



## Recycling local organic waste in peri-urban horticulture: a casestudy in the Parisian region

Léa Boros, Florent Levavasseur, Lelenda Florent Kebalo, Nicolas Bijon, Kevin Morel

### ► To cite this version:

Léa Boros, Florent Levavasseur, Lelenda Florent Kebalo, Nicolas Bijon, Kevin Morel. Recycling local organic waste in peri-urban horticulture: a casestudy in the Parisian region. International Horticulture Congress, International Society for Horticultural Science: ISHS, Aug 2022, Angers, France. hal-03765958

**HAL Id: hal-03765958**

**<https://hal.inrae.fr/hal-03765958>**

Submitted on 31 Aug 2022

**HAL** is a multi-disciplinary open access archive for the deposit and dissemination of scientific research documents, whether they are published or not. The documents may come from teaching and research institutions in France or abroad, or from public or private research centers.

L'archive ouverte pluridisciplinaire **HAL**, est destinée au dépôt et à la diffusion de documents scientifiques de niveau recherche, publiés ou non, émanant des établissements d'enseignement et de recherche français ou étrangers, des laboratoires publics ou privés.

# Recycling local organic waste in peri-urban horticulture: a case- study in the Parisian region

L. Boros<sup>1,2</sup>, F. Levavasseur<sup>1</sup>, L. F. Kebalo<sup>1</sup>, N. Bijon<sup>3,4,5</sup>, **K. Morel**<sup>2</sup>

<sup>1</sup>UMR ECOSYS INRAE, AgroParisTech, Univ. Paris Saclay;

<sup>2</sup>UMR SADAPT INRAE, AgroParisTech, Univ. Paris Saclay;

<sup>3</sup>Recyclage et Risque, Univ. Montpellier, CIRAD;

<sup>4</sup>Veolia Environment Research and Innovation;

<sup>5</sup>Hydrosciences Montpellier, Univ. Montpellier, IMT Mines Ales, IRD, CNRS

# Strengthening functional links between cities and peri-urban agriculture



# Strengthening functional links between cities and peri-urban agriculture



Instead of incineration



Shredding, composting, digesting



Recycled as amendment or fertiliser



Improve soil properties, fertility, increase soil carbon and organic matter, reduce mineral fertiliser so energy consumption and resource depletion (*Noirot-Cosson, 2016; O'Connor et al., 2021; Herrera et al., 2022*).

# Strengthening functional links between cities and peri-urban agriculture



Source gallica.bnf.fr / Bibliothèque nationale de France

**Not new !!!**

Instead of incineration



Shredding, composting, digesting

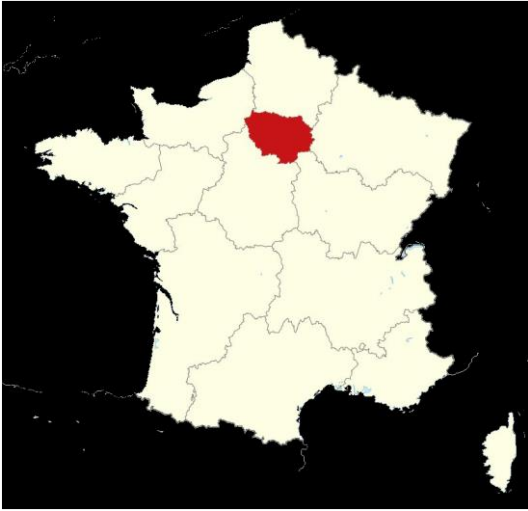


Recycled as amendment or fertiliser



Improve soil properties, fertility, increase soil carbon and organic matter, reduce mineral fertiliser so energy consumption and resource depletion (Noirot-Cosson, 2016; O'Connor et al., 2021; Herrera et al., 2022).

# The case of the Paris city-region



12 Millions inhabitants

48% of agricultural land

Per year:

900 000 T of OW produced only by private households

Compulsory to collect it separately by 2024

**== 300 000 T of compost**





# Knowledge gap about recycling urban OW for peri-urban vegetables and fruits

Existing work on potential recycling of OW in field crops (*Moinard et al., 2021*)

Information needed for vegetables and fruit which have high nutrient needs and often low return of organic matter to the soil (*Neuweiler and Krauss, 2017*)

**Hypothesis:** high potential !

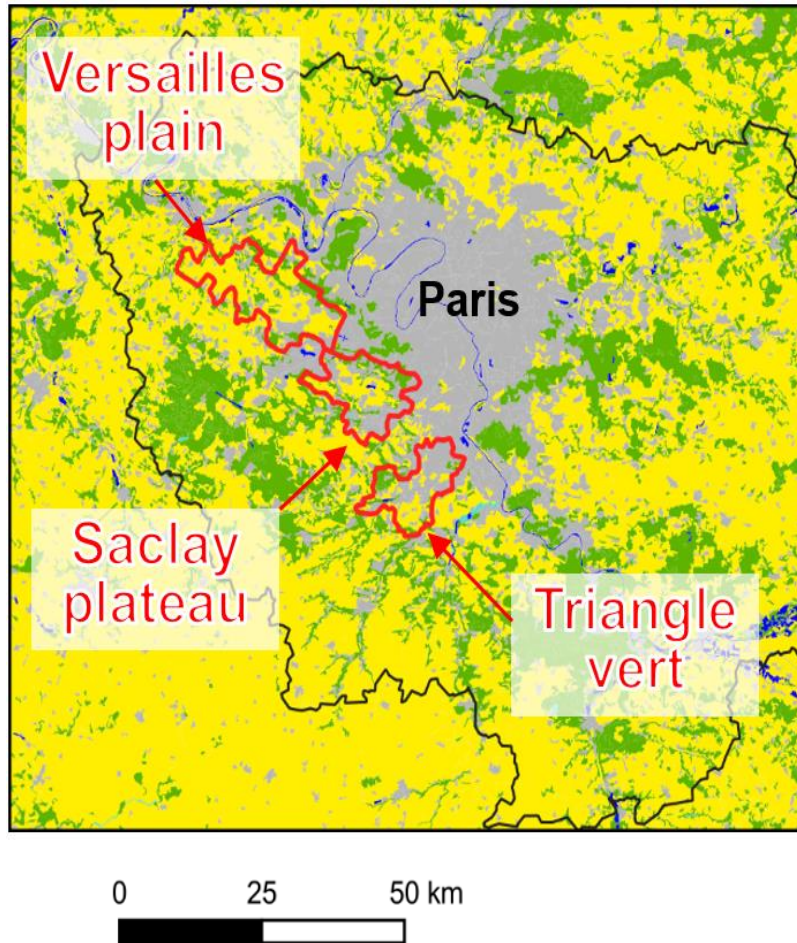
**Research questions:**

Current fertility management practices and use of OW?

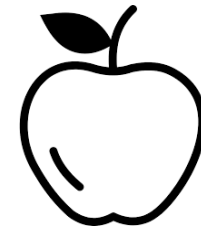
Perceptions of different types of OW ?



# A focus on 3 territories with strong local dynamic and F&V

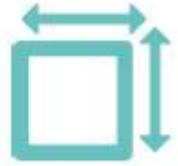


Studied areas	Ile-de-France	Versailles plain	Saclay plateau	Triangle Vert
Total surface (ha)	1,201,200	23,217	15,607	4,859
Total UAA (% of surface)	563,965 (47%)	12,156 (52,4%)	3,724 (23.9%)	1,491 (30.7%)
UUA dedicated to MG and FG** (ha) (% UAA)	5000ha (0.9%)	298 (2.5%)	100 (2.7%)	113 (7.6%)





# Qualitative analysis of interviews with 28 Fruit and Vegetable growers



**0,12 -30 ha**



**0 – 42 year**



**Diversity of marketing channels:  
89% in short**



**62% organic**

## Questions:

General context and farm

Fertility management

Discussion on a range of OW

# Types of OW presented to farmers

Ramial chipped wood (RCW)

Compost from green waste

Compost from biowaste

Digestate from biowaste

Cattle manure

Horse manure

Fertilisers from human urine

## COMPOST DE BIODECHETS

- **Amendement organique** composé à **50 % de biodéchets** (partie fermentescible des biodéchets de particuliers ou d'industrie agro-alimentaire) triés à la source et à **50% de déchets verts**, le tout **composté**
- Composition **variable** selon la **proportion de biodéchets** et de **déchets verts**, ainsi que la **gestion du compost** (temps maturation, aération, ...)
- **Meilleure nutrition azotée** que le compost de déchets verts simple, mais **apporte moins de MO** au sol



en g/kg	N organique	N minéral	P <sub>2</sub> O <sub>5</sub>	K <sub>2</sub> O
<b>Total</b>	9,8	0,3	5,1	8,3
<b>Dispo en année 1</b>	1	La totalité	La totalité	La totalité
<b>Dispo en année 2</b>	8,8	-	-	-

**Prix :** Gratuit à 50€/t



**Statut :** produit  
si NF U 44-051

**C/N :** 12 - 15  
(dépend de la quantité de biodéchets)

Autorisé en **AB**  
(seulement si produit dans un système de collecte fermé et contrôlé, accepté par l'État)

**pH :** 8 - 9

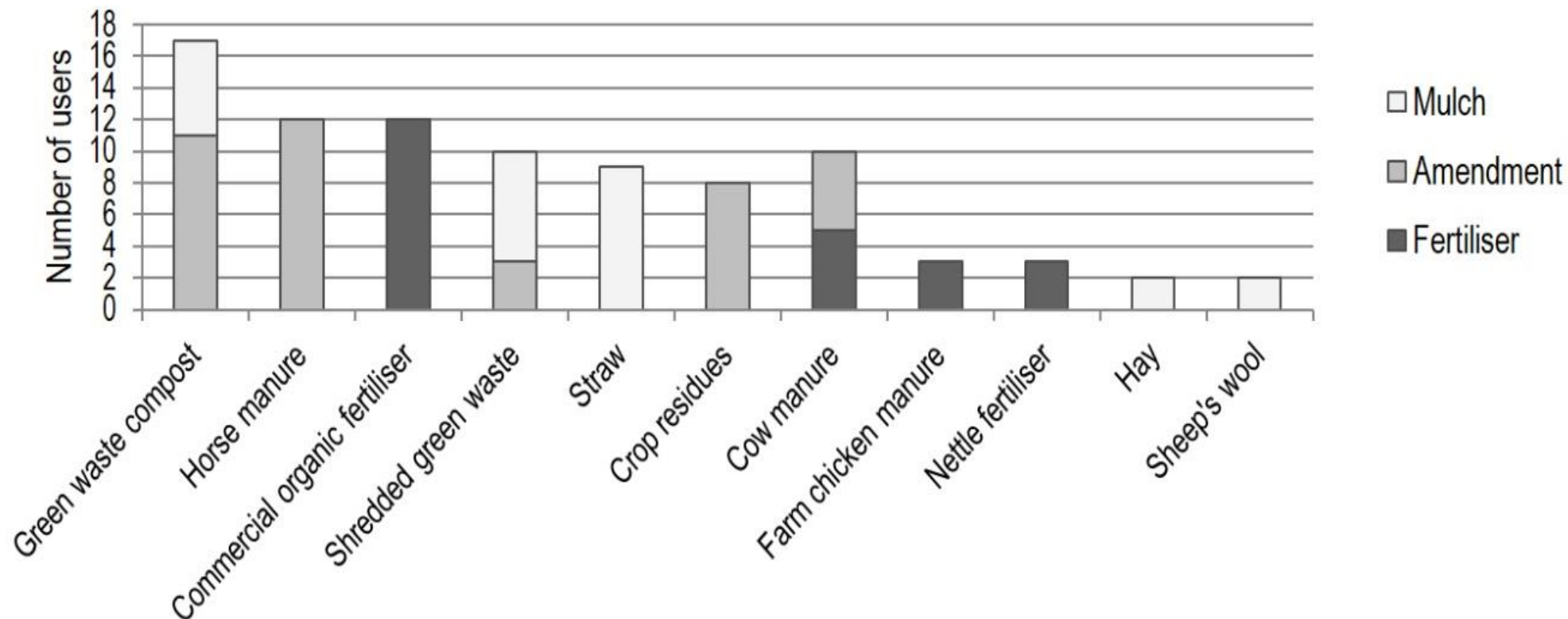
**Innocuité :**  
Très peu d'ETM, d'HAP et de pathogènes si normé.  
Etre prudent avec les composts non normés.

**280 kg/t de MO**

**Humus à terme :**  
120 kg/t

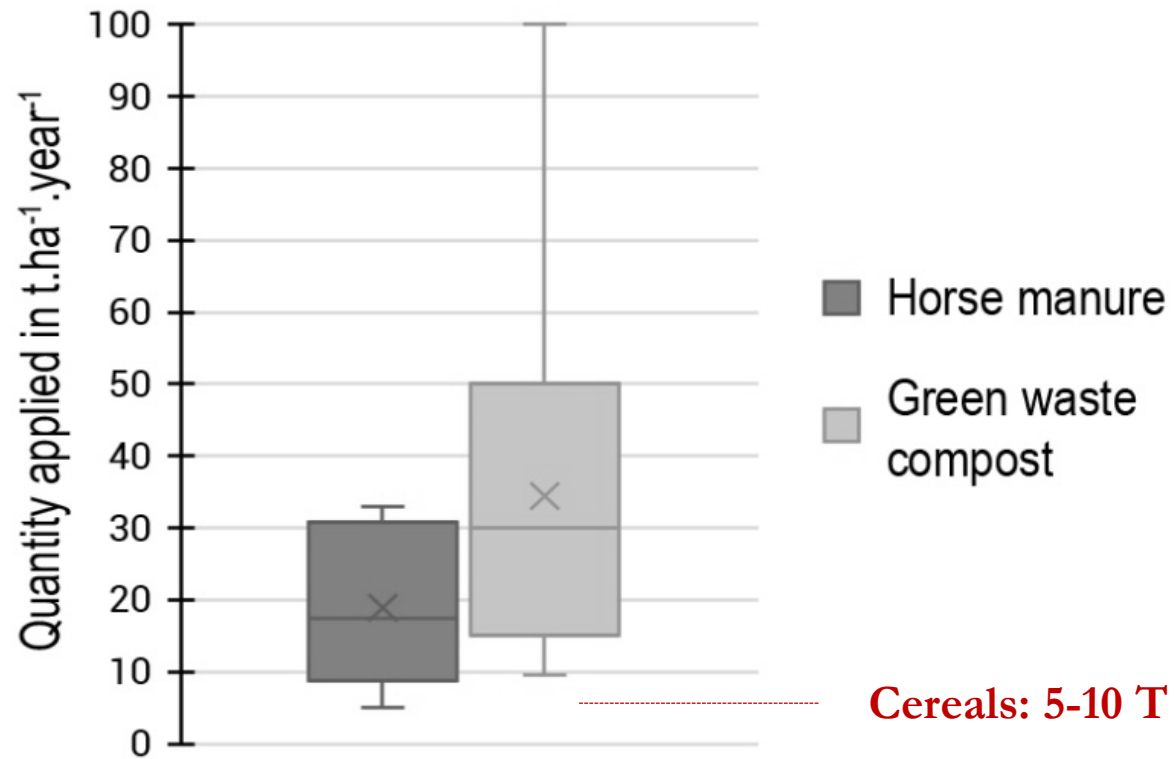


# Most farmers already use organic fertilisers and amendments



70% use commercial fertilizers  
(organic or mineral)

## Variable but high quantities of OW used



# Drivers to use OW

Offsetting nutrient export

Increase organic matter

Soil porosity

Global fertility

**But also:** mulching

Keeping humidity

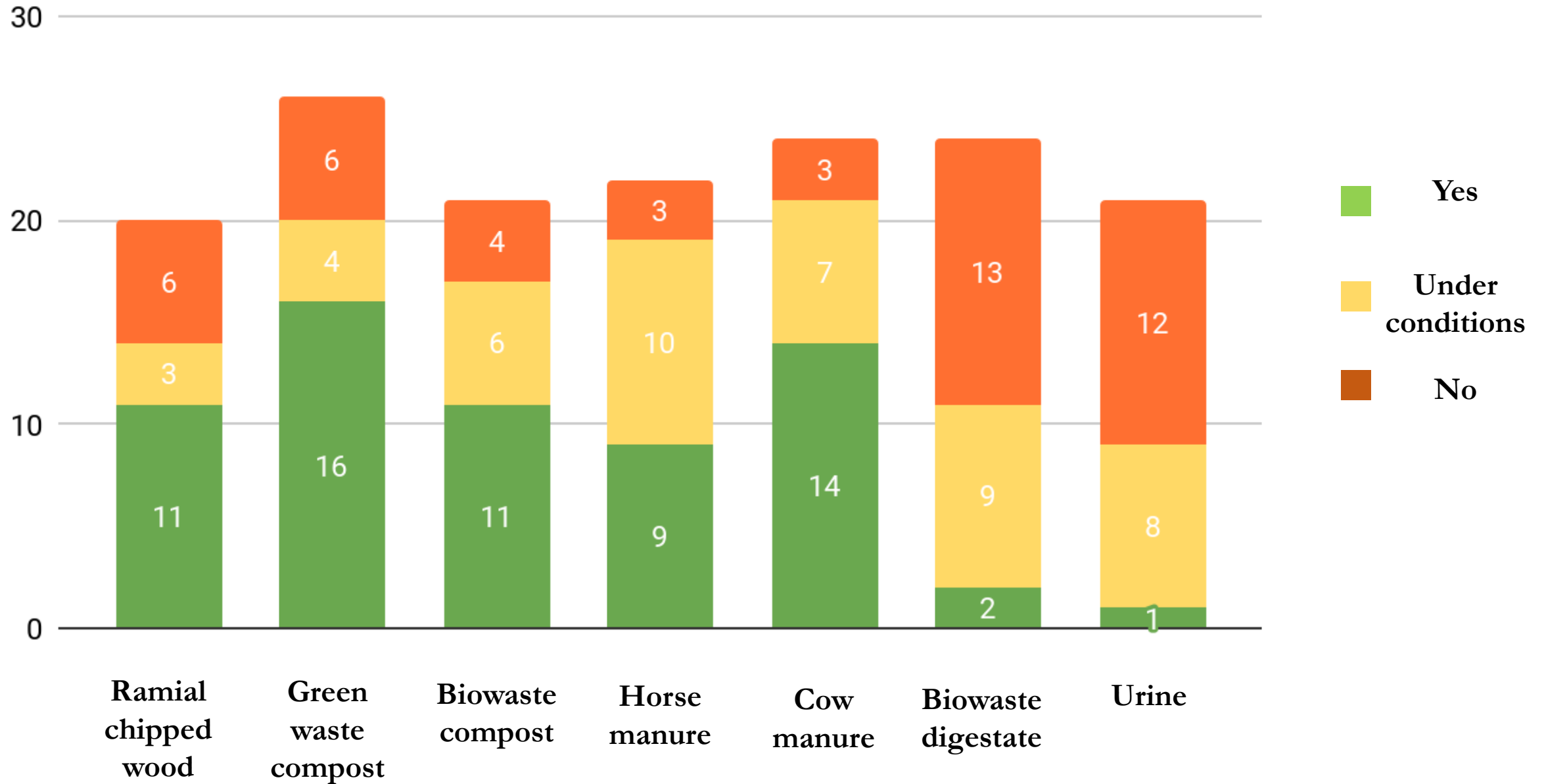
Reducing weed

Alternative to plastic





## Will you be ready to use these OW ?



# Barriers to use OW

For compost: plastic

**For urine and digestate:**

Regulations (urine forbidden for organic farming; digestate forbidden for vegetables)

Aspects

Smell

Liquid form

Investment (storing and spreading)

Industrial image

Perception by neighbours and consumers  
(hormone or pharmaceutical residues..)

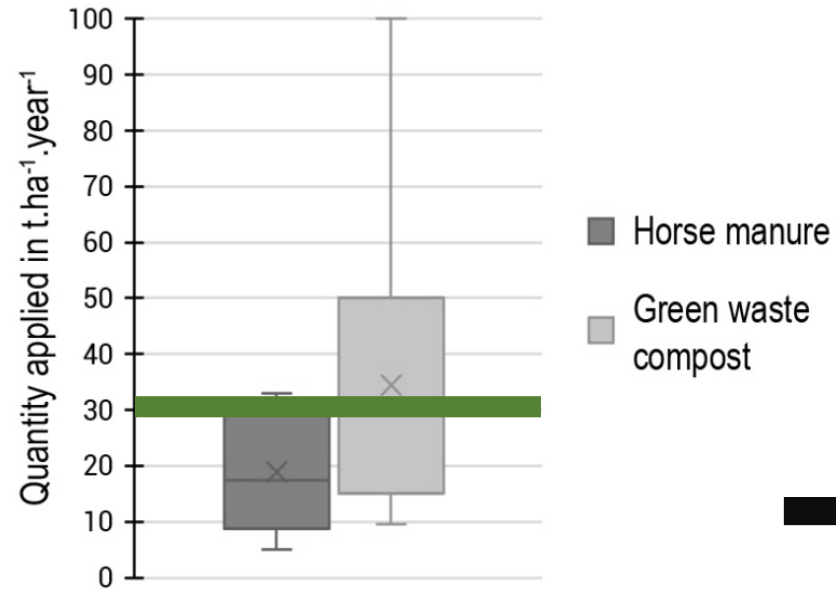


**A need to overcome these barriers**

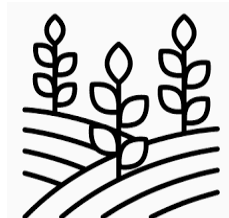
# Perspectives: extrapolation of required acreage to recycle all composted organic wastes from private households in Paris-city region



900 000 T of OW  
== 300 000 T  
of compost per year



30 T / ha / yr



10 000 ha of Fruit and  
Vegetables required  
(currently 5000ha)

High potential contribution of  
Fruit and Vegetable to recycle  
OW at city-region level

# Developing relevant collect, use and distribution systems for urban OW



Citizen behaviour  
(quality, plastic)

Composting vs  
methanisation

Logistics

Large-scale vs  
small-scale

Economic models



# Thank you for your attention

