statistics
- A high degree of control over the data collection process and environment is obtained through a face-to-face survey;
- Respondent suitability can be checked ensuring a representative sample;
- Results can be presented in different formats;
- It can incorporate other related issued in one survey (practices on problems of weeds and quantification on the uses of PPPs);
- *Lower costs for the personal interviews which are conducted at Libramont Fair (no travel is required to the respondent’s home; instead, the respondent comes to the interviewer, and many interviews have been conducted quickly in this way at Libramont Fair).

Disadvantages:

- Interviewer influence: the words or actions of the interviewer can influence unintentionally respondents to answer in a particular way (“Interviewer bias”);
- Lack of anonymity of respondent: questions of a personal nature are less likely to be answered fully and honestly in a face-to-face survey. A respondent in a personal interview may be reluctant to provide confidential information to another person;
- Costly for the researchers who must carefully hire, train, and monitor the interviewers and pay them to travel from one neighborhood to the next (and sometimes back again) knocking on doors;
- *Some populations can be difficult to reach in person at fair of Libramont: the targeted people at Libramont Fair have an interest on agriculture, forest and agri-food sector;
- If it produces qualitative data, it is often shallow and lacking in detail;
- It does not engage respondents in any detailed discussion or dialogue;
- It requires trained interviewers and good forward planning;
- It may be more time consuming for the respondent.

Source: Comité régional PHYTO, 2012

Method 5 : Survey carried out for amateur gardeners in the framework of the study « Recherche relative à l'actualisation des indicateurs des rapports sur l'état de l'environnement wallon relatifs à l'utilisation de PPP en Région wallonne »

Type of methodology: Face-to-face personal interviews (door-to-door surveys)

Description: A face-to-face survey is any survey in which an interviewer asks questions to the respondent in person. In our case, the door-to-door surveys were done by going to people's homes (chosen at random). In total, 1031 personal visits (nearly 60% of houses in the basin) were conducted in Pisselet basin which is located in a rural area but only 304 surveys have been completed. The surveys have been carried out by 10 holiday workers in August during one week between 3 pm and 7 pm. Questionnaires were administered interactively with the holiday worker asking the questions and recording the answers. The topics of personal visits were linked to the quantification of the use of herbicide substances. Information on the different practices of weeding has been gathered.

Advantages:

- Opportunity for detailed feedback and clarification: the exchange with the interviewee generates dialogue and avoids misunderstandings (social experience). An interviewer who senses confusion can clarify the instruction or questions. Detailed questions can be asked and explained to the respondent. It can also include open-ended questions and more complicated or technical questions;
- Probing complex answers: the researcher may request a more comprehensive or clearer explanation with standardized questions;
- The questionnaire can often be longer;
- Completeness of questionnaire: Questions are often fully answered due to the social interaction between a well-trained interviewer and a respondent in a personal interview;
- Offers a more personal approach, especially with the presence of four interviewers;
- The use of graphic, props and visual aids can be easily and economically incorporated into face-to-face surveys;
- High response rate: the presence of an interviewer generally increases the percentage of people willing to complete the interview. All they have to do is talk. Respondents typically are required to do not reading or writing;
- A means of gathering a snapshot on the views of a large number of people;
- Provides an efficient and often the only way of targeting opinions from consumers without internet access, email addresses or phone numbers, or who refuse to respond to other types of surveys;
- The results can be coded easily and quickly, analyzed and summarized in the form of numbers, percentages and sample statistics;
- A high degree of control over the data collection process and environment is obtained through a face-to-face survey;
- Respondent suitability can be checked ensuring a representative sample;
- Results can be presented in different formats;
- It can incorporate other related issued in one survey (practices on problems of weeds and quantification on the uses of PPPs);
- *Door-to-door interviews increase the participation rate: they provide a more representative sample of the population. People who do not have telephones, who have unlisted telephone numbers, or who are difficult to contact may be reached using door-to-door interviews.

Disadvantages:

- Interviewer influence: the words or actions of the interviewer can influence unintentionally respondents to answer in a particular way ("Interviewer bias");
- Lack of anonymity of respondent: questions of a personal nature are less likely to be answered fully and honestly in a face-to-face survey. A respondent in a personal interview may be reluctant to provide confidential information to another person;
- Costly for the researchers who must carefully hire, train, and monitor the interviewers and pay them to travel from one neighborhood to the next (and sometimes back again) knocking on doors;

- If it produces qualitative data, it is often shallow and lacking in detail;
- It does not engage respondents in any detailed discussion or dialogue;
- It requires trained interviewers and good forward planning;
- It may be more time consuming for the respondent;
- *Some populations can be difficult to reach in person because they are rarely at home: in our case, 1031 personal visits were conducted in Pisselet basin and 567 personal visits were not carried out due to the high rate of absenteeism;
- *Door-to-door interviews may exclude individuals who live in multiple-dwelling units with security systems, such as high-rise apartment dwellers, or executives who are too busy to grant personal interviews during business hours. Other people, for security reasons, simply will not open the door when a stranger knocks.

Source: Counet L., Janssens L., Marot J., Bragard C., 2010, Recherche relative à l'actualisation des indicateurs des rapports sur l'état de l'environnement wallon relatifs à l'utilisation de produits phytopharmaceutiques, Groupe de recherche « Phytopathologie », Earth and Life Institute, Université catholique de Louvain, Belgique, 69 pp.

Method 6: Survey conducted by Ph. Ruelle defining the share of use of pesticides by amateur gardeners

Type of methodology: Survey based on data collection

Description: a survey initiated by Philippe Ruelle has been carried out in 2004 on the use of plant protection products for amateur gardeners in 2004. This survey is based on the national sales figures of plant protection products in their commercial form which have been made available by “Federal Public Service Health, Food Chain Safety and Environment” and was focused on the packaging of sold commercial products. This survey allowed making an estimation on the distribution of professional uses (farmers, Infrabel, Municipalities and managers of green areas and roads) and amateur gardeners for the smoothed year 2001 (average 2001±1). The assumption used by Ph. Ruelle for the estimation on the use of PPPs by amateur gardeners is to consider that the small packaging of commercial products is considered as a product only intended for amateur gardeners provided that the commercial products are authorized for that use. The data related to the packaging were mentioned in the national sales figures of plant protection products in their commercial form. In other terms, this inquiry allowed identifying the sales quantities attributed to the amateur gardeners. Based on that assumption, 55 active substances were listed as active substances intended for amateur gardeners during the period comprised between 1992 and 2005.

Advantages:

- A way to estimate the use of plant protection products by amateur gardeners without the opinion of users;
- No travel required;
- Possible automation.

Disadvantages:

- Relative inaccuracy of criterion “size of packaging”: the big packaging can also be sold and used in 2001 by amateur gardeners (especially products containing diuron, MCPA, 2.4-D, glyphosate...) and inversely, the small packaging can also be sold and used by professional users in some cases;
- The sold quantities of commercial products are not equal to the used quantities. Amateur gardeners will often keep their products for several years.
- The unreliability of some data on the packaging supported by the authorization holders.

Source: Federal Public Service Health, Food Chain Safety and Environment (Service Maîtrise des Risques), 2004

Method 7: Distribution keys from Marot *et al.* (2008) allowing the allocation of used quantities of active substances between different types of users and between the different types of crops for agricultural use

Type of methodology: Expert judgment

Description: Expert judgment requires a consultation with one or more experts who are knowledgeable about one accurate topic to estimate the effort required to complete a specific project. Expert opinions may provide important knowledge to decision makers in many fields of politics, science and technology. The studies Marot *et al.* (2008) and Lievens *et al.* (2012) allowed the assessment of different uses of plant protection products for different users as well as for different categories of crops for the agricultural use between 1992 and 2010. More specifically, two distribution keys were implemented to distribute the quantities used of 44 active substances selected⁶⁵ between four types of users (amateur gardeners, Infrabel, municipalities and manager of railway network and farmers) (1) and between the different types of crops for agricultural use (2). Based on the methodology defined in the study Marot *et al.* (2008), allocation coefficients were defined for the four types of users by active substance and for the different categories of crops for agricultural use by active substance. Those allocation keys were submitted to a judgment of experts and were adapted according to their remarks and suggestions.

Advantages:

- the expert brings his experience and his knowledge from past projects to the proposed project;
- it does not require data, elaborate statistical tools or expertise;
- the expert judgment can be made easily and speedily;
- no travel required;
- no socio-economic intervention.

Disadvantages:

- the uncertainty of data in expert judgment: expert judgment depends on experts (knowledge, experience, motivation...), the state of knowledge on the topic and the dialogue between experts (person who has the knowledge) and researchers (person who carry on the expert judgment exercise);
- the expert's biases
- it can be hard to document the factors used by the expert who contributes to the estimate;
- it relies on judgment, hunch and intuition;
- in practice, this expert judgment is often done in an unstructured, subjective and ad hoc way.

Sources:

- Marot J., Rigo V., Fautré H., Bragard C., 2008, Contribution à l'actualisation des indicateurs de l'état de l'environnement wallon relatifs à l'utilisation des produits phytopharmaceutiques, Unité de phytopathologie (FYMY), Université catholique de Louvain, Belgique, 47 pp.
- Lievens E., Janssens L., Bragard C., 2012, Estimation quantitative des utilisations de produits phytopharmaceutiques par les différents secteurs d'activité en Wallonie. Rapport final de Convention entre le CRP et le SPW-DGO3. 129 pp (on-going study)

⁶⁵ 44 active substances represent approximately 80% (variable with the years) of the sold quantities of active substances in Belgium.

Type of methodology: Surveys and data collection

Description: Distribution key of pesticides between different uses in Belgium from CERVA/CODA/VAR is based on the results of six databases from surveys on the use of pesticides and on the national sales data of active substances. The comparison of registered uses with the registered national data sales leads to the definition of that distribution key. More specifically, the allocation of uses of pesticides has been defined by category (insecticides, fungicides, herbicides and soil disinfectants) and by user (agricultural and non-agricultural) in 1995, 2000 and 2003 inside agricultural regions and river sub-basins. The agricultural uses were divided into 14 categories of crops and the non-agricultural uses were split into amateur gardeners, Municipalities and managers of railway network. A share of use of pesticides remains not clearly enough attributed specifically to the identified users of the inquiries.

Advantages:

- See the advantages presented for the methods 1, 3, 7, 9 and 11

Disadvantages:

- See the disadvantages presented for the method 1, 3, 7, 9 and 11

Source:

- Pissard A., Van Bol V., Garcet JDP., Harckz P., Pussemier L., 2005, Calcul d'indicateurs de risques liés à l'utilisation de produits phytosanitaires. Etude préliminaire : détermination du niveau d'utilisation de pesticides en Région Wallonne, CERVA/CODA/VAR : Tervuren, Belgique. 42 pp.
- Flossie, J. and D. Van Lierde, Onderzoek naar gewasbeschermingmiddelen in wintergerst, blijvend grasland, tijdelijk grasland en laagstam appel in 1998. 1999, Ministerie van de Middenstand en Landbouw Bestuur voor Onderzoek en Ontwikkeling Centrum voor Landbouw Economie: Brussels (Belgium). 87pp.
- Flossie, J. and D. Van Lierde, Onderzoek naar gewasbeschermingmiddelen in aardappelen, suikerbieten en glasgroenten in 1999. 2000, Ministerie van de Middenstand en Landbouw Bestuur voor Onderzoek en Ontwikkeling Centrum voor Landbouw Economie: Brussels (Belgium). 48pp.
- Van den Bossche, A. and D. Van Lierde, Onderzoek naar gewasbeschermingmiddelen in wintertarwe, (korrel-en kuil) maïs, witloof, prei, champignons, en peren in 2000. 2002, Ministerie van de Middenstand en Landbouw Bestuur voor Onderzoek en Ontwikkeling Centrum voor Landbouw Economie: Brussels (Belgium). 131pp.

Method 9: Survey on the impacts of plant protection practices for Municipalities and the Ministry for Equipment and Transport in Walloon Region (October 2006-March 2007)

Type of methodology: Mail questionnaires and fax surveys

Description: Two surveys were carried out from October 2006 to March 2007 in order to have a better knowledge on the impact of plant protection practices for Municipalities and the Ministry for Equipment and Transport in Walloon Region. Those surveys were conducted for 97 Walloon Municipalities and 65 districts of the Walloon Ministry of the Equipment and Transport (MET) (Roads & Motorways Directorate-General and Hydraulics Ways Directorate-General). The questionnaire (26 questions about 6 topics) was sent by e-mail or fax with a response rate of 60/97 for Municipalities and 33/65 for districts.

Advantages for mail questionnaires:

- Geographic flexibility: mail questionnaires can reach a geographically dispersed sample simultaneously because interviewers are not required. Respondents who are located in isolated areas or those who are otherwise difficult to reach can easily be contacted by mail;
- Cost: mail surveys are less expensive, especially with very large samples. Most include follow-up mailings, which require additional postage and printing costs;
- Length of the questionnaire: the survey can sometimes contain longer and more complicated questions, since the respondent can see the questions and read it at their own pace;
- Respondent convenience: mail questionnaires can be filled out when the respondents have time, so respondents are more likely to take time to think about their replies;
- Pictures: mail questionnaires allow pictures to be shown as part of a question, or a tape to be included, if desired. Questionnaires can be personalized and data can be captured in real time;
- Anonymity of respondent: researchers almost always state that the respondent's answers specify will be confidential in the cover letter that accompanies a mail. Respondents are more likely to provide sensitive or embarrassing information when they can remain anonymous;
- Absence of interviewer: mail questionnaires can induce respondents to reveal sensitive or socially undesirable information. So, any potential interviewer bias may be reduced due to lack of contact with the interviewer;
- Standardized questions: mail questionnaires are highly standardized and the questions are quite structured. Questions and instructions must be clear-cut and straightforward.

Advantages for fax surveys:

- Cost: the fax surveys reduce the sender's printing and postage costs with potentially lower line transmission costs and can be delivered and returned faster than traditional mail surveys;
- No cover of letter: they avoid the folding and stuffing efforts and costs for both sender and respondent;
- Speed: the questionnaires are delivered faster, and if the respondent returns the questionnaire by fax, it delivers the return faster;
- Response rate: a faxed survey might encourage response by implying urgency or not being perceived as junk mail.

Disadvantages for mail questionnaires:

- No Internet access: not everyone has Internet access;
- Low response rate: many mailed surveys are never returned, making the sample very self-selective and less random, since there is little control over who completes and returns the survey and who does not;
- Absence of interviewer: the lack of personal contact can be a barrier for the respondent, especially in the comprehension of questions. Each respondent attaches a different personal meaning to each question. There is no interviewer to probe for additional information or clarification of an answer and

the recorded answers must be assumed to be complete. Ambiguous questions only create additional error. Surveys cannot be changed if problems are discovered in the course of data collection;

- Time: a minimum of two or three weeks is necessary for receiving the majority of the responses. The time between the first mailing and the cut-off date (when questionnaires will no longer be accepted) normally is six to eight weeks.

Disadvantages for fax surveys:

- Fax machines: a few households have got fax machines;
- Sample coverage: sample coverage is lower, unacceptably so in consumer and many small business populations;
- No colors: Image quality and the use of colors are restricted;
- No way to provide either prepaid response or a preaddressed response vehicle, such as an envelope;
- No possibility to enclose incentives;
- Possible delays: fax deliveries can be delayed by busy signals, equipment malfunctions and receivers running out of paper;
- Cost: the return of fax surveys costs the respondent money and so, some respondents may refuse to return the survey;
- Lack of privacy: the lack of privacy of faxes sent to central location machines could pose a problem, which can result in nonresponse or distorted responses for questionnaires involving sensitive issues.

Source : Godeaux D., Schiffers B., Culot M., 2007, Impact des pratiques phytosanitaires : enquête en Région wallonne auprès des utilisateurs non agricoles, FUSAGx-DGRNE, 15 pp.

Method 10: Survey carried out for Municipalities in the framework of the study “Recherche relative à l'actualisation des indicateurs des rapports sur l'état de l'environnement wallon relatifs à l'utilisation de PPP en Région wallonne”

Type of methodology: Face-to-face scheduled interviews (with appointments)

Description: Face-to-face personal interviews were made with ten Municipalities located in Pisselet basin and in Dyle-Amont basin. An appointment with the communal manager of green areas was scheduled before by phone. The scheduled face-to face based on a questionnaire was related to the practices of plant protection products used in the Municipalities. More specifically, the quantities and the names of PPPs in their commercial form were provided by the communal managers of green areas between 2007 and 2009.

Advantages: see the advantages (without *) presented for face-to-face personal interviews for the category “Amateur gardeners”

Disadvantages: See the disadvantages (without *) presented for face-to-face personal interviews for the category “Amateur gardeners”

Source : Counet L., Janssens L., Marot J., Bragard C., 2010, Recherche relative à l'actualisation des indicateurs des rapports sur l'état de l'environnement wallon relatifs à l'utilisation de produits phytopharmaceutiques, Groupe de recherche « Phytopathologie », Earth and Life Institute, Université catholique de Louvain, Belgique, 69 pp.

Method 11: Data on active substances uses by Infrabel (kg) in Wallonia between 2005 and 2010 (chemical weeding of railway tracks and sites)

Type of methodology: Data collection

Description: Data which are provided by Infrabel are quantitative figures on:

- ➡ 1) Used quantities of active substances (expressed in kg) in Wallonia on railways and various railway sites between 2005 and 2010
- ➡ 2) Used quantities of PPPs in their commercial form (expressed in kg or in L) in Wallonia on the site of Infrabel between 1996 and 2010
- ➡ 3) Used quantities of PPPs in their commercial form (expressed in L) in Wallonia through the train weeder (weed control on main rail tracks)

Advantages:

- Actual quantities used of PPPs and not based on assumptions of estimation
- Reliability of data
- Accuracy of data

Disadvantages:

- No disadvantage

Source: Infrabel, Jean-Pierre Deforêt, 2005-2010

Method 12 : Survey carried out for golfs in the framework of the study « Recherche relative à l'actualisation des indicateurs des rapports sur l'état de l'environnement wallon relatifs à l'utilisation de PPP en Région wallonne »

Type of methodology: Personal interview

Description: In the framework of this survey, one person in charge of the maintenance of golf courses was contacted and agreed to give some information to the interviewer about the quantities used of PPPs in golf courses during the years 2006, 2007 and 2008. At the time of this study in 2014, the president of greenkeepers in Wallonia has initiated data collection on uses of PPPs for golf courses in Wallonia.

Advantages:

- Overview of quantities used by a manager and person in charge of golf courses
- See the advantages (without *) presented for face-to-face personal interviews for the category "Amateur gardeners"

Disadvantages:

- Data on uses of PPPs for the golf courses not yet available at the time of this study
- See the disadvantages (without *) presented for face-to-face personal interviews for the category "Amateur gardeners"

Source: Counet L., Janssens L., Marot J., Bragard C., 2010, Recherche relative à l'actualisation des indicateurs des rapports sur l'état de l'environnement wallon relatifs à l'utilisation de produits phytopharmaceutiques, Groupe de recherche « Phytopathologie », Earth and Life Institute, Université catholique de Louvain, Belgique, 69 pp.

Method 13: Data on orders of herbicides (+ the place of destination) in 2010 and 2011 in military fields and airport

Type of methodology: Data collection

Description: Data on orders of herbicides (+ the place of destination) in the military fields and airports for the years 2010 and 2011 were provided by the officer of the Belgian Army which is in charge in particular of the management of green areas. The figures are only for PPPs applied by the teams of the Belgian Army for 2010 and 2011.

Advantages:

- Availability of data on orders of herbicides from the Belgian Army.

Disadvantages:

- Availability of data on orders of PPPs only for 2010 and 2011;
- No control about the quality of data that are supplied;
- Quantities are not systematically applied during the same year and can be temporarily stored;
- Some military quarters still have stocks (reduced) coming from orders of previous years but the quantities held are getting marginal.

Source: Ph. Melange (Officer-Section Infrastructure-Sous-section Appui), 2013

Method 14: Data on pesticide use by amateur gardeners

Type of methodology: Online survey

Description: In the context of the EFSA project 'Collection and assessment of data relevant for non-dietary cumulative exposure to pesticides and proposal for conceptual approaches for non-dietary cumulative exposure assessment (CFT/EFSA/PPR/2010/04)', few data on the pesticide use by amateur users in Belgium were recorded. The methodologies chosen to contact for interview the people for the compilation of the survey were by email, with a web-based direct access at the "Survey Monkey" link or hand in survey paper copy. In both cases, the survey was accompanied by a cover letter explaining the aim of the project. The survey was online from September 2011 until January 2012. The "Survey Monkey" software was used for this purpose. Contact was made with people known by the students and staff members of Department of Crop Protection Chemistry at Ghent University. Furthermore all Belgian e-mail address lists, such as the one held for participants in the International Symposium of Crop Protection (annual conference hosted at Ghent University) were used to make contacts for the survey. Recipients were also requested to forward the e-mail to their own contacts asking them if they were willing to participate in the survey. Contact was made by approximately 1000 e-mail addresses.

Advantages:

- It is easy to send the questionnaire to a large number of people at once;
- They all get the same basic information, so no bias is expected from the way the questions are asked;
- The survey covers all aspects needed to determine how amateur users are applying plant protection products;
- The respondents can complete the survey in their own time;
- Cost efficient because of the lack of printing, interviewer and data input costs;
- Less mistakes are made because of computerized filtering of the survey and because of automatic data collection;
- Reduction of the data collection time.

Disadvantages:

- The starting point for the contacts where chemistry or crop protection based educational institutes, therefore it cannot be considered for the general public. Any further surveys should look to improve this representativeness. For example a newspaper can be involved to help spread the survey across target countries, contacting the manufacturers and retailers such as garden centers. Contact with staff receiving specialized journals or e-information (for instance warning systems for amateurs to pests and diseases) or a professional institute involved in looking at what people purchase in supermarkets etc.
- Respondents replied that they enjoyed filling in the data in the survey. The group of respondents is divided quickly when asked if they like apply chemical pesticides or not. Up to the point where they are asked to give details of the products they have at home most people continue the survey. Getting details of the products to add to the survey on the computer, usually in the home is difficult. If a list of all products available on the market could be presented as a pick lists, maybe more people would complete the survey.

Source: "Laboratory of Crop Protection Chemistry"

Method 15: Data on sales figures (non-public) of plant protection products of private companies in Belgium

Type of methodology: Data collection

Description: The goal of the study ‘Evaluatie van bestrijdingsmiddelen voor amateurgebruik’ was to make an evaluation of the impact of plant protection products for amateur use on aquatic organisms in surface water, on bees and on the user. The impact was determined on the basis of various indicators using data on sales figures of plant protection products of private companies in Belgium. Phytofar is the Belgian Association of the plant protection products (pesticides). Phytofar promotes the proper use of pesticides to ensure a sustainable agriculture with respect for people, animals and the environment. This association collects data on sales figures of the private companies in Belgium.

Advantages:

- The data are more reliable than a survey, since a survey applies to a particular public and the data are also provided by the companies themselves.
- Cost effective way of collecting data.

Disadvantages:

- The collected data involve the sales figures of plant protection products for a given year, but there is no clarity on the import and/or export data of the products.
- Companies associated with Phytofar distribute about 90% of the amateur market.
- There is also a difference between the sales data of plant protection products and the actual amount that is used. Since the companies themselves supply their data, they decide which data will be announced. This is not the case when data are provided by the government.
- Some data are still incomplete: missing data occur because they are not always recorded. There is no uniformity in the data and the data collection.
- The obtained data apply to Belgium and are not regionally based.
- Finally, there is no control over the quality of the data supplied.

Source: “Phytofar vzw”

Method 16: Data on pesticide use by public authorities in Flanders

Type of methodology: Online inventory

Description: From 2010, public authorities in Flanders are required to complete an annual online inventory on the website www.zonderisgezonder.be in order to give some information about the used quantities of chemical pesticides and/or alternative control methods. Thus, the public authorities report what chemicals and alternative control methods were used during the year for which the inventory is applicable. The reporting on the previous year, according to the decree of 19 December 2008 and the provisions to the cooperation agreement for 2009-2013 should happen before April 1. For practical reasons, the data is exported annually by the VMM. Reporting on the previous year is no longer possible after April 1.

Advantages:

- The method is user-friendly. It is easy for the public authorities to fill in the online inventory. On the website of the VMM (www.zonderisgezonder.be) there is a guide how to use the online inventory of pesticide use. It contains step by step instructions how to complete the inventory.
- The respondent can complete the survey in their own time.
- Cost effective because of the lack of printing, interviewer and data input costs.
- Less mistakes are made because of computerized filtering of the survey and because of automatic data collection.
- Reduction of the collection time.

Disadvantages:

- There is no control over the quality of the data that is supplied. In addition, important parameters are missing in the final calculation file of the VMM for instance the composition of certain products. If a list of all products available on the market could be presented as a pick list, this problem might be overcome.

Source: "Vlaamse MilieuMaatschappij: Zonder is gezonder"

2.3. Summary table of degree of certainty about different methods of data collection in relation to the non-agricultural users

The summary table illustrates the degree of certainty (through a rating scale from 1 to 5) related to each method of data collection and related to each actor listed in task 1. A distinction has been made between Walloon, Flemish and federal methods.

	Method 1	Method 2	Method 3	Method 4	Method 5	Method 6	Method 7	Method 8	Method 9	Method 10	Method 11	Method 12	Method 13	Method 14	Method 15	Method 16
1. Amateur gardeners	2	2	3	3	3	4	3	4	*	*	*	*	*	3-4	3	*
2. Green areas (parks, gardens, cemeteries...)	*	*	*	*	*	*	3	3	2	2	*	*	*	*	*	2
3. Road infrastructure	*	*	*	*	*	*	3	3	2	2	*	*	*	*	*	2
4. Transport service	*	*	*	*	*	*	3	2	2	*	1	*	*	*	*	2
5. Industrial areas, tertiary sector (commercial, touristic, car park ...)	*	*	*	*	*	*	3	3	2	2	*	*	*	*	*	2
6. Sport areas (stadium, race course, tennis court...)	*	*	*	*	*	*	3	3	2	2	*	*	*	*	*	2
7. Golf courses	*	*	*	*	*	*	*	*	*	*	*	2	*	*	*	*
8. Military fields and airport for military fields	*	*	*	*	*	*	*	*	*	*	*	*	2	*	*	2
9. Leisure park, adventure park, campsites and miniature golf	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	2
10. Schools	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	2
11. Health care establishment, rest home, hospital, day-nursery, childcare facilities	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	2
12. Public Social Assistance Centre	*	*	*	*	*	*	3	3	2	2	*	*	*	*	*	2
13. Water, electricity, gas and phone companies	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	2
14. Forests and nature management	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	2
15. navigable waterways	*	*	*	*	*	*	*	*	2	*	*	*	*	*	*	2
16. Donation Royale	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
17. Immovable heritage	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*

	Federal methods
	Walloon methods
	Flemish methods
*	No existing data collection

Rating scale of the existing method	Evaluation
1	Very satisfactory
2	Satisfactory
3	Moderately satisfactory
4	Not very satisfactory
5	Very unsatisfactory

2.4. Proposal of best available methods and/or new methods of data collection

The definition of the best method of data collection has to be considered through the implementation of different tools. Also, a new methodology has to take into account the changes of legislative requirements in Belgium. The barriers have to be identified in order to find solutions and to propose new perspectives.

The different tools, the legislation, the data, the identified problems and the perspectives implemented in Wallonia and in Flanders can be found in Annex 2.

Task 3: Consolidation of official statistics

The objective of task 3 is **to implement a methodology of consolidation on pesticide statistics of sales and uses of PPPs based on obtained results.**

In order to implement this methodology, task 3 will result in proposals to National Statistical Institute (NSI) which is the reference authority for national statistics in Belgium and which has developed some expertise on pesticide statistics. The methodological and strategic support of NSI leads to design most appropriate data collection methods.

The **proposals to NSI** involve:

- a use of current database in terms of use of pesticides (at Belgian scale, more precisely in Wallonia and in Flanders)
- a confrontation of data on the use of pesticides in agriculture with non-agricultural data in order to avoid incoherence between statistics

The results of small scale surveys or data collections carried out in the second point will be **extrapolated** to a level (regional or national) which allows comparisons with data on pesticide sales (national) and agricultural use of pesticides (regional). Data gaps and incoherencies will be explained as much as possible and proposals will be formulated to improve the degree of confidence for the different categories of data.

The **extrapolation of results** involves an analysis of collected data on the use of pesticides for non-agricultural purposes in relation to agricultural uses.

3.1. Data on the use of plant protection products in agriculture

1. Wallonia

In Wallonia, the use of plant protection products in agriculture has been estimated through two types of databases: sales data from “Federal Public Service Health (FPS) Food Chain Safety and Environment” and data coming from the network for the collection of accountancy data from “Direction de l’Analyse Economique Agricole” (DAEA).

I. Sales data from FPS

a) Data sources

i. Data on sales figures of active substances in Belgium⁶⁶

National sales data of active substances have been provided by “Federal Public Service Health, Food Chain Safety and Environment” between 1992 and 2010 (except for 2006). Data on sales figures take the form of a table including the active substance and the sold quantity (expressed in kilograms).

ii. Data on utilized agriculture area

Data on utilized agricultural area for main crops are available in the "agricultural censuses / inquiries of May 2000-2010" on the website⁶⁷ of “Direction générale Statistique et Information économique (DGSIE)” for the period 2005-2010.

iii. Distribution key from Marot *et al.* (2008)⁶⁸

The distribution key of sold quantities of active substances sold by category of users and by category of crops for agricultural use has been provided by the study Marot *et al.* (2008)⁶⁹.

b) Methodology

The distribution key allowed the assessment of different uses of plant protection products for different users as well as for different categories of crops for agricultural use between 1992 and 2010 (except for 2006)⁷⁰. The principle of this distribution key is based on the fact that only active substances which represented more than a half-percent of the total tonnages of active substances sold in Belgium for at least a year were selected. On basis of this filter, 38 active substances accounting for 80% of sold quantities have been selected. Six active substances likely to have an impact on the quality of underground and surface waters have been added to this filter. Overall, the distribution key has been applied to 44 active substances in order to estimate the used quantities of

⁶⁶ See Method 1: Data on sales figures of active substances in Belgium

⁶⁷ <http://statbel.fgov.be/fr/statistiques/chiffres/economie/agriculture>

⁶⁸ See Method 7: Distribution keys from Marot *et al.* (2008) allowing the allocation of used quantities of active substances between different types of users and between different types of crops for agricultural use

⁶⁹ Marot J., Rigo V., Fautré H., Bragard C., 2008, Contribution à l’actualisation des indicateurs de l’état de l’environnement wallon relatifs à l’utilisation des produits phytopharmaceutiques, Unité de phytopathologie, Université catholique de Louvain, Belgique, 47 pp.

⁷⁰ Marot J., Rigo V., Fautré H., Bragard C., 2008, Contribution à l’actualisation des indicateurs de l’état de l’environnement wallon relatifs à l’utilisation des produits phytopharmaceutiques, Unité de phytopathologie, Université catholique de Louvain, Belgique, 47 pp and Lievens E., Janssens L., Bragard C., 2012, Estimation quantitative des utilisations de produits phytopharmaceutiques par les différents secteurs d’activité en Wallonie. Rapport final de Convention entre le CRP et le SPW-DGO3. 129 pp (on-going study)

those 44 active substances by category of users and by category of crops for agricultural sector based on sales data. More specifically, four types of users have been defined: amateur gardeners, municipalities and manager of railway network (Infrabel) and farmers. At the same time, fourteen categories of crops have been identified. In the distribution key, allocation coefficients were defined for the four types of users by active substance and for the different categories of crops for agricultural use by active substance. The allocation coefficients were submitted to an expert judgment and were adapted according to their remarks and suggestions. To sum up, the detailed distribution of sales data of active substances by type of users and by type of crops for agricultural use has been made on 44 active substances between 1992 and 2010 based on the allocation coefficients attributed by the experts.

c) Obtained data

Based on the methodology developed in the studies Marot *et al.* (2008) and Lievens *et al.* (2012), data on agricultural use for 44 active substances are available at Walloon and Belgian levels using national sales data. More precisely, the estimated quantities (expressed in kilograms) of 44 active substances (accounting for the majority of sales in Wallonia) used in agriculture are available for the period 1992-2010 (except for 2006) in Wallonia and in Belgium. Also, the estimated quantities of active substances used in agriculture can be obtained for 14 categories of crops.

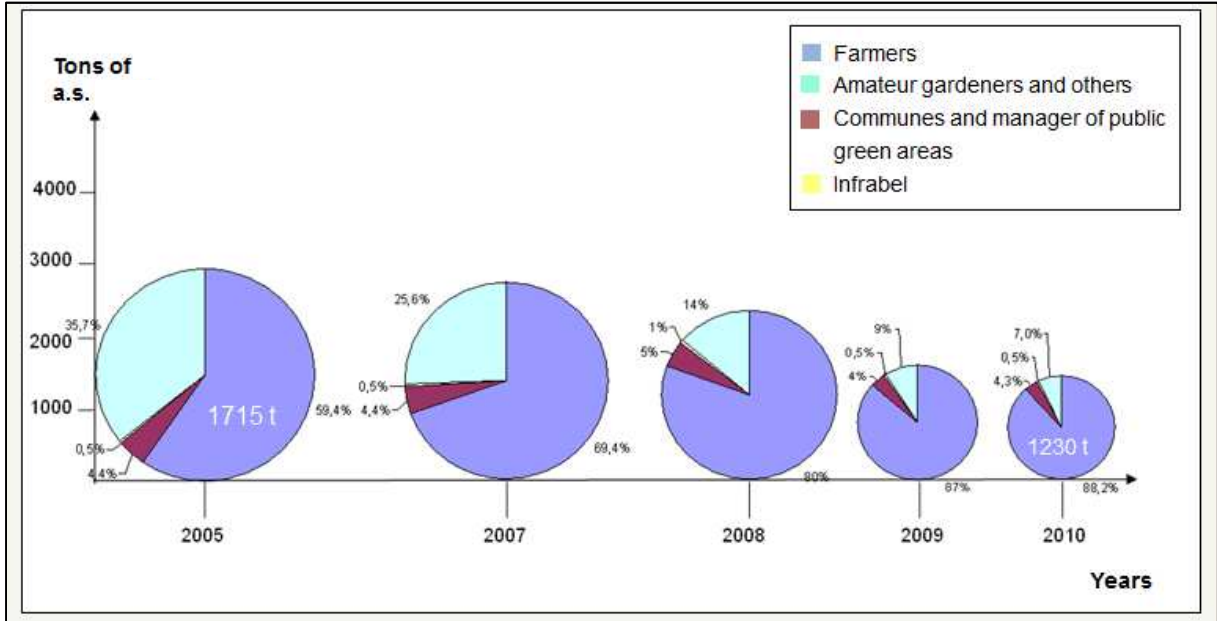


Figure 39: Distribution of estimated quantities (kg) of 44 active substances (which refer to the most sold active substances) used between the different types of users in Wallonia for 2005 (n=2.886.932 kg), 2007 (n=2.617.328 kg), 2008 (n=2.259.661 kg), 2009 (n=1.585.316 kg) and 2010 (n=1.394.666 kg)

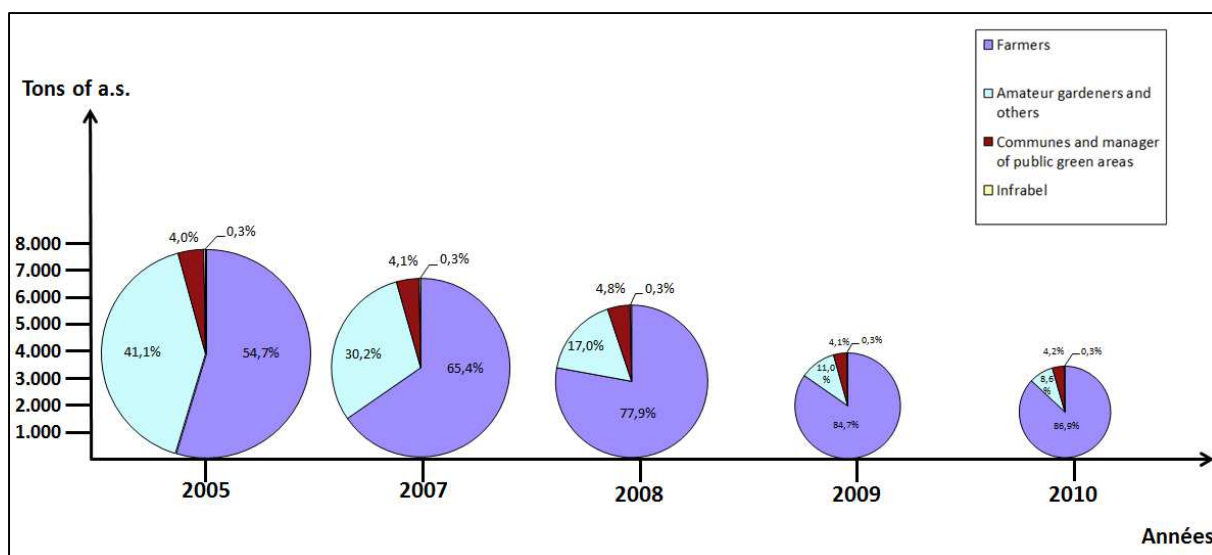


Figure 40: Distribution of estimated quantities (kg) of active substances (which refer to the most sold active substances) used between the different types of users in Belgium for 2005 (n=7.729.975, 13 kg), 2007 (n=6.841.055,98 kg), 2008 (n=5.739.599,05 kg), 2009 ((n=3.981.356,38 kg) and 2010 (n=3.513.367,73 kg)

As a reminder, the estimated quantities of 44 active substances (accounting for 80% sales in 2005 and 64% sales in 2010) were estimated to 1.230 tons in the agricultural sector for the year 2010 in Wallonia (Figure 39) and to 3.054 tons in Belgium (Figure 40) (Lievens *et al.* (2012)). By applying a rule of three in order to account for 100% sales of active substances in Wallonia, the estimation of used quantities in agriculture is equivalent to 1.921 tons in Wallonia and 4.770 tons in Belgium.

Data for the base year 2010:

- estimated quantities (kg) of 44 a.s. used in agriculture in Belgium: **3.054 tons**
- estimated quantities (kg) of all a.s. used in agriculture in Belgium: **4.770 tons**
- estimated quantities (kg) of 44 a.s. used in agriculture in Wallonia: **1.230 tons**
- estimated quantities (kg) of all a.s. used in agriculture in Wallonia: **1.921 tons**

II. Data of the network for the collection of accountancy data from DAEA

a) Data sources

i. Data on a sample of \pm 500 Walloon agricultural and horticultural holdings

The data sources on the uses of plant protection products have been provided by “Direction de l’Analyse Economique Agricole (DAEA)” which collected information on a sample of Walloon agricultural and horticultural holdings between 2004 and 2010 and more precisely, on:

- the characterization of agricultural holdings of the sample (types of farming and economic size)
- the type of crops in the agricultural holding
- the areas cultivated for each category of crops
- the commercial name of used plant protection products
- the authorization number of commercial products
- the applied quantities of active substances
- the unit price of plant protection product

- the seed prices, fertilizers, treatment product

The purpose of DAEA is to collect and to gather technical and economic data on the Walloon agricultural and horticultural holdings through a network for the collection of accountancy data in order to answer the requirements of the European legislation⁷¹. The legislation requires the Member States to create a network for the collection of accountancy data on the incomes and business operation of agricultural holdings in the European Community. In other terms, the accountancy data from DAEA are used for estimating and monitoring the profitability trend of agricultural and horticultural holdings in Wallonia. In the database of DAEA, there are also some data related to the plant protection products. DAEA has collected data on uses of plant protection products (in quantity and in monetary value) since 2002. The number of agricultural and horticultural holdings in the yearly samples from DAEA for Wallonia is presented in the table below between 2004 and 2010.

Table 3: Number of agricultural and horticultural holdings in the yearly samples and in Wallonia and the share of holdings included in the yearly sample in comparison with Wallonia

Years	Number of holdings in the yearly samples	Number of holdings in Wallonia ⁷²	% of number of holdings included in the yearly sample in comparison with Wallonia
2004	505	17.712	2,85%
2005	502	17.274	2,91%
2006	483	16.557	2,92%
2007	445	16.008	2,78%
2008	442	15.500	2,85%
2009	444	14.966	2,97%
2010	454	14.502	3,13%

The number of holdings in the yearly samples of the network from DAEA accounts, on average, for 2,91% of the total number of holdings in Wallonia. The number of holdings in the yearly samples ranges between 442 and 505 for the period 2004-2010.

ii. Data on utilized agricultural area

The utilized agricultural areas (UAA) of different crops between 2004 and 2010 were provided by the “Direction générale Statistique et Information économique (DGSIE)” for each agricultural region and for Wallonia. There are 10 agricultural regions in Wallonia (Table 4).

Table 4: List of agricultural regions in Wallonia

Agricultural regions	
Région sablo-limoneuse	Haute Ardenne
Région limoneuse	Région herbagère Fagne
Région herbagère liégeoise	Famenne
Campine hennuyère	Ardenne
Condroz	Région jurassique

⁷¹ Regulation n° 79/65/EEC of the Council of 15 June 1965 setting up a network for the collection of accountancy data on the incomes and business operation of agricultural holdings in the European Economic Community.

⁷² Source : « Direction générale Statistique et Information économique » from FPS

b) Methodology

The used quantities of plant protection products are available for a sample of agricultural and horticultural holdings in Wallonia between 2004 and 2010. The detailed information concerning the uses of plant protection products in agriculture are collected yearly among farmers and horticulturists through the network for the collection of accountancy data from “Direction de l’Analyse Economique Agricole” in Wallonia. According the studies Lievens *et al.* (2012) and Comité regional PHYTO (2013), a methodology has been implemented in order to extrapolate the quantities of active substances from annual samples of DAEA network up to Walloon level. This methodology has been applied for main crops between 2004 and 2010 taking into account the variability and the geographic distribution of farms. The weight corresponds to the ratio between the Walloon area (expressed in hectares) and the area (expressed in hectares) of each yearly sample from DAEA. The calculation was made for each crop and for each aggregated agricultural region. The Walloon area corresponds to the area of crops from DGSIE. The area of the yearly samples corresponds to the area of crops from the accounts data of DAEA. This methodology has been applied on all active substances of yearly samples from DAEA and not only on 44 active substances from sales data of FSPHFCSE.

c) Obtained data

Based on the network for the collection of accountancy data from DAEA, data on agricultural use for all active substances authorized on the Belgian market are available at Walloon level. More precisely, the extrapolated quantities (expressed in kilograms) of all active substances and not only of 44 active substances used in agriculture can be obtained for the period 2004-2010 (Lievens *et al.*, 2012) in Wallonia. The extrapolated quantities (expressed in kilograms) of all active substances in agriculture in Wallonia for the year 2010 is equivalent to 1.318 tons.

Data for the base year 2010:

-extrapolated quantities (kg) of all a. s. used in agriculture in Wallonia in 2010: 1.318 tons

2. Flanders

In Flanders, the use of plant protection products in agriculture has been estimated through two types of databases. Up to 2012, the use was estimated based on sales data from “Federal Public Service Health (FPS) Food Chain Safety and Environment”. Since 2013, data of the “Farm Accountancy Data Network (FADN)” managed by the Department of Agriculture and Fisheries of the Flemish government have been used to estimate the use of plant protection products in agriculture.

I. Sales data from FPS (Up to 2012)

a) Data sources

i. Data on sales figures of active substances in Belgium⁷³

National sales data of active substances have been provided by the “Federal Public Service Health, Food Chain Safety and Environment (FPS)” between 1992 and 2010 (except for 2006). Data on sales figures take the form of a table including the active substance and the sold quantity (expressed in kilograms).

⁷³ See Method 1: Data on sales figures of active substances in Belgium

ii. Data on utilized agricultural area

Data on utilized agricultural area for the main crops are available in the "landbouwenquête" on the website⁷⁴ of "The Directorate General Statistics and Economic Information (DGSEI)" for the period 2000-2013.

iii. Distribution key from De Smet & Steurbaut (2002)⁷⁵

The distribution key of sold quantities of active substances sold by category of crops for agricultural use has been provided by the study "Verfijning van de Seq-indicator voor de evaluatie van het bestrijdingsmiddelengebruik in Vlaanderen".

b) Methodology

A percentage distribution of the use of active substances per cultivation area was done in the first phase in the Flanders Environment Report (MIRA) based on a survey conducted in 1994 at the department of Crop Protection (UGent) in cooperation with authorized agents of plant protection products. Agriculture and horticulture were divided into 13 crop groups (Table 5). The distribution formula created based on that survey of 1994 is also called the distribution key of 1994. A new distribution key was determined in 2002, according to the methodology of De Smet & Steurbaut (2002). This method was more complex and consisted of a combination of the distribution key of 1994 improved with figures from FADN. The distribution in 13 crop groups was remained. Based on the Belgian sales figures the use in Flanders was calculated, taking into account the ratio of crop areas for agriculture and the population number for non-agricultural use. For all the products which came on the market after 2002, a method was developed that divided the quantities sold on the crops based on data from the agricultural monitoring network, information provided by Fytoweb, the percentage area of crops relative to the total crop area and per crop the ratio of the area in Flanders relative to Belgium.⁷⁶

Table 5: Classification of agricultural and horticultural crops in 13 groups

Agriculture	Horticulture
1 Potato	9 Ornamentals (outdoor)
2 Beet	10 Ornamentals (greenhouse)
3 Cereals	11 Fruit (outdoor)
4 Vegetables	12 Fruit (greenhouse)
5 Maize	13 Vegetables (greenhouse)
6 Industrial crops	
7 Fodder	
8 Meadows and pasture	

⁷⁴ <http://statbel.fgov.be/nl/statistieken/cijfers/economie/landbouw/bedrijven/#.U8T4NLFNjj9>

⁷⁵ De Smet, B. & Steurbaut, W. (2002). Verfijning van de Seq-indicator voor de evaluatie van het bestrijdingsmiddelengebruik in Vlaanderen, studie uitgevoerd in opdracht van de Vlaamse Milieumaatschappij, MIRA, MIRA/2002/02, Universiteit Gent, Vakgroep Gewasbescherming, 117p.

⁷⁶ Peeters, B. & Spanoghe, P. & Steurbaut, W. & Theuns, I. & De Cooman, W. & De Wulf, E. & Eppinger R. & D'hont, D. & Vanhille, A. & Huysmans, A. & Geeraerts, C. & Belpaire, C. & den Hond, E. (2010). Milieu- en natuurrapport Vlaanderen (MIRA), Achtergronddocument 2010: Thema Verspreiding van bestrijdingsmiddelen. Vlaamse Milieumaatschappij, 98p.

c) Obtained data

Based on the methodology developed in the study De Smet & Steurbaut (2002), data on agricultural use for the active substances are available at Flemish level using national sales data. More precisely, the estimated quantities (expressed in kilograms) of active substances used in agriculture and horticulture are available for the period 1990-2010 (except for 2006) in Flanders. Also, the estimated quantities of active substances used in agriculture can be obtained for 13 categories of crops⁷⁷.

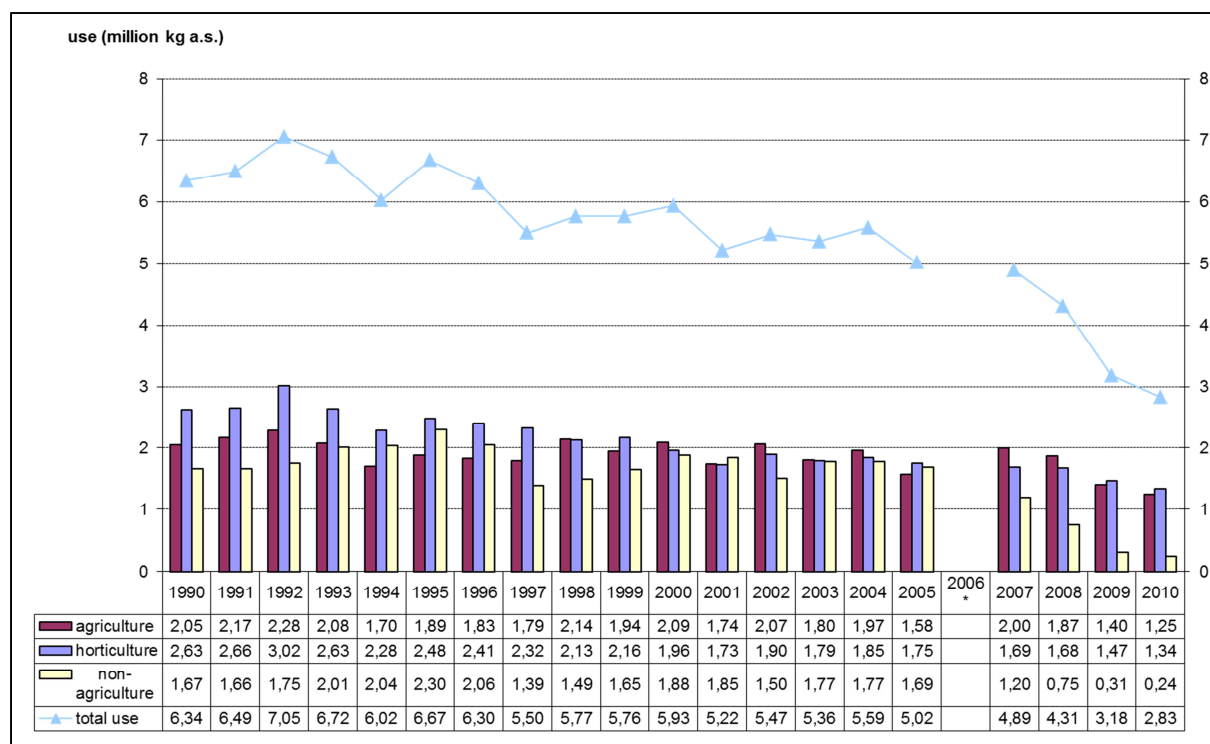


Figure 41: Use of plant protection products in agriculture, horticulture and non-agriculture (Flanders, 1990-2010))

Data for the base year 2010:

- estimated quantities (kg) of all a.s. used in agriculture in Flanders: **2.590 tons**

II. Data of the Farm Accountancy Data Network (FADN)

a) Data sources

i. Data on a sample of ± 700 Flemish agricultural and horticultural holdings

The division for Policy Analysis of the department of Agriculture and Fisheries provided data on the use of each product per crop for the years 2007 to 2011. Data concerning the active substances used in pesticides are registered by the Farm Accountancy Data Network (FADN). It is based on a representative survey of ± 700 farmers across Flanders and more precisely on:

- the characterization of agricultural holdings of the sample (types of farming and economic size)
- the type of crops in the agricultural holding

⁷⁷ <http://www.milieurapport.be/>

- the areas cultivated for each category of crops
- the commercial name of used plant protection products
- the authorization number of commercial products
- the applied quantities of active substances
- the unit price of plant protection product
- the seed prices, fertilizers, treatment product

The purpose of the FADN is to collect and to gather technical and economic data on the Flemish agricultural and horticultural holdings through a network for the collection of accountancy data in order to answer the requirements of the European legislation⁷⁸. The legislation requires the Member States to create a network for the collection of accountancy data on the incomes and business operation of agricultural holdings in the European Community. In other terms, the accountancy data from the FADN are used for estimating and monitoring the profitability trend of agricultural and horticultural holdings in Flanders. In the database of the FADN, there are also some data related to the plant protection products. The FADN has been collected data on plant protection products (in quantity and in monetary value) since 2005.

The number of agricultural and horticultural holdings differ from year to year, the average of some 700-750 holdings participate in FADN.

ii. Data on utilized agricultural area

The surfaces of the different crop groups required to express the obtained data of FADN in kg active substance were provided by the Directorate General Statistics and Economic Information (DGSEI). Data on utilized agricultural area for main crops are available in the "landbouwenquête" on the website⁷⁹ of "The Directorate General Statistics and Economic Information (DGSEI)" for the period 2000-2013. The number of areas recalculated based on the combination of croppings shown in Table 6, which are separately reported by DGSEI.

Table 6: Calculated crop acreages based on DGSEI data

	Crop group	Category
1	Potato	potatoes
2	Beet	fodder beets + sugar beets
3	Cereals	cereals for grain - grain maize
4	Vegetables	outdoor vegetables (strawberries included)
5	Maize	grain maize + fodder maize
6	Industrial crops	industrial crops - sugar beets
7	Horticulture (greenhouse)	horticulture (greenhouse)
8	Fruit (greenhouse)	fruit (greenhouse)
9	Floriculture	floriculture (outdoor)
10	Fodder	fodder - fodder beets - fodder maize - temporary meadows + post-cultivation hack fodder + post-cultivation other fodder
11	Meadows and pasture	area with permanent meadows + temporary meadows
12	Fruit (outdoor)	perennials - outdoor tree nursery

⁷⁸ Regulation n° 79/65/EEC of the Council of 15 June 1965 setting up a network for the collection of accountancy data on the incomes and business operation of agricultural holdings in the European Economic Community.

⁷⁹ <http://statbel.fgov.be/nl/statistieken/cijfers/economie/landbouw/bedrijven/#.U8T4NLFNjj9>

13	Vegetables (greenhouse)	vegetables (greenhouse)
14	Pulses	dry harvested pulses
15	Green manure	green manure

b) Methodology

The used quantities of plant protection products are available for a sample of agricultural and horticultural holdings in Flanders between 2005 and 2011. The detailed information concerning the uses of plant protection products in agriculture are collected yearly among farmers and horticulturists through the network for the collection of accountancy data from “Farm Accountancy Data Network” in Flanders. In the framework of a study for the Flemish Environment Agency ⁸⁰(2013), the division for Policy Analysis of the department of Agriculture and Fisheries provided data on the use of each product per crop for the years 2007 to 2011. The following numerical data were calculated and delivered (based on several assumptions as described in Fevery & Spanoghe (2013)):

- the number of observations,
- the applied amount of active substance,
- the area of cultivation group and
- a weighted average expressed in kg of active substance per hectare of a cultivation group.

Data from FADN were delivered on both regional Flemish and national Belgian level. The conversion factors (ratio of the areas) for various crops were based on the relationship between the growing areas per crop type in Flanders and Belgium (DGSEI).

c) Obtained data

Based on the network for the collection of accountancy data from FADN, data on agricultural use for all active substances authorized on the Belgian market are available at Flemish level. More precisely, the extrapolated quantities (expressed in kilograms) of all active substances used in agriculture can be obtained for the period 2007-2011 in Flanders. In the framework of the study for the Flemish Environment Agency ⁸⁰ non-agricultural use and seed treatment were also calculated to estimate the total use of plant protection products in Flanders. Data for non-agricultural use were only available for the period 2009-2011. Due to the lack of data for the period 2007-2008, the estimation of the total use in Flanders was done for the period 2009-2011.

⁸⁰ Fevery D. & Spanoghe P.(2013), Aanpassingen van de indicator Druk op het waterleven door gewasbescherming, studie uitgevoerd in opdracht van de Vlaamse Milieumaatschappij, MIRA,MIRA/2013/11, UGent.

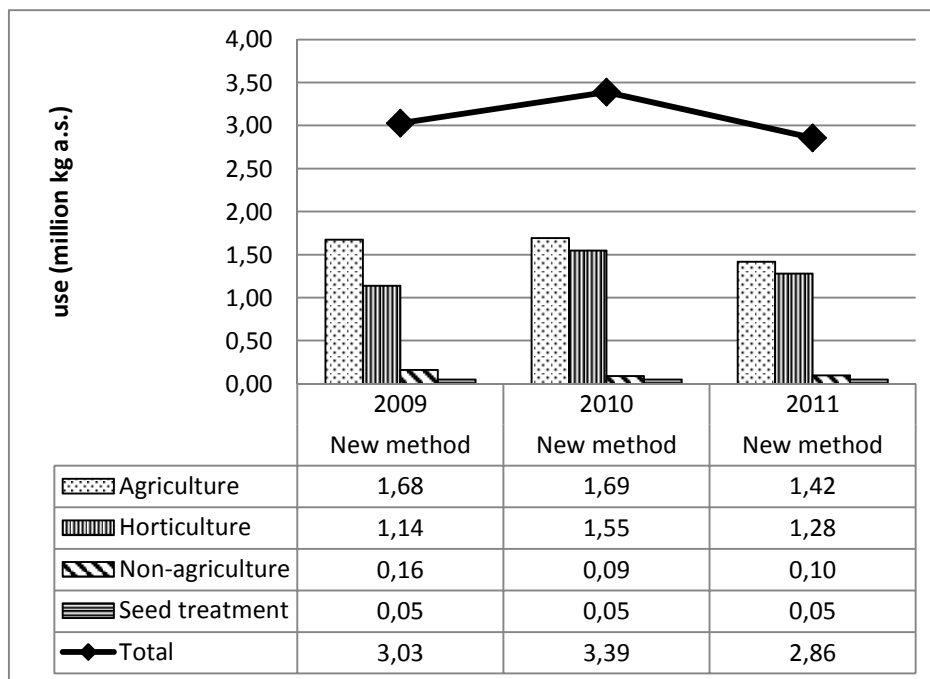
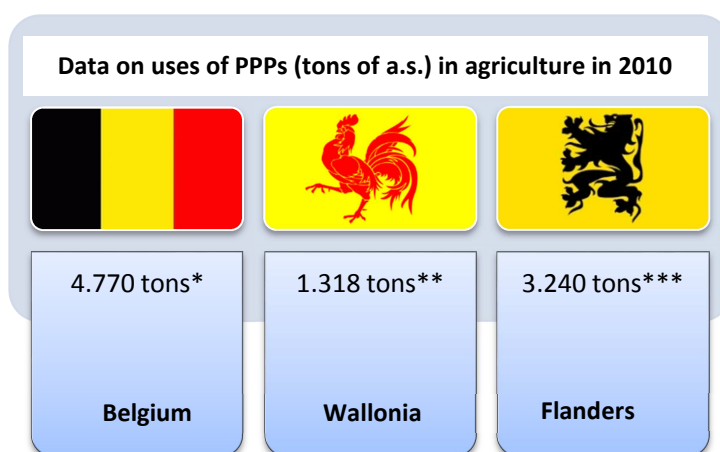


Figure 42: Use of plant protection products in agriculture, horticulture, non-agriculture and seed treatment (Flanders, 2009-2011)

Data for the base year 2010:

- estimated quantities (kg) of all a.s. used in agriculture in Flanders: **3.240 tons**
- estimated quantities (kg) of all a.s. used in agriculture in Belgium: **5.260 tons**

3. Summary table



* Based on sales data from FPS

** Based on the network for the collection of accountancy data from DAEA

*** Based on the Farm Accountancy Data Network (FADN)

3.2. Use of current database in terms of use of plant protection products

1. Statement on uses of plant protection products in Belgium

In order to get an overview on use of plant protection products at Belgian level, UCL and UGent collected current databases on the used quantities of active substances respectively for Wallonia and for Flanders. As a reminder, Brussels has not been taken into account in the framework of the implementation of this methodology. The study has been focused only on Wallonia and on Flanders.

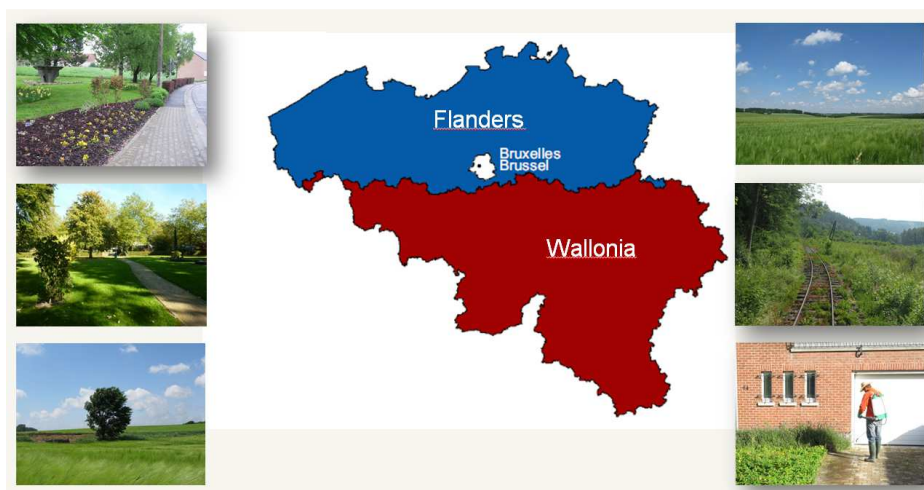


Figure 43: Statement on use of PPPs in Belgium

The figure below illustrates the repartition between the different types of users of plant protection products in Belgium. For each category of user, a statement of data on the used or sold quantities of active substances has been made at Belgian level and more precisely, at Walloon and Flemish levels.

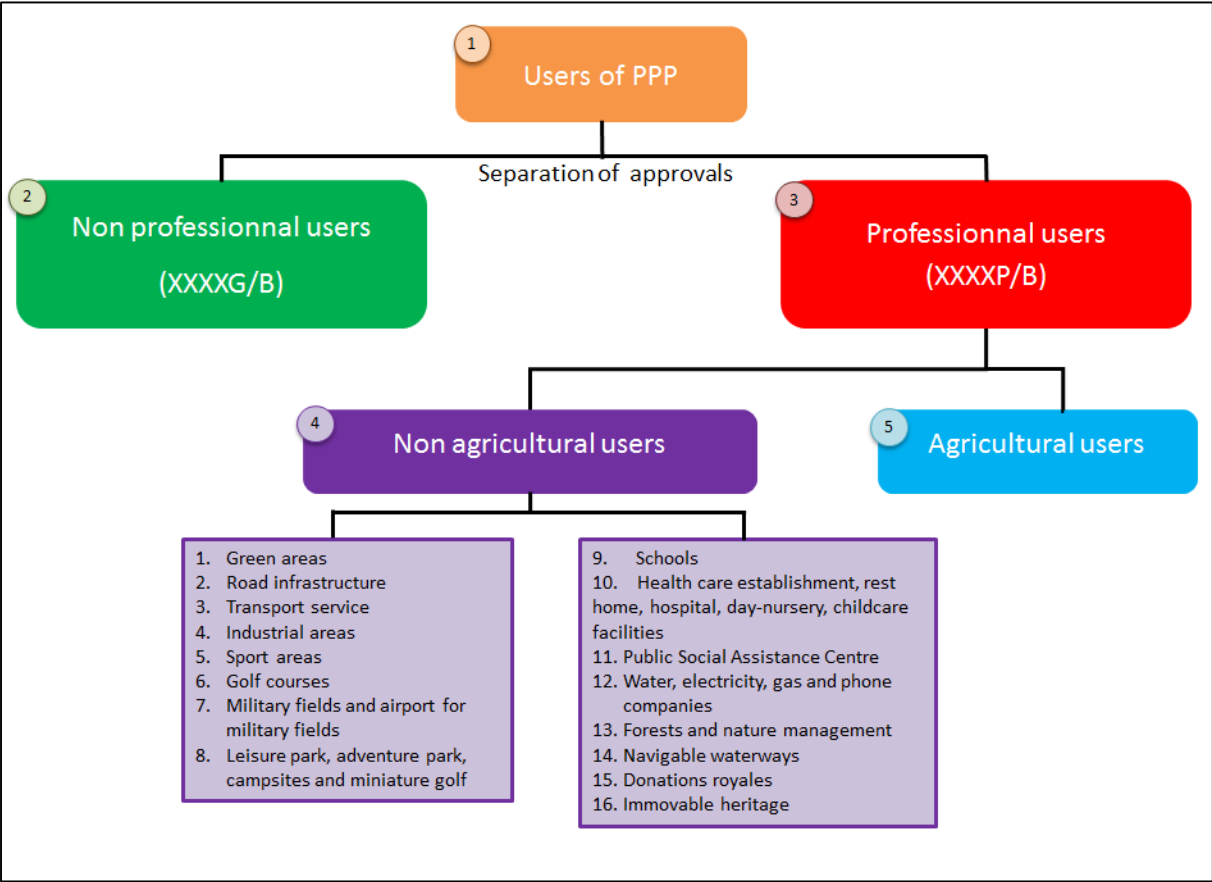


Figure 44: Statement on different types of users of PPPs in Belgium

2. Statement of data on the used or sold quantities of active substances for each type of users of PPPs for the base year 2010

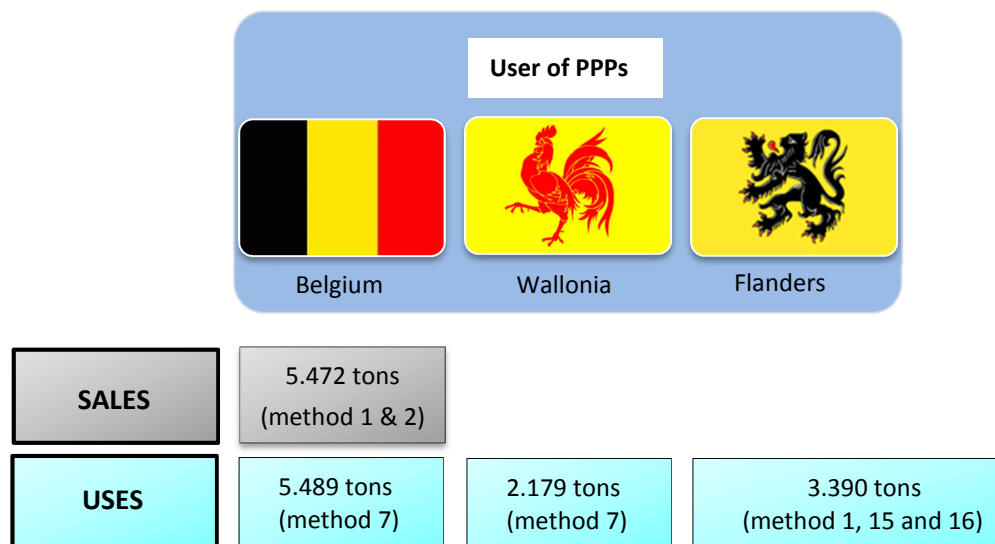
The baseline year considered has been set in 2010 to get a clear statement of data on the used or sold quantities of active substances for each type of users.

I. User of PPPs

The national sales data from FPS are available for active substances and for plant protection products in their commercial form at Belgian level between 1992 and 2010 (except for 2006). The sold quantities of active substances of plant protection products are not equal to the used quantities, mainly because of the existing stocks.

See the methods 1, 2, 7, 15 and 16 of task 2

The availability of data on the used or sold quantities of active substances in 2010 for **all users** is:



The estimated used quantities of active substances (5.489 tons) for all users based on the method 7 are similar to the sold quantities of active substances (5.472 tons) based on the data sales of FPS for the year 2010 in Belgium. Moreover, the addition of the estimated used quantities of active substances for Wallonia (2.179 tons) with the estimated used quantities of active substances for Flanders (3.390 tons)⁸¹ is equivalent to 5.569 tons (value which is close to the 5.489 tons based on the method 7 and close to the 5.472 tons based on the sales data from FPS). In other terms, the methodologies 1, 2, 7, 15 and 16 are methodologies which can contribute efficiently to the estimation of used quantities of active substances for all users. In view of the results obtained, the sold quantities of active substances can be considered as equivalent to the used quantities of active substances.

⁸¹ Fevery D. & Spanoghe P.(2013), Aanpassingen van de indicator Druk op het waterleven door gewasbescherming, studie uitgevoerd in opdracht van de Vlaamse Milieumaatschappij, MIRA,MIRA/2013/11, UGent. The estimated used quantities in Flanders for all users are based on several methods: the method 1, 15, 16 and the method which has been implemented to estimate the used quantities of PPPs for agricultural use.

II. Non-professional user

Overall, the general use of plant protection products in Belgium can be approached by distinguishing the professional use and the non-professional use thanks to the “Separation of approvals”. As a reminder, this system has been implemented on 18th August 2012 in order to separate approvals for products intended for professionals and approvals for products intended for amateur gardeners. All plant protection products in their commercial form are identified by an authorization number which is specified in the national sales figures. In practical terms, the plant protection products authorized for a professional use are identified by an authorization number: XXXX(X) P/B (product for the Belgian market) or XXX(X) P/P (product for the parallel trade). The products authorized for a non-professional use are defined by the figures comprising the letter G: XXXX(X) G/B (product for the Belgian market) or XXX(X) G/P (product for the parallel trade) (Figure 45). So, the distinction between sold quantities of PPPs for a non-professional use and for a professional use can easily be made thanks to the authorization number given in the national sales of plant protection products.

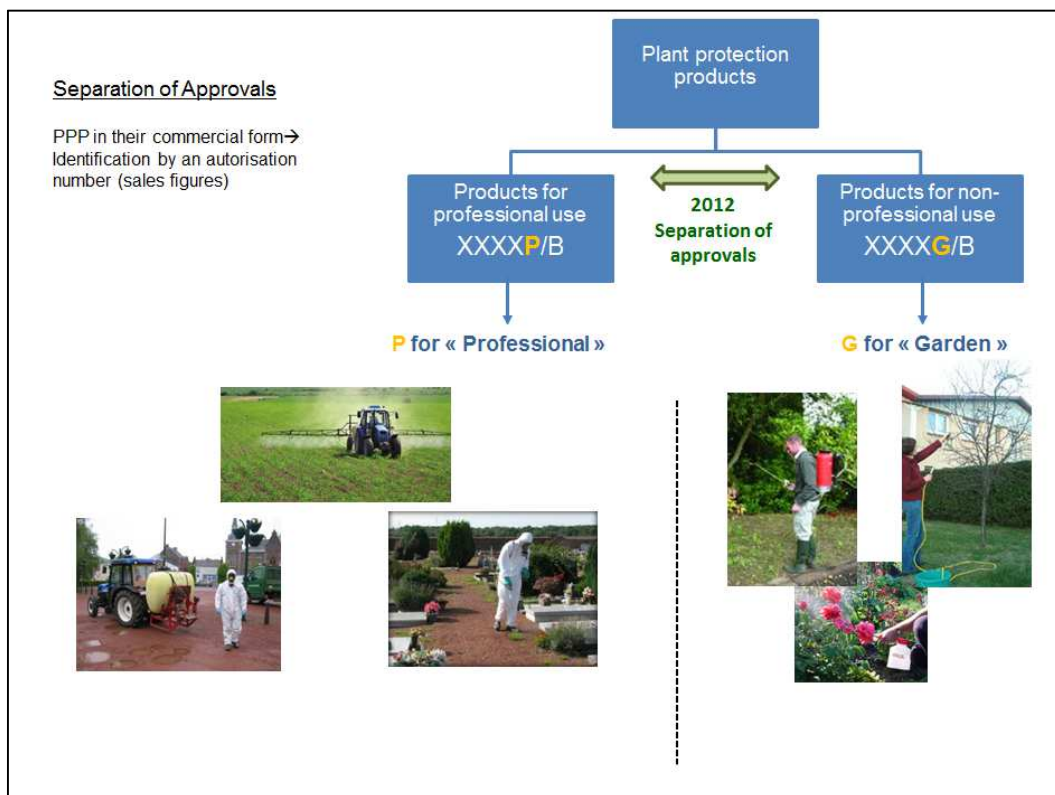
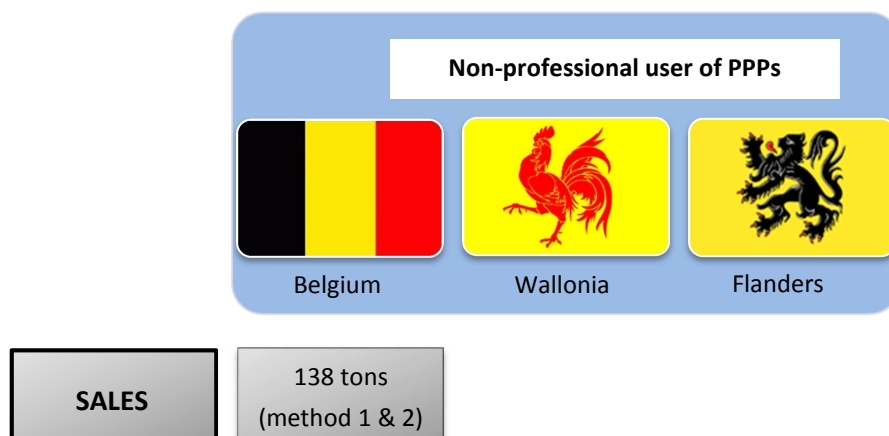


Figure 45: Separation of approvals in Belgium

The exercise which aimed at quantifying the sold quantities of PPPs for a professional use and a non-professional use has been made for the year 2010 from sales data of FPS.

See the methods 1 and 2 of task 2

The availability of data on the sold quantities of active substances for non-professional users is:



Based on the separation of approvals, non-professional users include the actors which use only products authorized for a non-professional use (XXXX(X) G/B or XXX(X) G/P). So, the actors which bought 138 tons of active substances can be amateur gardeners and private companies of parks and gardens which used products for a non-professional use. Private companies of parks and gardens which used products for a professional use on areas which belong to individuals are not considered as non-professional users.

III. Professional user

As explained for the non-professional users, the products authorized for a professional use are defined by the figures comprising the letter: XXXX(X) P/B (product for the Belgian market) or XXX(X) P/P (product for the parallel trade). That means that the individuals who use products only in the private household are not allowed to buy products for a professional use. The distinction between approvals for professional products and for non-professional products is necessary given that there are big differences in terms of needs, training in the use of pesticides, materials, plant species involved... Nevertheless, professional users can buy products for a professional use or for a non-professional use. The interest for a professional user to buy a product for a non-professional use is really limited. Indeed, the products for amateur gardeners are more expensive, more diluted and delivered in small packaging. However, all professional users will have to hold a "phytolicence"⁸² from 25 November 2015.

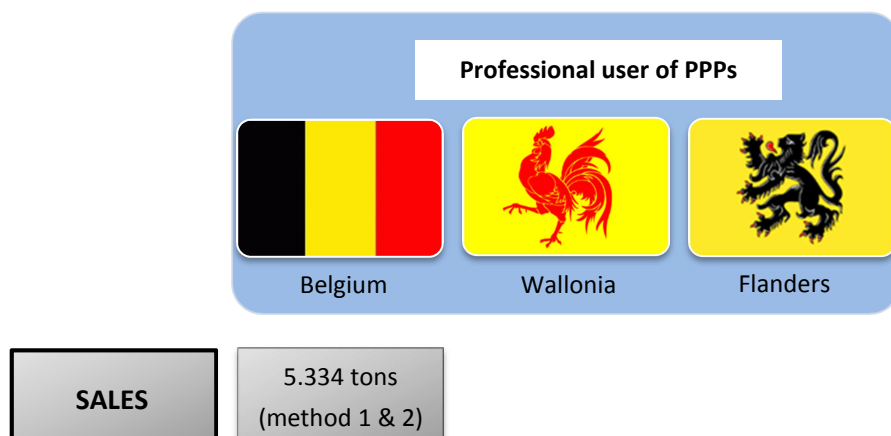
As a reminder, the exercise which aimed at quantifying the sold quantities of PPPs for a professional use and a non-professional use has been made for the year 2010 from sales data of FPS⁸³.

See the methods 1 and 2 of task 2

⁸² The system of licensing certificates is called "Phytolicense" in Belgium. The phytolicense is a certificate delivered by the Federal Public Service which ensures that all professional use of plant protection products is based on sufficient knowledge and proficiency, which is regularly updated. The knowledge and proficiency required include the ability to recognize the problems that occur, seeking long and short-term solutions from among the alternatives to chemical pest control and the proper use of plant protection products. Only those in the possession of the certificate will be able to buy products for professional use. The phytolicense will be mandatory from 25 November 2015 for all professional users, distributors and advisors. To obtain the certificate, a transitory period with various transitory measures has been implemented from 1 September 2013 to 31 August 2015.

⁸³ Comité régional Phyto, 2013 Comité régional PHYTO, 2013, Estimation quantitative des utilisations de produits phytopharmaceutiques par les différents secteurs d'activité en Wallonie, Rapport final de Convention (On-going study). UCL- Earth and Life Institute (ELI) –Applied microbiology – Phytopathology (ELIM), Comité Régional Phyto (CRP).

The availability of data on the sold quantities of active substances for professional users is:



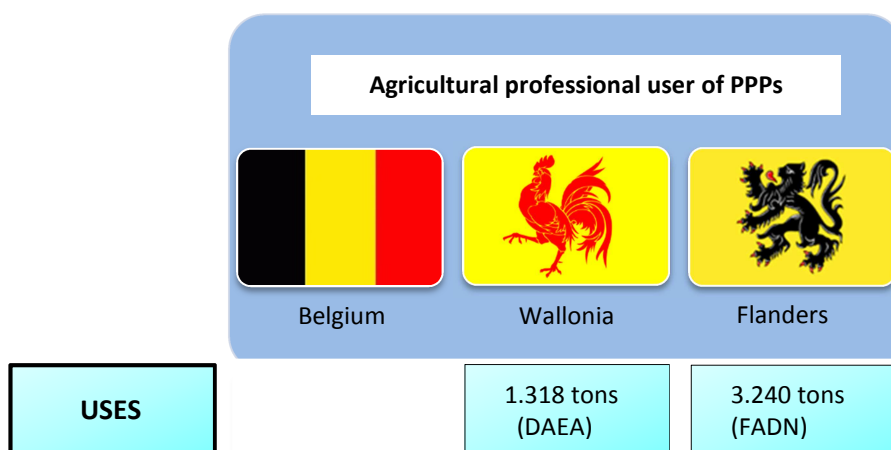
The sold quantities of active substances attributed to the professional users of PPPs are equivalent to 5.334 tons.

IV. Agricultural professional user

Among professional users, a distinction can be made between non-agricultural professional users and agricultural professional users. Data on the real used quantities of active substances for agricultural professional user are based on a sample of ± 500 agricultural and horticultural holdings in Wallonia and on a sample of ± 700 agricultural and horticultural holdings in Flanders. Data on the real used quantities of active substances for agricultural professional user have been collected by the network for the collection of accountancy data from "Direction de l'Analyse Economique Agricole (DAEA)" in Wallonia and by the Farm Accountancy Data Network (FADN) from "Policy Analysis of department of Agriculture and Fisheries" in Flanders. Based on those agricultural samples, the real used quantities of active substances (expressed in kilograms) have been extrapolated at the Walloon and the Flemish levels for the year 2010.

Data collection in agriculture: network for the collection of accountancy data from DAEA in Wallonia and Farm Accountancy Data Network from Policy Analysis of department of Agriculture and Fisheries in Flanders

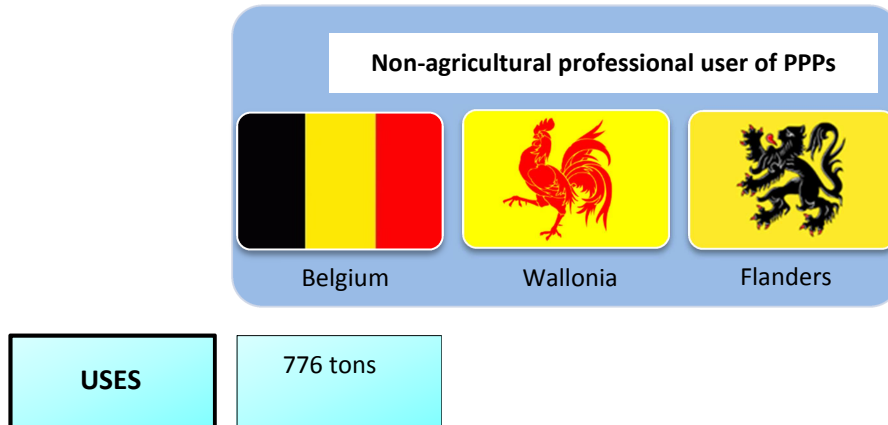
The availability of data on the used quantities of active substances for agricultural professional users at Walloon and Flemish levels is:



The extrapolated quantities (expressed in kilograms) of all active substances used in agriculture for the year 2010 is equivalent to 1.318 tons in Wallonia and to 3.240 tons in Flanders. The used quantities of active substances are higher in Flanders than in Wallonia given that there are a lot of horticultural crops (orchards...) which need intensive treatments.

V. Non-agricultural professional user

An overview on the used quantities of active substances for non-agricultural professional users can be obtained by subtracting the used quantities of agricultural users (4.558 tons) from the sold quantities of active substances of professional users (5.334 tons), with an estimated value of 776 tons.



As explained in task 1, 17 categories of non-agricultural users of plant protection products have been identified. The point is to quantify the used quantities of active substances for non-agricultural professional users for sixteen of seventeen categories. Among the non-agricultural professional users, only the used quantities of active substances for the sub-category “Transport service for **train** (category 4.a)” are well known in Belgium and are equivalent to **9.301 kg** of active substances for 2010.

See the method 11 of task 2

The figure 46 illustrates the distribution of used quantities of active substances to remove weeds on areas linked to enable trains to travel.

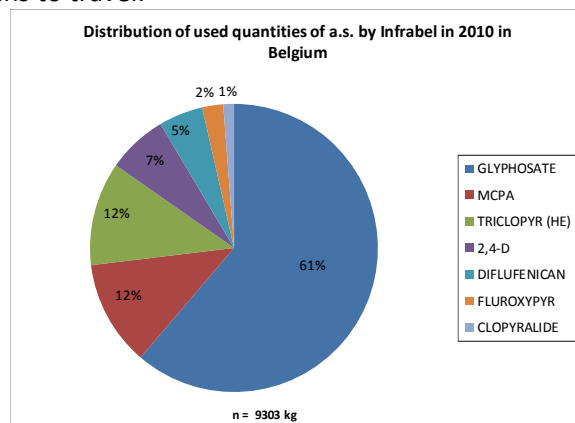


Figure 46: Distribution of used quantities of active substances for trains in 2010 in Belgium⁸⁴

⁸⁴ Data provided by Infrabel for 2005-2010 (Contact person : Jean-Pierre Deforêt)

Moreover, the used quantities of active substances can be easily approached for the category 8 called “Military fields and airport for military fields”. Only the quantities of PPPs used by the Belgian Army have been obtained (including the stored quantities of PPPs). The quantities of PPPs used by the private companies of parks and gardens are missing. It is important to underline that the data on the used quantities of active substances includes the stored quantities of active substances. Only one active substance is used in the military fields and airports: Glyphosate⁸⁵. The use of insecticides and rodenticides is prohibited in the military fields.

See the method 13 of task 2

For the other categories included in the non-agricultural professional users, specific methodologies have to be implemented and tested with support from the Statistical Institute of FPS. Different proposals will be presented in the point 3.3.3.

VI. Summary table

The summary table below illustrates the statement on the used or sold quantities of active substances for all types of users of PPPs in Belgium in 2010.

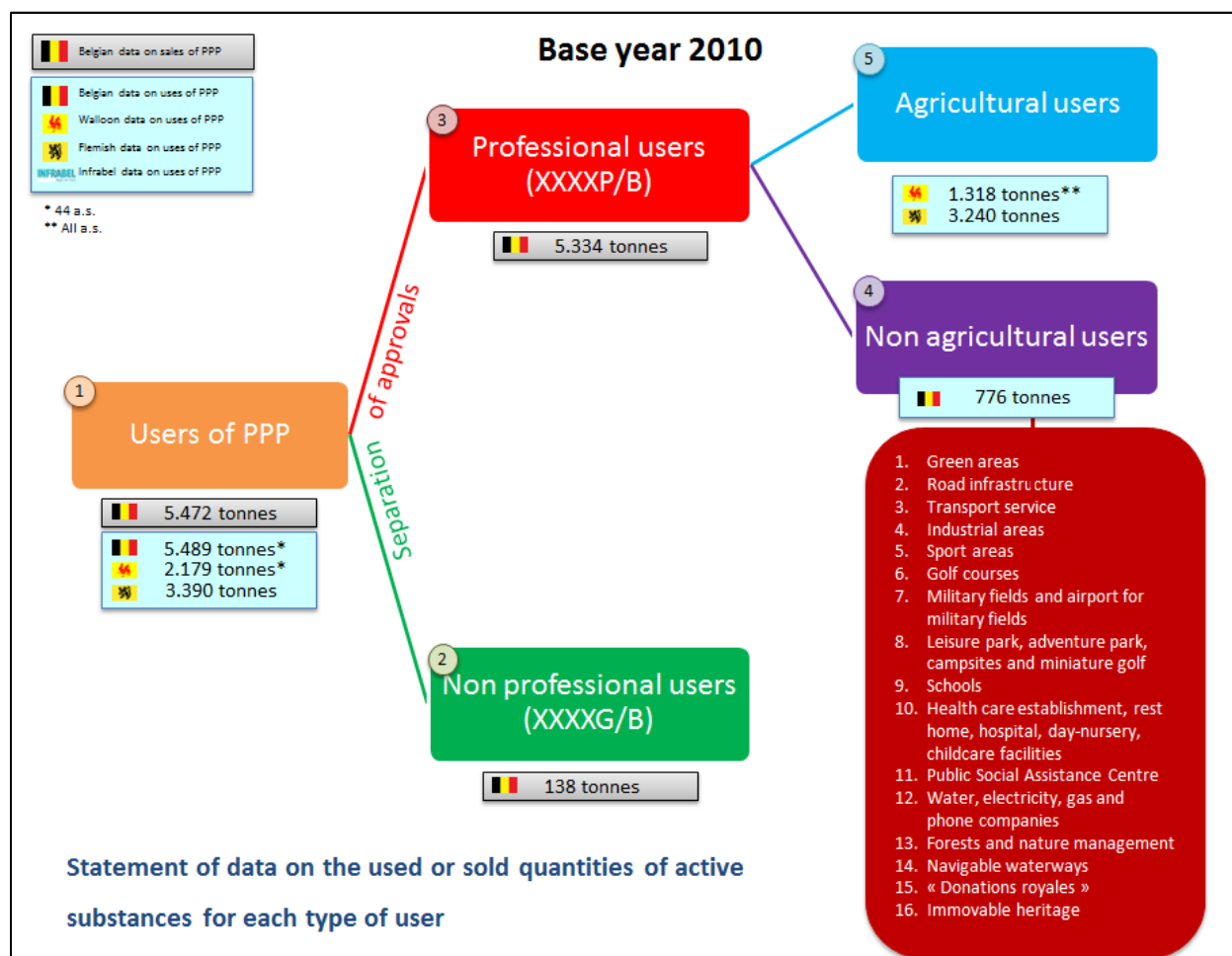


Figure 47: Statement of data on the used or sold quantities of active substances for each type of user in Wallonia, Flanders and Belgium

⁸⁵ Name of commercial product : Madrigal (8619P/B)

The figure below shows the distribution of estimated quantities (expressed in %) of active substances between the different types of users in Belgium in 2010. Among sold quantities of active substances to all users (5.472 tons), the pie chart clearly shows that 97,5% of quantities of active substances on the Belgian market are sold to professional users (5.334 tons) and 2,5 % of quantities of active substances are sold to non-professional users (138 tons). In the share of 97,5% allocated to the professional users, 83,3% of quantities of a.s. on the Belgian market are used by the agricultural users (4.558 tons) and 14,2% of quantities by non-agricultural professional users (776 tons).

In the framework of this study, the estimation of non-agricultural uses of PPPs in Belgium includes the sold quantities to non-professional users (138 tons) and the estimated quantities of active substances used by the non-agricultural professional users (776 tons). In other terms, roughly 17% of used quantities of active substances correspond to the non-agricultural uses of PPPs in Belgium (914 tons out of a total of 5.472 tons). The sold quantities to non-professional users account for 15% of non-agricultural uses (138 tons) and the estimated quantities of active substances used by the non-agricultural professional users account for 85% of non-agricultural uses in Belgium (776 tons).

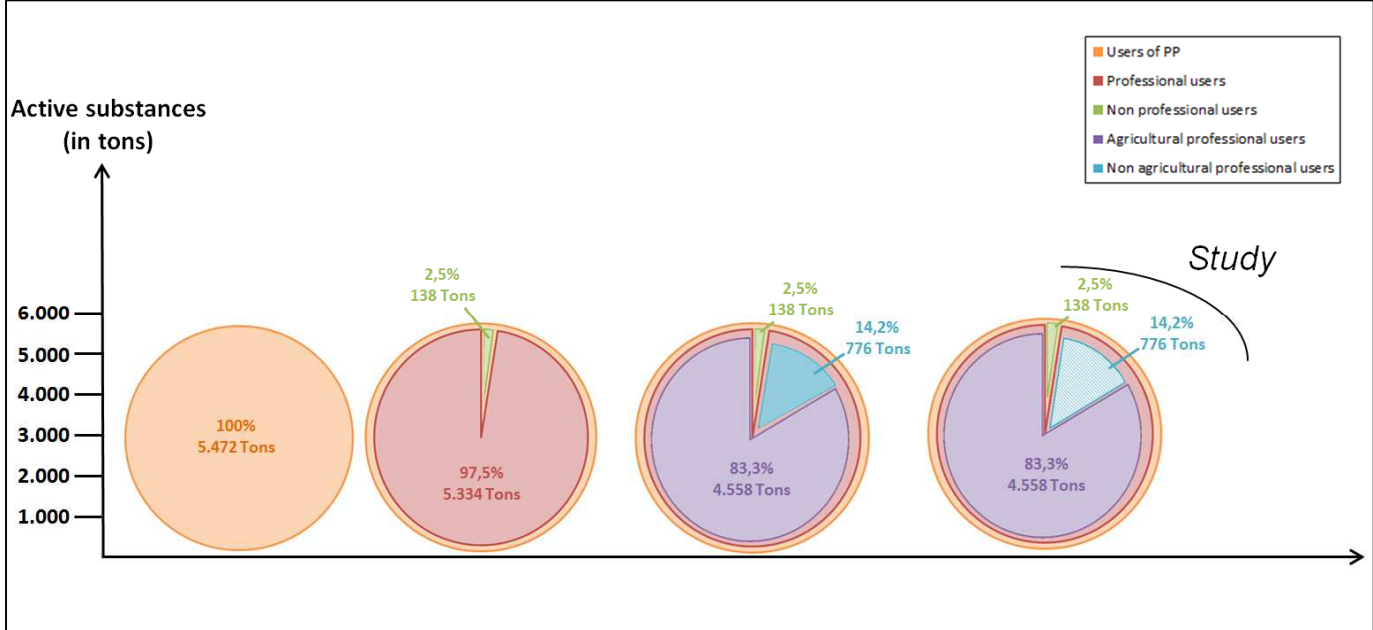


Figure 48: Distribution of estimated quantities (expressed in %) of active substances between the different types of users in Belgium in 2010

3. Use and interlocutors

In order to avoid any confusion between “use” and “interlocutor”, it is important to remind the meaning of those two terms. “Use” corresponds to areas where plant protection products are applied. Categories of users explained in task 1 means “use”. “Interlocutor” corresponds to real user (the person who applied PPPs on some areas). A table with the relationships between uses and interlocutors has been developed in Annex 3. Among uses of plant protection products, many interlocutors can be identified. The figure below illustrates that there are five interlocutors (Private companies of parks and gardens, private companies, municipality, province and Region) for the category “Road infrastructure” in Belgium. Two kinds of road infrastructure can be found in Belgium: public (in orange) and private (in blue). The interlocutors will be different according to the type of infrastructure (public or private).

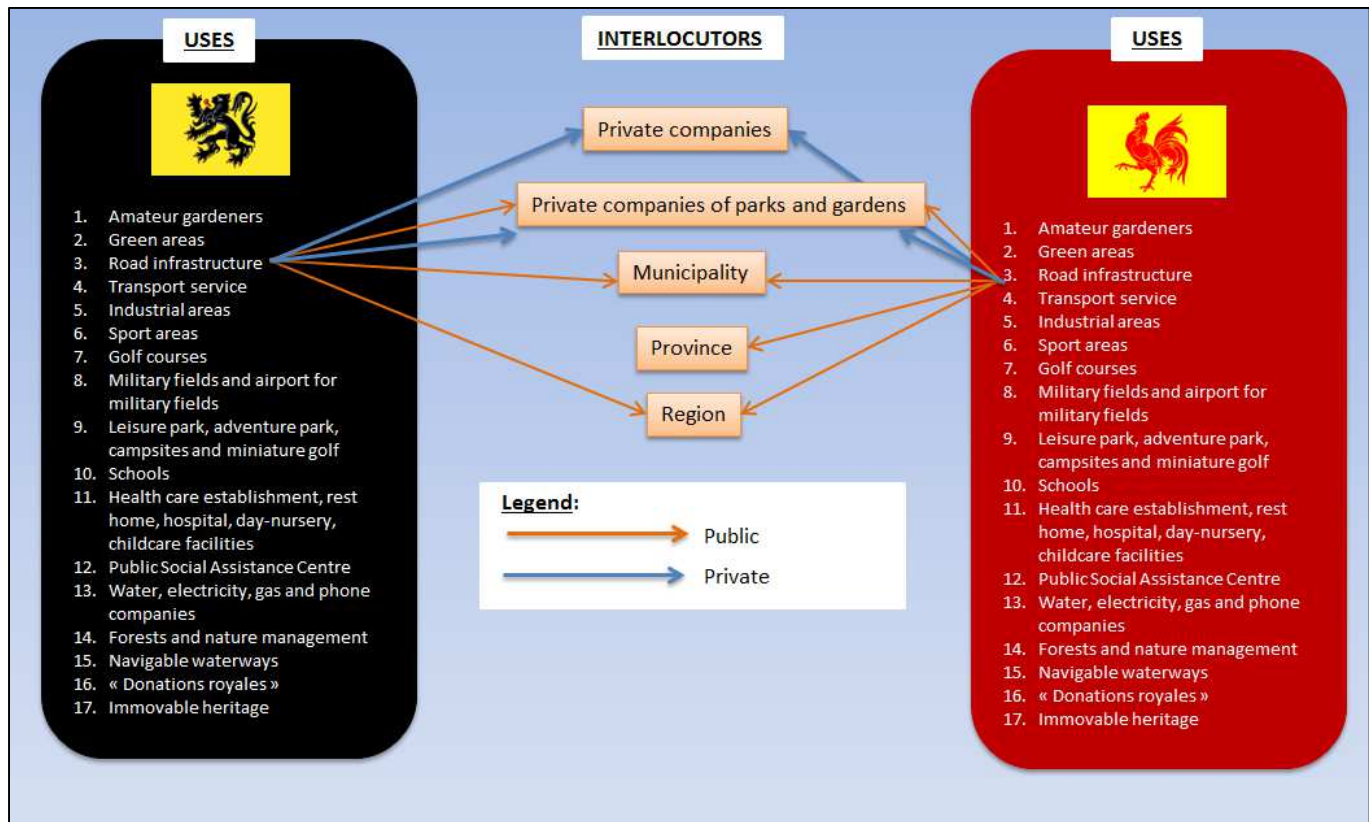


Figure 49: Distribution of uses of plant protection products for Flanders (left) and for Wallonia (right) in relation with (public or private) interlocutors for the category of user: “Road infrastructure”

The figure below shows the complexity of relations between interlocutors and uses of PPPs in Flanders and in Wallonia. A lot of interlocutors can be identified for each category of users. The links between uses and interlocutors of PPPs are really diversified and complex. More precisely, 23 interlocutors and 17 categories of users of PPPs have been identified in Belgium. This identification of interlocutors for each category of users shows that some important information on non-agricultural uses of PPPs can be given through the help of the interlocutor and not only through the category.

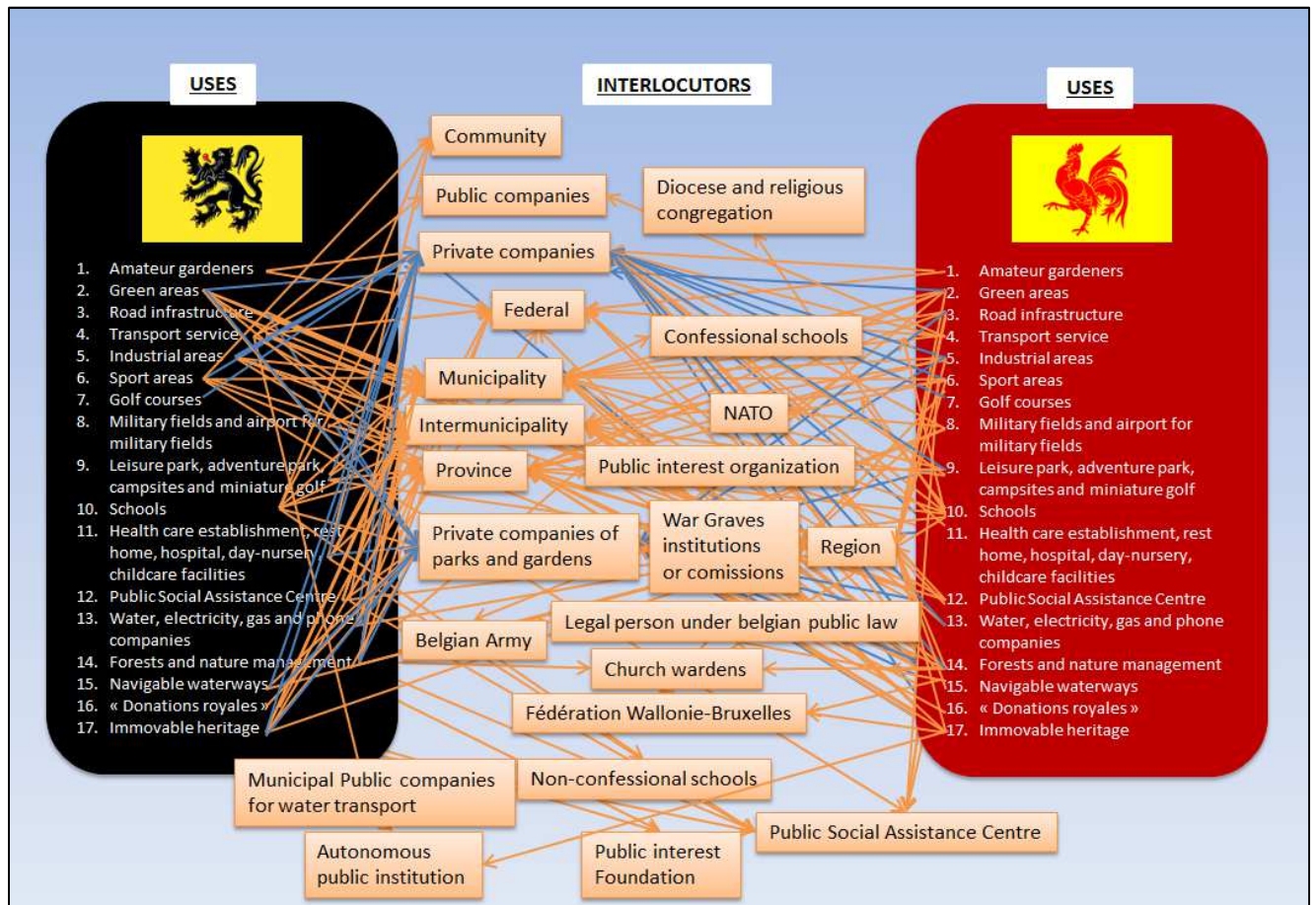


Figure 50: Distribution of uses of plant protection products for Flanders (left) and for Wallonia (right) in relation with (public or private) interlocutors for all categories of users

4. Expert judgement

Given the complexity of relations between interlocutors and categories of users in Wallonia and in Flanders, it appears essential to order the 17 categories of users of PPPs (identified in task 1) according to their importance in terms of using PPPs and according to the accessibility of data. This ranking will help to highlight the main key players in the non-agricultural use of plant protection products and to implement some tools (inquiries, data collection...) which are indispensable to the estimation of non-agricultural uses of PPPs.

Therefore, an expert meeting has been organized in May 2014 to classify the 17 categories of users of PPPs (identified in task 1) according to their importance in terms of using PPPs and according to the accessibility of data. The experts interviewed⁸⁶ are all members of Phytofar⁸⁷ and have many years of experience in sales of PPPs.

⁸⁶ Expert 1 : UGENT, Expert 2 : FPS, Expert 3 : UCL, Expert 4 : Bayer 1, Expert 5 : Mosanto, Expert 6 : Belchim, Expert 7 : Bayer 2, Expert 8 : Dow and Expert 9 : Phytofar.

I. Ranking on the importance in terms of using PPPs

Each expert was invited to put all the categories of users of PPPs in an order according to their importance in terms of using PPPs for the year 2014. The different categories were scored with numbers 1 to 17. 1 means the largest importance of use of PPPs and 17 the smallest importance. Afterwards, the average scores of all experts were taken to obtain a ranking of all the categories. The table below illustrates the ranking of categories of users in terms of importance of using of PPPs based on the scores attributed by expert judgment.

Table 7: Final ranking obtained after the discussion with several experts in 2014

	Expert n°1	Expert n°2	Expert n°3	Expert n°4	Expert n°5	Expert n°6	Expert n°7	Expert n°8	Expert n°9	Mean of scores
1) Private use	5	1	1	1	1	1	1	1	1	1,4
2) Green areas	7	2	2	2	2	2	2	5	2	2,9
4) Transport service	1	8	4	4	4	4	4	2	5	4,0
3) Road infrastructure	2	6	3	3	5	3	3	9	6	4,4
5) Industrial areas, tertiary sector	3	3	5	7	3	6	7	3	7	4,9
6) Sport areas	4	4	7	5	6	8	5	6	4	5,4
7) Golf courses	10	10	6	6	7	7	8	4	3	6,8
9) Leisure park, adventure park, campsites and miniature golf	6	5	8	9	12	10	11	7	8	8,4
13) Water, electricity, gas and phone companies	8	15	9	8	16	5	8	8	9	9,6
8) Military fields and airport for military fields	9	11	10	10	11	9	9	15	11	10,6
10) Schools	14	7	15	13	13	11	13	10	12	12,0
12) Public Social Assistance Centre and housing corporations	15	14	12	11	15	13	12	12	10	12,7
14) Forests and nature management	11	17	16	12	8	14	10	16	14	13,1
11) Health care establishment, rest home, hospital, day-nursery, childcare facilities	13	13	14	16	14	12	16	11	13	13,6
17) Immovable heritage	17	12	11	15	9	17	15	14	17	14,1
15) Navigable waterways	12	9	13	17	17	15	17	17	15	14,7
16) Donations Royale	16	16	17	14	10	16	14	13	16	14,7

According to the expert judgement, the most important categories in terms of using PPPs are private use, green areas, road infrastructure and transport service for the year 2014. Some relevant remarks were given during the ranking exercise and can be investigated in Annex 4.

II. Ranking on the importance in terms of using PPPs, the accessibility of data and the legislative changes

On the basis of the expert judgment explained above and the recommendations of Statistical Institute of FPS, a ranking has been made to order the 17 categories of users of PPPs according to their importance in terms of using PPPs, the accessibility of data and the legislative changes in 2014 and in 2020 for Flanders and for Wallonia respectively. Given the transposition of Directive 2009/128/EC which aims at reducing the risk of PPPs to human health and the environment, all Member States had to set up national action plans (called NAPAN⁸⁸ in Belgium) in which they set quantitative objectives, targets, measures, timetables and indicators to reduce risks and impacts of pesticide use on human health and the environment. Legislative texts in Wallonia and in Flanders have been adapted in order to respect the requirements (especially, provided for under Article 12) of that Directive. In Wallonia, zero-use of PPPs will be implemented from 1st June 2019 in public spaces and from 1st June 2018 in some specific areas⁸⁹. Some specific protection measures have been defined for the vulnerable groups (children, pregnant women, patients, the elderly...) in order to avoid the exposure to PPPs. In Flanders, the use of plant protection products will be prohibited from

⁸⁷ Phytofar is the Belgian Association of the industry of plant protection products and groups manufacturers and formulators of PPPs (phytosanitary or phytopharmaceutical products).

⁸⁸ Nationaal Actie Plan d'Action National

⁸⁹ Décret du 10 juillet 2013 instaurant un cadre pour parvenir à une utilisation des pesticides compatible avec le développement durable et modifiant le Livre Ier du Code de l'Environnement, le Livre II du Code de l'Environnement, contenant le Code de l'Eau, la loi du 28 décembre 1967 relative aux cours d'eau non navigables et le décret du 12 juillet 2001 relatif à la formation professionnelle en agriculture (M.B. 05.09.2013) et Arrêté du Gouvernement wallon du 11 juillet 2013 relatif à une application des pesticides compatible avec le développement durable et modifiant le Livre II du Code de l'Environnement, contenant le Code de l'Eau et l'arrêté de l'Exécutif régional wallon du 5 novembre 1987 relatif à l'établissement d'un rapport sur l'état de l'environnement wallon (M.B. 05.09.2013)

1st January 2015 for all public services⁹⁰. In Flanders, as in Wallonia, PPPs can then only be used under specific conditions after undergoing a certain procedure. In Flanders, many areas will have a minimum use of PPPs, like all areas accessible to the general public or to vulnerable groups which are not owned by government or not in management of a public service. This means that a reduction in PPP-use in this field should be defined; PPPs may only be used in spots (not the surrounding area). Where possible, alternative non-chemical methods should be used and only PPPs approved or permitted may be used. The application requirements must strictly be respected. If an area is (re)constructed, the design should be tested against a control without PPPs. So in the design of some new areas, a pesticide-free management should be taken into account. In Annex 2, the complete legislation of the use of PPPs in Wallonia and in Flanders is described. From 2014 to 2020, a lot of identified users of PPPs will not use plant protection products anymore. Many of them will have already switched to alternative control methods. Also, the global quantities of active substances attributed to the non-agricultural professional users will probably decrease over time and will be allocated to the remaining categories, involving that the categories of users which have been ranked as not important in terms of using PPPs in 2014 might be considered as important in terms of using of PPPs in 2020. The transposition of Directive 2009/128/EC will impact the estimation on the used quantities of PPPs according to the years. For most categories of users, the used quantities of PPPs will decrease strongly over time. The objective targets and the measures deriving from Directive 2009/128/EC will influence a huge change in the plant protection practices in the future.

The table below illustrates the ranking of categories of users of PPPs for the current situation (2014) and for the future situation (2020) in Wallonia and in Flanders related to the importance in terms of using of PPPs and the accessibility of data (always based on the expert judgment explained above). It is important to note that some categories are restricted in 2020 to private areas. The categories of users of PPPs which will be eliminated in 2020 and the causes of the elimination of some categories are specified in the second table below. It is important to note that the category 1 called “private use” will be considered as a category important in terms of using of PPPs in 2014 and 2020 in both Wallonia and Flanders.

Some **general remarks** have been underlined:

¹ For many of categories of users, data on uses of PPPs from private companies and private companies of parks and gardens (working for public or private institutions) are not readily accessible, but quite important.

² Data are readily accessible for water companies. These companies are municipal, intermunicipal or provincial mixtures and belong to public services. They are obliged to record their use of PPPs.

³ In Flanders, the use of PPPs is prohibited since 1990 according to the decree⁹¹ that has been adapted on 9/05/2014. In special cases some deviations are approved to allow the use of PPPs. These data are readily accessible. In Wallonia, the use of herbicides, fungicides and insecticides is prohibited⁹², except in some cases laid down by the Walloon Government⁹³ since 2009.

⁴ The sold quantities of PPPs for a non-professional use (based on the authorization number) are not equal to the used quantities because of the existing stocks. These existing stocks in the warehouses of amateur gardeners can be an important bias in the quantitative estimation of uses by amateur gardeners. Most of amateur gardeners store significant quantities of plant protection products over

⁹⁰ Decree of 21/12/2001 on the reduction of pesticide use by public services in the Flemish Region (December 21, 2001) and decision of the Flemish Government on the detailed rules for the reduction programs to reduce pesticide use by public services in the Flemish Region (December 19, 2008).

⁹¹ Artikel 20-Bosdecreet van 13 juni 1990

⁹² Article 42 - Décret relatif au Code forestier du 15 juillet 2008 (M.B. 12.09.2008 - entré en vigueur le 13 septembre 2009 : A.G.W. 27 mai 2009 - M.B. 04.09.2009)

⁹³ Article 27 - Arrêté du Gouvernement wallon du 27 mai 2009 relatif à l'entrée en vigueur et à l'exécution du décret du 15 juillet 2008 relatif au Code forestier (M.B. 04.09.2009 - err. 05.11.2009)

time in their warehouse. The problem of existing stocks is the most important when looking at yearly figure but is in principle very limited on the medium term (3-5 years averages).

⁵ The used quantities of PPPs are partly available for military fields and airports. Only the quantities of PPPs used by the Belgian Army have been obtained (including the stored quantities of PPPs) in the framework of this study. The quantities of PPPs used by the private companies of parks and gardens are missing for 2014.

⁶ All areas managed by private companies which are not accessible for the general public, have no ban on the use of PPPs. Areas managed by private companies which are accessible for the general public, should have a minimum use of PPPs.

Current situation (2014)				
Wallonia ¹			Flanders ¹	
Data readily accessible	Important	Not important	Important	Not important
		Cat.1: Private use ⁴ Cat.7: Golf courses Cat.8: Military fields and airport ⁵		Cat.1: Private use ⁴ Cat.2: Green areas Cat.3: Road infrastructures Cat.4: Transport service Cat.6: Sport areas Cat.7: Golf courses Cat.8: Military fields and airport ⁵
Data not readily accessible	Cat.2: Green areas Cat.3: Road infrastructures Cat.4: Transport service Cat.5: Industrial areas, tertiary sector (commercial, touristic...) Cat.6: Sport areas Cat.9: Leisure park, adventure park, campsites and miniature golf	Cat.10: Schools Cat.11: Health care establishment, rest home, hospital, day-nursery, childcare facilities Cat.12: Public Social Assistance Centre and housing corporations Cat.13: Water, electricity, gas phone companies and public interest organisations Cat.14: Forests and nature management ³ Cat.15: Navigable waterways Cat.16: Donation royale Cat.17: Immovable heritage	Cat.5: Industrial areas, tertiary sector (commercial, touristic...) Cat.9: Leisure park, adventure park, campsites and miniature golf Cat.13: Water, electricity, gas phone companies and public interest organisations ²	Cat.10: Schools Cat.11: Health care establishment, rest home, hospital, day-nursery, childcare facilities Cat.16: Donation royale Cat.17: Immovable heritage
Future situation (2020)				
Wallonia ¹			Flanders ⁶	
Data readily accessible	Important	Not important	Important	Not important
	Cat.1: Private use ⁴		Cat.1: Private use ⁴ Cat.7: Golf courses	
Data not readily accessible	Cat.5: Industrial areas, tertiary sector (commercial, touristic...) (private) Cat.12: Housing corporations (private) Cat.4: Transport service (private) Cat.13: Water, electricity, gas phone companies and public interest organizations	Cat.3: Road infrastructures (private) Cat.15: Quays for navigable waterways (private) Cat.17: Immovable heritage (private)	Cat.2: Green areas Cat.3: Road infrastructures (private) Cat.4: Transport service (private) Cat.5: Industrial areas, tertiary sector (commercial, touristic...) (private) Cat.6: Sport areas (private) Cat.9: Leisure park, adventure park, campsites and miniature golf (private) Cat.13: Water, electricity, gas phone companies and public interest organizations (private) ²	Cat.12: Public Social Assistance Centre and housing corporations (private companies) Cat.17: Immovable heritage (private)

List on the categories of users of PPPs which will be eliminated in 2020 and the causes of the elimination of some categories

Wallonia		Flanders	
Elimination of categories	Causes of the elimination of categories	Elimination of categories	Causes of the elimination of categories
<p>Cat.2: Green areas Cat.7: Golf courses Cat.6: Sport areas Cat.9: Leisure park, adventure park, campsites and miniature golf</p>	<p>Zero-use of PPPs from the first of June 2019 for all public spaces and zero-use of PPPs from the first of June 2018 in the parts of parks, gardens, green areas, sport and recreation grounds which are used by the general public and which are not included in the public spaces</p>	<p>Cat.2: Green areas (public) Cat.3: Road infrastructure (public) Cat.4: Transport service (public) Cat.5: Industrial areas, tertiary sector (commercial, touristic...)(public) Cat.6: Sport areas (public) Cat.8: Military fields and airport Cat.9: Leisure park, adventure park, campsites and miniature golf (public) Cat.10: Schools Cat.11: Health care establishment, rest home, hospital, day-nursery, childcare facilities Cat.12: Public Social Assistance Centre and housing corporations Cat.13: Water, electricity, gas phone companies and public interest (public) organisations Cat.15: Navigable waterways Cat.16: Donation royale Cat.17: Immovable heritage (public)</p>	<p>Zero-use of PPPs from the first of January 2015 for all public services. Pesticides can then only be used under specific conditions after undergoing a certain procedure (Annex II).</p>
<p>Cat.8: Military fields and airport Cat.16: Donation royale Cat.3: Road infrastructure (public) Cat.4: Transport service (public) Cat.5: Industrial areas, tertiary sector (commercial, touristic...)(public) Cat.12: Social Assistance Centre and housing corporations (public) Cat.15: Quays for navigable waterways (public) Cat.17: Immovable heritage (public)</p>	<p>Zero-use of PPPs from the first of June 2019 for all public spaces</p>	<p>Cat.14: Forests and nature management</p>	<p>The use of PPPs is prohibited since 1990 according to the decree⁶ that has been adapted on 9/05/2014. In special cases some deviations are approved to allow the use of PPPs. These data are readily accessible.</p> <p align="right">⁶Artikel 20-Bosdecreet van 13 juni 1990</p>

5. Order of importance of interlocutors in terms of using PPPs related to the ranking of experts

As said previously, each category of users includes different interlocutors which correspond to the real users of PPPs. It appeared important to focus not only on categories of users of PPPs but also on interlocutors. Therefore, the order of importance of interlocutors related to the scores attributed by the experts on the importance of categories of users (in terms of using PPPs) have been evaluated in Wallonia and in Flanders for the year 2014 (Tables 8 and 9).

The recommendations of Statistical Institute of FPS for the calculation are explained as follows:

- the inverse of the sum of scores attributed by the experts on the importance of categories of users (in terms of using PPPs) has been calculated for each category of users;
- the categories of users of PPPs have been identified for each interlocutor (Example: the interlocutor “Province” in Wallonia includes 11 categories of users) ;
- the results (i.e. the inverse of the sum of scores attributed based on expert judgment) have been attributed for each category of users⁹⁴ included in each interlocutor;
- the total sum of different results from different categories of users included in each interlocutor has been calculated;
- a ranking of different results obtained for each interlocutor has been made in descending order.

Table 8: List of interlocutors ranked by order of importance related to the scores attributed by the experts on the importance of categories of users (in terms of using PPPs) in Wallonia in 2014

Interlocutors	Scores
Interlocutor 3: Private companies of parks and gardens for private institutions	26
Interlocutor 9: Private companies of parks and gardens for public institutions	20
Interlocutor 2: Private companies (asbl, s.a., sprl, sclr...)	20
Interlocutor 4: Municipality	18
Interlocutor 6: Province	17
Interlocutor 5: Intermunicipalities	15
Interlocutor 7: Region	12
Interlocutor 1: Amateur gardeners	8
Interlocutor 13: Public Social Assistance Centre	5
Interlocutor 9: Fédération Wallonie-Bruxelles	5
Interlocutor 8: Federal public company	4
Interlocutor 17: Public interest organization	1
Interlocutor 10: Belgian Army	1
Interlocutor 11: NATO	1
Interlocutor 12: War Graves Commissions and institutions	1
Interlocutor 15: Dioceses and religious congregations	0
Interlocutor 14: Church Wardens	0
Interlocutor 19: Legal person under public Belgian law	0
Interlocutor 18: Public interest Fondation	0
Interlocutor 16: Autonomous public institution	0

⁹⁴The category 4 called “Transport service” includes 9 different transport services: train, bus/coach, underground, touristic tramway, tramway, plane, boat, bicycle and railbikes. Given that some interlocutors can use only PPPs only for some services transport, the management of different types of transport with the large number of interlocutors has to be defined in order to quantify the order of importance of interlocutors related to the previous ranking of experts. According to FPS Economy, a solution will be to have a global estimation on the used quantities of active substances for each type of transport and to weight the obtained values for each type of transport because it does not make any sense if we put a global value gathering all types of transport with all interlocutors. Based on the extrapolation of some obtained used quantities of PPPs for the different services transport in Belgium, we’ve considered that 90% of used quantities of PPPs allocated to the category 4 have been attributed to the trains and 10% for the others transport services.

Table 9: List of interlocutors ranked by order of importance related to the scores attributed by the experts on the importance of categories of users (in terms of using PPPs) in Flanders in 2014

Interlocutors	Scores
Interlocutor 3: Private companies of parks and gardens for private institutions	25
Interlocutor 2: Private companies (asbl, s.a., sprl, sclr...)	19
Interlocutor 10: Private companies of parks and gardens for public institutions	19
Interlocutor 4: Municipality	16
Interlocutor 7: Region	15
Interlocutor 6: Province	14
Interlocutor 5: Intermunicipality	13
Interlocutor 1: Amateur gardeners	8
Interlocutor 15: Public Social Assistance Centre	5
Interlocutor 8: Federal public company	4
Interlocutor 9: Community	4
Interlocutor 12: Belgian Army	1
Interlocutor 14: War Graves Commissions and institutions	1
Interlocutor 19: Confessional schools	0
Interlocutor 20: Non-confessional schools	0
Interlocutor 16: Church Wardens	0
Interlocutor 23: Legal person under public Belgian law	0
Interlocutor 21: Public interest organization	0
Interlocutor 22: Public interest Foundation	0

According to this ranking, the trend observed in Wallonia and in Flanders in terms of importance of using of PPPs related to the interlocutors is that the private companies of parks and gardens (for public or private institutions) and the private companies are considered as the largest users of PPPs. The interlocutor 1 called "Amateur gardeners" has got a score of 8; which means that the uses of PPPs can be considered as high. As a reminder, the ranking carried out by the expert judgement is based on an ordinal ranking. That means that a category of users ranked fourth (for example) by the expert judgment can use five times more of PPPs than the category of users ranked fifth. That kind of ranking does not give an idea on the importance of quantities used of active substances. This ranking sets priorities and can help to make choices to go into more details in the implementation of inquiries and to identify the interlocutors for who it seems necessary to collect data on used quantities of active substances.

3.3. Design of the national surveys

In order to obtain more information on non-agricultural uses of PPP, it appears appropriate to define the type of data collection methods to implement which could be adapted to each interlocutor and then, to develop some data collection methods for some targeted interlocutors.

1. Data collection methods

Data collection methods for each type of interlocutors have been divided into three types of investigations for Flanders and for Wallonia for 2014:

- exhaustive investigations
- investigations into sample
- administrative data

The table 10 illustrates the different data collection methods on the non-agricultural use of PPPs adapted to each interlocutor in Wallonia and in Flanders.

Table 10: Data collection methods on the use of PPPs adapted to each interlocutor in Wallonia and in Flanders⁹⁵ in 2014

Interlocutors	Data collection methods		
	Exhaustive investigation	Investigation into sample	Administrative data
PRIVATE			
Amateur gardeners		×	(×) ⁹⁶
Private companies (asbl, s.a., sprl, scl...)		×	
Private companies of parks and gardens for private institutions	×		
PUBLIC			
Municipality	×		×
Intermunicipality	×		×
Province	×		×
Region	×		×
Federal Public company	×		
Community	×		×
Private companies of parks and gardens (for public institutions)			×
Fédération Wallonie-Bruxelles	×		×
Belgian Army	×		
NATO	×		
War Graves institutions or Commissions	×		
Public Social Assistance Centre	×	×	× ⁹⁷

⁹⁵ For some interlocutors, two methods of data collection can be adapted in function of the rate of answer.

⁹⁶ Data on uses of PPPs for amateur gardeners can be approached by data on sales of PPPs for a non-professional use (separation of approvals) from FPS. Data on sales of PPPs are really close to the data on uses of PPPs and correspond to administrative data.

⁹⁷ In Flanders, OCMW are obliged to record their data on uses of PPPs.

Church wardens	×		
Dioceses and religious congregations	×		
Autonomous public institution	×		
Confessional schools (private)		×	
Non-confessional schools (private)		×	
Public interest organization	×		
Public interest Fondation	×		
Legal person under Belgian public law	×		

2. Pre-survey

After the definition of each data collection method for each interlocutor, the next step was the implementation of a pre-survey which corresponds to an exploratory investigation and which aims at getting an overview on the availability of data on non-agricultural uses of PPPs among each interlocutor identified in task 1. Therefore, some contacts by phone were held by the two partners in order to invite the interlocutors to answer various questions about the chemical weed control and to ask directly how the interlocutors feel about the implementation of data collection methods. In practice, each interlocutor has been contacted by phone in order to know:

- if they use plant protection products or not on some of their areas
- if they subcontract (or not) areas maintenance to the private companies of parks and gardens
- if they have their own maintenance crew
- the reasons on their uses of PPPs (security...)
- the areas where PPPs are applied

For some of them, they were asked if they are ready to fill out a survey on the uses of plant protection products and if so, what the allowable limit of number of pages was and which type of questionnaires was preferable for them: web survey or a survey by phone. They were also asked if there were interested in receiving results of such inquiry.

Globally, a lot of contact persons have no idea about what kind of products they are using. The definitions of pesticides, plant protection products and biocides are not quite well known.

In Flanders, a lot of categories are no longer allowed to use PPPs from January 2015. Public services still need to record their use to the Flemish government. It would be useful to include some questions in the online survey of the Flemish government. Otherwise, it is for these institutions a lot of extra work. Some tools should be implemented in order to incite every user of PPPs to complete the record-keeping of uses provided by the Article 67 of Regulation 1107/2009.

Also, the pre-survey corresponds to a pre-contact phase in order to identify the real respondents among interlocutors. This pre-contact phase allowed highlighting the importance of adapting each survey in function of each interlocutor.

3. Questionnaire for the pre-survey

Questions asked in the framework of the pre-survey are indicated as follows:

Are PPPs currently used by your company/institution?

If so, the questions are:

- Is the application of PPPs done by a team of the company or is it done by subcontractors (private companies of parks and gardens)?
- Which kind of PPPs are exactly used?
- Why are PPPs used (e.g. for security, maintenance of car parks...)?
- Where are those PPPs exactly applied?
- Do you have any idea which products are used? What amount?
- Does your company/institution collect some information about the use of PPPs?

If not, the questions are:

- Are some alternative methods used? Will PPPs still be used in future?
- Are you willing to fill in a survey about PPP-use in the future?
- Should this involve a lot of extra work?

In the framework of the real survey, the questions should have to be adapted and completed to the objective which will be set by the future institution.

4. Prospects for the implementation of inquiries

All categories of non-agricultural users of PPPs do not require the implementation of an inquiry because they are considered as not important in terms of using PPPs by the expert judgment and data for that kind of category are not readily accessible⁹⁸. This is why a focus on the categories which are considered as important in terms of using PPPs and where data are readily accessible has been made: amateur gardeners, golf courses and military fields and airports. More specifically, a questionnaire on the uses of stocks for amateur gardeners should be implemented in order to have a better knowledge on the real used quantities of PPPs. Data on the used quantities of active substances for golf courses can be obtained for Belgium through the greenkeeper's association of Belgium. For military areas, the quantities of PPPs used by private companies of parks and gardens could be obtained through data collected in the record-keeping for uses of PPPs which is imposed to all professional users. For instance, a few private companies of parks and gardens complete the record-keeping even if they are obliged to record their data on uses of PPPs (see Annex 2).

According to the requirements of Directive 2009/128/EC, the ranking on categories of users of PPPs based on the scores attributed by expert judgment and the calculation evaluating the degree of importance of different interlocutors, it appears that the implementation of inquiries makes sense for three main kinds of interlocutors of PPPs: 1) amateur gardeners, 2) private companies and 3) private companies of parks and gardens (working for public or private institutions). Those three interlocutors will stay important interlocutors in terms of using for the future too.

As a reminder, the estimation of non-agricultural uses of PPPs has to consist of a collection of Belgian statistics on the used quantities of PPPs including at least the names of active substances and their quantities (expressed in kilograms) used in a given year. In order to pursue the aim of this study,

⁹⁸ See the two tables illustrating the ranking of categories of users of PPPs for the current situation (2014) and for the future situation (2020) in Wallonia and in Flanders (p.102 and 103)+ tables 8 and 9.

different proposals on the implementation of inquiries for the three key-interlocutors which would be acceptable from a statistical point of view were developed with the assistance of Statistical Institute of FPS.

- 1) Data on uses of PPPs for **amateur gardeners** can be approached by the data on sales of PPPs from FPS allocated to the amateur gardeners calculated thanks to the separation of approvals. Data on sales of PPPs correspond to administrative data. As a reminder, the separation of approvals implemented by Royal Decree of 10 January 2010 is a procedure which allows making a distinction between approvals for products intended for professionals and approvals for products intended for amateur gardeners. The distinction between sold quantities of PPPs for amateur gardeners (XXXX(X)G/B or XXX(X)G/P) and for professional users (XXXX(X)P/B or XXX(X)P/P) of PPPs can easily be made thanks to the authorisation number given in the national sales of plant protection products since 18th August 2012 (see Annex 2.1). From a statistical point of view, the implementation of inquiries for amateur gardeners through “investigation into sample” is considered as inappropriate in comparison with the advantages which could be gained. The added value of such an inquiry would be limited to stocks, regional distribution and consolidation of already obtained results.
- 2) The implementation of inquiries for **private companies (asbl, s.a., sprl, sclr...)** means “investigation into sample”. In order to sample that kind of target public, an interesting tool would be the “Central Balance sheet Office” which aims at collecting annual accounts of almost all Belgian companies which pursues a professional activity in Belgium. The annual accounts for Belgian companies are accessible via this link: <http://www.bnb.be/pub>. The “Central Balance sheet Office” gives an overview on data about the tax return of capital asset for Belgian companies. Those data are centralized by the National Bank. If we focus on data from the “Central Balance sheet Office”, it is really important to create categories and to set a minimum threshold for capital asset expressed in monetary terms for each category. The sample has to include 1% of Belgian companies. The response rate will be very low (inferior to 10%). Before sending the inquiries, the funder has to define the funds that he is ready to invest. It is also important to determine who is in charge of the establishment of the inquiries, on what basis and whether this was authorized, legitimate and transparent. Inquiries should be in the form of paper questionnaires. A work with some federations could be useful too.
- 3) The implementation of inquiries for **private companies of parks and gardens** means “exhaustive investigation”. All private companies of parks and gardens should be questioned. Belgian enterprise register includes official company information like the type of enterprise (legal persons (companies, foundations, associations...), sole traders, foreign companies, government agencies...), the establishment units of enterprises (a place where, or from where, the activities of the enterprise are exercised) and some general information (name, address, legal functions, activities, authorizations and qualities, establishment units information...). For the inquiries, professional activities of each Belgian company could be really useful in order to identify the potential private companies of parks and gardens. In “Belgian enterprise register”, the professional activities are specified in the form of codes NACEBEL. The response rate should be low. The inquiry will be in the form of paper questionnaires or web survey and should be anonymous. The indication of annual turnover should be mentioned. Another option would be to implement a survey which is not anonymous. In this case, if the response rate is not sufficient, a reminder will be sent which would specify that the inquiry is anonymous. Before sending the inquiries, the funder has to define the funds that he is ready to invest. It is also important to determine who is in charge

of the establishment of the inquiries, on what basis and whether this was authorized, legitimate and transparent.

- 4) The implementation of inquiries **for private companies (asbl, s.a., sprl, sclr...)** for the category 13 (**Water, electricity, gas and phone** companies) means “exhaustive investigation”. The procedure to sample that kind of target public is similar to the recommendations developed for inquiries for private companies of parks and gardens (see point 2)).

A weighting schema (with extrapolation) will be implemented in function of the number of answers received.

5. Recommendations for a Belgian monitoring of the non-agricultural use of PPPs

The expected results for the estimation of non-agricultural uses of PPPs in Belgium correspond to a collection of Belgian statistics on the used quantities of PPPs including at least the names of active substances and their quantities (expressed in kilograms) used in a given year.

In order to reach the global objective, it appears important to investigate deeply on four kinds of interlocutors which are relevant in terms of importance of non-agricultural uses of PPP: amateur gardeners, private companies, private companies of parks and gardens and private companies for water, electricity, gas and phone. The focus on that key-actors can be made through the implementation of different types of inquiries which are listed below:

- Investigation into sample for private companies (asbl, s.a., sprl, sclr...)
- Exhaustive investigation for private companies of parks and gardens
- Exhaustive investigation for private companies for water, electricity, gas and phone

The inquiries should be combined with data collection for amateur gardeners obtained by data sales of PPPs from FPS.

Conducting those inquiries for those targeted interlocutors could contribute efficiently to the estimation of non-agricultural uses of PPPs in Belgium and could serve as the basis for the definition of the guidelines of the European methodology.

Conclusions

The study for the estimation of non-agricultural uses of plant protection products in Belgium highlights the complexity and the diversity of actors involved in chemical weed control. Overall, seventeen categories of users of PPP have been identified. Each category includes a panel of users (= interlocutors) applying PPPs. Some difficulties were encountered while developing the project. Our approach emphasized the difficulty in identifying the final users of PPPs under the complex federal structure of Belgium. The lack of answers from some potential interlocutors was also an important barrier to propose a clear definition of actors. Also, the transposition of Directive 2009/128/EC which has been adopted on 21st October 2009 involved the changes on the Belgian legislation which influence the identification of users of PPPs. In Wallonia, the general banning of plant protection products will be implemented from 1st June 2019 in public spaces and from 1st June 2018 in some specific areas⁹⁹. In Flanders, the use of plant protection products will be prohibited from 1st January 2015 for all public services¹⁰⁰.

The legislative texts already adopted imply a change in the behavior and the practices of actors. Some interlocutors have already switched to alternative control methods; others have reduced their use systematically to a zero-use of PPPs. The targets as well as the measures deriving from Directive 2009/128/EC impact the estimation on the used quantities of PPPs according to the considered year.

The best methods to collect the information on the pesticide use from the different actors, identified in task 1, allow providing a review for different methods of data collection already tested in the past, for each category of users. Also, the advantages and disadvantages of all different methods of data collection have been identified and a degree of certainty has been attributed for each method. At the same time, different tools (mostly based on the legislation) for the estimation of non-agricultural uses of PPPs have been proposed for each category of users. The problems identified, data and the perspectives for the estimation of non-agricultural uses of PPPs have been considered in a detailed way.

The third task of this study involved the implementation of a methodology for the consolidation of pesticide statistics of sales and uses. Based on the current data on the use of plant protection products in agriculture in Wallonia and in Flanders, an overview on the uses of plant protection products in Belgium was calculated for the year 2010. More precisely, a statement of data on the used or sold quantities of active substances has been made, for each category of users at Belgian level (more specifically, at Walloon and Flemish levels), based on different methodologies. In 2010, roughly 17% of used quantities of active substances correspond to the non-agricultural uses of PPPs in Belgium (914 tons out of a total of 5.472 tons). The quantities sold to non-professional users account for 15% of non-agricultural uses (138 tons) and the estimated quantities of active substances used by the non-agricultural professional users account for 85% of non-agricultural uses in Belgium (776 tons). Based on a ranking by expert judgement, the private companies of parks and gardens (for public or private institutions), the private companies and the amateur gardeners are the

⁹⁹ Décret du 10 juillet 2013 instaurant un cadre pour parvenir à une utilisation des pesticides compatible avec le développement durable et modifiant le Livre Ier du Code de l'Environnement, le Livre II du Code de l'Environnement, contenant le Code de l'Eau, la loi du 28 décembre 1967 relative aux cours d'eau non navigables et le décret du 12 juillet 2001 relatif à la formation professionnelle en agriculture (M.B. 05.09.2013) et Arrêté du Gouvernement wallon du 11 juillet 2013 relatif à une application des pesticides compatible avec le développement durable et modifiant le Livre II du Code de l'Environnement, contenant le Code de l'Eau et l'arrêté de l'Exécutif régional wallon du 5 novembre 1987 relatif à l'établissement d'un rapport sur l'état de l'environnement wallon (M.B. 05.09.2013)

¹⁰⁰ Decree of 21/12/2001 on the reduction of pesticide use by public services in the Flemish Region (December 21, 2001) and decision of the Flemish Government on the detailed rules for the reduction programs to reduce pesticide use by public services in the Flemish Region (December 19, 2008).

interlocutors that require a combination of administrative data (for amateur gardeners) with inquiries (for all kind of private companies) in order to get data on the use of PPPs. The implementation of data collection methods (exhaustive investigation, investigation into sample or administrative data) had to be elaborated with utmost attention based on the needs and the objectives of the study.

Also, the transposition of Directive 2009/128/EC will impact the estimation on the used quantities of PPPs over time, involving an expected drop in the used quantities of active substances for most of categories of users of PPPs. The targets and the measures deriving from Directive 2009/128/EC will lead to a major change in the plant protection practices in the near future.

Bibliographic references

4.1. Task 1: Website references

1. Amateur gardeners

- <http://www.fytoweb.fgov.be/amateur/introindusnl.htm>
- <http://www.lbo-services.be/>
- http://www.phytofar.be/home/home_publiciek
- http://www.vilt.be/Strengere_regels_voor_amateurgebruik_gewasbescherming

2. Green areas (parks, gardens, cemeteries ...)

- http://www.natuurenbos.be/nl-BE/Over-ons/Wie_zijn_we.aspx
- http://www.belgium.be/fr/environnement/biodiversite_et_nature/conservation_de_la_nature/e_space_vert/

3. Road infrastructure

- <http://nl.wikipedia.org/wiki/Weg>
- <http://routes.wallonie.be/>
- <http://www.vlaanderen.be/nl/contact/adressengids/beleidsdomein-mobiliteit-en-openbare-werken-mow/agentschap-wegen-en-verkeer-awv>
- <http://www.wegenenverkeer.be/images/stories/docs/jaarverslagen/jaarverslag-awv-2010-2011.pdf>
- <http://www.wegenenverkeer.be/over-awv/agentschap-wegen-en-verkeer.html>

4. Transport service

a) Train

- <http://www.belgianrail.be/>
- <http://www.infrabel.be/>

b) Bus/Coach

- <http://busetcars.unblog.fr/>
- <http://www.delijn.be/over/index.htm>
- <http://www.fbaa.be/fr/default.asp?Id1=0&Id2=0&Id3=0&Id4=0&Title=Home>
- <http://www.fbaa.be/nl/default.asp?Id1=81&Id2=0&Id3=0&Id4=0&Title=Bedrijven#>
- <http://www.infotec.be/index.aspx?PagelId=631734022642174032>

c) Underground/Light rail

- http://www.belgium.be/nl/mobiliteit/openbaar_vervoer/bus-tram-metro/
- <http://www.infotec.be/Medeplacer/Solutionsdemobilit%C3%A9/SolutionsTEC/M%C3%A9trodeCharleroi.aspx>

d) Touristic tram or train way

- <http://cfv3v.in-site-out.com>
- http://nl.wikipedia.org/wiki/Stoomcentrum_Maldegem
- http://nl.wikipedia.org/wiki/Stoomspoorlijn_Dendermonde-Puurs
- <http://www.asvi.be/index/index.htm>
- <http://www.cfboqc.be>
- <http://www.cfs-sprimont.be/>
- <http://www.kolenspoor.be/home.html>
- <http://www.rail-rebecq-rognon.eu>
- <http://www.stoomcentrum.be/>
- <http://www.stoomtrein.be/>
- <http://www.tramdehan.net>
- <http://www.tta.be/>

e) Tramway

- http://www.belgium.be/nl/mobiliteit/openbaar_vervoer/bus-tram-metro/
- <http://www.delijn.be/over/index.htm>

f) Plane in the common airports and aerodromes

- <http://aeroports.wallonie.be/opencms/opencms/fr/ebci/>
- http://fr.wikipedia.org/wiki/Liste_des_a%C3%A9rodromes_de_Belgique
- <http://nl.wikipedia.org/wiki/Vliegveld>
- http://users.telenet.be/privategroup/EBST/Route_Description.html
- <http://www.aeroclub-brasschaat.be/kacbccontacts.htm>
- <http://www.aeroclub-keiheuvel.be/>
- <http://www.aero-kiewit.be/DesktopDefault.aspx?tabindex=0&tabid=1>
- http://www.antwerp-airport.be/contentpage_nl.php?p=geschiedenis&search=oppervlakte
- http://www.antwerp-airport.be/contentpage_nl.php?p=over_ons
- <http://www.brusselsairport.be/nl/>
- <http://www.charleroi-airport.com/>
- <http://www.ebhn.be/>
- <http://www.ebzw.be/contact.html>
- <http://www.goudengids.be/aero-club-sanicole-vzw-hechtel-eksel-3940/>
- <http://www.gravitypark.be>
- <http://www.kortrijkairport.be/index.php?id=12>
- http://www.ost.aero/nederlands/frameset_b2b.htm
- <http://www.rvg.be/>
- <http://www.sainthubert-airport.com/>
- <http://www.skydivespa.com>
- <http://www.sowaer.be/>
- <http://www.vlaanderen.be/nl/mobiliteit-en-openbare-werken/waterverkeer/luchthavens>

g) Boat in the ports

- <http://charleroi.portautonome.be/en/pac.php>
- <http://nl.havengent.be/>
- http://www.binnenvaart.be/nl/wie_zijn_wij/index.asp
- <http://www.le-paco.be/fr/projets-en-cours/>
- <http://www.portdeliege.be/fr/liege-port-autonome>

- <http://www.portnamur.be/>
- <http://www.portofantwerp.com/nl/havenorganisatie-0>
- <http://www.portofoostende.be/agho/default.htm>
- <http://www.portofzeebrugge.be/>
- <http://www.vlaamsehavencommissie.be/vhc/belang-vlaamse-havens>
- <http://www.vlaanderen.be/nl/mobiliteit-en-openbare-werken/lucht-en-scheepvaart/vlaamse-havens>
- <http://www.waterrecreatie.be/html/start.html>

h) Bicycle

- <http://nl.villo.be/index.php>
- http://nl.wikipedia.org/wiki/Lijst_van_publieke_fietssystemen
- <http://ravel.wallonie.be/opencms/opencms/fr/>
- <http://www.infotec.be/index.aspx?PagelId=633072329512714856&Language=english>
- <http://www.scotty.be/nl/sites/blue-bike/>
- <http://www.sentiers.be/spip.php?rubrique89>
- <http://www.velo-antwerpen.be/>
- <http://www.fietsenwerk.be/nl/home-1.htm>
- <http://www.esf-agentschap.be/nl/projectenkaart/fietsenwerk-vzw-0>

i) Railbikes

- <http://www.365.be/attractions/att/recreatief-toeristische-trein-tessengerlo-216-railbike-of-spoorfiets.html?lang=NL>
- <http://www.molignee.be/draisines/draisines.htm>
- <http://www.railbike.be/fr/>
- <http://www.railbikelimburg.be/>

5. Industrial areas, tertiary sector (commercial, touristic, car park...)

- <http://dgo4.spw.wallonie.be/dgatlp/dgatlp/>
- <http://www.agentschapondernemen.be/content/over-ons>
- http://www.belgium.be/fr/environnement/pollution/pollution_du_sol/
- <http://www.ewi-vlaanderen.be/ewi/wat-doen-we/programmas-subsidies/bedrijfsbeleid-en-ruimtelijke-economie/agentschap-ondernemen>
- <http://www.panoramio.com/>

6. Sport areas (stadium, race course, tennis court...)

- <http://archive.canalc.be/>
- <http://nl.wikipedia.org/wiki/Bloso>
- <http://www.bloso.be/OverBloso/Pages/default.aspx>
- <http://www.cjasm.vlaanderen.be/sport/index.shtml>
- <http://www.isbvzw.be/nl/477/collections/465/over-isb.html>
- <http://www.lalibre.be/>
- <http://www.sportvlaanderen.be/>
- <http://www.wikistadiums.org/>
- <http://pouvoirslocaux.wallonie.be/jahia/Jahia/site/dgpl/accueil/pid/982>
- <http://amenagementdejardinscorroy.be/fr>

7. Golf courses

- http://fr.wikipedia.org/wiki/Liste_des_golfs_belges_par_r%C3%A9gion
- http://nl.wikipedia.org/wiki/Lijst_van_golfbanen_in_Belg%C3%AB
- <http://www.afgolf.be/>
- <http://www.golfbelgium.be/>
- <http://www.golfvlaanderen.be/>

8. Military fields and airport

- http://fr.wikipedia.org/wiki/Base_a%C3%A9rienne_de_Chi%C3%A8vres
- http://www.inbo.be/content/page.asp?pid=BEL_VLA_GEB_MilitaireDomeinen
- <http://www.mil.be/def/index.asp?lan=fr>
- <http://www.mil.be/fr/composante-air>
- <http://www.mil.be/fr/composante-marine>
- <http://www.mil.be/fr/composante-medicale>
- <http://www.mil.be/fr/composante-terre>
- <http://www.museespitfire.be/>
- http://www.natuurenbos.be/nl-BE/Over-ons/Wie_zijn_we.aspx
- <http://www.shape.nato.int/shape.aspx>
- <http://www.cwgc.org/about-us/what-we-do.aspx>

9. Leisure Park, Adventure Park, campsites and miniature golf

- <http://cgt.tourismewallonie.be/homepage.aspx>
- <http://fr.camping.info/belgique/wallonie>
- http://nl.wikipedia.org/wiki/Center_parcs
- http://nl.wikipedia.org/wiki/Olmense_Zoo
- <http://nl.wikipedia.org/wiki/Planckendael>
- <http://subsites.studio100.be/st100/>
- <http://www.a-z.be/pretparken.html>
- <http://www.bobbejaanland.be/>
- <http://www.boudewijnpark.be/>
- <http://www.compagniedesalpes.com/en/profil>
- <http://www.desierk.be/>
- <http://www.kakelendkippenmuseum.be/contact.html>
- <http://www.kampenhoeve.com/index.php/contacten/ligging>
- <http://www.keiheuvel.be/pages/info/volwassenen/1/keiheuvel.html>
- <http://www.kmda.org/>
- http://www.minigolf.be/joomla2/index.php?option=com_contact&view=category&catid=12&Itemid=27
- <http://www.minigolf-wallon.be/>
- <http://www.mvonderland.nl/partner/center-parcs-europe-nv>
- <http://www.olmensezoo.be/cms/index.php?lang=nl>
- <http://www.pour-nos-enfants.be/parcs-promenades-namur.asp>
- <http://www.toerismevlaanderen.be/content/over-ons>
- <http://www.visitsealife.com/blankenberge/>
- <http://www.vlaanderen-vakantieland.be/>
- <http://www.wilhelmtell.com/recreatie/default.htm>

- <http://www.walibi.com>
- <http://www.pairidaiza.eu/>
- <http://www.vlaanderen.be/nl/contact/adressengids/vlaamse-overheid/administratieve-diensten-van-de-vlaamse-overheid/beleidsdomein-economie-wetenschap-en-innovatie/agentschap-plantentuin-meise>
- http://nl.wikipedia.org/wiki/Nationale_Plantentuin_van_Belgi%C3%AB

10. Schools

- <http://enseignement.catholique.be/>
- http://nl.wikipedia.org/wiki/Onderwijs_in_Vlaanderen
- <http://open.furto.be/fopem/>
- <http://steinerscholen.be/>
- <http://www.agion.be/organisatie.aspx>
- <http://www.a-z.be/scholenAH.html>
- <http://www.brabantwallon.be/fr/Enseignement-et-formation/Enseignement-provincial/>
- <http://www.cocof.irisnet.be/>
- <http://www.federation-wallonie-bruxelles.be/>
- <http://www.freinetschool.be/>
- http://www.g-o.be/Net_eMagazineHome/Pages/OverGO.aspx
- <http://www.hainaut.be/template/template.asp?page=enseignement&navcont=12,0,0&branch=30>
- <http://www.ipco.be/>
- <http://www.ond.vlaanderen.be/onderwijsaanbod/>
- <http://www.ond.vlaanderen.be/onderwijsaanbod/adres.asp?sn=962951>
- <http://www.ovsg.be/>
- <http://www.pov.be/site/provinciaal-onderwijs-vlaanderen/wat-is-provinciaal-onderwijs-vlaanderen>
- <http://www.province.luxembourg.be/fr/education-enseignement.html?IDC=3757>
- <http://www.province.namur.be/sections/enseignement>
- <http://www.provincedeliege.be/enseignement>
- <http://www.voop.be/>
- http://www.vsko.be/portal/page?_pageid=1510,1&_dad=portal&_schema=PORTAL

11. Health care establishment, rest home, hospital, day-nursery, childcare facilities...

- <http://nl.wikipedia.org/wiki/Gezondheidszorg>
- <http://www.apsyucl.be/>
- <http://www.hospitals.be/francais/hopitaux.html>
- <http://www.kindengezin.be/>
- <http://www.levif.be/>
- <http://www.maisonsderepos.be/>
- <http://www.vaph.be/vlafo/view/nl/>
- <http://www.vlaanderen.be/nl/contact/adressengids/agentschap-jongerenwelzijn-jwz/beleidsdomein-welzijn-volksgezondheid-en-gezin-wvg/administratieve-diensten-van-de-vlaamse-overheid/vlaamse-overheid/fonds-jongerenwelzijn>
- <http://www.zorg-en-gezondheid.be/>
- <http://www4wvg.vlaanderen.be/wvg/vipa/Paginas/Default.aspx>

12. Public Social Assistance Centre and housing corporations

- <http://fr.yelp.be/>
- http://www.belgium.be/nl/familie/sociale_steun/ocmw/
- <http://www.swl.be/>
- <http://www.vmsw.be/nl/algemeen/over-vmsw>
- <http://dgo4.spw.wallonie.be/dgatlp/dgatlp/>

13. Water, electricity, gas and phone companies

- <http://corporate.telenet.be/>
- <http://nl.wikipedia.org/wiki/Waterbeheer>
- <http://www.aanbieders.be/energie/energieleveranciers>
- <http://www.aanbieders.be/telefonie/operators>
- <http://www.aide.be/jahia/Jahia/site/aide/general>
- <http://www.aiem.be/>
- <http://www.aquawal.be/fr/nos-associes/production-distribution/ciesac.html>
- <http://www.belgacom.com/be-nl/>
- <http://www.belpower.be/index.php?lng=nl>
- <http://www.billi.be/?lang=nl>
- <http://www.burg-reuland.be/>
- <http://www.cile.be/frame.html>
- <http://www.creg.be/nl/index.html#>
- <http://www.cwape.be/?dir=4.1.02&title=Fournisseurs>
- <http://www.cwape.be/?dir=4.1.03&title=GRD>
- <http://www.cwape.be/?dir=4.2.02>
- <http://www.dewatergroep.be/>
- <http://www.eauxducondroz.be/acceuil.html>
- <http://www.ebem.be/>
- <http://www.ecopower.be/>
- <http://www.edpnet.be/>
- <http://www.eneco.be/>
- <http://www.energie2030.be/?lang=nl>
- http://www.energiesparen.be/over_vea
- http://www.eni.com/nl_BE/home.html
- <http://www.ibpt.be/>
- <http://www.ibw.be/>
- <http://www.idea.be/>
- http://www.idelux-aive.be/pages/wwwroot_lang_fr/index.html
- <http://www.iden-eau.be/>
- <http://www.iecbw.be/default/acceuil.aspx>
- <http://www.ieg.be/index.htm>
- http://www.igretec.com/doc.php?rub_id=41&site=1&lg=1
- <http://www.inasep.be/>
- <http://www.ipalle.be/>
- <http://www.kpngroup.be/>
- <http://www.lampiris.be/nl/>
- <http://www.mobistar.be/>
- <http://www.octaplus.be/nl/>
- <http://www.rochefort.be/>

- <http://www.spge.be/xml/index.html>
- http://www.st.vith.be/index_fr.htm
- <http://www.swde.be/>
- <http://www.theux.be/>
- <http://www.troisponts.be/>
- <http://www.ville-de-chimay.be/>
- <http://www.vivaqua.be/fr>
- <http://www.vmm.be/>
- <http://www.vreg.be/>
- <http://www.waimes.be/>
- <http://www.wasewind.be/>
- <https://www.electrabel.be/>
- <https://www.elegant.be/>
- <https://www.essent.be/>
- <https://www.luminus.be/nl/vlaanderen/Prive.aspx>
- <http://nl.wikipedia.org/wiki/Pidpa>
- <https://www.pidpa.be/over-pidpa/organisatie/bedrijf>
- <http://nl.wikipedia.org/wiki/Eandis>
- <http://nl.wikipedia.org/wiki/Netbeheerder>
- http://nl.wikipedia.org/wiki/Belgische_elektriciteitsvoorziening
-

14. Forest and nature management

- <http://www.experts-forestiers.be/>
- http://www.inbo.be/content/page.asp?pid=OVERINBO_startpagina
- http://www.natuurenbos.be/nl-BE/Over-ons/Wie_zijn_we.aspx
- <http://www.woodnet.com/fr/home.asp>
- <http://spw.wallonie.be/dce/spip.php?mot26>

15. Navigable waterways

- <http://voies-hydrauliques.wallonie.be>
- <http://www.agentschapmdk.be/>
- <http://www.descheepvaart.be/Rubriek/Overons/Wie-zijn-wij.aspx>
- <http://www.maritiemetoegang.be/>
- <http://www.vlaanderen.be/nl/mobiliteit-en-openbare-werken/lucht-en-scheepvaart/beheer-van-de-bevaarbare-waterwegen-vlaanderen>
- http://www.wenz.be/nl/overons/#.URy9J_K9a7s
- <http://cgt.tourismewallonie.be/>

16. Donation Royale

- <http://minfin.fgov.be/portail2/nl/site/royaldonation.htm>
- http://nl.wikipedia.org/wiki/Koninklijke_Schenking
- <http://www.monarchie.be/nl/de-monarchie-vandaag/koninklijke-initiatieven/koninklijke-schenking>
- <http://minfin.fgov.be/portail2/fr/site/royaldonation.htm>
- http://finances.belgium.be/fr/sur_le_spf/institutions_qui_dependent_du_spf_finances/donation_royale/

17. Immovable heritage

- <http://dgo4.spw.wallonie.be/dgatlp/dgatlp/Pages/Patrimoine/Pages/Directions/ProtectionPresentation.asp>
- http://nl.wikipedia.org/wiki/Categorie:Lijsten_van_onroerend_erfgoed_in_Vlaanderen
- <http://www.corroy-le-chateau.com/>
- <http://www.federation-wallonie-bruxelles.be/index.php?id=2230>
- <http://www.vlaanderen.be/nl/contact/adressengids/beleidsdomein-ruimtelijke-ordering-woonbeleid-en-onroerend-erfgoed-rwo/administratieve-diensten-van-de-vlaamse-overheid/vlaamse-overheid/onroerend-erfgoed>
- <https://www.onroenderfgoed.be/over-ons/>
- <http://www.federation-wallonie-bruxelles.be/index.php?id=329>

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- Fevery D. & Spanoghe P.(2013), Aanpassingen van de indicator Druk op het waterleven door gewasbescherming, studie uitgevoerd in opdracht van de Vlaamse Milieumaatschappij, MIRA, MIRA/2013/11, UGent.
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- Houbraken, M. & Spanoghe, P. (2013). Evaluatie van bestrijdingsmiddelen voor amateurgebruik. Studie uitgevoerd in opdracht van Phytofar. 27p.

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- Van den Bossche, A. and D. Van Lierde, Onderzoek naar gewasbeschermingmiddelen in wintertarwe, (korrel-en kuil) maïs, witloof, prei, champignons, en peren in 2000. 2002, Ministerie van de Middenstand en Landbouw Bestuur voor Onderzoek en Ontwikkeling Centrum voor Landbouw Economie: Brussels (Belgium). 131pp.

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- Decree of the Flemish government of 15 March 2013 for the application of pesticides
- Decreet houdende duurzaam gebruik van pesticiden in het Vlaamse Gewest van 08/02/2013 (BS 22/02/2013); Besluit van de Vlaamse Regering houdende nadere regels inzake duurzaam gebruik van pesticiden in het Vlaams Gewest voor niet-land- en tuinbouwactiviteiten en de opmaak van het Vlaams Actieplan Duurzaam Pesticidengebruik van 15/03/2013 (BS 18/04/2013)
- Directive 2009/128/EC of the European Parliament and of the Council of 21 October 2009 establishing a framework for Community action to achieve the sustainable use of pesticides
- Flemish government decree of 15 March 2013 describes different application areas of pesticides
- Koninklijk Besluit tot wijziging van het koninklijk besluit van 28/02/1994 betreffende het bewaren, het op de markt brengen en het gebruiken van bestrijdingsmiddelen voor landbouwkundig gebruik van 10 januari 2010 (BS 18/02/2010)
- Koninklijk besluit van 19 maart 2013 ter verwezenlijking van een duurzaam gebruik van gewasbeschermingsmiddelen en toevoegingsstoffen.
- Regulation (EC) n°1107/2009 of the European Parliament and of the Council of 21 October 2009 concerning the placing of plant protection products on the market and repealing Council Directives 79/117/EEC and 91/414/EEC
- Regulation (EC) N°1166/2008 of the European Parliament and of the Council of 19 November 2008 on farm structure surveys and the survey on agricultural production methods and repealing Council Regulation (EEC) n° 571/88.
- Regulation (EC) n°1185/2009 of the European Parliament and of the Council of 25 November 2009 concerning statistics on pesticides.
- Richtlijn 2009/128/EC van het Europees Parlement en de Raad van 21 Oktober 2009 tot vaststelling van een kader voor communautaire actie ter verwezenlijking van een duurzaam gebruik van pesticiden.
- Royal Decree of 28 February 1994 on the authorisation of manufacturing, import, export of packaging companies of pesticides for agricultural use has been modified by Royal Decree of 16 October 2007.
- Royal Decree of 15 December 2013 on the federal pesticide reduction programme for the period 2013-2017.

4.4. Task 2: website references

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- <http://www.zonderisgezonder.be>
- <http://www.zonderisgezonder.be/archief/productenlijsten-voor-openbare-besturen/2013/productenlijst-2013-voor-openbare-besturen>
- <http://www.zonderisgezonder.be/pesticiden-gebruiken/rapporteren-en-bijhouden-gebruiksgegevens>
- <http://www.interview-efm.fr/cawi-computer-assisted-web-interviewing/>
- http://www.cengage.com/marketing/book_content/1439080674_zikmund/book/ch10.pdf
- <http://srmo.sagepub.com/view/encyclopedia-of-survey-research-methods/n368.xml>