

# THE REJECTION OF PESTICIDE USE IN FRANCE, BETWEEN NEW DYNAMICS IN THE FUNCTION OF GREEN SPACES AND DIFFERENTIATED MANAGEMENT

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**Abstract:** The rejection of pesticide use in non-agricultural areas is a subject of public policy, national initiatives, and collective activism. As private actors renew and expand their perceptions on the value of green space, the rise in sentiment against pesticide use is leading public policy makers to re-examine the management of these areas and orient it towards an approach that is more sensitive to the different requirements of non-agricultural terrains and the evolving functions of green space and Nature within cities. This study examines the problematic of pesticide use and it shows that the social and political interactions at the interface of these issues are changing the dynamics of green space and nature in cities. It is necessary to consider the questions posed by the public and the collective actions abandoning pesticide use. The approach from multiple scales allows the focus on actions at local level to observe how these last actors appropriate and treat these issues. I will use the study of a collection of documents to better understand the objective reasons for local mobilization and identify the fundamental reasons for their actions. The rejection of pesticide use has become an issue at the interface between public policy and public action. A wide variety of actors has taken on this issue and it is capable of local mobilization. Public policies have become increasingly dominant: a favourable context for local mobilisation, but limited by complex legal procedures. The collection of documents used in this article suggests that the rejection of pesticide use is becoming an integral part of the management of urban projects through multiple public policies and collective actions.

**Keywords:** Rejection of pesticide use, green space, urbanization, differentiated management, France

## 1. INTRODUCTION

Today, the rejection of pesticide use has become an issue of public policy and community mobilization that is spreading in western societies. But this increasingly visible diffusion also highlights the long road ahead with respect to the pervasive use of pesticides, particularly in France. Although the bulk of pesticide use is certainly an agricultural concern, there is still significant application of pesticides on land managed by regional authorities responsible for infrastructure, and this use poses questions that are the concern of both society and scientific research. The rejection of pesticides can be seen as part of an accumulation of issues that are leading our societies to question the relationship that they maintain with their environment and in particular with Nature and green space.

### 1.1. A question for society

Pesticides are still primarily used in agriculture, gardening, and the maintenance of green spaces. In France, 100000 tons of pesticides are applied each year, representing an average of more than 5 kilograms of active materials for each cultivated hectare. Herbicides are the first in line with 40% of sales, followed by fungicides and insecticides. Large grain farms, producers of oilseeds, and grape growers are the primary users of phytosanitary products (Butault et al., 2011).

The recognition of the extent of pesticide use and the increasing media attention to the consequences and risks involved have created a context in which the rejection of pesticides has become a major issue in today's society (Riley & Curtis, 1992; Coppin et al., 2002; Gunter, 2005). This, in turn, has led to political actions such as laws (law Labbé, January 2014) that aim to reduce or

eliminate pesticide use. This law anticipates setting the objective – Objective zero phyto – in all public spaces as of January 1, 2020: banning the use of phytosanitary products by the State, local communities, and public establishments for the maintenance of green spaces, hiking trails, and forests. The sale and possession of phytosanitary products designated for non-professional use will be banned as of January 1, 2022. This measure concerns amateur gardeners in particular.

The European Union made the reduction of pesticide use one of seven strategic themes in the 6<sup>th</sup> program of actions in favour of the environment (2002-2012) (European Commission, 2015). In transcripts from the French Commission on sustainable development and territorial planning, Allain (2014) points out that the construction of law concerning the future of agriculture seeks to encourage agro-ecology, and should do more to protect agricultural and Non-agricultural users (Warner, 2008). In 2013, INSERM (National Institute of Health and Medical Research) began drawing attention to health risks associated with pesticide use. This political will to address pesticide issues followed the commitments made during the works before Grenelle's environment Law (2007) to reduce agricultural pesticide use by 50% between 2008 and 2018 (Ecophytoplan 2018). The Ministry of Environment launched a complementary initiative (*zérophyto*) in non-agricultural zones which is aimed at amateur gardeners and local communities.

## **1.2. A theme of scientific research**

Due to the spread of social concerns over pesticide use and the uncertainties that the subject engenders, more scientific studies have been including the controversies over pesticides in research covering health risks, environmental issues, and loss of biodiversity (Igbedioh, 1991). This trend has led to the development of an important line of research investigating the questions of environmental health (Hodgson & Levi, 1996; Hancock, 2002).

Environmental health incorporates prevention and management of health problems related to pollution or deterioration of the environment. Following this trend, a French institute of observation was created in 2006 to focus on pesticide residues. Jouzel & Prete (2014) and Salaris (2014) studied the links between pesticide exposure and health of agricultural workers in the context of uncertainties and public controversies. This approach joins the work of Aubertot et al. (2011) in which researchers analyse the links between agriculture and pesticides and the impacts on the environment. This analysis

coincides with the research conducted on the interface between cities and agriculture in which Fleury (2006) examines agriculture's technical issues in an urban context where the proximity to urban infrastructure and the related multifunctional expectations require specific accommodations in agricultural engineering (Ferrão & Fernández, 2013).

This interface between agriculture and city echoes the approach of Becerra (2012), who studies environmental risks that create social vulnerability. Her work looks at the vulnerability of agriculture due to its place in the urban landscape, and the vulnerability of the population to agricultural practices. The study follows the subject to the final point of questioning the compatibility of agriculture in cities and the modalities of their proximity, one to the other.

Barrault-Lefelle (2012) develops a thesis on gardening practices that brings another category of actors to the scene, amateur gardeners (recognized by the political hierarchy as nuisance producers). This approach is essential since the overwhelming majority of analyses show nothing but benefits to urban gardening (Brown & Jameton, 2000). The work puts a spotlight on a fundamental controversy over the merits of urban agricultural production (Mobbs, 2012; Klein & Wenner, 2001).

This controversy also appears in line with another popular topic, the interests and benefits of urban biodiversity (Bourcier, 2012; Arnould, 2011). Today's focus on the benefits of biodiversity appears to be a prerequisite for advancing towards a sustainable city, a condition which *a priori* would inevitably have an impact on the management techniques governing green spaces (Cole, 1991). The rejection of pesticides is part of these changing dynamics in the way society interacts with green spaces, placing it at the heart of issues faced by urban renewal (Platt, 2006).

## **1.3. Problematics and hypothesis**

Approaching this research through the subject of pesticides goes back to this choice of the interface between a diverse set of actors including agriculturists, gardeners, local communities, and policy actors. Beyond the basic subject of pesticides, it means understanding how the rejection of pesticide use has led to changes in the relationships between these actors and how these changes translate spatially. How do public policy actions and collective actions influence and interconnect in the changing dynamics of green spaces? The resulting hypothesis contends that the rejection of pesticides is contributing to the evolution of agricultural and horticultural practices, and new perspectives on the function of green spaces.

## 2. MATERIALS AND METHODS

It is necessary to consider the questions posed by the public and collective actions abandoning pesticide use. Both types of actions merge in the realm of public policies and their implementation (Hassenteufel, 2008). But the policies are initiated at different spatial scales, and each political level has the responsibility of implementing programs initiated at a higher political level. However, this hierarchy is mitigated at the local level by an awareness and willingness to act on local problems and maintain control over the social and environmental issues related to public spaces. Studying the rejection of pesticides requires examining the public policy interface between an increasingly complex legal apparatus and the local mobilisation instigated by a variety of actors against a variety of risks.

By “public action”, I mean to indicate the large legal texts of law, governmental, State, European, and international as well as assessments enabling an inventory and measurement of on-going developments. The symbolic actions (dedicating a week highlighting alternatives to pesticides for example) are measures used to publicise public action. The chronology is extremely important because this awareness is concomitant to other orientations such as sustainable cities, evolution in agricultural models, or environmental issues.

“Collective action” is used to identify the mobilised actors, the aim of their actions, and their existing networks. These collective actions are organized in response to the implementation of public actions. But they also emerge through the mobilisation of local actors that seek to appropriate issues through the adoption of labels and arousing the support of local organizations.

The approach from multiple scales allows me to focus on actions at local level and to observe how these last actors appropriate these issues. Will they succeed in transforming this international issue into a local one where the struggle against pesticides allows the questioning of the development model chosen and followed? I will use the study of a collection of documents to better understand the objective reasons for local mobilization and to identify the fundamental reasons for their actions. This is not meant to be an exhaustive study, which would be unrealistic, but a selection of typical examples of the diversity of public and collective actions intended to combat the use of pesticides. How do collective actions incorporate public actions and go further to transform the presentiments, the constraints and obligations, and engender new perspectives in the field of ecological land management?

## 3. RESULTS

The rejection of pesticide use has become an issue at the interface between public policy and public action. A wide variety of actors has taken on this issue and it is capable of local mobilization. Public policies have become increasingly dominant: a favourable context for local mobilisation, but limited by complex legal procedures.

One of the most important conclusions of Grenelle’s Environment law in 2007 proclaims: “It is necessary to reduce the use of pesticides”. So, two of the conference’s objectives appear essential: to reduce the utilisation of pesticides by 50%, and to obtain the suppression of roughly forty of the most dangerous molecules by 2010 (Observatoire des résidus de pesticides, 2015, *Plan interministériel de réduction des risques liés aux pesticides: 2006-2009*).

The Ecophyto plan for 2018 contains the operational translation of Grenelle’s Environment law and it calls for a 50% reduction, if possible, in pesticide use by 2018. This plan also presents the French adaptation of the community framework directive relative to the sustainable use of pesticides (Directive 2009/128/CE). Different actions have been taken to reinforce the securitization of pesticides and to reduce their usage, one of which is the Certiphyto (*phare*) measure. The Certiphyto program stipulates that all professional operations concerning utilisation, distribution, or sale of phytopharmaceutical products must hold the appropriate certification for these products. These certifications evaluate if the knowledge is sufficient to safely use the product.

The directive of June 27, 2011, established a framework for pesticide use in public spaces. The NAZs (the Non-Agricultural Zone refers to green spaces, parks and gardens, amateur gardens, urban open space, public rights of way, etc.) encompass close to 10% of the use of phytosanitary products in France. Products with an acute toxicity, classified as “hazardous to health”, are strictly forbidden in these zones. One section of this directive pursues 3 objectives: to improve the qualification of professional users of pesticides in non-agricultural zones; to ensure the security of pesticide use by amateurs and to strictly regulate pesticide use in public spaces; and to develop and distribute specific tools to enable the reduction of pesticide use in these zones.

In this context, the collective engagement in favour of abandoning pesticides in NAZs is demonstrated by regional charters and labels. There are two particularly popular labels, the EVE® label and the “Ecojardins” label, as well as different charters.

**The family of charters** associated with the

campaign “Objective: zero pesticides in our cities and towns” are support programs that are recommended to communities which are then responsible for developing them. These programs ensure that participating communities adopt new techniques for maintaining public green spaces. They

are disseminated throughout the regions by a consortium of associations and local collectives under the direction of the FREDON (Fédération Régionale de Défense contre les Organismes Nuisibles or Regional Federation for protection against harmful organisms).

Table 1. Charters and community participation and commitment in the elimination of pesticides in France

<b>Name of French regions (Number of municipalities)</b>	<b>The most important charters and their regional distribution – Situation in 2014</b>
Alsace (904)	<ul style="list-style-type: none"> <li>Regional charter to maintain municipal spaces: 150 municipalities</li> <li>34 municipalities receive «3 libellules» (abandoning pesticides and incentives to implement differentiated management in green spaces)</li> </ul>
Aquitaine (2296)	<ul style="list-style-type: none"> <li>Weeding plan or differentiated management: 206 municipalities</li> <li>9 municipalities receive «Villes et villages fleuris» Label (level 4 flowers)</li> <li>«Zero pesticide» Charter, carried by the Department Council (65 adherent municipalities)</li> </ul>
Auvergne (1311)	<ul style="list-style-type: none"> <li>75 municipalities: Maintain public spaces charter. 20 municipalities are labeled</li> </ul>
Bourgogne (2046)	<ul style="list-style-type: none"> <li>76 municipalities: «Objectif zéro pesticide dans nos villes et nos villages» Charter</li> <li>25 garden tools stores: «Jardinez en préservant sa santé et l'environnement» regional charter</li> </ul>
Bretagne (1270)	<ul style="list-style-type: none"> <li>120 municipalities: remise du prix «zéro phyto»</li> <li>60% of municipalities have weeding plan</li> <li>50% of municipalities are engaged in the maintenance of municipal areas charter</li> <li>10% of municipalities engaged in «zérophyto» charter</li> </ul>
Centre (2175)	<ul style="list-style-type: none"> <li>78 municipalities: «Objectif zéro pesticide» Charter</li> <li>97 municipalities: weeding plan</li> </ul>
Champagne-Ardenne (1950)	<ul style="list-style-type: none"> <li>66 stores: «Jardinons en préservant notre santé et l'environnement» Charter</li> <li>39 municipalities: «entretien des espaces publics» Charter</li> </ul>
Franche-Comté (1785)	<ul style="list-style-type: none"> <li>57 municipalities: «zéro pesticide en Franche Comté» Charter</li> </ul>
Ile-de-France (1281)	<ul style="list-style-type: none"> <li>7 departments et 1400 municipalities: pesticides reduction</li> <li>10% of municipalities apply the «zérophyto» rule</li> <li>14% no longer use pesticides in spaces with constraints (sports fields, golf courses, cemeteries)</li> </ul>
Languedoc-Roussillon (1545)	<ul style="list-style-type: none"> <li>150 municipalities were launched in reducing pesticides, including: <ul style="list-style-type: none"> <li>One hundred with the support of «Plan d'Amélioration des Pratiques Phytosanitaires et Horticoles» (PAPPH)</li> <li>10% «zéro pesticide» Charter</li> </ul> </li> <li>18 management and local structures have integrated pesticide reduction actions in their planning documents (SAGE, river contract)</li> </ul>
Limousin (747)	<ul style="list-style-type: none"> <li>Nearly 20% of Limousin communities are engaged in pesticides reduction plan</li> </ul>
Lorraine (2339)	<ul style="list-style-type: none"> <li>12 new municipalities engaged in pesticide reduction plans in 2012</li> </ul>
Martinique (34)	<ul style="list-style-type: none"> <li>Support for Technical Services of 3 pilot municipalities of Martinique</li> </ul>
Nord-Pas-de-Calais (1545)	<ul style="list-style-type: none"> <li>58 municipalities «Entretien des espaces publics» Charter</li> </ul>
Basse-Normandie (1812)	<ul style="list-style-type: none"> <li>263 Maintenance of public spaces charters were signed in 2011 and 2012</li> <li>20 municipalities have achieved a maintenance plan and they implement it now</li> </ul>
PACA (963)	<ul style="list-style-type: none"> <li>Launching in 2013 «Vers une région sans pesticide» Charter</li> </ul>
Pays-de-la-Loire (1502)	<ul style="list-style-type: none"> <li>One hundred communities have signed a pesticides reduction charter</li> <li>344 communities (nearly 30%) reported being involved in a weeding plan</li> <li>«Jardiner au naturel, çacoule de source!» is adopted by three watersheds in 2012: 42 garden-stores signatories</li> <li>In 2013: 85 garden tools stores</li> </ul>
Picardie (2291)	<ul style="list-style-type: none"> <li>35 municipalities: Regional charter of public spaces maintenance</li> </ul>
Poitou-Charentes (1462)	<ul style="list-style-type: none"> <li>221 municipalities: «Terre saine, votre commune sans pesticides» Charter</li> </ul>
Rhône-Alpes (2879)	<ul style="list-style-type: none"> <li>81 municipalities: «Objectif zéro pesticide dans nos villes et villages» Regional Charter</li> </ul>

Source: Ecophyto en régions, 2013, <http://agriculture.gouv.fr/ecophyto>

An evaluation done in 2012-2013 (Table 1) reveals the proliferation of community actions and it reflects the increasing sensibility of elected officials and the impact of these efforts to educate and sensitize communities to these issues. Names of charters may vary among communities, but ultimate goal remains zero pesticides. The majority of France regions are supporting these collective efforts, and significant progress has been made even if only a minority of communities have participated at this point.

**The EVE® label (*espace vegetal écologique*)** was created in 2006 and it applies to a variety of green spaces, urban or rural, public or private, such as parks, town squares, gardens, historic sites, periurban forests, natural spaces, river basins, industrial sites, industrial parks, and even hotel and camping grounds. The label is meant to enhance the value of ecological management practices and the ecologically sensitive creation or rehabilitation of landscaped terrains. It is valid for 3 years and each site is subject to an annual review. Ecocert (an independent organization providing certification in the environmental field) developed the label at the request of the collective communities in collaboration with a committee of landscaping and environmental experts and professionals. Along with the integration of differentiated management principles, the label is used to incorporate the creation or rehabilitation and management of green spaces in the logic of sustainable development.

In order to qualify for the **EVE®** label, the management of green spaces must follow certain principles (see the internet site of Ecocert): avoid the use of chemical products, adhere to a water conservation policy, maintain techniques that regard the soil as a living environment, and act in favour of biodiversity and spontaneous plant life.

For the owners of green spaces, the label functions as a tool to guide the conception and realization of their ecological projects, to develop better ecological practices, and to motivate the teams involved while providing an authentication of quality for users of the space. During the creation or rehabilitation of spaces seeking the label, the project must also respect 3 criteria: (1) provide an environmental assessment of the site, (2) demonstrate a site concept that envisions the integration of environmental landscaping, and (3) maintain the site free of chemical products.

Although precise and accessible data is limited, more than 150 green spaces have acquired the **EVE®** label in France. Examples include the *Jardins Passagers du Parc de La Villette* in Paris, the city of Quimper (for 12.2 hectares), and tourist

sites like the Evian Resort (15 hectares). There is a large diversity among sites, from areas as small as 250 square meters in the community of Seixen Ariège or 2 537 square meters in L'Isle Jourdain in the Gers department, to large sites like a forest of 2 823 hectares as part of *l'Agence des Espaces Verts d'Ile-de-France*. Since the creation of the label in France, 7 800 hectares of ecological green space have qualified for the label. Foreign sites have also acquired the label in Monaco, Belgium, South Africa, Switzerland, Brazil, and Turkey.

**The Ecojardins label** (eco-gardens) has been used to certify the ecological management of green spaces since 2012, and it covers any type of publicly accessible green space. The label aims to encourage the adoption of management practices which respect the environment, valorise the work of green space gardeners, and raise the awareness of public users to ecological practices as well as to issues of sustainable development. It was developed under the aegis of *Plante & Cité* (a national platform of experimentation and technical advice for green space services provided by communities and professional landscaping companies) and it involved 9 cities (Besançon, Lille, Lyon, Marseille, Montpellier, Nantes, Orléans, Paris and Rennes) in association with a group of professional partners. This effort represents the collaboration between central protagonists, local communities and professional landscaping companies. The label guarantees that the administrator of a public green space is committed to an ecological approach in all aspects of management. Several evaluation tools are suggested for roadside or bordering trees, developed green spaces, shared family gardens, camping grounds, and memorial parks. The *Ecojardins* label was conceived as part of the response to the objectives of the Ecophyto 2018 plan.

In France, 56 green spaces acquired the label in 2012. Another 85 were added in 2013 and 33 joined the ranks in 2014. As of 2014, at least one site with the *Ecojardins* label can be found in 26 of 95 French departments, and 17 of 22 regions are involved. Communities account for the strongest engagement among administrators of green spaces (17/21 in 2012, 23/26 in 2013). Parks and gardens make up the largest group of green spaces concerned (57%, Fig. 1).

Practices of managers, both positive and those needing improvement, show that there is still much to be done. How do managers implement the commitments supporting the principles of differentiated management, like maintenance practices of green spaces, and the commitment to respect the label principles on different elements that constitute green spaces?

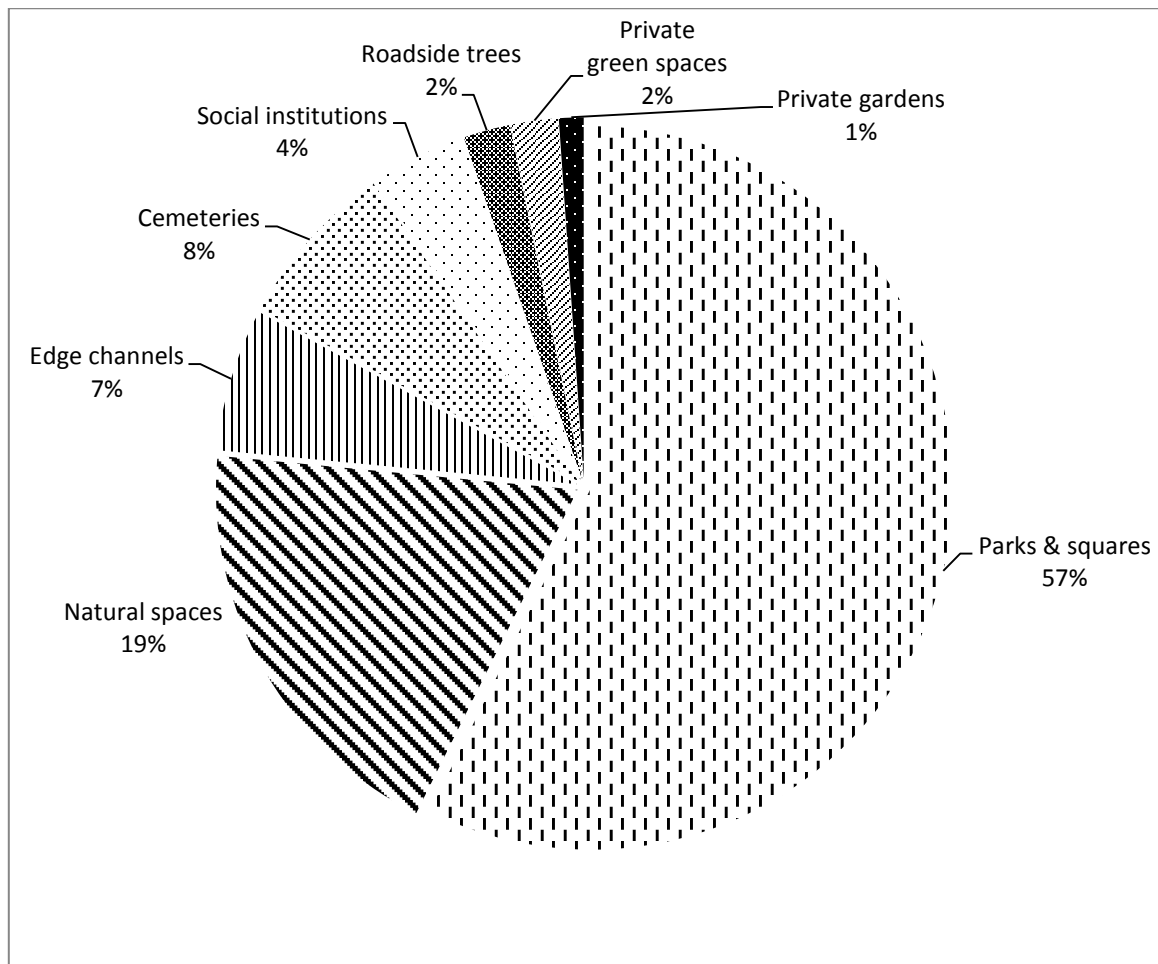


Figure 1. Different green spaces acquired the label “Ecojardin” in 2012-2013. Source: Natureparif & PlanteCité, 2014

Most important practices are considered those that may have an environmental impact. This explains the variety of technical choices around differentiated management:

- 97% managers implement principles of differentiated management (“*Differentiated management is changing the standard horticulture model by adding an ecological element to the management of green spaces. It enables better management of city’s green assets with precise objectives while taking human uses into account. It creates new types of spaces free to adapt to more varied functions of contemporary use*”).
- 94% managers use preventive methods to conserve water (ground cover, for example).
- 92% work the soil only as needed for planting.
- 90% implement preventive methods to avoid weeding.
- 90% follow strategies that give preference to environmentally conscious purchases of equipment.
- 88% group plants according to their watering requirements.
- 83% performed an initial biodiversity inventory at

the site.

- 83% implement measures to limit the use of combustion engines.
- 81% conserve dead wood and standing dead trees.
- 80% use forested locally wood or sustainably managed wood.
- 79% accept seasonal yellowing of the herbaceous layer.
- 68% give preference to native flora for replanting.

The theme «fauna and flora» is present in the training materials of all labels; other themes are also mentioned in some of the labels: water (70%), accommodation for the public (52%) and soil (46%).

While different deficiencies exist, technical practices should make further progress, as educational activities are insufficient:

- 86% managers do not monitor or they only partially monitor soil biodiversity.
- 66% managers have not made an assessment of sources or levels of pollution.
- 42% managers do not monitor flora, and 35% managers do not monitor fauna.
- 35% managers have little or no knowledge about soils.

A strong percentage of the managers have not integrated actions to improve the participation of the public in green spaces (39%), to sensitize the public (41%), nor have they implemented a sorting system on the site (52%).

#### 4. DISCUSSION

Presented results explain how the rejection of pesticide use is affecting the policy decisions and actions made by the public authorities, on one hand, and how it fosters organization and mobilization among local actors, on the other hand. Charters and labels validating the evolution of practices reflect that these public policy decisions and actions reduce pesticide use, emphasizing the timetable and rates of reduction, and the involvement of communities and businesses. The actions in turn demonstrate the changing perspective on pesticides.

One of the principal elements of this change is the evidence of public policy actions in which political actors affirmed that the problematics of pesticide use do not reside uniquely in the domain of agriculture.

This fact influenced the choice to examine non-agricultural zones (NAZs) in the present analysis. These zones may not be at the heart of these issues, but they present an image of how society is integrating the reduction of pesticide use and appropriating it as an issue in public green spaces and private spaces (such as gardens).

Obviously, it is impossible to ignore that the struggle against pesticide use concentrates primarily on agricultural land and practices. This struggle has led to numerous research programs and the spread of the agroecology model (Goulet & Meynard, 2012).

The prevalence of studies on pesticide use in agriculture is indicative of the dominant place that agriculture holds in relation to these practices (agriculture is the origin of 90% of pesticide use), but efforts to analyse the rejection of pesticides in non-agricultural zones are less expected. The idea is to observe, analyse and attempt to understand how these issues are evolving in the NAZs.

Approximately 10% of pesticide use occurs in NAZs (amateur gardening accounts for 8% while usage on community managed land accounts for 2%). Some reviews (such as work from the *Grenelle's Environment Law*) suggest that the impact of NAZ pesticides could be more important than their statistical share of usage due to the fact that they are often applied in areas where much of the terrain is impermeable due to urban construction.

This political and professional awareness is supported and transmitted by training centers (such

as the CNFPT-The National Public Training Center, available to regional communities in France. It is responsible for personnel training for these communities) that assure the dissemination of the model of differentiated management for community employees. Several training programs use this objective to help community professionals analyse the management of urban green spaces, and to support the objectives of differentiated management. Training can also include issues of environmental protection as well as public expectations regarding environmental constraints.

Currently, issues surrounding differentiated management are in the domain of a variety of entities: urban development agencies, cities and metropolitan areas, consulting firms, "hybrid" (private/public) organizations, such as CAUE (created in 1977. They are responsible for overseeing the objectives defined at national level with the intention of promoting the quality of architecture, urbanism and the environment).

Although it is a current practice in many northern European countries, the integration of differentiated management was not widespread in France until the emergence of scientific events like the 1994 European conferences in Strasbourg – "Towards differentiated management of green spaces" – and its follow-up in 2000.

In 1997, the agency for urban development in Lille metropolitan community was among the first to initiate a program to sensitize actors to the concepts of differentiated management. Of course, these concepts involve much more than just the rejection of pesticide use, nevertheless numerous examples listed in table 1 show that it remains a central issue. But even if various charters and labels demonstrate the advances made in the dissemination of this model, it remains a project in only a minority of communities compared to the 36 552 communities existing in mainland France.

Nevertheless, numerous cities and, in particular, larger metropolitan areas are now mobilizing in the struggle against pesticide use. These new efforts are linked to renewed interests and the inclusion of green spaces in urban planning.

A growing number of cities seek to "change the perspective", as seen in the Montpellier metropolitan community (SCOT of metropolitan Montpellier, in CERTU, 2005). This perspective suggests moving from an image of green spaces as a simple adjustment variable in urban development, towards an image of green space as armature framing protecting the success of these projects.

The diffusion of "*Trame verte et bleue*" (a French development tool for maintaining an

ecological/environmental network) provides strong evidence of changing values even if France has lagged behind in the implementation of this type of policy. The struggle against pesticide use constitutes a symbolic action in the qualitative strategy required to increase the social recognition of this ecological network. In addition, the increasing number of publicised studies on environmental health reinforces social vigilance over this action, and the current context, as presented here in the introduction, is particularly favourable to this evolution. The rise in both expectations and social vigilance should progressively reinforce each other in the years to come.

The expectations and social vigilance do carry contradictions in that they confront individuals with their ambiguous relationship with nature. Encouraging differentiated management amounts to giving an important status and place for wild nature in cities. The idea is to limit the amount of green space under horticultural management and to allow more flexible management methods for other green spaces. In 2008, these questions were debated during a conference held in Chambéry, titled: “*Colloque Biodiversité Naturalité Humanité*” (conference on biodiversity, naturalness, humanity) (Vallauri et al., 2010).

The bureau/agency on environment and sustainable development in Burgundy in 2010 (Alterre Bourgogne, 2010) published a technical report on the different manifestations of nature in cities. It examines the ability of urban nature to respond to environmental issues, and it comes to the conclusion that there is an intermingling of several different notions of nature in cities. Planners and developers think of nature in a spatial dimension, in the way it complements the organization of structures or buildings. Their view of nature tends to be limited to plants. Management authorities categorize green spaces according to their legal statute as public or private space. Naturalists are more sensitive to the degrees of anthropization of green spaces and the general role of humans or the place that they occupy in these spaces. They consider nature as a system of interaction among plants and animals. Average citizens have different relationships with nature, ranging from those who simply enjoy the benefits of natural space to those who work or garden in these spaces. They use these spaces in a multitude of different ways. In view of these varied elements, nature in cities is an extremely complex subject.

Actors implicated in charters and labels illustrate this complexity even if they are often overshadowed by the predominance of actors in

public policy. These charters and labels construct a strong relationship between the different perspectives and they show that collective actions are a determining factor in the rejection of pesticide use. Community actions are particularly persuasive since communities (and the professionals who work for them) are approaching the issues from a position of authority.

The implication of amateur gardeners is another situation entirely. As a group, they are completely heterogeneous, difficult to reach, difficult to sensitize and to convince. Existing programs suggest that training is essential for this group. There is evidence of this in several actions organized by the *syndicat des étangs littoraux* (SIEL: Union of Coastal lagoons in Languedoc). Since 2008, the SIEL (2015) had a program focused on sensitizing and educating the public at large on the advantages of reducing pesticide use (Exposition “Zero pesticides in our cities and towns” and booklet “Tomorrow, our gardens without pesticides”). Over the last few years, 54 public sensitivity days have been held in different communities, primarily to encourage community engagement in the project “*Vert Demain*” (Green Tomorrow).

The inclusion of pesticide reduction in urban projects modifies the way these projects are conceived and conducted, and it places individual private actors in a central position. This new dynamic upends the traditional perimeters of these projects and it makes the element of participation a central mechanism in the process.

But the participation of individual private actors is still an element under construction. The differently identified charter and label examples show that this new perspective on the relationship between cities and nature is still in its infancy. The dynamic between green spaces, public actors, and individual private actors will surely continue to evolve. The public policy actions remain determinant in this context because they must provide the “good” example for the private partners who remain, in large measure, unconvinced.

The research that we are undertaking in the framework of a program titled “*Abeille*” (Bee) should enable a more complete evaluation of the subject than these first results drawn from the body of analysed documents.

## 5. CONCLUSION

The rejection of pesticides is a significant issue referring to an environmental and health emergency. But, in early 2015, the Agriculture Minister (Stéphane Le Foll) recognized the failure of

“Ecophyto politics”. Pesticides used in agriculture increased by 5% between 2009 and 2013. There was presented a new method based on research and innovation that pushes the target to a 50% reduction in pesticide, for the period 2018-2025. Given the current political and social disability to force the farming world to reduce the use of pesticides, the experiences developed in NAZs are both essential, although modest.

The collection of documents used in this article suggests that the rejection of pesticide uses is becoming an integral part of the management of urban projects through multiple public policies and collective actions such as charters and labels. However, optimism must be tempered by the fact that a significant reduction, or total elimination, of pesticides in non-agricultural zones requires reaching, convincing and accompanying the large population of individual private actors.

The context of the problem, particularly in the case of health hazards, may facilitate developing support and involvement among these actors. The evidence of dangers in pesticide use continues to develop and this will certainly reinforce the ability of collective activities to diffuse policies and tools to limit or eliminate pesticides in non-agricultural landscapes.

Should we be pessimistic or will there be developed the required social awareness? How to sustain strong arguments while the different risks to human health do not result in increased awareness? Different scientific research shows that the issue of pesticides rejection is now posed by political actors. New current challenges are to transform it into a social issue appropriate by the population.

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